AN ETHICO-LEGAL ANALYSIS OF BENEFIT SHARING FOR HEALTH RESEARCH IN SOUTH AFRICA

by

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DECLARATION

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I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.

_____ **27 June 2023**

SIGNATURE **DATE**

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ABSTRACT

Health care research conducted in LMICs, including South Africa, has exploded in the last few decades. Albeit a welcome development, there has emerged the fear of and actual exploitation of host communities. As health care research has become funded by private business and often in North-South collaborations at academic institutions by foreign government agencies, potential exploitation is a reality, as there is usually an unfair distribution of risks and benefits among the parties involved. While it stands true that the overall goal of health research is to attain global health and wellness for all, health research using HBMs cannot occur in an exploitative environment that takes unfair advantage of people's vulnerabilities. Benefit sharing should be a tool for guarding against exploitation and not the basis of a strategy to address urgent global health needs or resolve inherent issues of global distributive justice.

In an attempt to identify the best benefit sharing model for health research for South Africa from an ethico-legal view perspective, one that tempers (not diminishes) commercial interests, redresses economic imbalance and gives research participants fairer and more active roles in influencing the sharing of benefits, this thesis canvasses the current legal framework for benefit sharing in South Africa, as well as other jurisdictions.

The thesis concludes that a benefit sharing framework, based on the charitable trust model, could be adopted in South Africa. This framework recognises the various stakeholders that are part of a research project at different levels of society, whilst simultaneously acknowledging that it is possible to have different types of fair benefits at each stakeholder level, even in the absence of a final, tangible benefit. In terms of this model, academic medical centres and/or research institutions would cease to be brokers of the HBMs and instead become custodians of the samples. This proposed framework will promote compliance with data privacy and informed consent requirements without compromising its value as an information-rich HBM supplier. It would also make the first recipients of HBMs the trustees of the HBMs instead of brokers having legal fiduciary duties over the HBMs, whilst permitting the use of the donated HBMs in a way that benefits the donor as a beneficiary of the trust. Moreover, this trust model will be in the ideal position to create and facilitate continuous communication channels with the donor community, researchers, policymakers and teaching hospitals for fostering trust in health research and its benefits for all stakeholders involved.

CHAPTER 1

BACKGROUND TO THE STUDY, PROBLEM STATEMENT, OBJECTIVES AND FRAMEWORK

1.1 Background, literature review and problem statement

Healthcare research conducted in developing countries, including South Africa has exploded in the last decade.[1] According to the Global Forum for Health Research:[2]

> Every year only a 10th of global expenditure is spent on health research and development by the public and private sectors to address issues that affect the poorest 90% of the world's population. This is what is called the 10/90 gap.[3]

Although this 'research explosion' is a welcome occurrence for neglected diseases, it has brought a unique set of problems, mostly regarding the fear of and actual exploitation of host communities.[4] It is assumed that this research is safeguarded by ethical guidelines and regulations that provide guidance to sponsors and researchers. However, it has become increasingly difficult to protect communities and individuals when healthcare research becomes a privately funded business.[5] It also emerged from North–South healthcare research collaborations based at academic institutions that most of the donors are foreign government agencies.[6] Thus, there are indeed genuine concerns about potential exploitation through the unfair distribution of risks and benefits among the parties involved.

It is against this background that the concept of benefit sharing arises. In reality, research in lower- and middle-income (LMIC) countries is frequently conducted in communities that have often been exploited by higher-income countries (HICs). This is particularly evident

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[1]Lairumbi *et al* "Forms of benefit sharing in global health research undertaken in resource poor settings: a qualitative study of stakeholders' views in Kenya" 2012 *Philosophy, Ethics, and Humanities' in medicine* 7(1):1–8.

[2]Global Forum for Health Research. The 10/90 report on health research 2000.Geneva: Switzerlandhttps://apps.who.int/iris/bitstream/handle/10665/66474/Global_Forum_for_Health_Research_eng.pdf?sequence=1&isAllowed=y (Date of use: 20 September 2023).

[3]Global Forum for Health Research. The 10/90 report on health research 2000. Geneva. Switzerland

[4]Evans N.G., Hills K and Levine A.C. "How should the WHO Guide Access and Benefit Sharing during Infectious Disease Outbreaks" *2020 AMA Journal of Ethics* 22(1):28-35.

[5]Staunton C and Moodley K "Data mining and biological sample exportation from South Africa: A new wave of bioexploitation under the guise of clinical care" 2016 *South African Medical Journal* 106(2):136-138.

[6]H3A Consortium, Rotimi C, Abayomi A *et al* "Research capacity. Enabling the genomic revolution in Africa" 2014 *Science* 344 (6190):1346–1348.

in South Africa, a country that has not yet recovered from the ravages of Apartheid, during which communities were marginalised into distinct geographical locales along racial lines.[7] Adding to South Africas' socio-economic challenges, are the fact that inequality amongst its citizens remains the highest in the world; electricity supply shortages are prevalent; structural challenges have increased; and that the country has shown persistent weak growth, not to mention that the ravages of the COVID-19 pandemic are still evident.[8] Inequitable and/or neocolonial practices and power imbalances are evident in many ongoing research collaborations between the global North and global South.[9] There is growing consensus by researchers in the global North, as they become sensitised to global inequities in research practices generally, that research sponsors from industrialised countries are obliged to provide benefits to the research participants and host communities whenever they conduct research in LMICs.[10]

The mapping of the entire human genome brought about a staggering increase in human genomic and biobank research globally, including in South Africa. This includes extensive North–South collaborations in these genomic studies with a growing number of studies being conducted on the African continent.[11] Genomic research and biobanking depend on vast amounts of samples and data from diverse populations. African genetic diversity is unmatched,[12] making African samples and data highly valuable. Problems arise when there is a unidirectional flow of these samples and data out of Africa, particularly from South Africa, without proper legal protection to prevent or at least minimise the exploitation of vulnerable communities.[13]

[7]Christopher AJ "Apartheid and urban segregation levels in South Africa" 1990 *Urban Studies* 3:421–440.
[8]https://thedocs.worldbank.org/en/doc/bae48ff2fefc5a869546775b3f010735-0500062021/related/mpo-zaf.pdf (Date of use: 23 September 2023).
[9]Bedeker A, Nichols M, Allie T et al., "A framework for the promotion of ethical benefit sharing in health research" 2022 BMJ Global Health 7(2): e008096.
[10]Bedeker A, Nichols M, Allie T et al., "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7(2): e008096.
[11]Guardasani D, Carstensen T, Tekola-Ayele F *et al* "The African Genome Variation Project shapes medical genetics in Africa" 2015 *Nature* 517:327–32.
[12]Tishkoff SA, Reed FA, Friedlaender FR *et al* "The genetic structure and history of Africans and African Americans" 2009 *Science* 324:1035–44.
[13]Moodley K and Singh S "'It's all about trust': reflections of researchers on the complexity and controversy surrounding biobanking in South Africa" 2016 BMC *Medical Ethics* 17(1):1–9.

Considering the historical injustices brought about by a lack of integrity, cultural insensitivities and unfair collaborations,[14] it is not surprising that the exploitation of local researchers and populations has ensued.[15] Hence, the concept of benefit sharing must be taken very seriously. An international collaborative genetic research project undertaken with villagers living in Anhui, an extremely impoverished province in China,[16] is an appropriate example of such exploitation. This study was conducted between 1995 and 2000. It involved a collaboration between researchers from Harvard University in the United States, local research institutes and the Chinese government.[17] At the time, the Chinese government was aggressively driving the agenda for international research collaborations in order to robustly advance the science and technology fields in the country. This eagerness by Chinese academics, institutions and government led to scientific research institutions and researchers from HICs taking advantage of the host communities and local researchers.[18]

In 2002, a report surfaced, indicating that a Chinese-American scientist, with the assistance of a grant from the National Institutes of Health (NIH) and biopharmaceutical companies, had been collecting blood samples from the villagers in the Anhui province for five years.[19] The blood samples were transferred to a US biobank for research into several diseases. Pharmaceutical companies invested a considerable amount of money in this research as they envisaged a lucrative market in drugs as the end product.[20] The

[14]Moodley K and Singh S "'It's all about trust': reflections of researchers on the complexity and controversy surrounding biobanking in South Africa" 2016 BMC *Medical Ethics* 17(1):1–9.

[15]O'Daniel J and Haga SB "Public perspectives on returning genetics and genomics research results" 2011 Public *Health Genomics* 14(6):346–55.

[16]Zhao Y and Zhang W "An international collaborative genetic research project conducted in China" in Schroeder D, Cook Lucas J *et al* (eds) *Ethics dumping, case studies from North-South research collaborations* (Springer International Publishing: Cham, 2018) 71–80.

[17]Zhao Y and Zhang W "An international collaborative genetic research project conducted in China" in Schroeder D, Cook Lucas J *et al* (eds) *Ethics dumping, case studies from North-South research collaborations* (Springer International Publishing: Cham, 2018) 71–80.

[18]Zhao Y and Zhang W "An international collaborative genetic research project conducted in China" in Schroeder D, Cook Lucas J *et al* (eds) *Ethics Dumping, Case Studies from North-South research collaborations* (Springer International Publishing: Cham, 2018) 71–80.

[19]Pomfret J and Nelson D "An isolated region's genetic mother lode" 2000-12-20 Washington Post https://www.washingtonpost.com/archive/politics/2000/12/20/an-isolated-regions-genetic-mother-lode/4280cf1f-ae9c-42f7-b132-9ddbe26e502f/ (Date of use: 27 May 2023).

[20]Pomfret J and Nelson D "An isolated region's genetic mother lode" 2000-12-20 Washington Post https://www.washingtonpost.com/archive/politics/2000/12/20/an-isolated-regions-genetic-mother-lode/4280cf1f-ae9c-42f7-b132-9ddbe26e502f/ (Date of use: 27 May 2023).

participant communities did not know why their blood samples were being collected.[21] These genetic harvest experiments were later found to have compromised research ethics, for example, the recruitment of 16 686 participant farmers instead of 2000 in the approved protocol of an asthma study, the drastic reduction of monetary compensation to the farmers and the use of bronchodilators that were different from the approved ones in the protocol.[22] No ethics committee had sanctioned the collection of the participants' blood. There was also no prior informed consent by the participants and very little benefit to them. Harvard University benefitted significantly from monies received from the NIH and pharmaceutical companies. In March 2002, the US Department of Health and Human Services found that Harvard University's genetic project in China had violated multiple regulations in ethics, participant safety and supervision and management.[23] The Chinese government, via the ministries concerned, tried to limit and halt exportation of the genetic samples. However, it was too late, as Harvard University already had an enormous amount of Chinese DNA samples in its biobank.

Lower- and middle-income countries often do not realise their full potential in genetic research due to lack of specific expertise and technical and manufacturing capabilities. Nevertheless, it is critical that given the history of exploitation in LMICs, the law cannot be silent about genetic research and biobanks. South African law has not addressed issues around such research until very recently, when the National Material Transfer Agreement (MTA) was gazetted in July 2018.[24] The issue around access to genomic resources and benefit sharing are relevant in modern-day South Africa because of an increasing number of research collaborations between South African universities and universities in HICs countries, as well as their respective government departments.[25] These collaborations have given rise to complex ethical, legal and social issues.[26]

[21]Pomfret J and Nelson D "An isolated region's genetic mother lode" 2000-12-20 Washington Post https://www.washingtonpost.com/archive/politics/2000/12/20/an-isolated-regions-genetic-mother-lode/4280cf1f-ae9c-42f7-b132-9ddbe26e502f/ (Date of use: 27 May 2023).

[22]Xiong L and Wang Y "Harvard University's genetic research in China is illegal" 2002 *Outlook Weekly* 15:48–50.

[23]Xiong L, Wang Y "Harvard University's genetic research in China is illegal" 2002 *Outlook Weekly* 15:48–50.

[24]South Africa National Health Act No. 61 of 2003 Material Transfer Agreement for Human Biological Materials. Government Gazette No. 41781 2018.

[25]Moodley K and Singh S "'It's all about trust': reflections of researchers on the complexity and controversy surrounding biobanking in South Africa" 2016 *BMC Medical Ethics* 17(1):1–9.

[26]Dhai A, Mahomed S and Sanne I "Biobank and human health research: balancing progress and protections" 2015 *S Afr J BL* 9:55–59.

Human biobanks can store and distribute human biological materials (HBMs) in perpetuity. These materials include DNA, RNA, blastomeres, polar bodies and human tissues[27] and their associated data for the purposes of health research, which has precipitated ethico-legal issues such as, but not limited to, benefit sharing that arises from the primary and secondary use of such samples.[28]

It is not improbable to imagine that due to rapid developments in biotechnology, large amounts of tissue samples may be leaving South Africa and the region for health research conducted in HICs in a questionable manner.[29] The reason for this is that biobanks are guided by a very flexible legal framework. The Department of Health (DoH) Ethics in Health Research Guidelines,[30] and the recently gazetted Material Transfer Agreement (MTA) for Human Biological Materials,[31] attempt to legally regulate biobanks in South Africa. However, because the tissue bank regulations promulgated in terms of Chapter 8 of the National Health Act (NHA) refer to tissue banks but do not mention biobanks, researchers and clinicians tend to rely on the regulations for tissue banks, which, in turn, have been deemed inadequate.[32]

Considering South Africa's background of exploitation in research and indeed, that of many other African countries, it is imperative that these governments establish a template for benefit sharing agreements that outlines how benefits from health research should be shared, with whom and through what mechanisms. These benefit sharing agreements should be based on justice in an attempt to remedy past exploitation and uphold public interest. In addition, these agreements must also respect local traditions.[33]

[27]Republic of South Africa. Regulations relating to the use of Human Biological Materials No R177 Pretoria. Government Gazette 2012: Section 1.
[28]Mahomed S and Sanne I "Benefit sharing in health research" 2015 *S Afr J BL* 8(Suppl 1):60–64.
[29]Mahomed S, Behrens K, Slabbert M and Sanne I "Managing human tissue transfer across national boundaries-an approach from an institution in South Africa" 2016 *Dev World Bioeth* 16:39–35.
[30]Department of Health, South Africa. Ethics in Health Research: Principles, Processes and Structures. 2nd ed Pretoria DoH.
[31]Republic of South Africa. Regulations relating to the use of Human Biological Materials No R177 Pretoria Government Gazette, 2012: Section 1.
[32]Labuschaigne M and Mahomed S "Regulatory challenges relating to tissue banks in South Africa: impediment to accessing healthcare" 2019 *S Afr Bioethics Law* 12(1):27–31.
[33]Slabbert MN "The legal regulation of access and benefit sharing of human genetic resources in South Africa" 2011 *74 Tydskrif vir Hedendaagse Romeins-Hollandse Reg* 605–632.

Simm's claims that a universal consensus exists between researchers, public health officials amd research participants. regarding the need to share benefits arising from collaborative research.[34] The problem arises when defining a 'fair benefit' since it is unclear what the nature of such benefits should be. Would it be to address justice at the micro level (relating to individuals participating in the research) or justice at the macro level (meaning for the common good of all)[35], or at both levels? It is also important to question when, how and with whom benefits should be shared in a study, as well as what such a benefit would entail.

Dauda and Dierickx[36] maintain that the concept of benefit sharing is almost always accompanied by controversies and contradictions associated with what the notion entails and what its definition is. Benefit sharing in health research is the process or act of sharing the benefits that derive from research fairly and equitably.[37] Benefit sharing is considered to be one of the important benchmarks for ethical research in LMICs.[38] Most people in these countries live in poverty and have no access to decent medical care. It seems fair that any research conducted should improve the quality of their healthcare.

Therefore, questions arise about exactly what a benefit is and how it should be justified, especially in a world where research is meant to be altruistic in nature and for the advantage of all humankind. In the field of human genetic research, for example, the Human Genome Organisation's Committee on Ethics, Law and Society defines a benefit as follows:

> A benefit is a good that contributes to the well-being of an individual and/or a given community (e.g., by region, tribe, disease-group …). Benefits transcend avoidance of harm (non-maleficence) insofar as they promote the welfare of an individual and/or of a community. Thus, a benefit is not identical with *(sic)* profit in the

[34]Simm K "Benefit–sharing: an inquiry regarding the meaning and limits of the concept in human genetic research*"* 2005 *Genomics, Society and Policy* 1(2):29–40.
[35]Simm K "Benefit–sharing: an inquiry regarding the meaning and limits of the concept in human genetic research*"* 2005 *Genomics, Society and Policy* 1(2):29–40.
[36]Dauda B and Dierickx K "Benefit sharing: an exploration on the contextual discourse of a changing concept" 2013 *BMC Medical Ethics* 14(1):1–8.
[37]Mohamed S and Sanne I "Benefit sharing in health research" 2015 *S Afr J BL* 8:60–64.
[38]Emmanuel EJ, Wendler D, Killen J and Grady C "What makes clinical research in developing countries ethical? The benchmarks of ethical research" 2004 *J Infect Dis* 189:930–937.

monetary or economic sense. Determining a benefit depends on needs, values, priorities and cultural expectations.[39]

The exact nature and specification of a benefit is a very controversial topic.[40] According to Dauda and Joffe,[41] two models of benefit sharing dominate the ethical debate. These models have their roots in the concept of the common heritage of humankind that was used to guide the idea of benefit sharing when it first surfaced. With the generalised view that the underlying purpose of all studies is the creation of generalizable knowledge,[42] Dauda and Dierickx explain that the idea of the common heritage of humankind evolved from the doctrine of *res communis*, which directs that resources obtained from common heritage territories are not meant to be monopolised, possessed or owned by individuals, communities or the state. The use of such resources has to be subjected to the rights and interests of all humankind.[43] This idea promotes equal sharing of all resources, suggesting that benefit sharing should be used to address the differences between HICs and LMICs.[44] The authors note that a benefit need not be tangible but could be in another form, such as technology transfer, which would result in capacity building.

Treaties that emphasise benefit sharing in the context of the common heritage of humankind include the United Nations Convention on Law of the Sea (UNCLOS)[45] and the International Undertaking on Plant Genetic Resources (IUPGR).[46] The UNCLOS treaty strives for sharing benefits from the seas, regardless of whether the country is landlocked or coastal. It also urges other countries to consider the vulnerability of developing countries in accessing benefits in Article 140, Paragraph 1, 13.[47] The IUPGR stipulates that the genetic resource of plants should be for the use of all humankind to benefit present and

[39]HUGO Ethics Committee: https://www.eubios.info/BENSHARE.htm#:~:text=The%20HUGO%20Ethics%20Committee%20recommends,the%20issue%20of%20benefit%2Dsharing (Date of use: 22 May 2023).
[40]Dauda B and Dierickx K "Benefit sharing: an exploration on the contextual discourse of a changing concept" 2013 *BMC Medical Ethics* 14(1):1–8.
[41]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing World Bioeth* 18:165–170.
[42]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing World Bioeth* 18:165–170.
[43]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing World Bioeth* 18:165–170.
[44]Basler K *The concept of the common heritage of mankind in international law* (Published by Nijhoff Publishers 1998).
[45]UN Convention on the Law of the Sea publication https://www.imo.org/en/ourwork/legal/pages/unitednationsconventiononthelawofthesea.aspx#:~:text=The%20United%20Nations%20Convention%20on,the%20oceans%20and%20their%20resources (Date of use: 23 May 2023).
[46]FAO: *International undertaking on Plant and Genetic Resources* Rome: Electronic Publishing 1983:10.
[47]United Nations: *United Nations Convention on the Law of the Sea* Montego Bay: United Nations Publication 1982:71.

future generations.[48] The proposal stated in the IUPGR, coupled with increasing cases of bioprospecting and concern from developing countries regarding the exploitation of indigenous genetic resources without fair and just compensation, render this benefit sharing model problematic to implement and it also allows for the adoption of sovereign rights to biodiversity.[49]

This leaves two benefit sharing models: The first model is rooted in reciprocity and is known as the reasonable availability model. This model argues that research benefits for host communities must emerge from the research findings[50]. The model is endorsed by the Council for International Organisations of Medical Sciences (CIOMS).[51] It is argued that in this model, communities involved in clinical research are susceptible to exploitation and need guarantees that they will benefit from the research. Critics of the model argue that this model is restricted to tangible products only, which, in itself, is a form of exploitation.[52]

The second, the fair benefit model, is similar to the reasonable availability model but differs in that it argues that there are more ways than just tangible benefits for sponsors to meet their benefit obligations.[53] Furthermore, the fair benefit model asserts that the host communities should be allowed to determine the fairness of the benefits that are to be provided. This fairness model is typically exemplified by the Majengo sex workers case study in Kenya. The research involved the Majengo Observational Cohort Study (MOCS) and started in the late 1980s in the Majengo slum in Nairobi. Funded by the Canadian government and the Public Health of Nairobi City council, it was thought the sex workers could aid in the development of a vaccine against HIV.[54] A clinic was set up to provide basic outpatient medical care to female sex workers. This clinic also served as a research facility for collaborative research in HIV vaccine development as it was discovered that some of these sex workers had developed immunity to HIV, despite long-term exposure to

[48]FAO: *International undertaking on plant and genetic resources* Rome: FAO Electronic Publishing 1983:10.
[49]Dauda D and Dierickx K "Benefit sharing: an exploration on the contextual discourse of a changing concept" 2013 *BMC Medical Ethics* 14(1):1-8.
[50]Participants in the 2001 Conference on Ethical Aspects of Research in Developing Countries "Moral standards for research in developing countries: from reasonable availability to fair benefits" 2004 *Hastings Cent rep* 34:17–27.
[51]CIOMS in collaboration with the World Health Organisation "International Ethical Guidelines for Biomedical Research involving Human Subjects" 2016 Geneva.
[52]Wolitz R, Emanuel EJ and Shah S "Rethinking the responsiveness requirements for international research" 2009 *Lancet* 2374: 847–49.
[53]Wolitz R, Emanuel EJ and Shah S "Rethinking the responsiveness requirements for international research" 2009 *Lancet* 2374: 847–49.
[54]Andada P and Cook Lucas J HIV/AIDS Research Case. A Report for GenBenefit, 2007 https://www.uclan.ac.uk/genbenefit (Date of use: 23 May 2023).

HIV. Blood, cervical, vaginal and saliva samples were drawn from the women with their consent and used to study the epidemiology and immunology of HIV. In 2005, national guidelines for the research and development of HIV/AIDS vaccines were developed in specific response to this case in Kenya.[55] The guidelines provide for the "fair and equitable sharing of benefits" arising from research results attained from biological materials.[56] In this regard, the fair benefit was that the socioeconomically disadvantaged sex workers received access to healthcare and free antiretrovirals while the researchers obtained sound research results.

It is worth noting that the proponents of the fair benefit model also argue that the benefits to the community and/or participant should be directly proportional to the risks associated with the research.[57] In their opinion, those who contribute more and bear more risks should receive more of the benefits from the collaboration.[58]

Benefit sharing has been established as a principle of international law in the context of non-human genetic resources via the Nagoya protocol,[59] a supplementary agreement to the Convention on Biological Diversity (CBD).[60] South Africa is a signatory to the Nagoya protocol, which is a binding agreement regarding the benefit sharing of non-human genetic resources.[61] The guidelines relating to human genetic material represent a shift away from a concept that is protected and bound by law, towards non-binding regulations, as documented in the UNESCO Declaration on the Human Genome and Human Rights (1997),[62] the HUGO Ethics Committee Statement on Benefit Sharing (2000),[63] the

[55]Kenyan Ministry of Health. Kenyan Ministry of Health National Guidelines 2005 https://www.globalgiving.org/pfil/1108/projdoc.pdf (Date of use: 23 May 2023).
[56]Ministry of Health. National Kenyan Guidelines for Research and Development of HIV/AIDS Vaccines Appendix 5: Biological Material Transfer Agreement. Kenya: Ministry of Health 2005 http://www.globalgiving.org/pfil/1108/projdoc.pdf (Date of use: 23 May 2023).
[57]Lie RK "Fair benefit approach revisited*"* 2010 *Hastings Cent rep.* 40(4):3–3.
[58]Lie RK "fair benefit approach revisited" 2010 Hastings Cent rep. 40(4): 3-3.
[59]Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilisation. Secretariat of the Convention of Biological Diversity, 2011 http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf (Date of use: 23 May 2023).
[60]The Convention on Biological Diversity 1992. http://www.cbd.int/abs/about (Date of use: 23 May 2023).
[61]Mohamed S and Sanne I "Benefit sharing in health research" 2015 *S Afr J BL* 8:60–64.
[62]UNESCO: *UNESCO Declaration on Human Genome and Human Rights*. Paris, 1997:1.
[63]HUGO Ethics Committee: HUGO urges genetic benefit sharing. *Community Ganet* 2000, 3:88–92.

UNESCO Declaration on Bioethics and Human Rights (2005)[64] and the Helsinki Declaration of the World Medical Association (WMA, 2013).[65]

Dauda and Dierickx[66] suggest that benefit sharing in international health research should be formulated into a legal framework. The legal framework is necessary because benefit sharing is mostly ignored even though it is known to be an ethically sound concept. This recommendation is sound and resonates with the aims and objectives of this study, which seeks to recommend an ethico-legal framework for benefit sharing in South African health research. Health research in South Africa is governed by the National Health Act (NHA).[67] The National Health Research Ethics Council (NHREC) was formed under the mandate of section 69(1) of the NHA and is tasked with the responsibility of determining guidelines for the functioning of health research ethics committees.[68]

It is worth noting that although the NHA was proclaimed in 2003, certain Regulations in Chapter 8 of the NHA which deal with human biological materials (for example, blood, blood products, tissue and gametes) were only enacted in 2012.[69] Furthermore, the government of South Africa only gazetted a national template of a Material Transfer Agreement of Human Biological Materials (HBMs) under the NHA in 2018.[70]

South African law does not legally enforce policies, ethical guidelines and local documents, although these may point to instances of professional misconduct in the context of health research, which may have legal consequences. Only legislation, regulations promulgated in terms of legislation, and judicial precedent are legally binding and enforceable. However, under current legal literature, ethical guidelines are considered 'soft law' or customary international law in the case of international ethical guidelines.[71] International instruments may be referred to when local laws are unforthcoming, but a judge is not obliged to

[64]UNESCO Declaration on Bioethics and Human Rights https://en.unesco.org/about-us/legal-affairs/universal-declaration-bioethics-and-human-rights#:~:text=and%20human%20rights-,1.,interest%20of%20science%20or%20society (Date of use: 23 May 2023).

[65]World Medical Association Declaration of Helsinki - Ethical Principles for Medical Research Involving Human Subjects. Accessed August 28 2019. http://www.wma.net/policies-post/wma-declaration of helsinki-ethical-principles-for-medical-research-involving-human-subjects/. (Date of use: 23 May 2023).

[66]Dauda B and Dierickx K "Benefit sharing: an exploration on the contextual discourse of a changing concept" 2013 *BMC Medical Ethics* 14(1):1–8.

[67]61 of 2003, Chapter 9.

[68]Section 72(6)(a) of the NHA.

[69]Proclamation No 11 *Government Gazette* 35081 of 27 February 2012.

[70]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.

[71]Andanda P, Schroeder D, Chaturvedi S *et al* "Legal frameworks for benefit sharing: from biodiversity to human genomics" in Schroeder D and Lucas JC (eds*) Benefit sharing: from biodiversity to human genetics* (New York Springer 2013) 333–364.

consider these guidelines, despite the fact that these guidelines may have persuasive force.[72] The National Department of Health's Ethics in Health Research Guidelines of 2004[73] derive from section 72 of the NHA, mandating the NHREC to table ethical guidelines concerning health research involving human participants.[74] These ethical guidelines have been endorsed in the 2014 Regulations relating to Research with Human Participants.[75] The guidelines were revised in 2015, regulation 2(a) of the revised 2015 guidelines state that there are the minimum benchmark or standard to be followed in health research involving human participants, thereby affording the 2015 guidelines legal standing.

The South African Biodiversity Act 10 of 2004[76] is the only piece of legislation that regulates benefit sharing agreements in terms of illustrating and defining what the agreement should contain.[77] The Act undeniably *excludes genetic material of human origin* in section 80(2)(b)(i); rather, it applies to bioprospecting and research which involve indigenous biological resources. Chapter 6 of the Act prohibits the removal of any biological material and any bioprospecting from and in South Africa unless a permit has been granted.[78] For this permit to be granted, section 82 of the Act requires the applicant to conclude a material transfer agreement (MTA) with the stakeholder (which could be a person, organ of state, community or indigenous community). The MTA should regulate the provision of or access to the biological resources and a benefit sharing agreement that provides for sharing by the stakeholder in any future benefits that may be derived from the relevant bioprospecting.[79] The sitting minister responsible for national environmental management must approve the benefit sharing arrangement. Chapter 6 of the Act also allows the issuing authority to mediate negotiations between the applicant and stakeholder fairly and equitably.

Similarly, the South African national MTA relating to the use and transfer of human biological material (HBM) provides in section 7 that the sharing of benefits should be

[72]The Constitution of South Africa 1996, Section 39 (1).
[73]South Africa. National Health Act No 61.2003, Section 72.
[74]South Africa. National Health Act No 61.
[75]South Africa. Regulations relating to Research with Human Participants. GR No R719 in Government 3800 of 19 September 2014.
[76]Republic of South Africa. Biodiversity Act 10. Government Gazette 2004.
[77]Republic of South Africa. Biodiversity Act 10. Government Gazette 2004.
[78]Section 81.
[79]Section 82(2).

discussed and negotiated solely between the provider and recipient before the materials are transferred to the recipient.

The Biodiversity Act, although excluding human biological material, provides a template for a legally binding benefit sharing arrangement that could be adjusted or developed for research involving Human Biological Materials, be it tissue, genetic material or clinical research. A legally binding benefit arrangement would instil a culture of trust and provide for fair and equitable research collaborations.

The concept of benefit sharing has received considerable attention in South Africa with regard to *non-human* genetic material. This is best exemplified by the San Code of Ethics, which defines how researchers are to interact when dealing with the San peoples of Southern Africa,[80] following the San Hoodia case of 2003.[81] In the absence of legal guidelines, the San people were able to benefit from the South African Research Council for Scientific and Industrial Research (CSIR) and the pharmaceutical company Phytopharm in the form of royalties, for their patenting of the *Hoodia gordonii* plant, a plant that is indigenous to the home of the San people, the Kalahari Desert, and which has been used by the San people to curb hunger for centuries.[82]

There is a paucity of legal literature in South Africa relating to benefit sharing agreements involving human biological material in general. In 2010, following a publication by *Nature*[83] regarding the sequencing of the genomes of Archbishop Desmond Tutu and a few Khoisan individuals, Slabbert and Pepper[84] commented on the troubling nature of the lack of legally binding benefit sharing frameworks in South Africa and the concept of genomic sovereignty.

The regulation of access to and benefit sharing of human genetic resources in South Africa was also examined in a 2011 paper. This paper concluded that despite an enormous number of genomic studies occurring in South Africa, there is an absence, both

[80]Chennelis R and Steenkamp A "International genomics research involving the San people" in Schroeder D, Cook Lucas J *et al* (eds) *Ethics dumping, case studies from North-South research collaborations* (Springer International Publishing 2018).

[81]Chennels R and Steenkamp A "International genomics research involving the San people*"* in Schroeder D, Cook Lucas J *et al* (eds) *Ethics dumping, case studies from North-South research collaborations* (Springer International Publishing 2018).

[82]The San people and the Hoodia plant available at: https://gfbr.global/wp-content/uploads/2015/09/Fifth_Casestudy4.pdf (Date of use: 26 May 2023).

[83]*Nature* 2010 463–857.

[84]Slabbert MN and Pepper MS "'A room of our own?' Legal lacunae regarding genomic sovereignty in South Africa" 2011 *73 Tydskrif vir Hedendaagse Romeins-Hollandse Reg* 432–50.

internationally and locally, of a clear regulatory framework that guides these studies in drawing up benefit sharing arrangements that are agreeable to all parties in research regarding human genetic material. [85]

In 2015, Mahomed and Sanne[86] debated the requirement of benefit sharing in the context of genetic research. Citing the Majengo and the San Hoodia cases, they concluded that these two cases could be cited as examples of successful benefit sharing arrangements that could be used to form a template for legally binding benefit sharing arrangements. As recently as 2013, Sathar,[87] Dhai *et al* conducted a retrospective study regarding compliance with national and international guidelines involving the use, collection, storage, transfer and benefit sharing of HBM in collaborative research between South Africa and HICs. When reviewing the records of one South African institution's research ethics committee specifically, the authors found many instances of HBMs leaving South African borders, without the legally required export permits and MTAs, to international destinations. This paper recommended that benefit sharing in collaborative research using HBMs is best addressed through MTAs, which have been a legal requirement for any collaborative research project in South Africa since July 2018.

Moodley and Singh[88] recently cautioned on the risks of research participants' lack of trust, in the context of biobanking in South Africa, and that the absence of a clear legal framework and national legislation governing simple processes from sample collection to sample export are seriously impinging on the biobanking revolution.

Earlier in 2014, Chennells[89] emphasised the need for equitable access to human biological resources in developing countries, which includes ensuring that benefit sharing in genomic research is implemented to prevent exploitation in resource-poor countries.

[85]Slabbert MN "The legal regulation of access and benefit sharing of human genetic resources in South Africa" 2011 74 *Tydskrif vir Hedendaagse Romeins-Hollandse Reg* 605–632.
[86]Mahomed S and Sanne I "Benefit sharing in health research" 2015 *S Afr J BL* 8 (2)(1):60–64.
[87]Sathar A, Dhai A and Van der Linde S "Collaborative international research: ethical and regulatory issues pertaining to human biological materials at a South African institutional research ethics committee" 2014 *Dev World Bioethics* Vol 14:150–157.
[88]Moodley K and Singh S "'It's all about trust': reflections of researchers on the complexity and controversy surrounding biobanking in South Africa" 2016 *BMC Medical Ethics* 17(1):1–9.
[89]Chennells R *Equitable access to human biological resources in developing countries: benefit sharing without undue inducement* (PhD Lancashire University 2014).

One year later, Moodley's study[90] provided recommendations on how the governance of biobanks in South Africa could be developed to engender trust in potential donors and communities in the context of international collaborative health research. She explained that in health research, good governance is rarely employed as it is in the corporate world.[91]

The backdrop of this study, as well as the review of South African scholarly literature on benefit sharing discussed above, point to a problem statement that requires critical legal analysis, namely that there is currently no prescribed benefit sharing model or template in South African health research. This dire shortcoming, as contextualised above, provides the context for the rationale of this study, which is discussed next.

1.2 Rationale of the study

Considering the legislative vacuum outlined above, namely the absence of a legally prescribed template or guidelines directing benefit sharing agreements relating to human biological material, as well as the related challenge of unmonitored movements in the region and internationally of HBMs, tissue samples and valuable research data during health research collaborations, the need for a legal response in this regard is clear and justified. In a world where inequitable North–South research collaborations have become commonplace, the risk exists that South Africa, as one of the most genetically diverse populations, may not be able to benefit from its genetic diversity—at the expense of its people.

The global explosion of genomic research and biobanking makes it imperative that the law and ethics are not silent on protecting South African researchers and research participants from the risks of exploitation and unfair research agreements. There is a definite need to provide the best possible legal and ethical framework and national legislation to govern simple processes, from sample collection to sample export.

1.3 Research question

In South Africa, there are currently no national guidelines governing benefit sharing in health research, specifically genetic health research, which is the focus of this study. The research question of this study explores which benefit sharing model would best regulate

[90]Moodley K *Legitimacy, trust and governance in biobanking in South Africa* (MBA UCT 2015).
[90]Moodley K *Legitimacy, trust and governance in biobanking in South Africa* (MBA UCT 2015).
[91]Moodley K *Legitimacy, trust and governance in biobanking in South Africa* (MBA UCT 2015).

benefit sharing in the context of South African health research from an ethico-legal perspective. In addition, by exploring this question, this study hopes to provide a robust foundation for further research questions relating to benefit sharing in the context of health research.

1.4 Aims and objectives

This study aims to critically analyse the current ethical and legal guidelines in South Africa that have a bearing on benefit sharing or benefit sharing agreements in health research, intending to recommend an ethico-legally justified benefit sharing model for South Africa. This model should serve to protect South African institutions, researchers, research participants or research subjects and communities while, at the same time, promoting collaborative research.

The above-mentioned aim of the study requires consideration of the following objectives related to the aim of the study:

(1) To determine what is meant by a 'benefit' and 'sharing' in the context of health research generally, as well as ethical and legal norms and values that inform the concept of benefit sharing.
(2) To explore the concept of benefit sharing from a historical perspective.
(3) To address the controversial question of the ownership of human biological materials in South Africa.
(4) To critically review and evaluate current ethical and legal frameworks that have a bearing on benefit sharing in health research in South Africa.
(5) To critically analyse existing regional and international benefit sharing agreements to identify guiding principles for the best possible benefit sharing agreement.

1.5 Expected outcomes of the study

It is morally just that those who participate in research should benefit from the process. Benefit sharing is important in research programmes as it ensures equitable and just distribution of the benefits that arise from research.[92]The primary intended outcome of this study is the development of a model benefit sharing agreement for South African researchers that would protect South African research and researchers, as well as the South African population, without hindering research collaborations in health research.

[92]Bedeker A, Nichols M and Allie T "A framework for the promotion of ethical benefit sharing in health research" 2022 BMJ Global Health 7:e008096.

This is morally imperative and it is a matter of justice if it is agreed that all who participate in research should benefit from the said research and correct the exploitation in colloborative health research between LMIC and HIC. The generic model benefit sharing agreement would be presented to the National Department of Health for use towards national policy guidelines and regulations. The benefit sharing model should highlight commercial interests, but at the same time, redress economic imbalances and accomplish the fair and equal distribution of profits (if any) and burdens of the collaborating researchers.

1.6 Methodology

This research involves legal and normative research analysis. The research was library- and desktop-based and no human participants were involved. The study is informed by relevant laws and ethical literature relevant to the topic.

This study also adopts a qualitative research approach, drawing on national and international legislation and documents to guide the research. The study entails a critical analysis of relevant legislation, case law, journals, articles, books and internet sources.

1.7 Limitations of the study

Ethico-legal literature on benefit sharing is limited and may impose a limitation. However, as stated elsewhere in this proposal, the study aims to provide a theoretical foundation for further research on the topic of benefit sharing, which should ideally be followed by an empirical study in future.

1.8 Chapter outline

The ethico-legal analysis of benefit sharing in health research is a complex topic requiring a careful reading of relevant legal and ethical sources. The following section details the outlay of the chapters in the thesis:

Chapter 1 details the background to the research problem, the problem statement, a literature review of the topic, the research question(s), the methodology, as well as possible limitations.

Chapter 2 introduces the history and concept of benefit sharing. It attempts to best define benefits and the ethics around benefit sharing. The chapter also explains benefit sharing models in detail and the arguments in favour of and against these models.

Chapter 3 explores the ethico-legal framework relevant to benefit sharing in South Africa in different sectors of health research. The emphasis is on biobanks and genomic research benefit sharing arrangements, including an analysis of the concept of the ownership of genetic material.

Chapter 4 examines the legal framework of benefit sharing models in the United Kingdom, Australia and Uganda. These are analysed to discern the most pertinent guiding principles that may inform the development of a benefit sharing model for South Africa.

Chapter 5 analyses the key elements of benefit sharing arrangements and presents a template of a benefit sharing agreement for health research in South Africa.

Chapter 6 concludes the thesis and discusses the relevant findings and specific recommendations for local researchers entering into collaborative research with either private companies, foreign institutions and/or foreign government institutions.

CHAPTER 2
BENEFIT SHARING IN HEALTH RESEARCH

2.1 Introduction

The concept of benefit sharing around the involvement of human biological resources is a relatively new phrase that was developed and coined in the past three decades.[93] Despite the many years of discussion and debate it is also a highly unresolved topic,[94] because of intern alia there exists a belief that health research should be altruistic in nature and because the concept of benefit sharing defeats altruism,[95] and what the concept entails and whats its definition is.[96]

The past few decades have witnessed an explosion of research in the context of healthcare research being conducted in developing countries including, but not limited to, South Africa.[97] Not surprisingly, there has also been a proliferation of biobanks.[98] Reports reflect that since 2015, the global tissue engineering market accounted for an estimated USD23.3 billion, with projections that it would exceed USD 94.7 billion in the succeeding years.[99] The mapping of the entire human genome brought about a monumental increase in human genomic and biobank research globally, including in South Africa. African genetic diversity is unmatched,[100] making African human biological samples and data highly valuable. This fact precipitated a rise in North–South collaborations in genomic studies, with a growing number of these studies conducted on the African continent.[101] Molecular diagnostics have

[93]Dauda B and Dierickx K "Benefit sharing: an exploration on the contextual discourse of a changing concept" 2013 *BMC Medical Ethics* 14(1):1–8.
[94] Schroder D "Benefit sharing: it's time for a definition" 2007 *J Med Ethics* 33:205–209.
[95]Berg K "The ethics of benefit sharing" 2001 *Clin Genet* 59:240–243.
[96]Dauda B and Dierickx K "Benefit sharing: an exploration on the contextual discourse of a changing concept" 2013 *BMC Medical Ethics* 14(1):1–8.
[97]Lairumbi G, Parker M, Fitzpatrick R and English M "Forms of benefit sharing in global health research undertaken in resource poor settings: a qualitative study of stakeholders' views in Kenya" 2012 *Philosophy, Ethics, and Humanities in medicine* 7(1):1–8.
[98]Schroeder D and Lucas J "Benefit sharing: from biodiversity to human genetics—an introduction" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 1–8.
[99]Hexa Research. Tissue engineering market analysis, market size, application analysis, regional outlook, competitive strategies and forecasts, 2016–2024. Felton, CA: Hexa Research, 2015 http//www.hexaresearch.com/research-report/tissue-engineering-market (Date of use: 23 May 2023).
[100]Tishkoff SA, Reed FA, Friedlaender FR *et al* "The genetic structure and history of Africans and African Americans" 2009 *Science* 324:1035–44.
[101]Guardasani D, Carstensen T, Tekola-Ayele F *et al* "The African genome variation project shapes medical genetics in Africa" 2015 *Nature* 517:327–32.

emerged as the leading industry within the molecular diagnostic industry.[102] Market research[103] estimated the value for these products in 2020 at US$ 9.2 billion, projected to reach US$23.9 billion by 2030.

This health research explosion in lower- and middle-income countries (LMICs), combined with the global commercialisation of health research products, sometimes via privately funded business,[104] point to the need to address the issue of benefit sharing in the context of human biological resources.

Research conducted in LMICs is often undertaken in communities that have historically been exposed to exploitation by high-income countries (HICs).[105] As outlined in chapter one, because of the lack of a clear legislative framework governing benefit sharing in health research in South Africa, the question that arises is what should happen when donors provide their human biological resources for health research purposes. Unlike the clear and legally binding obligations of the Convention on Biological Diversity (CBD) that provide a legal framework governing the access and use of a natural resource of one sovereign country by another party,[106] no legally binding international instrument exists to guide the use of human biological materials in health research.[107]

In truth, without legal obligations and protective measures, exploitation will occur. Historical injustices in such cases are often brought about by a lack of integrity, cultural insensitivity and unfair collaborations.[108] The concept of benefit sharing in the context of research in LMICs must be taken seriously because not taking LMIC seriously is an injustice, which would perpetuate exploitation.[109]

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[102]Chaturvedi S, Crager S *et al* "Promoting an inclusive approach to benefit sharing: expanding the scope of the CBD" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 153–178.

[103]Molecular Diagnostic market Allied Market Research https://www.alliedmarketresearch.com/molecular-diagnostics-market (Date of use:20 September 2023)

[104]Simm K "Benefit sharing: an inquiry regarding the meaning and limits of the concept in human genetic research" 2005 *Genomics, Society and Policy* 1(2):29–40.

[105]Evans NG,Hills K and Levine AC "How should WHO Guide Access and Benefit Sharing During Infectious Disease Outbreaks" 2020 *AMA Journal of Ethics* 22(1): 28-35.

[106]Mahomed S and Sanne I "Benefit sharing in health research" 2015 *S Afr J BL* 8(Suppl 1):60–64.

[107]Schroder D "Benefit sharing: it's time for a definition" 2007 *J Med Ethics* 33:205–209.

[108]Moodley K and Singh S "'It's all about trust': reflections of researchers on the complexity and controversy surrounding biobanking in South Africa" 2016 *BMC Medical Ethics* 17(1):1–9.

[109]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 9–32.

This chapter addresses the concept of benefit sharing from a historical perspective by outlining the international and national positions on benefit sharing agreements in health research. The chapter will also propose a definition of what a benefit entails and will critically discuss different models of benefit sharing.

2.1.1 Defining benefit

Benefit sharing is considered to be one of the most important factors in conducting ethical research in LMICs.[110] The concept of benefit sharing, though necessary, is often accompanied by controversies and contradictions about what it truly comprises and how it should be defined.[111] It is evident that a benefit does not need to be monetary-based, as suggested by the Nagoya Protocol[112] on Benefit Sharing of Non-human Genetic Resources.

The Nagoya Protocol suggests that benefits could take the following forms (CBD 2010a, annex):[113]

> 1. Monetary benefits may include, but are not limited to:
>
> (a) Access fees/fee per sample collected or otherwise acquired;
>
> (b) Up-front payments;
>
> (c) Milestone payments;
>
> (d) Payment of royalties;
>
> (e) Licence fees in case of commercialisation,;
>
> (f) Special fees to be paid to trust funds supporting conservation and sustainable use of biodiversity;
>
> (g) Salaries and preferential terms where mutually agreed;
>
> (h) Research funding;
>
> (i) Joint ventures; and
>
> (j) Joint ownership of relevant intellectual property rights.

[110]Emmanuel EJ, Wendler D, Killen J and Grady C "What makes clinical research in developing countries ethical? The benchmarks of ethical research" 2004 *J Infect Dis* 189:930–937.

[111]Dauda B and Dierickx K "Benefit sharing: an exploration on the contextual discourse of a changing concept" 2013 *BMC Medical Ethics* 14(1)1–8.

[112]Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilisation. Secretariat of the Convention of Biological Diversity, 2011 http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf (Date of use: 26 May 2023).

[113]Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilisation. Secretariat of the Convention of Biological Diversity, 2011 http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf (Date of use: 26 May 2023).

2. Non-monetary benefits may include, but are not be limited to:

(a) Sharing of research and development results;

(b) Collaboration, cooperation and contribution in scientific research and development programmes, particularly biotechnological research activities, where possible in the Party providing genetic resources;

(c) Participation in product development;

(d) Collaboration, cooperation and contribution in education and training;

(e) Admittance to *ex situ* facilities of genetic resources and databases;

(f) Transfer to the provider of the genetic resources of knowledge and technology under fair and most favourable terms, including on concessional and preferential terms where agreed, in particular, knowledge and technology that make use of genetic resources, including biotechnology, or that are relevant to the conservation and sustainable utilisation of biological diversity;

(g) Strengthening capacities for technology transfer;

(h) Institutional capacity-building;

(i) Human and material resources to strengthen the capacities for the administration and enforcement of access regulations;

(j) Training related to genetic resources with the full participation of countries providing genetic resources, and where possible, in such countries;

(k) Access to scientific information relevant to conservation and [the] sustainable use of biological diversity, including biological inventories and taxonomic studies;

(l) Contributions to the local economy;

(m) Research directed towards priority needs, such as health and food security, taking into account domestic uses of genetic resources in the Party providing genetic resources;

(n) Institutional and professional relationships that can arise from an access and benefit sharing agreement and subsequent collaborative activities;

(o) Food and livelihood security benefits;

(p) Social recognition; and

(q) Joint ownership of relevant intellectual property rights. [114]

This list serves the purpose of showing that benefits need not always be monetary compensation.

[114] Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 9–32.

Reference is often made to a fair benefit in the context of the use of human biological material. What constitutes a fair benefit in human health research? Schroeder[115] suggests that the problem of realising what this actually means is related to the lack of a proper definition of the concept. The phrase is used in various fields where it is prominent, often with a definition that suits the concept as used in that context.[116]

As there is no uniform definition of a benefit, a comparative analysis of some definitions may offer some guidance.

The Nagoya Protocol[117] defines benefit sharing as:

> Benefits arising from the utilization of genetic resources as well as subsequent applications and commercialization shall be shared in a fair and equitable way with the Party providing such resources that is the country of origin of such resources or a Party that has acquired the genetic resources in accordance with the Convention. Such sharing shall be upon mutually agreed terms.[118]

The HUGO's Committee on Ethics, Law and Society define a benefit regarding human genetic resources as follows:

> A benefit is a good that contributes to the well-being of an individual and/or a given community (e.g. by region, tribe, disease-group. […] Benefits transcend avoidance of harm (non-maleficence) in so far as they promote the welfare of an individual and/or of a community. Thus, a benefit is not identical with profit in the monetary or economic sense. Determining a benefit depends on needs, values, priorities and cultural expectations.[119]

In the framework of the access and use of genetic resources in terms of the CBD, benefit sharing is defined as:

[115]Schroeder D "Benefit sharing: it's time for a definition" 2006 *J Med Ethics* 205–209.

[116]Dauda B and Dierickx K "Benefit sharing: an exploration on the contextual discourse of a changing concept" 2013 *BMC Medical Ethics* 14(1):1–8.

[117]Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilisation. Secretariat of the Convention of Biological Diversity 2011 http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf (Date of use: 23 May 2023).

[118]CBD 2010a, Article 5.1.

[119]HUGO Ethics Committee Statement on benefit sharing https://www.eubios.info/BENSHARE.htm#:~:text=The%20HUGO%20Ethics%20Committee%20recommends,the%20issue%20of%20benefit%2Dsharing. (Date of use : 23 May 2023).

> The action of giving a portion of advantages or profits derived from the use of genetic resources or traditional knowledge to resource providers in order to achieve justice in exchange.[120]

It is worth noting that the HUGO definitation of benefit sharing is contradictory to the definition in the CBD. The HUGO definition provides that a benefit need not be profit in a monetary or economic sense because its definition of benefit is based on the argument that we all share a common genetic heritage, which supports the notion that all health research should be altruistic in nature. However, the HUGO committee goes on to recommend that profit-making entities dedicate a percentage of their annual net profit to healthcare infrastructure and/or humanitarian efforts.[121] In a world where health research is increasingly profit-driven by the private sector,[122] it is imperative that we apply background conditions and their impact on what is beneficial in a given location to address social injustices.[123] It is fair that all benefits monetary or otherwise should be considered a fair benefits in LMICs.

In the context of international human health research, the definition of benefit sharing in the framework of access and use of genetic resources in the CBD is useful. The said definition focuses on resource providers and by extension, may apply to research participants providing biological samples, including denoting what benefits resource providers (and communities) in developing countries ought to receive in compensation for their participation in research.[124] This is in accordance with updated CIOMS research ethics guidelines[125] that call for sponsors and researchers from HICs to negotiate research priorities and benefits with LMIC hosts.

In South Africa, the concept of benefit is mentioned in several documents, such as the Department of Health's Ethics in Health Research Guidelines, which do not define what a

[120]Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilisation. Secretariat of the Convention of Biological Diversity, 2011 http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf (Date of use: 23 may 2023).
[121]HUGO Ethics Committee Statement on benefit sharing https://www.eubios.info/BENSHARE.htm#:~:text=The%20HUGO%20Ethics%20Committee%20recommends,the%20issue%20of%20benefit%2Dsharing. (Date of use : 23 May 2023).
[122] Moodley K, Blockman M, Hawkridge AJ et al., "Hard choices: Ethical Challenges in phase 1 of COVID-19 vaccine roll-out in South Africa" 2021 *SAMJ* 111(6):554-558
[123]Macpherson CC "Research ethics guidelines and moral obligations to developing countries: Capacity-building and benefits" 2019 *Bioethics* 33:389-385.
[124]Simm K "Benefit sharing: a look at the history of an ethics concern" 2007 *Nat Rev Genet* 8(7):496–496.
[125]CIOMS and WHO International Ethical Guidelines for Health-related Research Involving Humans https://cioms.ch/wp-content/uploads/2017/01/WEB-CIOMS-EthicalGuidelines.pdf. (Date of use: 23 May 2023).

"benefit' is, but state that the ratio of risk of harm to likelihood of harm shoud be favourable;[126] the HPSCA Guidelines of 2016 which also do not define what a 'benefit' entails but recommend that there should be a 'balance of burdens and benefits of research within different population groups';[127] and the Material Transfer Agreement of 2018.[128] The national MTA defines a benefit as:

> Amongst others, the sharing of information; use of research results; royalties; acknowledgement of the Provider as the source of the Materials; publication rights; transfer of technology or Materials; and capacity building.

The definition of a benefit in the MTA provides a guide to what may be negotiated as a benefit between researchers and research partipants.The MTA further defines benefit sharing in section 2(3) as "the process or act of sharing in the benefits that derive from the Project in a manner that is fair and equitable."[129] However, no specifics are given on how the arrangement should be structured and how benefit sharing should occur, leaving the researcher and the research participant in a difficult legal conundrum.

2.2 A brief overview of the recognition of benefit sharing globally and in South Africa

2.2.1 Background

Conventionally, benefit sharing has been regarded as a technical term used in human and non-human genetic resource research between the providers of the resource and those providing compensation and reward for the resource.[130]

The concept of benefit sharing has gained prominence in international law, research ethics and political philosophy in the last three decades .[131] Simms argues that there is a universal

[126]Department of Health Ethics in Health Research https://www.health.gov.za/wp-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 26 May 2023).
[127]HPCSA General Ethical Guidelines for Health Researchers https://www.hpcsa.co.za/Uploads/professional_practice/ethics/Booklet_13_Gen_Ethical_Guidelines_for_Health_Researchers.pdf (Date of use: 26 May 2023).
[128]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.
[129]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.
[130]Schroeder D and Lassen-Diaz C "Sharing the benefits of genetic resources: from biodiversity to human genetics" 2006 *Dev World Bioethics* 6: 135–143.
[131]Macpherson CC "Research ethics guidelines and moral obligations to developing countries: Capacity-building and benefits" 2019 *Bioethics* 33:389-395.

consensus regarding the need to share the benefits of collaborative research.[132] Benefit sharing in health research should be the process or act of sharing the benefits that derive from the research fairly and equitably.[133] To reiterate, questions arise as to what exactly constitutes a benefit and with whom it should be shared.

When benefit sharing is considered in terms of justice, a fair benefit would fall under the principle of justice.[134] The principle of justice manifests in many forms. *Justice in exchange* establishes the fairness or equity of transactions[135] and is meant to address the micro level of justice (relating to individuals directly participating in the research).[136] *Distributive justice*, on the other hand, deals with the division of scarce resources between qualifying recipients,[137] which addresses the macro level of justice (for the common good of all).[138]

2.2.2 Benefit sharing relating to *non-human biological resources*

Globally, the idea of benefit sharing emerged from a *distributive justice* notion.[139] Underlying this notion is the concept of the common heritage of humankind, founded upon the concept of *res communis*.[140] This concept directs that resources obtained from common heritage territories are not meant to be monopolised, possessed or owned by individuals, communities or the state, but rather, should all be subjected to the rights and interest of humankind.[141] It is worth noting that this idea, while promoting the equal sharing of all resources to help balance the inequity between HICs and LMICs, seeks to clarify that

[132]Simm K "Benefit sharing: an inquiry regarding the meaning and limits of the concept in human genetic research" 2005 *Genomics, Society and Policy* 1(2):29–40.
[133]Mohamed S and Sanne I "Benefit sharing in health research" 2015 *S Afr J BL* 8:60–64.
[134]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 9–32.
[135]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 9–32.
[136]Simm K "Benefit sharing: an inquiry regarding the meaning and limits of the concept in human genetic research" 2005 *Genomics, Society and Policy* 1(2):29–40.
[137]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue Inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 9–32.
[138]Simm K "Benefit sharing: an inquiry regarding the meaning and limits of the concept in human genetic research" 2005 *Genomics, Society and Policy* 1(2):29–40.
[139]Simm K "Benefit sharing: an inquiry regarding the meaning and limits of the concept in human genetic research" 2005 *Genomics, Society and Policy* 1(2):29–40.
[140]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing World Bioeth* 18:16–70.
[141]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing World Bioeth* 18:165–170.

a benefit need not be tangible but could be in another form, such as technology transfer and capacity building.[142]

International instruments deriving from *res communis* include the United Nations Convention on Law of the Sea (UNCLOS 1982)[143] and the International Undertaking on Plant Genetic Resources (IUPGR 1983), adopted by governments at the Food and Agriculture Organisation (FAO) of the United Nations in 1981.[144] UNCLOS stipulates that all nations should share benefits from the seas. In Article 140, Paragraph 1, 13[145] UNCLOS acknowledges the vulnerability of LMICs in accessing benefits from the sea and urges HICs to be aware of this discrepancy.

The IUPGR seeks to promote the use of plant genetic material to benefit all humankind, including present and future generations.[146] The lack of implementation of this treaty in conjugation increasing cases of biopiracy and concern from developing countries regarding the exploitation and depletion of their indigenous genetic resources without just compensation, this undertaking has, in effect, been rendered defunct.[147]

The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) of 2004 was the first legally binding international agreement focusing on the conservation and sustainable use of plant genetic resources for food and agriculture.[148] The ITPGRFA seeks to promote the conservation of biodiversity while controlling private or sovereign control of plant genetic resources, which is inappropriate for food and agriculture.[149]

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[142]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing World Bioeth* 18:165–170.

[143]UN convention on Law of the Sea https://www.imo.org/en/ourwork/legal/pages/unitednationsconventiononthelawofthesea.aspx#:~:text=The%20United%20Nations%20Convention%20on,the%20oceans%20and%20their%20resources. (Date of use: 23 May 2023).

[144]FAO: *International Undertaking on Plant and Genetic Resources*. Rome: Electronic publishing 1983:10.

[145]UN Convention on Law of the Sea. https://www.imo.org/en/ourwork/legal/pages/unitednationsconventiononthelawofthesea.aspx#:~:text=The%20United%20Nations%20Convention%20on,the%20oceans%20and%20their%20resources. (Date of use: 23 May 2023).

[146]FAO: *International Undertaking on Plant and Genetic Resources*. Rome: Electronic publishing 1983:10.

[147]De Jonge B and Korthals M "Vicissitudes of benefit sharing of crop genetic resources: downstream and upstream" 2006 *Dev World Bioeth* 6: 144–157.

[148]Gerstetter C, Gorlach B, Neumann K and Schaffrin D "The international treaty on plant genetic resources for food and agriculture within the current legal regime complex on plant genetic resources" 2007 *The Journal of World Intellectual Property* 10(3/4): 259–283.

[149]Halewood M and Nnadozie K "Giving priority to the commons: the international treaty on plant genetic resources for food and agriculture" in Tansey G and RajotteT (eds) *The future control of food* (London, Earthscan 2008).

The term benefit sharing was popularised at the Convention on Biological Diversity (CBD) and adopted at the 1992 Earth Summit in Rio de Janeiro, Brazil.[150] This was the first treaty which recognised that although the conservation of biodiversity is a common concern for all humankind, the genetic resources of a nation are sovereign.[151] The parties to this treaty all adopted the 2002 Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization (Bonn Guidelines).[152] These guidelines were to provide signatories with a "transparent framework to facilitate access to genetic resources and ensure fair and equitable sharing of benefits".[153] In a supplementary agreement to the CBD, through the Nagoya Protocol, benefit sharing has been established as a principle of international law in the context of non-human genetic resources.[154] Signatories to the CBD are legally obliged to share the benefits arising from access to biological resources. The resources covered by the CBD include animal, plant, micro-organisms and traditional knowledge.[155]

In the context of the principle of justice, the benefit sharing arrangements in the CBD and the Bonn guidelines rely on a mutually beneficial exchange, dealing with *justice in exchange,* be it of a monetary or non-monetary nature.[156] This entails that the provider of resource and user of the resource should benefit in some way from the research project.

At this juncture, it is necessary to briefly refer to the Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine (known as the Convention of Human Rights and Biomedicine or the Oviedo Convention).[157] This Convention of the Council Europe was open for signature in Oviado

[150]The Convention on Biological Diversity 1992 https://www.un.org/en/observances/biological-diversity-day/convention#:~:text=The%20Convention%20on%20Biological%20Diversity,been%20ratified%20by%20196%20nations (Date of use: 23 May 2023).

[151]Schroeder D and Lassen-Diaz C "Sharing the benefits of genetic resources: from biodiversity to human genetics" 2006 *Dev World Bioethics* 6(3):135–143.

[152]The Convention on Biological Diversity 2002. https://www.cbd.int/doc/publications/cbd-bonn-gdls-en.pdf (Date of use: 23 may 2023).

[153]Schroeder D and Lassen-Diaz C "Sharing the benefits of genetic resources: from biodiversity to human genetics" 2006 *Dev World Bioethics* 6(3): 135–143.

[154]Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilisation. Secretariat of the Convention of Biological Diversity, 2011 http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf (Date of use: 03 June 2020).

[155]Andanda P, Schroeder D, Chaturvedi S, Mengesha E and Hodges T "Legal frameworks for benefit sharing: from biodiversity to human genomic" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 33–64.

[156]Schroeder D and Lassen-Diaz C "Sharing the benefits of genetic resources: from biodiversity to human genetics" 2006 *Dev World Bioethics* 6(3):135–143.

[157]Council of Europe Convention of Oviedo 1997 found at https://rm.coe.int/168007cf98 (Date of use:10 October 2023).

by the member States, the non-member States which have participated in its elaboration and by the European Union, and for accession by other non-member States in 1997.[158] The Convention is the first legally-binding international text designed to preserve human dignity, rights and freedoms, through a series of principles and prohibitions against the misuse of biological and medical advances.[159] Article 21 of the Convention asserts that "[t]he human body and its parts shall not, as such, give rise to financial gain."[160] This Convention, although regarded as one of the most authoritative reference documents on subjects of bioethics,[161] makes no reference to benefit sharing in health research.

2.2.3 Benefit sharing relating to *human biological resources*

The concept of benefit sharing in human health research is less established.[162] Health research participation generally relies on altruism and strives to avoid undue inducement, which, in turn, could lead to the exploitation of vulnerable participants in LMICs.[163] Another reason for caution may be attributed to the concept of ownership of human biological resources.[164] The human body and its parts are classified as *res extra commercium* (that which cannot be commodified).[165] This classification has led to challenges in human tissue health research and the regulation of tissue banks and biobanks.[166]

In addition to the arguments advanced in chapter one above, and also considering the number of recorded exploitation cases in health research globally as exemplified by the avian flu virus samples case in Indonesia,[167] it becomes clear that a legal framework

[158] https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treatynum=164 (Date of use: 10 October 2023)

[159]https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treatynum=164 (Date of use: 10 October 2023).

[160]https://rm.coe.int/168007cf98 (Date of use :10 October 2023).

[161]Petrini C, and Ricciardi W "The Convention on Human Rights and Biomedicine twenty years later: a look at the past and a step towards the futur" 2018 *Annali dell'Istituto Superiore di Sanitā* 1(54)(3):17.

[162]Andanda P, Schroeder D, Chaturvedi S, Mengesha E and Hodges T "Legal frameworks for benefit sharing: from biodiversity to human genomic" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 33–64.

[163]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 9–32.

[164]Mahomed S, Nahrens K, Slabbert M and Sanne I "Managing human tissue transfer across national boundaries—an approach from an institution in South Africa" 2016 *Dev World Bioeth* 16:39–35.

[165]Mahomed S 2018 *An ethico-legal framework for the regulation of biobanks in South Africa* (Bioethics and Health Law PhD 2018 University of the Witwatersrand) Available at: https://wiredspace.wits.ac.za/server/api/core/bitstreams/7b7894ae-6f5a-4fd6-81cf-65e36ff9563e/content (Date of use: 23 May 2023).

[166]Labuschagne M and Mahomed S "Regulatory challenges relating to tissue banks in South Africa: impediments to accessing health care" 2019 *SAJBL* 12(1): 27–31.

[167]Cook Lucas J, Schroeder D, Arnarson G, Andada P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits? Cases from Iceland, Kenya and Indonesia" in Schroeder D and Cook

governing benefit sharing for human biological material must be established. Avian flu (H5N1 influenza type A) became a global pandemic in 2005, with most death casualties occurring in Indonesia.[168]

In the event of a world pandemic, the World Health Organisation (WHO) collects virus samples to distribute to affiliated laboratories for vaccine production purposes. Between 2005 to 2006, the Avian flu re-emerged in Indonesia, whereupon the country provided the WHO with a large number of virus specimens which were distributed to various US laboratories, as well as to Hong Kong University.[169] It emerged in 2006 that the WHO had shared the Indonesian virus samples with independent laboratories and that non-Indonesian researchers were presenting research using Indonesian samples without permission from the Indonesian government. Indonesia hence decided to withhold their virus samples from the WHO[170] which led to a rift developing between the WHO and Indonesia. This situation further deepened when reports confirmed that members of the WHO Global Influenza Surveillance Network (GISN) had shared information with private firms and its own member institutions (all situated in HICs), with the latter filing patent applications using the Indonesia virus samples.[171] It is patently unfair and inequitable for private firms, mostly from HICs, to use virus samples sourced from LMICs for the development of vaccines and subsequently to sell these therapies back to LMICs—often at inflated prices.

After new agreements were concluded by the WHO's Open-Ended Working group of Member States on Pandemic Influenza in 2011,[172] granting LMICs guaranteed access to therapies or royalties originating from their donated virus samples, Indonesia resumed

Lucas J (eds) *Benefit Sharing From Biodiversity to Human Genetics* (Springer Science 2013) 95–127.

[168]Cook Lucas J, Schroeder D, Arnarson G, Andada P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits? Cases from Iceland, Kenya and Indonesia" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 95–127.

[169]Cook Lucas J, Schroeder D, Arnarson G, Andada P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits? Cases from Iceland, Kenya and Indonesia" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 95–127.

[170]Sedyaningsih ER, Isfandari S, Soendoro T and Supari SF "Towards mutual trust, transparency and equity in virus sharing mechanism: the avian influenza case of Indonesia" 2008 *Ann Acad Med Singap* 37(6):482–488.

[171]Cook Lucas J, Schroeder D, Arnarson G, Andada P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits? Cases from Iceland, Kenya and Indonesia" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 95–127.

[172]Cook Lucas J, Schroeder D, Arnarson G, Andada P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits? Cases from Iceland, Kenya and Indonesia" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 95–127.

sharing its virus samples with the WHO.[173] This case demonstrates the negative consequences when a trust relationship is violated, which, in turn, illustrates the need for pre-arranged benefit sharing agreements between the sample providers (in this instance, the Indonesian government and end users of samples). It further underscores the requirement for transparency throughout the research process.

The next section will discuss global instruments, recommendations and guidelines relating to benefit sharing arrangements when human biological materials (HBMs), including human DNA, RNA, blastomeres, polar bodies and human tissues, are used in health research.

2.2.3.1 UNESCO Universal Declaration on Bioethics and Human Rights

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) was founded in November 1945. It is an organ of the United Nations which sets out to promote building a culture of peace, the eradication of poverty, sustainable development and intercultural exchange through education, the sciences, culture, communication and information.[174]

One of the first international pronouncements on benefit sharing and the ethics of genetic research was the Declaration on the Human Genome and Human Rights, issued and adopted by UNESCO in 1997.[175] Unfortunately, as a soft law instrument, the Declaration is not legally binding on member states. South Africa is a signatory to this declaration.

The statements of this declaration appear to be aligned with the idea of sharing benefits based on common property and distributive justice,[176] as may be concluded from Article 12(a), which states that "benefits from advances in biology, genetics and medicine, concerning the human genome, shall be available to all with due regard for the dignity and human rights for*(sic)* each individual." Article 19a(ii) further provides that:

> In the framework of international cooperation with developing countries, States should seek to encourage measures enabling: countries to benefit from the

[173]Cook Lucas J, Schroeder D, Arnarson G, Andada P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits? Cases from Iceland, Kenya and Indonesia" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 95–127.
[174]UNESCO Universal Declaration on Bioethics and Human Rights https://en.unesco.org/about-us/legal-affairs/universal-declaration-bioethics-and-human-rights#:~:text=and%20human%20rights-,1.,interest%20of%20science%20or%20society (Date of use: 23 May 2023).
[175]UNESCO: UNESCO Declaration of Human Genome and Human Rights. Paris: 1997.
[176]UNESCO: UNESCO Declaration of Human Genome and Human Rights. Paris: 1997.

> achievements of scientific and technological research so that their use in favour of economic and social progress can benefit all.[177]

These statements emphasise the idea that the human genome is the common heritage of mankind and must be available to all.[178]

In 2005, the UNESCO General Conference adopted the Universal Declaration on Bioethics and Human Rights.[179] Article 2(f) of the Declaration provides that the Declaration aims to:

> Promote equitable access to medical, scientific and technological developments as well as the greatest possible flow and the rapid sharing of knowledge concerning those developments and the sharing of benefits, with particular attention to the needs of developing countries.[180]

Article 15(1) of the Declaration deals with benefit sharing and provides that:

> Benefits resulting from any scientific research and its applications should be shared with society as a whole and within the international community, in particular with developing countries.[181]

Article 15 (1) furthermore identifies some of the forms that a benefit may take, which are:[182]

a) Special and sustainable assistance to, and acknowledgement of, the persons and groups that have taken part in the research;
b) Access to quality health care;
c) Provision of new diagnostic and therapeutic modalities or products stemming from research;
d) Support for health services;
e) Access to scientific and technological knowledge;
f) Capacity-building facilities for research purposes;
g) Other forms of benefit consistent with the principles set out in this Declaration.

Emphasising equal participation, Article 21(4) of the Declaration advises that:

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[177]UNESCO: UNESCO Declaration of Human Genome and Human Rights. Paris: 1997.
[178]Resnik DB "The human genome common resource but not common heritage" 2005 *ResearchGate* found at: https://www.researchgate.net/publication/255581513_The_human_genome_common_resource_but_not_common_heritage (Date of use: 23 May 2023).
[179]UNESCO Universal Declaration on Bioethics and Human Rights https://en.unesco.org/about-us/legal-affairs/universal-declaration-bioethics-and-human-rights#:~:text=and%20human%20rights-,1.,interest%20of%20science%20or%20society (Date of use: 23 may 2023).
[180]Article 2(f) of UNESCOs' Universal Declaration on Bioethics and Human Rights.
[181]Article 15(1) of UNESCOs' Universal Declaration on Bioethics and Human Rights.
[182]Article 15(1) of UNESCOs' Universal Declaration on Bioethics and Human Rights.

> [W]hen negotiating a research agreement, terms for collaboration and agreement on the benefits of research should be established with equal participation by those party to the negotiation.[183]

As stated above, benefit sharing need not be of a monetary nature. In LICs, the suggestions in Article 15(1) of what a benefit could entail seem reasonable and just. Capacity building, access to healthcare and infrastructure development are welcome benefits for LICs. In addition, participants involved in the research should be able to engage in discussions with researchers regarding benefit sharing arrangements either personally or via community representatives.

2.2.3.2 The Human Genome Organisation: Project Ethics Committee Statement

The mapping of the entire human genome brought about a proliferation of genomic and biobank research globally as well as in South Africa.[184] The Human Genome Organisation (HUGO) was founded in 1988 to coordinate the genomic research that was underway in different nations.[185]

The HUGO Ethics Committee set out to suggest whether and how to distribute profits that may accrue to commercial enterprises, governments or academic institutions based on the participation of particular communities.[186] The Committee published the following six recommendations in their Statement on Benefit Sharing in 2000:[187]

1) All humanity shares in and have *(sic)* access to the benefits of genetic research.
2) Benefits should not be limited to those individuals who participated in the research.
3) Prior discussions with groups or communities on the issue of benefit sharing should take place.
4) Even in the absence of profits, immediate health benefits as determined by community needs should be provided.
5) At a minimum, all research participants should receive information about general research outcomes and an indication of appreciation.

[183]Article 21(4) of UNESCOs' Universal Declaration on Bioethics and Human Rights.
[184]Guardasani D, Carstensen T, Tekola-Ayele FR *et al* "The African genome variation project shapes medical genetics in Africa" 2015 *Nature* 517:327–32.
[185]The Human Genome Organisation http://www.hugo-international.org/history/ (Date of use: 23 May 2023).
[186]HUGO Ethics Committee on benefit sharing https://www.eubios.info/BENSHARE.htm#:~:text=The%20HUGO%20Ethics%20Committee%20recommends,the%20issue%20of%20benefit%2Dsharing (Date of use: 23 May 2023).
[187]HUGO Ethics Committee: HUGO urges genetic benefit sharing 2000 *Clinical Genetics* 58:364-366.

6) Profit-making entities should dedicate a percentage (e.g., 1%–3%) of their annual net profit to healthcare infrastructure and/or to humanitarian efforts.

The HUGO Project Ethics Committee defines a benefit as:

> A good that contributes to the well-being of an individual and/or a given community (e.g., by region, tribe, disease-group …). Benefits transcend avoidance of harm (non-maleficence) insofar as they promote the welfare of an individual and/or of a community. Thus, a benefit is not identical with*(sic)* profit in the monetary or economic sense. Determining a benefit depends on needs, values, priorities and cultural expectations.[188]

Although the HUGO Ethics Committee acknowledges in its statement that "expenditures by private industry for genetic research now exceeds the contributions of governments",[189] it still advises that the benefits of genetic research should be available to all. Benefit sharing should be discussed with the relevant participants in the research and gratitude should be extended to them. Benefits arising from the research should be in the in line with the principle of distributive justice for the good of all. This last statement in my view may find application in the context of genetic research undertaken in HICs where the principle of distributive justice can be implemented for the sharing the benefits of the products of health research.

The HUGO Statement on Benefit Sharing of 2000 calls for private companies involved in health research to observe the "moral obligations" they have in the context of health research.[190] This is sadly not always the case. Private companies are profit-driven and are usually not interested in concluding a benefit sharing arrangement with research participants.[191] The HUGO Statement is predicated on the premise that all humans share a common genetic heritage, an idea that is contradicted by the many gene patents that exist and are held by private entities.[192] The question rightly arises as to how research participants in LMICs may benefit from these patented genes when they are used to create expensive therapies.

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[188]HUGO Ethics Committee https://www.eubios.info/BENSHARE.htm#:~:text=The%20HUGO%20Ethics%20Committee%20recommends,the%20issue%20of%20benefit%2Dsharing (Date of use: 23 May 2023).
[189]HUGO Ethics Committee: HUGO urges genetic benefit sharing 2000 *Clinical Genetics* 58:364–366.
[190]HUGO Ethics Committee: HUGO urges genetic benefit sharing 2000 *Clinical Genetics* 58:364–366.
[191]Moodley K and Kleinsmidt A "Allegations of misuse of African DNA in the UK: Will data protection legislation in South Africa be sufficient to prevent a recurrence?" 2021 *Developing Word Bioeth* 21:125-130.
[192]Resnick DB "The human genome: common resource but not common heritage" 2005 *Frontis* 197-210.

The HUGO Statement advocates for benefit sharing a form of distributive justice, which advocates for the equal sharing of benefits and burdens in society. Regarding collaborative research between LMICs and HICs health researchers,this is not easily achievable as power imbalances are operative and negotiation powers are consequently limited.

2.3.3.3 The Declaration of Helsinki

The World Medical Association was established in 1947 with the intention to discuss and provide guidance on the problems of practising medicine across borders.[193]

The Declaration of Helsinki[194] was first adopted by the World Medical Association (WMA) General Assembly in Helsinki. The declaration aims to provide ethical principles for medical research involving humans and human biological materials and data.[195] Since its adoption in 1964, the Declaration has undergone seven revisions, the latest of which was in 2013.[196]

At the Tokyo 2004 WMA General Assembly, a note of clarification was added to Article 30 of the Declaration, which reads as follows:

> The WMA hereby reaffirms its position that it is necessary during the study planning process to identify post-trial access by study participants to prophylactic, diagnostic and therapeutic procedures identified as beneficial in the study or access to other appropriate care.[197]

[193]The World Medical Association available at: https://www.wma.net/what-we-do/ (Date of use: 26 September 2023).

[194]World Medical Association Declaration of Helsinki - Ethical Principles for Medical Research Involving Human Subjects. https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/ (Date of use: 26 September 2023).

[195]World Medical Association (WMA) Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects https://www.wma.net/wp-content/uploads/2016/11/DoH-Oct2013-JAMA.pdf (Date of use: 26 September 2023).

[196]World Medical Association (WMA) Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects https://www.wma.net/wp-content/uploads/2016/11/DoH-Oct2013-JAMA.pdf (Date of use: 26 September 2023).

[197]World Medical Association (WMA) Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects https://www.wma.net/wp-content/uploads/2016/11/DoH-Oct2013-JAMA.pdf (Date of use: 26 September 2023).

This clarification meant that other benefits, such as “appropriate care” could be afforded to participants, unlike the previous rigidity of post study access to successfully tested drugs.[198]

The present 2013 Declaration directly addresses issues pertaining to benefit sharing. Article 17 and Article 20 of the Declaration relate to aspects of benefit sharing.

Article 19[199] provides that:

> Some groups and individuals are particularly vulnerable and may have an increased likelihood of being wronged or of incurring additional harm. All vulnerable groups and individuals should receive specifically considered protection.[200]

Article 20[201] cautions that medical research with a vulnerable group is justified only when the research cannot be conducted using a non-vulnerable group:

> Medical research with a vulnerable group is only justified if the research is responsive to the health needs or priorities of this group and the research cannot be carried out in a non-vulnerable group. Moreover, the group should stand to benefit from the knowledge, practices or interventions that result from the research.[202]

Article 34[203] of the 2013 version of the Declaration (with regard to post-trial access) states that:

> In advance of a clinical trial, sponsors, researchers and host country governments should make provisions for post -trial access for all participants who still need an intervention dentified as beneficial in the trial.

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[198]Andanda P, Schroeder D, Chaturvedi S, Mengesha E and Hodges T “Legal frameworks for benefit sharing:from biodiversity to human genomic” in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 33–64.

[199]World Medical Association (WMA) Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects https://www.wma.net/wp-content/uploads/2016/11/DoH-Oct2013-JAMA.pdf (Date of use: 23 September 2023).

[200]World Medical Association (WMA) Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects https://www.wma.net/wp-content/uploads/2016/11/DoH-Oct2013-JAMA.pdf (Date of use: 23 September 2023).

[201]World Medical Association (WMA) Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects https://www.wma.net/wp-content/uploads/2016/11/DoH-Oct2013-JAMA.pdf (Date of use: 23 September 2023).

[202]World Medical Association (WMA) Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects https://www.wma.net/wp-content/uploads/2016/11/DoH-Oct2013-JAMA.pdf (Date of use: 23 September 2023).

[203]World Medical Association (WMA) Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects https://www.wma.net/wp-content/uploads/2016/11/DoH-Oct2013-JAMA.pdf (Date of use: 23 September 2023).

2.2.3.4 Council for International Organisations and Medical Sciences (CIOMS)

The international ethical guidelines for biomedical research involving human subjects by the Council for International Organisations of Medical Sciences (CIOMS) was established jointly by the WHO and UNESCO in 1949.[204] This council aims to promote and assist in international activities regarding research in biomedical sciences.[205] The CIOMS International Ethical Guidelines for Biomedical Research Involving Human Subjects were published in 1993 and updated in 2016[206] to include explanations of what constitutes benefits and who is responsible for providing them. The CIOMs call for sponsors and researchers of HICs to negotiate research priorities and benefits with LMIC hosts.[207]

Benefits and benefit sharing feature extensively in the 2016 CIOMS Guidelines. Guideline 1[208] states that "scientific and social value cannot legitimate (sic) subjecting study participants or host communities to mistreatment, or injustice". It also explains that all stakeholders in health research have "a moral obligation that all research is carried out in ways that uphold human rights, and respect, protect, and is fair to research participants and communities."

Regarding research conducted in low-resource settings, Guideline 2[209] states that as part of their obligations, sponsors and researchers should "make every effort together with governments and other stakeholders to make available to the population or community any intervention or product developed as soon as possible and help build research capacity and infrastructure". The Guideline also states that the sponsors and researchers are to "consult with and engage communities in making plans for any intervention or product developed available, including the responsibilities of all relevant stakeholders". Additionally, Guideline 2[210]states that benefits other than those directly associated with

[204]CIOMS and WHO International Ethical Guidelines for Health-related Research Involving Humans https://cioms.ch/wp-content/uploads/2017/01/WEB-CIOMS-EthicalGuidelines.pdf. (Date of use: 23 May 2023).
[205]CIOMS International Ethical Guidelines for Biomedical Research Involving Human Subjects https://www.fhi360.org/sites/all/libraries/webpages/fhi-retc2/Resources/CIOMS02.pdf (Date of use: 23 May 2023).
[206]CIOMS International Ethical Guidelines for Biomedical Research Involving Human Subjects https://www.fhi360.org/sites/all/libraries/webpages/fhi-retc2/Resources/CIOMS02.pdf (Date of use: 23 May 2023).
[207]CIOMS International Ethical Guidelines for Biomedical Research Involving Human Subjects https://www.fhi360.org/sites/all/libraries/webpages/fhi-retc2/Resources/CIOMS02.pdf (Date of use: 23 May 2023).
[208]Guideline 1 of the CIOMS.
[209]Guideline 2 of the CIOMS.
[210]Guideline 2 of the CIOMS.

study participation, such as capacity building and improving health infrastructure, may be made available in resource-poor settings but must be determined after negotiations with the communities or local population.

Guideline 3[211] reiterates that the benefits and burdens of research should be equitably distributed among all stakeholders in the research project.

Guideline 7[212] suggests that researchers, sponsors, health authorities and other stakeholders should engage communities in the early stages of a project and the dissemination of its results.

Guideline 8,[213] while acknowledging that it is the responsibility of national governments to have competent ethical boards to review the feasibility of health-related research in their countries, specifically refers to capacity building being the responsibility of researchers and sponsors who conduct health research in low-resource countries. Capacity building is explained to include but is not limited to:

- Research infrastructure building and strengthening research capacity;
- Strengthening research ethics review and oversight capacity in host communities […];
- Developing technologies appropriate to healthcare and health-related research; educating research and health care personnel and making arrangements to avoid undue displacement of healthcare personnel;
- Engaging with the community from which research participants will be drawn […] arranging for joint publication consistent with recognized authorship requirements and data sharing; and
- Preparing a benefit sharing agreement to distribute eventual economic gains from the research.

In reference to collaborative partnerships, Guideline 8[214] provides that "to overcome power differences to give collaborators equal negotiating strength, steps to promote inclusion, mutual learning and social justice" must be taken.

[211]Guideline 3 of the CIOMS.
[212]Guideline 7 of the CIOMS.
[213]Guideline 8 of the CIOMS.
[214]Guideline 8 of the CIOMS.

Guideline 11[215] refers to biological materials and its related data. The guideline states that "if specimen[s] and data are stored outside the original setting, there should be plans to return all materials to its*(sic)* origins and share results, benefits and burdens with all the stakeholders involved in the research". Regarding governance of the reuse of samples, the guideline implores the custodians of samples to establish to whom any benefits should accrue.

Guideline 13[216] suggests that research participants should be appropriately reimbursed for participating in research and that such compensation could be monetary or non-monetary but should not be exorbitant, to prevent undue inducement.

The Guidelines emphasise the need for benefit sharing and for negotiations to occur on an equal level between HICs and LMICs, which is not always a possibility.

2.2.4 Benefit sharing in South Africa: *non-human biological resources*

As mentioned earlier, the concept of benefit sharing was coined at the Convention on Biological Diversity (CBD) and adopted in 1992 at the Rio de Janeiro Earth Summit in Brazil.[217] Consequently, benefit sharing for non-human biological materials was established as a principle of international law via a supplementary agreement to the CBD, namely the Nagoya protocol.[218] South Africa is a signatory to the Nagoya protocol, a coherent international legal framework regulating the access to and sharing of benefits arising from non-human genetic materials.[219]

2.2.4.1 Biodiversity Act 10 of 2004

The South African Biodiversity Act 10 of 2004[220] is the only binding piece of legislation that regulates benefit sharing agreements in terms of illustrating and defining what the

[215]Guideline 11 of the CIOMS.
[216]Guideline 13 of the CIOMS.
[217]Andanda P, Schroeder D, Chaturvedi S, Mengesha E and Hodges T "Legal frameworks for benefit sharing: from biodiversity to human genomic" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 33–64.
[218]Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilisation. Secretariat of the Convention of Biological Diversity, 2011 http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf (Date of use: 23 May 2023).
[218]The Convention on Biological Diversity 1992 http://www.cbd.int/abs/about (Date of use: 23 May 2023).
[219]Slabbert MN "The legal regulation of access and benefit sharing of human genetic resources in South Africa" 2011 *74 Tydskrif vir Hedendaagse Romeins-Hollandse Reg* 605–632.
[220]Republic of South Africa. Biodiversity Act 10. Government Gazette 2004.

agreement should contain.[221] Section 80(i)[222] in Chapter 6 of the Act defines the mandate of the Act as follows:

a. To regulate bioprospecting involving indigenous biological resources;

b. To regulate the export from the Republic of indigenous biological resources for the purpose of bio-prospecting or any other kind of research;

c. To provide for a fair and equitable sharing by stakeholders in benefits arising from bio-prospecting involving indigenous biological resources.[223]

In terms of Section 80(2)(b)(i) of the Biodiversity Act, genetic material of human origin is clearly excluded[224] and the Act only applies to bioprospecting and research involving indigenous biological resources.

Section 81(1)(b)[225] of the Act prohibits any bioprospecting in SA and the removal of any biological material from SA unless a permit has been granted. Further, for this permit to be granted, section 82 of the Act requires the completion of a material transfer agreement (MTA) between the applicant and stakeholder (which could be a person, organ of the state, community or indigenous community). The MTA should regulate the provision of or access to those biological resources and a benefit sharing agreement that provides for sharing by the stakeholder in any future benefits that may be derived from the relevant bioprospecting.[226] The sitting minister responsible for national environmental management must approve of the benefit sharing arrangement. Chapter 6 of the Act also allows the issuing authority to mediate negotiations between the applicant and stakeholder fairly and equitably.

The concept of benefit sharing concerning non-human genetic resources has received considerable attention in SA, as it provides an example of how two of South Africa's first benefit sharing arrangements were negotiated between a local indigenous community and one of the world's largest publicly trading pharmaceutical companies, in the absence of an enabling domestic legal environment.[227] The San *Hoodia* case led to two benefit sharing arrangements for the San community, the first with a pharmaceutical company and the

[221]Republic of South Africa. Biodiversity Act 10. Government Gazette 2004.
[222]Republic of South Africa. Biodiversity Act 10. Government Gazette 2004.
[223]S 80(1).
[224]S 80 (2).
[225]S 81.
[226]S 82(2).
[227]Mohamed S and Sanne I "Benefit sharing in health research" 2015 *S Afr J BL* 8:60–64.

second with *Hoodia* growers of Southern Africa.[228] The San people are among the oldest communities in Southern Africa. They have considerable traditional knowledge of the *Hoodia gordonii*, a moist plant which is indigenous to the Kalahari Desert that has been used by the San people to curb hunger for centuries.[229]

The Council for Scientific and Industrial Research (CSIR), established by an act of Parliament, is one of the largest research institutes in Africa. After secretly bioprospecting the *Hoodia* plant upon learning of its beneficial traditional uses, the CSIR lodged a patent in 1995 in South Africa (patent number 983170) regarding the active appetite suppressant ingredients in the *Hoodia*.[230] This was followed by international patent applications. In 1996, the CSIR patented a utility patent. No domestic access and benefit sharing laws or frameworks existed at the time.[231] Without establishing any agreements with the San community from whom the traditional knowledge derived, the CSIR further negotiated an exclusive license with Phytopharm, a company specialising in the development of phytomedicines, to transfer its research rights and commercial use of the patent for the development of Hoodia products for profit-making purposes.[232] Phytopharm, in turn, granted licenses to Pfizer and Unilever.[233] This also occurred without the consent of the San community, who were excluded from all of these negotiations. Furthermore, there were no negotiations surrounding the sharing of benefits resulting from the commercialisation of *Hoodia*.[234]

The San people had suffered centuries of marginalisation.[235] To advocate for their rights and access to land, the San leaders formed the Working Group for Indigenous Minorities

[228]Andanda P, Schroeder D, Chaturvedi S, Mengesha E and Hodges T "Legal frameworks for benefit sharing: from biodiversity to human genomic" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 33–64.

[229]The San people and the Hoodia plant available at: https://gfbr.global/wp-content/uploads/2015/09/Fifth_Casestudy4.pdf (Date of use: 26 May 2023).

[230]Andanda P, Schroeder D, Chaturvedi S, Mengesha E and Hodges T "Legal frameworks for benefit sharing: from biodiversity to human genomic" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 33–64.

[231]Andanda P, Schroeder D, Chaturvedi S, Mengesha E and Hodges T "Legal frameworks for benefit sharing: from biodiversity to human genomic" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 33–64.

[232]The San people and the Hoodia plant available at: https://gfbr.global/wp-content/uploads/2015/09/Fifth_Casestudy4.pdf (Date of use: 26 May 2023).

[233]The San people and the Hoodia plant available at: https://gfbr.global/wp-content/uploads/2015/09/Fifth_Casestudy4.pdf (Date of use: 26 May 2023).

[234]The San people and the Hoodia plant available at https://gfbr.global/wp-content/uploads/2015/09/Fifth_Casestudy4.pdf (Date of use: 26 May 2023).

[235]Suzman J "An introduction to the regional assessment of the status of the San in Southern Africa" (Windhoek: Legal Assistance Centre 2001).

in Southern Africa (WIMSA).[236] In 2003, WIMSA, with the help of NGOs and the CSIR, negotiated the first *Hoodia* benefit sharing agreement.[237] The San were to receive six per cent of the CSIR's royalties from licenses and eight per cent of the milestone payments.[238] This benefit sharing agreement received a lot of criticism and the San people never received the windfall they had expected.[239] Although far from perfect, the benefit sharing arrangement supplies a platform for future benefit arrangements that will enable communities to reap the benefits of their traditional knowledge and to share in the commercialisation of products based on such knowledge.[240] The San people have since negotiated subsequent benefit sharing agreements with commercial *Hoodia* farmers and others, covering the uses of different plants.[241]

It is submitted that the Biodiversity Act's benefit sharing provisions, albeit excluding human biological resources, could provide some direction in the development of a template for a legally binding benefit sharing arrangement for research involving human biological resources.

2.2.5 Benefit sharing in South Africa: *human biological resources*

Health research in South Africa is governed by the National Health Act 61 of 2003.[242] Although benefit sharing is an established principle of international law and adopted in SA through the Biodiversity Act, there exists no legally binding law in research that speaks directly to benefit sharing when using human biological materials.[243] A discussion of the

[236]Andanda P, Schroeder D, Chaturvedi S, Mengesha E and Hodges T "Legal frameworks for benefit sharing: from biodiversity to human genomic" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 33–64.

[237]The San people and the Hoodia plant available at: https://gfbr.global/wp-content/uploads/2015/09/Fifth_Casestudy4.pdf (Date of use: 26 May 2023).

[238]Andanda P, Schroeder D, Chaturvedi S, Mengesha E and Hodges T "Legal frameworks for benefit sharing: from biodiversity to human genomic" in Schroeder D and Cook Lucas J (eds) *Benefit Sharing From Biodiversity to Human Genetics* (Springer Science 2013) 33–64.

[239]Andanda P, Schroeder D, Chaturvedi S, Mengesha E and Hodges "Legal frameworks for benefit sharing: from biodiversity to human genomic" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 33–64.

[240]The San people and the Hoodia plant available at: https://gfbr.global/wp-content/uploads/2015/09/Fifth_Casestudy4.pdf (Date of use: 26 may 2023).

[241]Andanda P, Schroeder D, Chaturvedi S, Mengesha E and Hodges T "Legal frameworks for benefit sharing: from biodiversity to human genomic" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 33–64.

[242]61 0f 2003, Chapter 9.

[243]Slabbert MN "The legal regulation of access and benefit sharing of human genetic resources in South Africa" 2011 *74 Tydskrif vir Hedendaagse Romeins-Hollandse Reg* 605–632.

relevant guidelines and documents that currently guide research that involves human biological resources in South Africa follows below.

2.2.5.1 Department of Health Ethics in Health Research Guidelines, 2015

Section 69(1) of the National Health Act mandates the NHA to establish the National Health Research Ethics Council (NHREC), which is tasked with the responsibility of determining guidelines for the functioning of health research ethics committees.[244]

In terms of the NHA, the NHREC must: [245]

1) set norms and standards for health research involving humans and animals, as well as for conducting clinical trials;
2) determine guidelines to facilitate best practices for research ethics committees;
3) register and audit research ethics committees;
4) adjudicate complaints about research ethics and Animal Research Ethics committees;
5) refer matters concerning violations of ethical or professional rules to the relevant health professions council; recommend disciplinary action against persons found to have violated the norms and standards set for the responsible and ethical conduct of health research; and
6) advise the national and provincial departments of health on ethical matters concerning research.

As stated already, the 2014 Regulations relating to Research with Human Participants, as well as paragraph 1.8.1[246] of the Department of Health's Ethical Guidelines, stipulate that the Department's Guidelines are the minimum national benchmark of norms and standards for conducting responsible and ethical research, including human research, making them legally binding.

The Guidelines set out ethical principles that should govern all health research involving human participants as well as HBMs and data collected from living or deceased persons.

[244]Section 72(6) (a) of the NHA.
[245]Department of Health (DoH) Ethics in Health Research Guidelines https://www.health.gov.za/wp-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).
[246]DoH Ethics in Health Research Guidelines https://www.health.gov.za/wp-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).

The concept of benefit sharing is not directly addressed in the Guidelines. The Guidelines require that a fair balance of risks and benefits must apply to all who participate in research[247] and state that "the population from which the participants are drawn will benefit from the research results if not immediately, then in the future".[248] Furthermore, the Guidelines advise that the benefit to the participant or community in the research should outweigh the risk of harm.[249]In addition, the Guidelines outline that in obtaining informed consent, research participants should be informed of any potential benefits of their participation, both during and after the research.[250] However, there is no reference in the Guidelines on how a benefit sharing arrangement should be formulated.

Despite suggesting that benefit sharing is necessary for health research, the Guidelines do not comment on how benefit sharing arrangements should be structured and how these arrangements should be negotiated. There is a clear need for providing guidance on how to structure benefit sharing arrangements that are agreeable to both researchers and research participants. Since the guidelines have some legal force, it may be deduced that the Guideline's reference to benefit sharing points to an ethico-legal imperative in the context of health research.

2.2.5.2 Health Professions Council of South Africa (HPCSA) Guidelines

In 2016, the HPCSA published revised Guidelines in sixteen booklets to guide health practitioners and health researchers in their mandate as health professionals.[251] The Guidelines were to "offer more precise guidance and direction for action in concrete situations" and to enable the HPCSA to implement sanctions against transgressors.[252]

[247]DoH Ethics in Health Research Guidelines https://www.health.gov.za/wp-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).
[248]DoH Ethics in Health Research Guidelines https://www.health.gov.za/wp-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).
[249]DoH Ethics in Health Research Guidelines https://www.health.gov.za/wp-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).
[250]DoH Ethics in Health Research Guidelines https://www.health.gov.za/wp-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).
[251]HPCSA mandate https://headroom.co.za/wp-content/uploads/2020/03/HPCSA-Ethics_Booklet-03_2020-1.pdf (Date of use: 26 May 2023).
[252]HPCSA mandate https://headroom.co.za/wp-content/uploads/2020/03/HPCSA-Ethics_Booklet-03_2020-1.pdf (Date of use: 26 May 2023).

Booklet 13 specifically deals with ethical guidelines for health researchers. The guidelines recognise that biomedical research has advanced very swiftly in the last century and caution that with South Arica's Apartheid past, which led to the marginalisation of specific racial groups, the misuse of power in health research cannot be ignored.[253]

Section 6 of the guidelines relating to the duties of research participants cautions against the undue inducement of research participants and remarks that research participants should be fairly compensated for their time. Such compensation is to be specified in the relevant research protocol or proposal.[254]

The Guidelines also provide that the balance of burdens and benefits should be equalised within different population groups. Guideline 6.6.3 proposes that at the end of a study, the research participants are entitled to benefit from the study by accessing the best proven prophylactic, diagnostic and therapeutic methods identified by the study.[255]

Despite alluding to the need for benefit sharing, the guidelines do not suggest how this process should occur.

2.2.5.3 National Material Transfer Agreement for Human Biological Material

Although the NHA Act was proclaimed in 2003, certain regulations in Chapter 8 of the NHA Act dealing with Human Biological Materials (for example, blood, blood products, tissues and gametes) were only enacted in 2012.[256] The National Department of Health only gazetted the national template of a Material Transfer Agreement of Human Biological Materials (HBMs) under the NHA in 2018.[257]

The MTA in section 2(2)[258] defines a benefit as:

[253]HPCSA General Ethical Guidelines for Health Researchers https://www.hpcsa.co.za/Uploads/professional_practice/ethics/Booklet_13_Gen_Ethical_Guidelines_for_Health_Researchers.pdf (Date of use: 26 May 2023).
[254]HPCSA General Ethical Guidelines for Health Researchers https://www.hpcsa.co.za/Uploads/professional_practice/ethics/Booklet_13_Gen_Ethical_Guidelines_for_Health_Researchers.pdf (Date of use: 26 May 2023).
[255]HPCSA General Ethical Guidelines for Health Researchers https://www.hpcsa.co.za/Uploads/professional_practice/ethics/Booklet_13_Gen_Ethical_Guidelines_for_Health_Researchers.pdf (Date of use: 26 May 2023).
[256]Proclamation No 11 *Government Gazette* 35081 of 27 February 2012.
[257]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.
[258]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.

> Amongst others, the sharing of information; use of research results; royalties; acknowledgement of the Provider as the source of the Materials; publication rights; transfer of technology or Materials; and capacity building.[259]

The MTA further defines benefit sharing in section 2(3) as "the process or act of sharing in the benefits that derive from the Project in a manner that is fair and equitable".[260] Section 7 of the MTA expressly provides that "the sharing of benefits should be discussed and negotiated between the Provider and Recipient before Materials are transferred to the Recipient".[261]

The rapid commercialisation of health research has precipitated increased traffic of HBMs across national boundaries. In South Africa, universities and research institutions are increasingly experiencing financial hardships, with the result that there is a dire need to procure funds from sources other than government funds.[262] This financial burden may often lead to unequal partnerships in research. Evidence of the exploitation of research participants exists, as well as documented proof that HBMs have left South Africa without ethical clearance, export permits and MTAs during collaborative research.[263] This is why the gazetted MTA is of particular importance for collaborative health research in the current environment. If collaborative research is to equally benefit all involved, a need for a legally binding contract that protects all participants involved in the study is warranted. The gazetted MTA attempts to set out "a national, uniform template within which the Parties in research collaboration will engage in the transfer, use and other processing of the Materials".[264] At the time of writing this thesis, some shortcomings in the gazetted MTA have been identified, as well as the need to revise the template. This is discussed in more detail elsewhere in this thesis.

The MTA specifically refers to benefit sharing in section 7.[265] In principle, the MTA recognises the need for a benefit sharing agreement between research collaborators at the start of the research. However, the MTA does not provide a template of a benefit sharing agreement, which is one of the aims of this thesis, i.e., to propose a template that

[259]Section 2 (2) of the National MTA.
[260]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.
[261]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.
[262]Labuschaigne M, Dhai A, Mahomed S *et al* "Protecting participants in health research: the South African Material Transfer Agreement" 2019 *S Afr Med J* 109(5):353–356.
[263]Labuschaigne L, Dhai A, Mahomed S ***et al*** *"*Protecting participants in health research: the South African Material Transfer Agreement" 2019 *S Afr Med J* 109(5):353–356.
[264]Labuschaigne L, Dhai A, Mahomed S *et al.* "Protecting participants in health research: the South African Material Transfer Agreement" 2019 *S Afr Med J* 109(5):353–356.
[265]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.

can be routinely used to guide on benefit sharing arrangements for health research in South Africa.

2.3 The ethics of benefit sharing

The notion of justice as an ethical principle has existed for centuries in many communities,[266] whereas the concept of benefit sharing, which serves to implement justice, only emerged towards the end of the 20th century.[267] As discussed already, the notion of benefit sharing has been accepted in many national and international ethics guidelines, not to mention its inclusion in the CBD, the Declaration of Helsinki (WMA 2008) and in UNESCO's Universal Declaration on Bioethics and Human Rights (UNESCO 2005).[268]

Since it has been recognised that scientific advancement without benefit sharing is unjust, it follows that those who contribute to the advancement of science need to benefit in return.[269] These are the foundational principles informing the philosophical principle of benefit sharing; however, just because the idea of benefit sharing exists, does not mean it is actually realised. If benefit sharing does not occur, it is warranted to assert that an injustice has occurred, possibly resulting in the exploitation of another party.[270]

The argument against benefit sharing states that it may lead to the undue inducement of participants in a study and that the more vulnerable a population, the more probable that this undue inducement would result in the exploitation of the population.[271] An argument that benefit sharing should legally be constrained by legal prohibition on the commercialisation of human tissue, is legally and ethically unsound, as benefit sharing

[266]Schroeder D and Lucas CJ "Towards best practice for benefit sharing involving access to human biological resources: conclusions and recommendations" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 217–230.

[267]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue Inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

[268]Schroeder D and Lucas CJ "Towards best practice for benefit sharing involving access to human biological resources: conclusions and recommendations" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 217–230.

[269]Schroeder D and Lucas CJ "Towards best practice for benefit sharing involving access to human biological resources: conclusions and recommendations" in Schroeder D and Cook J Lucas (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 217–230.

[270]Schroeder D and Lucas CJ "Towards best practice for benefit sharing involving access to human biological resources: conclusions and recommendations" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 217–230.

[271]Schroeder D and Lucas CJ "Towards best practice for benefit sharing involving access to human biological resources: conclusions and recommendations" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 217–230.

cannot be equated to the sale of human biological material. Research participants donating biological material do so altruistically, whilst their participation in the research is the contribution that benefit sharing aims to redress.

It is impossible to consider the ethics of benefit sharing without detailing its relationship with the ethical concepts of exploitation, vulnerability and undue inducement,[272] which is addressed in the next section.

2.3.1 Vulnerability

The protection of vulnerable persons is central to research ethics; however, how to define vulnerable persons or populations is not very clear.[273] Vulnerability is an important concept in bioethics because a vulnerable person or population is more prone to exploitation, which is morally wrong.[274] Problems arise when considering health research conducted in LMICs by sponsors or institutions from HICs causing the necessity to determine what constitutes exploitation as well as when or if harm has occurred.[275] All humans are vulnerable and can experience intrinsic harm (due to mental illness or old age) or extrinsic harm (due to external circumstances).[276]

The Oxford English dictionary describes vulnerability as exposure to the risk of being attacked or harmed, either physically or emotionally.[277] The CIOMS Guidelines of 2002 refer to vulnerability as:

> A substantial incapacity to protect one's own interest owing to such impediments as lack of capability to give informed consent, lack of alternative means of obtaining medical care or other expensive necessities, or being a junior or subordinate member of a hierarchical group.[278]

[272]Schroeder D and Lucas CJ "Towards best practice for benefit sharing involving access to human biological resources: conclusions and recommendations*"* in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 217–230.
[273]Hurst S "Vulnerability in research and healthcare; describing the elephant in the room?" 2008 *Bioethics* 22:191–202.
[274]Macklin R "Bioethics, vulnerability, and protection" 2003 *Bioethics* 17(5-6):472–486.
[275]Macklin R "Bioethics, vulnerability, and protection" 2003 *Bioethics* 17(5-6):472–486.
[276]Dhai A "Vulnerability exploited and a population betrayed" 2012 *SAJBL* 5(2): 62–63.
[277]Oxford Dictionary 12th Ed Oxford University Press.
[278]CIOMS Guidelines https://cioms.ch/wp-content/uploads/2016/08/International_Ethical_Guidelines_for_Biomedical_Research_Involving_Human_Subjects.pdf (Date of use: 26 May 2023).

This definition is broad. Guideline 13 of CIOMS explains that vulnerable persons cannot protect their own interests because of a lack of power, intelligence, education, resources and strength.[279]

Current ethical guidelines, such as the amendment to the Declaration of Helsinki of 2013, refer to several groups in the definition of vulnerable persons.[280] In article 19, the Declaration provides that "some groups and individuals are particularly vulnerable and may have an increased likelihood of being wronged or incurring additional harm. All vulnerable groups should receive specially considered protection".[281] It would not be wrong to assume from this definition that all persons in LMICs are vulnerable persons when exposed to specific circumstances, yet this is not necessarily true. When defining vulnerability, the Declaration focuses on the ability of an individual or persons to give informed consent, for the protection of the autonomy of a person or society which seems to link vulnerability to medical vulnerability and legal age of consent.[282] The Declaration seeks to fulfil the notion of distributive justice by recognising that the vulnerable needs to be protected and should stand to benefit from medical research.[283] The Declaration however, is silent on contextual vulnerability, for example, research done in LMICs, conflict areas or refugee camps where there is a broad range of vulnerable populations and where benefit sharing should be a pre-requisite for health research. The Declaration furthermore lacks clarity on a description of vulnerable persons or populations during disaster situations like floods,earthquakes and pandemics. Evans and others[284] correctly argue that there is no adequate direction for responders, researchers and organisations to guide benefit sharing during infectious disease outbreaks. During the recent COVID-19 pandemic, the world has witnessed (despite calls for solidarity and social justice) unfair access to vaccines to LMICs, with HICs

[279]CIOMS Guidelines https://cioms.ch/wp-content/uploads/2016/08/International_Ethical_Guidelines_for_Biomedical_Research_Involving_Human_Subjects.pdf (Date of use: 26 May 2023).
[280]WMA 2013 https://www.wma.net/wp-content/uploads/2016/11/DoH-Oct2013-JAMA.pdf (Date of use: 23 September 2023).
[281]WMA 2013 https://www.wma.net/wp-content/uploads/2016/11/DoH-Oct2013-JAMA.pdf (Date of use: 23 September 2023).
[282]Article 25 of the WMA Declaration of Helsinki 2013
[283]Article 20 of the WMA Declaration of Helsinki 2013.
[284]Evans NG, Hills K and Levine AC "How should the WHO Guide Acess and Benefit Sharing During Infectious Disease Outbreaks?" 2020 *AMA Journal of Ethics* 22(1):28-35.

unconscionably nationalising and stock-piling limited COVID-19 vaccines, and this despite LMICs having participated in research that lead to the development vaccines.[285]

Schroeder and Gefanas[286] argue that the definition of vulnerability should merge the traditional dictionary definition, which focuses on extrinsic factors (like harm from outside), with the CIOMS guidelines' definition, which focuses on intrinsic factors (e.g., the inability to protect oneself). The authors also suggest that special protection cannot be offered to every person, only to persons who are at risk of exploitation during medical research. In this regard, they offer another definition of vulnerability in medical research. They propose that these definitions, in combination, may be paraphrased as follows: "To be vulnerable means to face a significant probability of incurring an identifiable harm, while substantially lacking the ability or means to protect oneself". [287]

Levine *et al*[288] suggest that in health research collaborations in LMICs, the principal concerns surrounding the issue of vulnerability revolve around inequalities of power and resources. It should be acknowledged that even within one country or setting, not all persons share the same level of vulnerability. According to a World Bank report,[289] poverty in South Africa in 2022 was estimated at 62.6%, based on the upper-middle-income country poverty line.[290] In the previous World Bank survey conducted 2014/2015, approximately 55% of the population were reported to be living below the national upper-bound poverty line.[291] Despite the advent of democracy in South Africa, most of the previously marginalised citizens remain exposed to abject poverty,[292] making the inequality

[285] Moodley K, Blockman M, Hawkridge AJ et al., "Hard choices: Ethical challenges in phase 1 of COVID-19 vaccine roll-out in South Africa" 2021 SAMJ 111(6):554-558.

[286]Schroeder D and Gefanas E "Vulnerability: too vague and too broad?" 2009 *Cambridge Quarterly of Healthcare Ethics* 18:113–121.

[287]Schroeder D and Gefanas E "Vulnerability: too vague and too broad?" 2009 *Cambridge Quarterly of Healthcare Ethics* 18:113–121.

[288]Levine C, Faden R, Grady C *et al* "The limitations of "vulnerability" as protection for human research participants" 2004 *AJOB* 4(3):44–49.

[289] https://thedocs.worldbank.org/en/doc/bae48ff2fefc5a869546775b3f010735-0500062021/related/mpo-zaf.pdf (Date of use: 23 september 2023).

[290]https://thedocs.worldbank.org/en/doc/bae48ff2fefc5a869546775b3f010735-0500062021/related/mpo-zaf.pdf (Date of use: 23 september 2023).

[291]https://databankfiles.worldbank.org/public/ddpext_download/poverty/987B9C90-CB9F-4D93-AE8C-750588BF00QA/current/Global_POVEQ_ZAF.pdf (Date of use: 23 September 2023).

[292]Dhai A "Vulnerability exploited and a population betrayed" 2012 *SAJBL* 5(2):62–63.

among the highest in the wolrld.[293] The government has not been able to eradicate distributive inequality which has led to distinct inequalities in the income, education and health of its citizens.[294] These inequalities, coupled with ongoing electricity supply shortages, socio-economic disparities and the COVID-19 pandemic,[295] expose many South Africans to specific vulnerabilities because they may lack education, adequate access to health care resources and financial freedom.

Considering that the level of vulnerability may vary for every person and that different kinds of health research may involve different levels of risk, identifying vulnerable persons should be based on what harm could occur to such persons during the specific type of health research. There are many parameters of possible harm to research participants in studies; these range from but are not limited to, an unfavourable risk–benefit ratio, breach of privacy, invalid consent and the lack of access to the benefits of health research.

Health research involving genetic material usually only requires a swab to obtain DNA and is of minimal harm to research participants from a physical or health-related view. Harm may occur on many other levels, for example if the research participants did not enjoy access to health care services or access to the benefits that followed from their participation in research. It is in this regard that benefit sharing agreements should be mandatory for research collaborations to address the issue of justice, which requires that all who participate in research should benefit from that research.

2.3.2 Exploitation

According to the Oxford English Dictionary, the ordinary meaning of exploitation is to make use of and unfairly and unjustly benefit from the work of another.[296] Anarson and Schroeder propose another meaning, specifically relating to health research in LMICs, by describing wrongful exploitation as “a failure to benefit others as some norm of fairness requires”.[297]

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[293]https://thedocs.worldbank.org/en/doc/bae48ff2fefc5a869546775b3f010735-0500062021/related/mpo-zaf.pdf (last accessed 23 september 2023).

[294]https://thedocs.worldbank.org/en/doc/bae48ff2fefc5a869546775b3f010735-0500062021/related/mpo-zaf.pdf (last accessed 23 september 2023).

[295]https://thedocs.worldbank.org/en/doc/bae48ff2fefc5a869546775b3f010735-0500062021/related/mpo-zaf.pdf (last accessed 23 september 2023).

[296]Oxford Dictionary Twelfth Edition Oxford University Press.

[297]Anarson G and Schroeder D “Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement” in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

When considering human health research, the word *exploitation* is often used freely when referring to an injustice, a seeming lack of fairness or a wrong inferred on a person, community or population.[298] Exploitation is supposedly immoral and wrong, but sometimes its wrongfulness cannot easily be explained or described.[299]

Where collaborative research occurs between HICs and LMICs, the term becomes more prominent because of the assumed vulnerabilities of research participants in LMICs, yet exploitation of the vulnerabilities of research participants is not always deemed wrong. Schroeder and Anarson[300] attempt to explain this by referring to the following hypothetical drug trial: If the only way for an HIV-positive pregnant woman to obtain antiretrovirals to halt HIV transmission to her unborn baby is to participate in a placebo-controlled trial (where some participants are given the active drug and the control group are given an inactive pill); then, despite access to healthcare, it could be said that she has indirectly been forced or compelled to enrol in the study. Although seemingly unfair to the research participants in the placebo arm of the research, it may be said that no actual harm has been done to them.

There is no consensus on what makes an instance of exploitation wrong, even when there is agreement that it has indeed occurred.[301] Schwartz[302] suggests that exploitation is wrong because it is coercive, as with the hypothetical HIV drug trial. It is an injustice because the research is only used to benefit others. Some claim that it is wrong because it degrades the participants treating them as a means to an end,[303] while others claim that it is wrong because the vulnerable should be protected.[304]

In 2007, Mayer suggested that fundamental wrongdoing could be found with exploitation if it is grouped into a family of inequities to which it partially belongs.[305] Exploitation is one type of wrongful gain because it has something in common with robbery and theft.[306]

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[298]Chennels R *"Equitable access to human biological resources in developing countries: benefit sharing without undue inducement"* (PhD Thesis School of Health University of Lancaster 2014).

[299]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

[300]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 9–32.

[301]Mayer R "What's wrong with exploitation?" 2007 *Journal of Applied Philosophy* 24(2):137–150.

[302]Schwartz J "What's wrong with exploitation?" 1995 *Nous* 29(2):158–188.

[303]Wood A "Exploitation" 1995 *Social Philosophy and Policy* 12(2):136–158.

[304]Macklin R "Bioethics, vulnerability and protection" 2003 *Bioethics 17*(5-6):472–486.

[305]Mayer R "What's wrong with exploitation?" 2007 *Journal of Applied Philosophy* 24(2):137–150.

[306]Mayer R "What's wrong with exploitation?" 2007 J*ournal of Applied Philosophy* 24(2):137–150.

However, exploiters are not criminals like thieves—they gain wrongfully but not necessarily illegally.[307]

Mayer classifies three groups of exploitation of wrongful gain based on fairness. Cass 1 exploiters do not benefit the disadvantaged party at all, even if they ought to. They are 'freeloaders' who benefit from the input of others while contributing nothing. This is exemplified by persons who are capable of paying taxes but avoid doing so, yet still want to access roads and hospitals funded by other taxpayers' money. This class of exploitation involves no exchange of any kind and is thus irrelevant to this discussion. Class 2 exploiters typically never benefit others sufficiently; they only provide the bare minimum. In this form of exploitation, an exchange occurs but not to the fair benefit of both parties. This form of exploitation involves reciprocal exchanges where fairness is questioned.[308] It is also the most common form of exploitation that typically occurs in research collaborations between HICs and their institutions, and LMICs and their institutions. This type of classification of exploitation is depicted by the genetic harvest project example below. With increased health research occurring in LMICs like SA where communities were historically marginalised,[309] there are justified concerns about the exploitation of vulnerable communities. This type of exploitation is illustrated by an international collaborative research project that was conducted with villagers in Anhui, a poor province in China from 1995 to 2000,[310] by Harvard University, the Chinese government and local Chinese research institutes.[311]

In 2002 it was reported that a Chinese American scientist, jointly funded by the National Institutes of Health (NIH) of America and biopharmaceutical companies had been collecting blood samples from the Anhui villagers over a period of five years.[312] This occurred without the prior informed consent of the villagers, yet their blood samples were

[307]Chennels R "*Equitable access to human biological resources in developing countries: benefit sharing without undue inducement*" (PhD Thesis School of Health University of Lancaster 2014).

[308]Chennels RS "*Equitable access to human biological resources in developing countries: benefit sharing without undue inducement* (PhD Thesis School of Health University of Lancaster 2014).

[309]Christopher AJ "Apartheid and urban segregation levels in South Africa" 1990 *Urban Studies* 3:421–440.

[310]Zhao Y and Zhang W "An international collaborative genetic research project conducted in China" in Schroeder D, Cook Lucas J *et al* (eds) *Ethics dumping, case studies from North-South research collaborations* (Springer International Publishing Cham 2018) 71–80.

[311]Zhao Y and Zhang W "An international collaborative genetic research project conducted in China" in Schroeder D, Cook Lucas J *et al* (eds) *Ethics dumping, case studies from North-South research collaborations* (Springer International Publishing Cham 2018) 71–80.

[312]Pomfret J, Nelson D "An isolated region's genetic mother lode" 2000-12-20 https://www.washingtonpost.com/archive/politics/2000/12/20/an-isolated-regions-genetic-mother-lode/4280cf1f-ae9c-42f7-b132-9ddbe26e502f/ (Date of use: 27 May 2023).

transferred to a US biobank for research into several diseases.[313] No research ethics committee had also sanctioned this genetic harvesting. The study had 16 686 participants instead of 2 000, as stipulated in the approved protocol for the asthma study; the monetary compensation promised to the farmers was significantly reduced and the bronchodilators used were different from those approved in the protocol.[314] Class 2 exploitation is undeniably portrayed in this scenario since an unfair exchange had occurred between the researchers and participants. The injustice exists in that Harvard University benefitted significantly from the monies received from the NIH and the biopharmaceutical companies, whereas the villagers received very little benefit.

Finally, in Class 3 exploitation, the exploitation also involves an exchange between two parties, but the exchange does not benefit the vulnerable individual. It is also an exchange that under societal norms should not occur at all. An example of this would be where a drug dealer sells drugs to an addict, ostensibly providing the addict with what he or she needs, yet, in reality is exploiting the addict's addiction in an exchange that society would frown upon.[315]

Mayer argues that although exploitation is wrong, when there is an exchange, it is usually a wrongful action that benefits the exploiter as well as their victim, as is typically the case in Class 2 exploitative transactions.[316] In the case of the Anhui villagers in China, an exploitative transaction undoubtedly occurred. The villagers received something, albeit less than promised. It may be said that their participation in the study left them better off than before. This presents a challenge to policymakers because if successful asthma drugs are indeed developed from the research results of this collaboration, why would the study have needed to stop? In my view, it remains morally wrong that the villagers did not receive fair benefits from the study. Perhaps if there had been a legally binding benefit sharing arrangement between the villagers and the researchers, the villagers would have been awarded more favourable benefits.

Accordingly, to avoid Class 2 and 3 exploitative transactions in human health research, it is evident that there is a need for authentically negotiated benefit sharing arrangements

[313]Pomfret J, Nelson D "An isolated region's genetic mother lode" 2000-12-20 https://www.washingtonpost.com/archive/politics/2000/12/20/an-isolated-regions-genetic-mother-lode/4280cf1f-ae9c-42f7-b132-9ddbe26e502f/ (Date of use: 27 May 2023).

[314]Xiong L and Wang Y 2002 "Harvard University's genetic research in China is illegal" *Outlook Weekly* 15:48–50.

[315]Mayer R "What's wrong with exploitation?" 2007 *Journal of Applied Philosophy* 24(2):137–150.

[316]Mayer R "What's wrong with exploitation?" 2007 *Journal of Applied Philosophy* 24(2):137–150.

with *fair* benefits for the resource providers. The case in Anhui, China could easily have been a case in a village in Limpopo in South Africa, confirming the need for drafting a national benefit sharing agreement for health research in South Africa.

When benefit sharing does not take place, exploitation becomes possible, which is more troublesome when it occurs in vulnerable populations. Critics of benefit sharing in health research suggest that the undue inducement of vulnerable populations should not take place since the more vulnerable the population, the more a small benefit may constitute an undue inducement.[317] This statement begs the question: what is an undue inducement and how does it relate to fair benefit sharing?

2.3.3 Undue Inducement

When research partipants, who may be vulnerable persons or communities, are coerced —either covertly or overtly—to participate against their better judgement in a health research project, the coercions may be construed as undue inducements. Emphasis is placed on informed consent of research participants in ethical guidelines relating to human research. Coercion and undue inducement are both unethical methods of obtaining consent.[318]

The term undue inducement was coined to protect participants in health research from harm to themselves in return for payment or some benefit. The CIOMS guidelines caution that "the payments should not be so large […] or the medical services so extensive as to induce prospective subjects to consent to participate in the research against their better judgment (undue inducement)."[319]

Undue inducements are problematic for the following reasons:[320]

1. They jeopardise the voluntary nature of informed consent.
2. The research participant might accept a risk that would not otherwise be acceptable.

[317]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

[318]Chennels RS "Equitable access to human biological resources in developing countries: benefit sharing without undue inducement" (PhD Thesis School of Health University of Lancaster 2014).

[319]CIOMS 2002: Guideline 7.

[320]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

3. Research participants might participate in research against their better judgment.

4. The entire practice of rewards or inducements is alien to the noble ideals and altruistic intent of the medical practice.

Inducements are an intrinsic part of life and not all are necessarily undue. Yet, there is rising concern that health research conducted in LMICs where economic challenges are prevalent, may affect the voluntariness of informed consent owing to undue inducements such as access to proven efficacious but unlincenced technologies, ancillary care that is better than local standards of care, financial reimbursements for participation and other unidentended benefits if particpants choose to share or sell investigational drugs.[321] Research participants in LMICs are often subjected to poverty and have minimal or hardly any access to healthcare services. In such an instance, even the benefit of better healthcare during research participation could be construed as an undue inducement. Emmanuel *et al*[322] refer to an example of HIV research participants receiving antiretroviral treatments that would improve their health. Is it unethical for these participants to participate in a study when their status quo may improve? How can this incentive diminish their freedom to choose to participate in the study? Anarson and Van Niekerk[323] suggest that "desperate need is not sufficient to undermine consent" and that *denying* people the right to take inducements may be infringing upon their freedom of choice.

The argument that research participants would take more risks when offered undue inducements is not convincing. A research subject freely chooses to participate in a study, which is mandated to be cleared by a research ethics committee or institutional review board globally, as is the case in South Africa. These bodies are tasked, *inter alia* with evaluating the risk–benefit ratio of the research.[324] Some risks are of such a nature that they outweigh any potential benefits that may arise from the research. With research involving HBMs, such as genome research or tissue research, the risk of physical harm may be minimal; whereas serious ethical considerations may arise due to privacy issues

[321]Mngadi KT, Singh JA, Mansoor L and Wassenaar DR "Undue inducement:a case study in CAPRISA 008" 2017 *J Med Ethics* 43:824-828.

[322]Mngadi KT, Singh JA, Mansoor L and Wassenaar DR "Undue inducement:a case study in CAPRISA 008" 2017 *J Med Ethics* 43:824-828.

[323]Anarson G and Van Niekerk A "Undue fear of inducements in research in developing countries" 2009 *Cambridge Quarterly of Healthcare Ethics* 18(2):122–129.

[324]Emmanuel EJ, Currie XE and Herman A "Undue inducement in clinical research in developing countries: is it a worry?" 2005 *The Lancet* 366:336–340.

and potential social harms, such as stigmatisation and discrimination of participants and their families.

According to Emmanuel,[325] the claim that undue inducements will persuade research participants to make decisions against their better judgement is unfounded. The purpose of incentives is to induce people to do what they would otherwise not. Emmanuel[326] points out that if research is ethical, excessive inducements would not cause people to take unreasonable risks. Accordingly, if a research project has been granted ethical clearance by the relevant IRB and REC, it should follow that the risks of harm to the research participants will be either negligible, and if moderate or high, that these have been carefully considered by the IRB or the REC, together with relevant precautions and interventions to ensure the continuing safety of participants.

The idea that research should be altruistic and that there should thus not be a need for inducements is unsound.[327] Lee[328] argues that with monetary inducements, it is not that offering any amount is wrong, but that the problem is rather that offering too much money which could result in undue inducement, is wrong. HICs and LMICs do not share the same resources. Suggesting that sharing benefits with participants should be discouraged when research is conducted in LMICs because of the undue inducement prohibition is akin to an exploitative transaction. According to Macklin,[329] this is another form of the double standard in medical research, where ethical standards formulated in HICs have the potential to disadvantage LMICs.

As stated earlier, the NHREC in South Africa is tasked with developing national ethical guidelines for the functioning of health research ethics committees (RECs), as well as registering and auditing RECs.[330] Section 1.4.3 of the Guidelines requires that all RECs reviewing research involving human participants must register with the NHREC.[331] This is

[325]Emmanuel EJ, Currie XE and Herman A "Undue inducement in clinical research in developing countries: is it a worry?" 2005 *The Lancet* 366:336–340.
[326]Emmanuel EJ, Currie XE and Herman A "Undue inducement in clinical research in developing countries: is it a worry?" 2005 *The Lancet* 366:336–340.
[327]Lee E "Our flawed approach to undue inducement in medical research" 2019 *Bioethics* 33:13-18.
[328]Lee E "Our flawed approach to undue inducement in medical research" 2019 *Bioethics* 33:13-18.
[329]Macklin R "Double standards in medical research in developing countries" 2004 *Cambridge University Press*, Cambridge.
[330]Department of Health Ethics in Health Research https://www.health.gov.za/wp-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).
[331]Department of Health Ethics in Health Research https://www.health.gov.za/wp-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).

important because it means the individual research participant should be protected from research with an unfavourable risk–benefit ratio, owing to REC oversight.

The Guidelines refer in Section 3.1.7[332] specifically to the issues of reimbursements and inducements for participants. The guidelines stipulate that all research participants are entitled to reimbursement for travel and time. Regarding inducements, the guidelines state that "inducements encourage participation and may be offered in circumstances where[,] e.g.[,] recruitment, especially of healthy participants, is anticipated to be difficult". This is useful and positive because as previously stated, not all inducements are necessarily undue in nature.

The notion of undue inducements is historically rooted in a very literalist interpretation of the notion that health research should be altruistic and that all ethical research should avoid harm. The Department of Health's Ethics in Health Research Guidelines refer in Section 2.1[333] to distributive justice by stating that "there should be a fair balance of risks and benefits amongst all role-players involved in research". It is necessary to briefly canvass what altruism in health research entails, as discussed next.

2.4 Altruism and justice in health research

2.4.1 Altruism in health research

Altruistic participation in health research means that the research will benefit all. It is founded on the common heritage of humankind with the general view that the underlying purpose of all research is the creation of generalised knowledge.[334] Considering that health research is routinely conducted in LMICs whose participants may be vulnerable to exploitation, [335] doubts have been cast on the altruism and solidarity model in health research.[336] There is a substantial distinction between practising altruism in health

[332]Department of Health Ethics in Health Research https://www.health.gov.za/wp-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).

[333]Department of Health Ethics in Health Research https://www.health.gov.za/wp-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).

[334]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing World Bioethics* 18(2):165–170.

[335]Lairumbi G, Parker M, Fitzpatrick R and English M "Forms of benefit sharing in global health research undertaken in resource poor settings: a qualitative study of stakeholders' views in Kenya" 2012 *Philosophy, Ethics, and Humanities in medicine* 7(1):1–8.

[336]Schroeder D and Lassen-Diaz C "Sharing the benefits of genetic resources: from biodiversity to human genetics" 2006 *Dev World Bioeth* 5(3):135–143.

research in HICs and doing so in LMICs.[337] The benefits in HICs are numerous and for all citizens in HICs, altruistic health research possibly leads to the following:[338]

1. Ever-increasing numbers of medical interventions to achieve and maintain health tailored to local health needs and, in principle, accessible to all.

2. Increased knowledge about human health is made available to citizens through general education or health campaigns.

3. The availability of jobs in a high-tech industry (pharmaceutical research) and various related sectors (e.g., academia) and indirectly the very infrastructure and institutions that make such jobs possible.

4. Profits for commercially oriented research companies and the pharmaceutical production and retail industry.

These benefits are not readily available in LMICs and if one views benefit sharing in terms of justice, the absence of these benefits for LMICs may be considered an injustice.

2.4.2 Justice in health research

The principle of justice takes many forms. *Justice in exchange* establishes the fairness or equity of transactions, whereas *distributive justice* espouses that the risks and benefits are shared equitably in society.*Corrective justice* redresses an injustice; *retributive justice* determines which punishment is appropriate for a given crime.[339] According to Article 25 of the 1948 Universal Declaration of Human Rights, all humans have the right to healthcare through the notion of distributive justice;[340] yet it is an added injustice to take something

[337]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 9–32.

[338]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 9–32.

[339]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 9–32.

[340]UN Universal Declaration on Human Rights https://www.ohchr.org/en/human-rights/universal-declaration/translations/english (Date of use: 23 May 2023).

from another person without allowing the sharing of benefits, which, in turn, defeats the purposes of *justice in exchange*.[341] Consequently, this is a form of exploitation.

However, this does not necessarily imply that health research in HICs is always altruistic and void of exploitation. When healthcare research becomes privately funded enterprises, it becomes difficult to shield communities from exploitation.[342] This is evident in health research involving human tissue.[343] For example, in the USA, biotechnology has brought about a revolution in human tissue research that has turned human tissue into a commodity and an object of property. In terms of this model, human tissue may be modified and hence commodified as material, leading to big business in the USA as well as globally.[344] Hospitals are in the unique position of being able to supply huge amounts of tissue and medical information to the biotechnology industry to generate revenue.[345] For example, the Beth Israel Deaconess Medical Centre (BIDMC), the teaching hospital of Harvard Medical School, is one such hospital. BIDMC specialises in patient care, biomedical research and teaching.[346] In 2002, BIDMC began a collaboration with Ardais Corporation.[347] Ardais Corporation is a private company which offers "healthcare services with a focus on tissue samples for use as clinically relevant and statistically valid human disease models such as cancer, inflammation, and vascular diseases".[348] BIDMC provides Ardais with residual human tissue from biopsies or other HBMs, together with their associated medical information (typically data from a tissue bank or biobank), for which BIDMC would then be financially compensated.

The human genetic resources that BIDMC trades to Ardais derive from altruistically donated samples. The donors of these resources sign an informed consent agreement

[341]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.
[342]Simm K "Benefit sharing: an inquiry regarding the meaning and limits of the concept in human genetic research" 2005 *Genomics, Society and Policy* 1(2):29–40.
[343]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[344]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[345]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[346]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[347]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[348]Ardais Corp https://www.bloomberg.com/profile/company/551614Z:US (Date of use: 23 May 2023).

which primarily serves to protect their identity and privacy.[349] This agreement, *inter alia*, stipulates that donors:

> Understand and agree that the tissue they donate as participants in the research program becomes the permanent property of the BI Medical Centre, and that BI Medical Centre does not make provision for compensation to donors in the event of product testing of commercial development.[350]

BIDMC treats the donated samples and their associated data as its legal property and then transfers the use of these samples via a license to Ardais. This license permits Ardais to sublicense the tissue to other companies that can provide revenue.[351] The BIDMC consent form expressly states that "there will be no direct benefit" under the guise of distributive justice which would accomplish healthcare for all. One may rightly ask who is truly benefitting from this altruism and if so, to what extent?[352] It may be argued that by using reputable hospitals and medical centres that people trust, the researchers coerce patients to sign informed consent forms requiring altruistic donation of tissue for the broader aim of serving research that would benefit the collective, yet this situation in reality may be said to lead to the unfair allocation of benefits, which could be considered exploitation.[353]

2.4.2.1 Fair benefit: the case of the Majengo sex workers

To date, a good example of a fair benefit agreement in human health research carried out in a LMIC is the Majengo sex workers study that was conducted in the slums of Nairobi in Kenya.[354] AIDS has been endemic in sub-Saharan Africa for a number of decades, and has killed and infected millions of people, yet a vaccine to suppress it remains elusive.[355] In 1980, an infectious disease expert from Canada, Francis Plummer, noticed that a percentage of the 2000 sex workers recruited for a study on sexually transmitted diseases

[349]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[350]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[351]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[352]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[353]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[354]Andada P, Cook Lucas J. *Majengo HIV/AIDS research case. A report for GenBenefit* 2007 http://www.uclan.ac.uk/genbenefit (Date of use: 27 May 2023).
[355]Schroeder D and Lassen-Diaz C "Sharing the benefits of genetic resources: from biodiversity to human genetics" 2006 *Dev World Bioeth* 5(3):135–143.

(STDs) remained uninfected with HIV, despite their high-risk behaviour.[356] It was thought that this observation could lead to the development of a vaccine.

A collaborative study by the universities of Oxford (UK), Nairobi (Kenya) and Manitoba (Canada), including the UK Medical Research Council and the AIDS Vaccine Initiative and Uganda Virus Research Institute, commenced in 1998.[357] Funded by the Canadian government and the public health of Nairobi City Council, vaccine trials started in 2001 and progressed to clinical trial Stages I and II.[358]

A clinic that also served as a research facility was set up in the Majengo slums to provide basic outpatient medical care for female sex workers. With the sex workers' informed consent, blood, cervical, vaginal and saliva samples were obtained from these women and used to study the epidemiology and immunology of HIV. In 2005, national guidelines for the research and development of HIV/AIDS vaccines were developed in Kenya, specifically in response to this case.[359] Although no effective vaccine against HIV was developed from these studies, the research in this study provided the foundation for understanding the epidemiology of HIV and the risk factors associated with its spread.[360]

The Kenyan guidelines provide for the "fair and equitable sharing of benefits" arising from the research results attained from biological materials.[361] In this regard, the fair benefit was that the socioeconomically disadvantaged sex workers have received access to healthcare and free antiretrovirals since 2005, whereas the researchers obtained sound research

[356]Cook Lucas J, Schroeder D, Arnason G, Andanda P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits?" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 95–128.

[357]Cook Lucas J, Schroeder D, Arnason G, Andanda P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits*?*" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 95–128.

[358]Andada P and Cook Lucas J *Majengo HIV/AIDS research case. a report for GenBenefit* 2007. http://www,uclan.ac.uk/research/explore/projects/assets/cpe_genbenefit_nairobi_case.pdf (Date of use: 20 October 2019).

Phase I clinical trials determine the best way to administer a drug, its frequency and the maximum tolerated dose. Also, possible side effects and if the treatment is safe.

Phase II trials have a larger cohort of research participants than Phase I. These trials determine the most successful dose, evaluate potential efficacy and characterise the treatment benefit for the disease.

[359]Kenyan Ministry of Health Kenyan Ministry of Health National Guidelines 2005 available at: https://www.globalgiving.org/pfil/1108/projdoc.pdf (Date of use: 23 May 2023).

[360]Bandewar SVS, Kimani J and Lavery JV "The origins of a research community in the Majengo observational cohort study*"* BMC Public Health available at: https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-10-630 (Date of use: 23 May 2023).

[361]Ministry of Health National Kenyan Guidelines for Research and Development of HIV/AIDS Vaccines Appendix 5: Biological Material Transfer Agreement. Kenya: Ministry of Health 2005. http://www.globalgiving.org/pfil/1108/projdoc.pdf (Date of use: 23 may 2023).

results. Considering the stigma women in LMICs suffer in the sex work trade, and the lack of access to adequate healthcare, this is regarded as a fair exchange.

One cannot ignore the fact that the concepts of vulnerability, exploitation, benefit sharing and undue inducements are inevitably entwined with human health research.[362] However, although a very fine line exists between unethical inducement and appropriate benefit sharing, this should not present an obstacle to the development of appropriate benefit sharing mechanisms, especially in LMICs.[363]

2.5 Benefit sharing models

The aforementioned discussion has determined that to avoid the exploitation of research participant as a sample donor, even when the donation is altruistic, some benefit sharing in the advantages or profits arising from the use of their human biological resource must take place.[364] The next section will evaluate some of the existing benefit sharing models.

2.5.1 The private benefit sharing model

In private biobanks or private tissue banks, private biotechnology companies act as brokers of tissue and health data for many researchers.[365] However, as seen in the collaboration between BIDMC and ARDAIS Inc. above,[366] it is evident that the role of academic teaching institutions as suppliers of HBMs to these private biobanks needs close monitoring.[367] Winickoff and Winickoff[368] suggest that in the USA, where many such collaborations exist, several challenges arise in the existing system of federal oversight, despite compliance with federal regulations.

[362]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013).

[363]Thambisetty S "Human genome patents and developing countries" http://www.iprcommission.org/papers/pdfs/study_papers/10_human_genome_patents.pdf (Date of use: 23 May 2023).

[364]Schroeder D "Benefit sharing: it's time for a definition" 2006 *J Med Ethics* 205–209.

[365]Winickoff DE and Winickoff RN "The charitable trust as a model for genomic biobanks" 2003 *New Engl J Med* 349(12):1180–1184.

[366]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.

[367]Winickoff DE and Winickoff RN "The charitable trust as a model for genomic biobanks" 2003 *New Engl J Med* 349(12): 1180–1184.

[368]Winickoff DE and Winickoff RN "The charitable trust as a model for genomic biobanks" 2003 *New Engl J Med* 349(12): 1180–1184.

South Africa has unique shortcomings pertaining to tissue banks and biobanks. Biobanks, which can store millions of HBMs, including human tissue and their associated data, are not specifically regulated in terms of South African law.[369] Despite the increase in demand for human tissue in the medical context, SA does not have a national tissue procurement agency, nor a national tissue authority.[370] Biobanks are regulated by a very flexible legal framework broadly based on regulations relating to tissue banks and the Department of Health's Ethics in Health Research Guidelines, in contrast to human tissue banks, which are governed by a specific dedicated set of regulations promulgated in terms of Chapter 8 of the National Health Act.[371]

The acknowledgement of benefit sharing poses unique challenges in the case of human biobanks and tissue banks that store and distribute human biological materials (DNA, RNA, blastomeres, polar bodies and human tissue) and potentially their associated medical data in perpetuity.[372] For example, who should benefit from the primary and secondary use of these samples?

2.5.2 The altruistic benefit sharing model

The constitutional republic of Iceland proposed an ambitious model of benefit sharing in 1998. Driven by the notion that all health research should be altruistic, the Icelandic government passed the Act on a Health Sector Database (HSD Act).[373] This law allowed the Minister of Health to grant a license to a private American company, deCODE Genetics, to construct and operate a centralised database linking medical records with genealogical and genetic information.[374] The biggest problem with the Act was that it provided for presumed consent, meaning that consent would be assumed and that a person could only be excluded from the database if they specifically objected. This health sector database, however, never materialised as the Supreme Court of Iceland found the

[369]Labuschaigne M and Mahomed S "Regulatory challenges relating to tissue banks in South Africa: impediments to accessing health care" 2019 *SAJBL* 12(1):27–31.
[370]Labuschaigne M and Mahomed S "Regulatory challenges relating to tissue banks in South Africa: impediments to accessing health care" 2019 S*AJBL* 12(1):27–31.
[371]Department of Health, South Africa *Ethics in health research: principles, processes and structures* 2nd edition Pretoria DoH.
[372]Dhai A, Mahomed S and Sanne I "Biobank and human health research: balancing progress and protections" 2015 *S Afr J BL* 9:55–59.
[373]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[374]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.

HSD Act to be unconstitutional for violating citizens' privacy.[375] The Act itself did not require any benefit sharing arrangements, but Article 4 of the Act allowed for negotiations of any benefit sharing agreements to be conducted between the health minister and the licensee.[376] Two specific benefit sharing arrangements were subsequently concluded, one between the pharmaceutical company, Roche, and deCODE, for free pharmaceutical and diagnostic products for the Icelandic people, and a second between the Ministry of Health and deCODE as part of the operating licence.[377] Despite these benefits, it is has been argued that the use of presumed consent and the government laying claim to all medical records of the Icelandic population, points to the Icelandic government exploiting its own population.[378]

2.5.3 The charitable trust benefit sharing model

A trust involves a fiduciary relationship in which trustees hold the title to property but are obligated to keep or use said property for the benefit of the beneficiary.[379] This model suggests that if hospitals solicit altruistic donations of HBMs, then the hospitals should act as trustees of the HBMs donations rather than brokers.

Winickoff and Winickoff advance the argument that "in order to protect rights and scientific value", biobanks should be based "on a new form of agreement among the medical institution, the researcher, and the donor community: one modelled on the charitable trust".[380] This model could also be used for tissue banks. This model proposes that informed consent should be a continuous process of communication with the donor of the genetic resource or tissue. Since a trust involves a fiduciary relationship, the trustee holds legal fiduciary duties towards the human biological resource but must keep or use the

[375]Cook Lucas J, Schroeder D, Arnarson G, Andada P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits? cases from Iceland, Kenya and Indonesia*"* in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 95–127.

[376]Cook Lucas J, Schroeder D, Arnarson G, Andada P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits? cases from Iceland, Kenya and Indonesia" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 95–127.

[377]Cook Lucas J, Schroeder D, Arnarson G, Andada P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits? cases from Iceland, Kenya and Indonesia" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 95–127.

[378]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.

[379]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.

[380]Winickoff DE and Winickoff RN "The charitable trust as a model for genomic biobanks" 2003 *New Engl J Med* 349(12):1180–1184.

property for the benefit of the specified party, i.e., the beneficiary/donor.[381] All researchers wishing to use the samples in the tissue bank or biobank would require to propose the project to both an IRB or a REC, as well as the trust's ethics committee. This model is thought to present the best alternative to modern biobanks and tissue banks because it presents clear ethical, legal and scientific advantages.[382]

Such a model is used by various rare disease groups that have constructed tissue banks to enable researchers to control research design, implementation and benefit.[383] One such example is PXE International, a non-profit foundation that collects HBMs and their associated health data from approximately 1000 volunteers affected by Pseudoxanthoma elasticum (PXE).[384] PXE is a rare, hereditary connective tissue disorder that affects the skin, eyes and cardiovascular system. [385] The goal of the organisation is to induce researchers to study the genetic basis of PXE to develop therapies.[386] PXE International serves as the trustee of all collected samples; all research using PXE tissue must be cleared by its own IRB and an ethics committee of PXE International.[387] PXE International informs all its donors of all the research projects and is also in constant communication with its collaborating research groups.[388] Potential benefits to the group are linked to specific research and these are communicated. PXE International has been extremely successful as it was already collaborating with as many as 17 laboratories by 2003.[389]

Another successful organisation based on the charitable trust model of benefit sharing is the United Kingdom's Human Tissue Authority (HTA). The HTA was created by the Human Tissue Act of 2004. It serves to regulate activities concerning the removal, storage, use

[381]Winickoff DE and Winickoff RN "The charitable trust as a model for genomic biobanks" 2003 *New Engl J Med* 349(12):1180–1184.
[382]Winickoff DE and Winickoff RN "The charitable trust as a model for genomic biobanks" 2003 *New Engl J Med* 349(12):1180–1184.
[383]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[384]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[385]Laube S and Moss C "Pseudoxanthoma elasticum" 2005 *Archdischild* available at: https://adc.bmj.com/content/archdischild/90/7/754.full.pdf (Date of use: 23 May 2023).
[386]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[387]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[388]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[389]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.

and disposal of human bodies, organs and tissue.[390] The HTA serves as the trustee of all human tissue collected in the UK.

2.6 Conclusion

Benefit sharing in human health research is considered to be one of the benchmarks for ethical research in LMICs.[391] It has been argued by some scholars that health research should be altruistic to avoid exploitation by incentivising potential participants with undue inducement.[392] Altruism is a concept that is easily attained in research within HICs where health systems function and health research can be of benefit to all. However, benefit sharing for health research in LMICs is a central concern and is difficult to attain in the absence of legal frameworks. In LMICs, it is innately exploitative to allow participation in health research without participants receiving any benefits, especially where no prospect exists that participants may have access to the benefits (such as pharmaceuticals) once a study ends.[393]

A situation where research participants in LMICs bear all the risks and burdens of participating in research without accruing any benefits, is a failure of *justice in exchange*.[394] The question of undue inducements is pertinent when harm to participants is likely. It is assumed that with most genetic research, where only a swab is required (which is of minimal physical risk), the question of undue inducements is less relevant. However, because genetic swabs involve social risks which may trigger genetic discrimination, stigmatisation and stereotyping, the last-mentioned all high risks, the question of undue inducements become highly pertinent.

Schroeder's[395] suggestion that benefit sharing is a technical term that is used as a tool to achieve communicative justice should be accepted. When research participants are

[390]UK Human Tissue Authority mandate https://www.hta.gov.uk/policies/human-tissue-act-2004 (Date of use: 26 May 2023).

[391]Emmanuel EJ, Wendler D, Killen J and Grady C "What makes clinical research in developing countries ethical? The benchmarks of ethical research" 2004 *J Infect Dis* 189:930–937.

[392]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducemant" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

[393]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducemant" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

[394]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducemant" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

[395]Schroeder D "Benefit sharing: it's time for a definition" 2006 *J Med Ethics* 205–209.

vulnerable, it is necessary to correct such injustice, which makes benefit sharing instrumental in preventing exploitation.[396]

Benefit sharing is indeed a proportionally modest and indirect way to achieve respect for the human rights of health for all. It is of grave concern that many governments, including SA, do not have templates for benefit sharing agreements in their legal frameworks for health research.

The next chapter explores the question of ownership and the commodification of HBMs, as well as the ethico-legal framework relevant to benefit sharing in South Africa, with particular emphasis on biobanks, tissue banks and genomic research benefit sharing arrangements.

[396]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducemant" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

CHAPTER 3
ETHICO-LEGAL FRAMEWORK RELEVANT TO BENEFIT SHARING

3.1 Introduction

The notion of benefit sharing in health research requires the identification of the parties that are to share the benefits. In health research involving human biological materials (HBMs), this identification may be challenging[397] and is further compounded by the issue of ownership of the materials. The issues and controversies regarding ownership of HBMs that are donated for medical research have become long-standing and ongoing legal disputes[398] which are key to discussions around benefit sharing. The commercialisation of the products resulting from research using HBMs, brought about by the buying and selling of HBMs, is a complex and often controversial issue in health policy.[399] The proliferation of health research in LMICs[400] and the boom in biobanks[401] in these countries, including South Africa, have challenged perceptions regarding the human bodies in law.[402]

It is globally understood that the sale of and trade in human tissue is prohibited.[403] In South Africa, section 60(4)(b) of the National Health Act enforces this prohibition.[404] According to Mahomed *et al,*[405] this universally understood principle stems from the traditional belief that persons cannot own their bodies and accordingly their HBMs too, since this owning of oneself implies the objectification of oneself and in so doing, allows the objectification of one's body by others.

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[397]Mahomed S "*An ethico-legal framework for the regulation of biobanks in South Africa*" (PhD Bioethics and Health Law University of the Witwatersrand Johannesburg 2018) Available at: https://wiredspace.wits.ac.za/server/api/core/bitstreams/7b7894ae-6f5a-4fd6-81cf-65e36ff9563e/content (Date of use: 26 May 2023).

[398]Mahomed S, Nöthling-Slabbert, M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.

[399]Bjorkman B and Hansson SO "Bodily rights and property rights" *2006 J Med Ethics* 32:209–214.

[400]Lairumbi G, Parker M, Fitzpatrick R and English M "Forms of benefit sharing in global health research undertaken in resource poor settings: a qualitative study of stakeholders' views in Kenya" 2012 *Philosophy, Ethics, and Humanities in medicine* 7(1):1–8.

[401]Schroeder D and Lucas J "Benefit sharing: from biodiversity to human genetics-an introduction" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 1–8.

[402]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.

[403]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.

[404]Section 60(4) of the NHA.

[405]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.

The law has generally not been consistent in clarifying the issue of treating persons and their HBMs as property. However, in efforts to promote health research, the law has been clear regarding the issue of intellectual property emanating from research involving HBMs.[406]

Because the concept of benefit sharing aspires to protect and benefit all participants in health research, it requires that the notion of ownership of HBMs, as well as to whom this might apply, must be explored.

To address this, aligned with the objective of developing a standard framework for benefit sharing agreements in South Africa, this chapter will first discuss the current ethico-legal framework governing health research involving HBMs in South Africa. Where relevant, foreign judgements dealing with the so-called ownership of HMBs will be referred to, as there is presently no legal precedent concerning the ownership of HBMs in South Africa.[407]

Gibson[408] rightly argues that the law relies on tradition and legal precedent, however, in the current age of genomics, tissue engineering and biotechnology, novel situations arise, leading to legal disputes involving these technologies. The challenge is that while the law must be seen to both follow tradition and precedent when formulating public policy or legislation, it should also be responsive and flexible enough to respond to changes requiring legal regulation. Before the ethico-legal framework is discussed, the notion of ownership in HBMs will first be canvassed.

3.2 Ownership of HBMs in the era of biotechnology

As stated above, it is universally recognised that no person can own another person since this would constitute objectification by another, which is tantamount to slavery. However, the question of a person's ownership of his or her own body is more complicated.[409] In law, the human body and its parts have traditionally been classified as *res extra commercium* (a thing outside the commercial sphere), while separated bodily materials are considered *res nullius* (belonging to no one) until they are brought under the control of the

[406]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.

[407]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.

[408]Gibson SF "The Washington University v Catalona: Determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.

[409]Petrini C "Ethical and legal considerations regarding the ownership and commercial use of human biological materials and their derivatives" 2012 *Journal of Blood Medicine* 3:87–96.

first person who obtains possession of the separated HBMs.[410] If the recipient has processed the HBM in some way, the recipient gains a proprietary interest or an additional series of rights and in some cases, a right of ownership in these HBMs.[411]

The commercialisation of products emanating from medical research using HBMs has resulted in difficult legal and ethical questions, which often lack definite answers.[412] It is the lack of precise answers that adds to the ongoing debate regarding who owns human tissue donated for medical research. The question of treating the human body and HBMs as property presents complex legal, ethical and philosophical dimensions.[413] The legal meaning of property asserts individual autonomy, describing a legal relationship between persons and objects, enabling the proprietor to exercise exclusive control over a said object.[414] According to the Oxford Dictionary, property is synonymous with ownership in law.[415]

Some scholars maintain that patients have ownership rights of their samples in perpetuity, including an unfettered right to determine what happens to these samples.[416] This is contrasted with the view that giving patients property rights to their samples will turn the human body into a commodity and hinder research.[417]

3.2.1 Ethico-legal issues relating to the ownership of HBMs and human dignity

The Bill of Rights of the Constitution of South Africa, 1996, states in section 10 that "everyone has inherent dignity and the right to have their dignity respected".[418] There is also international consensus that research using HBMs should respect human dignity and human rights.[419]

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[410]Nöthling-Slabbert M "Human bodies in law: arbitrary discursive constructions?" 2008 *Stellenbosch Law Review* 19(1): 71–100.

[411]Petrini C "Ethical and legal considerations regarding the ownership and commercial use of human biological materials and their derivatives" 2012 *Journal of Blood Medicine* 3:87–96.

[412]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.

[413]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.

[414]Nöthling-Slabbert M "Human bodies in law: arbitrary discursive constructions?" 2008 *Stellenbosch Law Review* 19(1): 71–100.

[415]Concise Oxford English Dictionary 12th ed 2011.

[416]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.

[417]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.

[418] The Constitution of South Africa 1996.

[419]Beyleveld D and Bronsword R "Human dignity, human rights, and human genetics" 1998 *Modern Law review* 61(5): 661–680.

The concept of human dignity demands that human beings have intrinsic value and cannot be commodified, as it violates their dignity and worth.[420] Moreover, if human beings can commodify themselves and have a market value, they can be treated as mere objects by themselves and others.[421] As stated above, the human body and its parts are traditionally said to be *res extra commercium*, (things outside of the commercial sphere) but once HBMs are separated from the body, they are deemed *res nullius* (belonging to no one) up until the first person who takes possession of them and intends to use them, who then acquires exclusive legal control by *occupatio.*[422] There are numerous examples in law that point to the law's uneasiness with classifying HBMs in terms of property, ownership or possession.[423] It appears that the law accepts that when an excised HBM has been subjected to labour and skill, such as the cultivation of tissue or the manipulation of the tissue, the persons who performs these actions with regard to the tissue may claim property rights in the tissue product that is developed.[424]

In terms of South African law, ownership is a real right. The law entitles the recipient of HBMs to a real right and ultimate control over the HBMs.[425] The common law description of ownership as found in case law is described thus as:

> The most complete real right which gives the owner the most complete and absolute entitlements to a thing. Even so, it is a right which can be limited by objective law and by the rights of others (limited real rights or creditor's rights).[426]

Because ownership is a real right, it is often defined based on entitlements.[427] Thus, the holder of the real right may control, use, encumber, alienate/transfer and vindicate the thing in which they hold a real right. Should an institution or organisation procure an individual's donated HBMs, they would be regarded as owners of the samples and would, unless the contrary is indicated and agreed upon by the parties, not be required to inform

[420]Resnick DB "The commodification of human reproductive material" 1998 *Journal of Medical Ethics* 24:388–393.
[421]Resnick DB "The commodification of human reproductive material" 1998 *Journal of Medical Ethics* 24:388–393.
[422]Nöthling-Slabbert M "Human bodies in law: arbitrary discursive constructions?" 2008 *Stellenbosch Law Review* 19(1): 71–100.
[423]Nöthling-Slabbert M "Human bodies in law: Arbitrary discursive constructions?" 2008 *Stellenbosch Law Review* 19(1): 71–100.
[424]Swain MS and Marusyk RW "An alternative To Property Rights in Human Tissue" 1990 Hastings Centre Report 20(5):12–16.
[425]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.
[426]Van der Walt AJ and Pienaar GJ *Introduction to the law of property* 7th ed (Juta 2017) 43–56.
[427]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.

the donor of any subsequent use of the sample and/or provide any information on the progress of the research process.[428] This situation prompts the question whether such an arrangement may withstand legal and ethical scrutiny, particularly with regard to informed consent requirements, as well as the provisions of the Regulations relating to Research with Human Participants,[429] not to mention potential violations of constitutional rights.[430] The need to protect and respect inherent human dignity and a person's right to bodily and psychological integrity, including the prerequisite that a person should not be subjected to medical or scientific experiments without their informed consent, are outlined in the Bill of Rights of the Constitution.[431]

Given the common law position that no man is *dominus membrorum suorum* (master of his bodily members) and the universally accepted maxim that the human body is *res extra commercium* (a thing outside of the commercial sphere), the question arises as to whether and under which circumstances South African law would recognise ownership of HBMs. Should such proprietary rights be found to exist, what would the consequences of such a classification in terms of South African law be. Put simply, this comes down to the question regarding what rights individuals have over their HBMs.[432]

There are abundant examples in law that demonstrate the law's contradictions in making sense of the human body in the context of ownership and property.[433] Examples in this regard relate to how the law regulates the various states of human transition (in other words, relating to a developing foetus and pregnant woman), activities that commodify the body and body parts, and more recently, in issues relating to developments in biotechnology and genetics.[434]

There is also a need to build trust with communities that value and attach great importance to blood and tissue collected for use as research samples, since they play an important

[428]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.
[429]National Department of Health. Notice 177: Regulations Relating to Human Biological Material. Pretoria: Government Gazette, 2012.
[430]The Constitution of South Africa https://www.justice.gov.za/legislation/constitution/pdf.html (Date of use: 23 May 2023).
[431]The Constitution of South Africa https://www.justice.gov.za/legislation/constitution/pdf.html (Date of use: 23 May 2023).
[432]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.
[433]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.
[434]Nöthling-Slabbert M "Human bodies in law: arbitrary discursive constructions?" 2008 *Stellenbosch Law Review* 19(1): 71–100.

cultural role in traditional ceremonies.[435] Indigenous communities[436] are reluctant to participate in biobanking and genomic research because they are concerned with the handling, treatment and ownership of HBMs and the knowledge gained from the specimen analysis.[437]

It is evident that the outright classification of HBMs as property gives rise to complex ethical and legal questions.[438] To promote fair and just altruistic research, researchers have proposed frameworks for ethical consent models which would mitigate potential conflict between biobanks, research participants, investigators and sponsors, especially when conflicting claims of ownership in HBMs arise.[439] These ethical consent models obviate the need to determine proprietary rights in HBMs.

3.2.2 Proposed ethical models when considering the regulation of HBMs

One of the proposed models is premised on *custodianship*, involving the caretaking obligation for HBMs from their initial collection to the final dissemination of research findings.[440] The custodianship model approaches these issues from a broader perspective than the framework of ownership which views HBMs as property with exclusive rights vested in the owner. The custodian model recognises the altruism of research participants and deems their donated HBMs as 'gifts', and with the informed consent of the donors, promotes free and fair research for the good of society. Custodianship rejects the notion that HBMs are for-profit commodities.

Another proposed ethical framework model is that of *stewardship*, which implies that everyone involved in research is responsible for protecting human subjects' interests and well-being to the best of their ability.[441] This model seeks to decrease ethical conflict emerging from the ethical challenges that may arise for all persons involved in research

[435]Aramoana J and Koea J "An integrative review of the barriers to indigenous peoples' participation in biobanking and genomic research" 2020 *JCO Global Oncology*, 6: 83–91. On behalf of the CommNETS Collaboration. doi: 10.1200/JGO.18.0015.

[436]Indigenous peoples are the ethnic groups which are the original inhabitants of a given region, in contrast to groups who have settled, occupied, or colonised the area more recently.

[437]Aramoana J and Koea J "An integrative review of the barriers to indigenous peoples' participation in biobanking and genomic research" 2020 *JCO Global Oncology*, 6: 83–91. On behalf of the CommNETS Collaboration. doi: 10.1200/JGO.18.0015.

[438]Skene L "Ownership of human tissue and the law" 2002 *Nature Reviews Genetics* 3:145–147.

[439]Yassin R, Lockhart N, Del Riego MG *et al* 2010 "Custodianship as an ethical framework for biospecimen-based research" *Cancer Epidemiology Biomarkers Prev* 19(4):1012–1015.

[440]Yassin R, Lockhart N, Del Riego MG *et al* 2010 "Custodianship as an ethical framework for biospecimen-based research" *Cancer Epidemiology Biomarkers Prev* 19(4):1012–1015.

[441]Jeffers BR "Human biological materials in research: ethical issues and the role of stewardship in minimizing research risks" 2001 *ANS Adv. Nurs. Sci 24*(2):32–46.

using HBMs. Stewardship arises from respect for human dignity and recognition of common humanity. Stewardship suggests that for researchers to retain public trust, investigators should design research protocols that respect and protect donors of the HBM and their communities.[442] The responsibilities of a steward may include protecting research results and not sharing confidential genetic and linked health information that could promote the stigmatisation of particular populations.[443]

Private biobanks are storing millions of HBM samples amassed from collaborations with medical institutions. A proposed consent model for private biobanks is that of a *charitable trust*. This model seeks to protect rights and maximise scientific value.[444] The model suggests that informed consent should be a process of continuous communication between researchers and research participants, while a biobank operates as a trustee or steward of HBMs to ensure the protection of the samples. The trust agreement would see the HBMs' donor or settlor transfer their property interest in their donation to the trustee, who would assume legal fiduciary duties to keep the HBMs for the benefit of the named beneficiary in which the public acts as the beneficiary.[445] The charitable trust model has clear ethical, legal and scientific advantages that accommodate altruism, good governance and benefit to the public.

It is worth noting that when dealing with indigenous populations, there exists a cultural link between an ancestral past to the present through blood and tissue. Genetic manipulation of their HBMs and the immortalisation of cell lines is troubling to some of these communities and thus, whichever ethical consent model is adopted, it must accommodate the indigenous community with ongoing input and the ability to influence specimen use and disposal.[446]

[442]Jeffers BR "Human biological materials in research: ethical issues and the role of stewardship in minimizing research risks" 2001 *ANS Adv. Nurs. Sci 24*(2):32–46.
[443]Fullerton SM, Nicholas RA, Guzauskas G *et al* "Meeting the governance challenges of next-generation biorepository research" 2010 *Science Translational Medicine 2*(15): 15cm3–15cm3.
[444]Winickoff DE and Winickoff RN "The charitable trust as a model for genomic biobanks" 2003 *New Engl J Med* 349(12):1180–1184.
[445]Winickoff DE and Winickoff RN "The charitable trust as a model for genomic biobanks" 2003 *New Engl J Med* 349(12): 1180–1184.
[446]Aramoana J and Koea J "An integrative review of the barriers to indigenous peoples' participation in biobanking and genomic research" 2020 *JCO Global Oncology*, 6: 83–91. On behalf of the CommNETS Collaboration. doi: 10.1200/JGO.18.0015.

3.3 South African legislative framework on the ownership of HBMs, intellectual property rights and benefit sharing

In South Africa, the issue of the ownership of HBMs is no less confusing than the universal confusion on this topic. This confusion mostly arises from an ambiguous definition of certain HBMs in the legislation.[447] Mahomed *et al*[448] address this issue and conclude that the ambiguity in the definition of HBMs, such as the definition of human tissue in South African legislation, makes it difficult to provide a clear and consistent message regarding any proprietary claims in respect of human tissue.

Some legal scholars argue that a close inspection of the common law and statutory law supports the conclusion that in the research context, HBMs are indeed susceptible to ownership.[449] Other scholars, on the other hand, maintain that any attempt to conceptualise the ownership of HBMs inevitably leads to the objectification of a person, with the result of reducing such person to a state of mere property.[450]

It is clear from the aforementioned discussion that the issue of ownership in HBMs is fraught with complex and conflicting views. To gain a better understanding of the scope of the opposing views, the discussion below will turn to the existing regulatory framework relating to the ownership of HBMs, as well as the related issue of benefit sharing around such materials.

3.3.1 Constitution of the Republic of South Africa, 1996

The Constitution of South Africa was adopted in 1996[451] and is deemed the supreme law of South Africa, whereby any law or conduct inconsistent with it is invalid.[452] In Chapter 2 of the Bill of Rights of the Constitution, the right to human dignity is stated as a right that should be protected entirely.[453] In addition to the protection of the right to human dignity in

[447]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.
[448]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.
[449]Thaldar DW and Shozi B "The legal status of human biological material used for research" 2021 *South African Law Journal.*
[450]Mahesh KP "Laws and regulations associated with ownership of human biological material in South Africa" 2015 *S Afr J BL* 15:8(1)11–18.
[451]The Constitution of South Africa https://www.justice.gov.za/legislation/constitution/pdf.html (Date of use: 23 May 2023).
[452]The Constitution of South Africa https://www.justice.gov.za/legislation/constitution/pdf.html (Date of use: 23 May 2023).
[453]The Constitution of South Africa https://www.justice.gov.za/legislation/constitution/pdf.html (Date of use: 23 March 2021).

section 10 of the Constitution, the Bill of Rights further recognises rights that are closely linked to dignity in section 12(2), which states that:

> Everyone has the right to bodily and psychological integrity, which includes the right to; make decisions concerning reproduction; security and control over their body and not to be subjected to medical and scientific experiments without their informed consent.[454]

Transposing the provisions of the Bill of Rights to apply in a research setting becomes challenging, especially considering the mistrust that communities have about the motives of research when the historical abuse of African resources is not confined to the past.

Considering a case from as recently as 2018, discussed next, it is evident that the exploitation of African research participants and research institutions by research institutions in HICs is an ongoing trend that results in justifiable mistrust. The Welcome Sanger Institute is based in the United Kingdom and specialises in genome research. This institute was accused by, among others, the Universities of KwaZulu-Natal and Stellenbosch, of commercialising a gene chip developed using DNA donated by African donors.[455] Allegedly, some of the MTAs used in the research did not give permission for the commercialisation of the gene chip, nor did the research participants consent to restrict commercialisation.[456] The accusations resulted in a legal dispute and although an external legal investigation concluded that there was no "unlawful exploitation of scientific work" nor any breach of contract or intellectual property rights, the 75 000 gene arrays stored at Sanger were never used and expired at the end of 2019.

Unfortunately, it is not always foreign institutions that cultivate a culture of mistrust in research using HBMs with research participants; sometimes local institutions in LMICs play a major role. A case in point is that of Discovery, a South African health insurer which, in 2015, partnered with Human Longevity Incorporation, a company owned by Craig Venter and based in the United States of America (USA).[457] Under this partnership, Discovery clients, all of whom were SA citizens, were offered genetic testing at a reduced cost (US$

[454]Chapter 2, Section 12(2) of the Constitution of South Africa 1996.

[455]Staunton C and Moodley K "Data mining and biological sample exportation from South Africa: a new wave of bioexploitation under the guise of clinical care?" 2016 *South African Medical Journal* 106(2):136–138.

[456]Staunton C and Moodley K "Data mining and biological sample exportation from South Africa: a new wave of bioexploitation under the guise of clinical care?" 2016 *South African Medical Journal* 106(2):136–138.

[457]Staunton C and Moodley K "Data mining and biological sample exportation from South Africa: a new wave of bioexploitation under the guise of clinical care?" 2016 *South African Medical Journal* 106(2):136–138.

250 per person) which was provided by the Human Longevity Incorporation. In return, Discovery members' samples and anonymised information would be transferred to the USA and stored at the Incorporation, supposedly for "clinical care and the aim of advancing medical research". Thousands of Discovery members' saliva samples were transferred to further this aim.[458] Subsequently, it became apparent that the real aim of this partnership was to create one of the world's biggest databases for whole genome, phenotype and clinical data by taking advantage of a legal *lacuna* that existed in South Africa at the time, specifically pertaining to a regulatory framework for the use, storage and export of biological samples.[459] This case illustrates the difficulty in applying the provisions of the Bill of Rights in the absence of legally binding frameworks for research using HBMs. In this particular case, scholars pointed out the need to protect research participants in SA.[460] In addition to the mistrust created by such research partnerships between participants and researchers, and sponsors and researchers, other ethical issues also arose: The collection of samples and data, and the storage, use and sharing of HBMs from African research participants without regard for culture, privacy, confidentiality, autonomy and the feedback of findings are creating a difficult research environment for South African researchers.[461]

The right to privacy is outlined in section 14 of the Bill of Rights in the Constitution.[462] On 1 July 2020, the Protection of Personal Information Act 4 of 2013 (POPIA) was enacted.[463] The Act provides a high-level, principle-based approach to the use of personal information—including genomic data—by outlining strict requirements that must be attained before personal information is processed and transferred outside of SA. It is worth noting that while the actual specimens derived from HBMs fall outside the remit of POPIA, any data derived from such samples would fall under the remit of POPIA as it is considered

[458]Staunton C and Moodley K "Data mining and biological sample exportation from South Africa: a new wave of bioexploitation under the guise of clinical care?" 2016 *South African Medical Journal* 106(2):136–138.

[459]Staunton C and Moodley K "Data mining and biological sample exportation from South Africa: a new wave of bioexploitation under the guise of clinical care?" 2016 *South African Medical Journal* 106(2):136–138.

[460]Staunton C and Moodley K "Data mining and biological sample exportation from South Africa: a new wave of bioexploitation under the guise of clinical care?" 2016 *South African Medical Journal* 106(2):136–138.

[461]Academy of Science of South Africa Consensus Study *Human genetics and genomics in South Africa: ethical, legal and social implications* 2018 found at: http://bit.ly/3sH15hH (Date of use: 23 May 2023).

[462]The Constitution of South Africa https://www.justice.gov.za/legislation/constitution/pdf.html (Date of use: 23 May 2023).

[463]POPIA Act 2013 https://www.gov.za/sites/default/files/gcis_document/201409/3706726-11act4of2013protectionofpersonalinforcorrect.pdf (Date of use: 23 May 2023).

to be personal information.[464] Even when anonymised for research purposes, genetic information requires consent for future use. POPIA requires personal information to be collected for specific, explicitly defined and lawful purposes.[465] As such, there exists a fine line between the exact point at a which a genetic sample becomes personal information.[466]

3.3.2 National Health Act 61 of 2003 and relevant regulations

The National Health Act [467] (NHA) came into effect in 2005. At that time, Chapter 8 of the Act, which deals with human tissue (such as blood, blood products, tissues and gametes) had not been enacted and the regulation of human tissue was governed by the former Human Tissue Act, which has since been repealed.[468] The NHA defines tissue as "human tissue, and includes flesh, bone, a gland, an organ, skin, bone marrow or body fluid, but excludes blood or a gamete".[469] Yet in the regulations relating to tissue banks, also promulgated in terms of Chapter 8 of the NHA, tissue is defined as "a functional group of cells used collectively in the regulations to indicate both cells and tissue".[470] The discrepancies in definitions become more confusing if the definitions of a cell in the NHA and regulations are compared. The regulations relating to the use of human biological material describe a cell as "the smallest structural and functional unit of an organism, consisting of cytoplasm and a nucleus enclosed in a membrane in living things".[471] This is in contrast with the definition of a cell in the Regulations relating to the Artificial Fertilisation of persons, also promulgated in terms of Chapter 8 of the NHA, where a cell is said to be "the basic structural and functional unit in people and all living things and is a small container of chemical and water wrapped in a membrane".[472] The lack of clear and consistent definitions in the NHA, illustrated by these examples, compromises the determination of the nature and status of these concepts, which in turn complicates clear inferences regarding possible uses and limitations regarding these entities.

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[464]Personal information is loosely defined in the Act as information relating to an identifiable, living natural person (Section 1).

[465]POPIA Act 2013 https://www.gov.za/sites/default/files/gcis_document/201409/3706726-11act4of2013protectionofpersonalinforcorrect.pdf Section 13 (Date of use: 23 May 2023).

[466]Mahomed S and Staunton C "Ethico-legal analysis of international sample and data sharing for genomic research during COVID-19: a South African perspective" 2021 *BioLaw* 1 Journal available at www.biodiritto.org ISNN2284-4503 (Date of use: 23 May 2023).

[467]61 of 2003.

[468]65 of 1983.

[469]61 0f 2003.

[470]South Africa. National Health Act No.61 of 2003. Regulations relating to tissue banks. Government Gazette No. 35099, 2012 (Published under Government Notice R182).

[471]GN R177 in Government Gazette 35099 of 2 March 2012.

[472]GN R 1165 in Government Gazette 40312 of 30 September 2016.

In 2012, the Regulations Relating to the Use of Human Biological Material,[473] an important set of Regulations promulgated in terms of Chapter 8 of the NHA, were enacted. These regulations define HBMs as "material from a human being including DNA, RNA, blastomeres, polar bodies, cultured cells, embryos, gametes, progenitor stem cells, small tissue biopsies and growth factors from the same". Mahomed *et al*[474] argue that this definition results in ambiguity, compared to the NHA's definition of tissue, which excludes gametes and the definition of tissue in the regulations relating to tissue banks, referring to tissue as a term used to collectively indicate both cells and tissues. The effect of these uncoordinated definitions is that the classification of human tissue remains open-ended.[475]

3.3.2.1 Regulations Relating to the Use of Human Biological Materials (HBMs)

These Regulations provide in regulation 5 that HBMs can be removed or withdrawn from living persons for the following medical and dental purposes:

a) DNA-, RNA- and chromosome-based genetic testing
b) Health research referred to in Section 69(3) of the NHA
c) Training referred to in Section 64(1)(a) of the NHA
d) Studies of archaeological, medical or heritage value on DNA obtained from human genetic material, conducted in terms of the National Heritage Resource Act.

Although the issue of ownership is not addressed in these Regulations, the emphasis on the requirement of informed consent as a prerequisite for the removal and use of HBMs suggests that the law recognises that HBMs have an origin or source which needs to be recognised. Regulation 2(a) of the same regulations states that only a competent person (trained and registered by the Health Professions Act) is eligible to remove biological material for genetic testing, genetic health research or therapeutic purposes. Regulation 3 deals with the removal of biological materials from living persons for the purposes stated in Regulation 2(a) and explicitly states that no competent person may remove any HBMs unless it is done with the written informed consent of the person from whom the HBMs are removed.

[473]GN R177 in Government Gazette 35099 of 2 March 2012.
[474]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.
[475]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.

Regulation 3(1)(b) of the Regulations provides that if a child is younger than 18 years but older than 12, written consent is required, provided the child is of sufficient maturity and has the mental capacity to understand the benefits, risks and social implications of the procedure. However, if a child is immature but above the age of 12, a parent, caregiver or guardian must provide informed consent similarly to if the child were below the age of 12. In the case of an emergency, informed consent could be provided by the head of the health establishment if the removal of HBMs from a person is required. Regulation 3 stipulates that the consent for the removal of HBMs may also be provided by the Minister (of Health), if a parent, guardian or caregiver of a child unreasonably refuses or is incapable of giving consent to assist a child, either because they are deceased or cannot be traced. In the case of mentally ill patients, consent may be provided by the patient if they are capable of doing so. In the case of a mentally ill patient who is incapable of consenting, a curator, spouse, next of kin, parent, major child, brother or sister, partner or associate can give consent. In the case of an emergency, the head of the health establishment could provide the relevant consent. Regulation 3(2) states that no person shall carry out genetic health research unless the research has been approved by a registered health research ethics committee.[476]

Regulation 4 addresses the removal of HBMs from deceased persons. Regulations 4(1) and 4(2) provide that any organisation, institution or person that intends to use tissue from a deceased person for purposes of genetic testing, health research and therapeutics, where no consent has been given by the deceased person before their death and where there is no evidence that the removal of the tissue or cells would be contrary to a directive given by the deceased before their death, such an organisation, institution or person must take steps to locate the spouse, partner, major child, parent, guardian, major brother or major sister of a deceased person, *in this specific order mentioned*, in order to obtain consent.[477] Regulation 4(3) states that if none of the persons referred to is located, an application, including evidence that the above steps have been taken, must be submitted to the Director General with a request to remove the HBMs from the deceased.[478]

Regulation 9 refers to the use of adult, embryonic and umbilical cord cells for the purposes of stem cell therapy. It categorically determines that any competent person wishing to

[476]GN R177 in Government Gazette 35099 of 2 March 2012.
[477]GN R177 in Government Gazette 35099 of 2 March 2012.
[478]GN R177 in Government Gazette 35099 of 2 March 2012.

utilise these stem cells for stem cell therapy must obtain written informed consent from the donor of such stem cells.

With respect to compensation for the withdrawal of these HBMs, Regulation 11 cautions that a person whose HBMs are withdrawn may only be reimbursed for reasonable expenses incurred by them in order to effect the donation concerned, as defined in section 60(4) of the NHA.[479] Accordingly, no payment may be made to a person donating HBMs, except to reimburse the donor for reasonable expenses relating to the donation. This prohibition, as was argued earlier in this thesis, does not preclude benefit sharing by participants in health research, as it is strictly limited to the donation of the HBMs only.

All of the regulations discussed in this chapter demonstrate that South African legislation is lacking on issues regarding benefit sharing. Even though the regulations adequately deal with the issue of informed consent for the removal of HBMs from living and deceased persons for purposes of research and or study, the regulations are silent on the issue of consent relating to any future use of the extracted HBMs. [480] Unlike other African countries such as Kenya and Nigeria,[481] the South African National Health Act and its regulations do not clarify the issue of informed consent for the future use of extracted HBMs after these have been procured for research purposes. This omission is a further issue that complicates the determination of who has ownership interests as regards the extracted HBMs.[482] Despite the omission in these regulations, the Department of Health's Ethics in Health Research Guidelines indeed attempt to regulate the secondary use of HBMs, as will be discussed below.

3.3.2.2 Regulations Relating to Artificial Fertilisation of Persons

The Regulations relating to the Artificial Fertilisation of Persons came into effect in 2016.[483] These regulations are the only set of regulations that specifically address the issue of the

[479]GN R177 in Government Gazette 35099 of 2 March 2012.
[480]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.
[481]Nienaber A "Consent to and authorisation of the export and use of human biological specimens for future research–perspectives from three African countries" 2011 *CILSA* 63:225–254.
[482]Nienaber A "Consent to and authorisation of the export and use of human biological specimens for future research–perspectives from three African countries" 2011 *CILSA* 63:225–254.
[483]Notice 1165 in Government Gazette 40312 of 30 September 2015.

ownership of human biological material in the context of gametes in fertilisation. In this regard, regulation 18[484] provides as follows:

> (1) Before artificial fertilisation, the ownership of a gamete donated for the purpose of artificial fertilisation is vested -
> *(a)* in the case of a male gamete donor but -
> (i) before receipt of such gamete by the authorised institution to effect artificial fertilisation by the authorised institution which removed or withdrew the gamete; and
> (ii) after receipt of such gamete by the authorised institution that intends to effect artificial fertilisation, in that institution;
> *(b)* in the case of a male gamete donor for the artificial fertilisation of his spouse, in that male gamete donor; and
> *(c)* in the case of a female gamete donor, for the artificial fertilisation of a recipient, in that female gamete donor.
> (2) After artificial fertilisation, the ownership of a zygote or embryo effected by donation of male and female gametes is vested -
> *(a)* in the case of a male gamete donor, in the recipient; and
> *(b)* in the case of a female donor, in the recipient.

Gametes are included in the definition of HBMs in the Regulations relating to the Use of Human Biological Materials, as referred to above. However, unlike the aforementioned regulations, the Regulations relating to Artificial Fertilisation expressly provide for ownership of the gametes and the product of the gametes. The above provision is the closest acknowledgement in South African law of some form of proprietary rights in a specific category of HBMs.[485] Mahomed[486] points out that it appears that whoever is in possession of the human biological material used in the process of artificial fertilisation would be regarded as the owner of the said material.

3.3.2.3 Regulations relating to Tissue Banks

These Regulations were enacted in 2012 in terms of section 68 of the National Health Act.[487] The issue of ownership does not appear in these Regulations since regulation 1 emphatically states that no person shall remove, acquire or import human tissue from any living person and use said tissue or its products for therapeutic, research or educational

[484]Regulation 18 of the Regulations Relating to the Artificial Fertilisation of Persons Notice 175 in Government Gazette 35099 of 2 March 2012.
[485]It is suggested that due to discrepancies in the definition of an embryo in South African law, there is no guidance on whether an embryo may fulfil the requirements to be classified as property.
[486]Mahomed S "*An ethico-legal framework for the regulation of biobanks in South Africa"* (Philosophy PhD University of the Witwatersrand Johannesburg 2018) Available at: https://wiredspace.wits.ac.za/server/api/core/bitstreams/7b7894ae-6f5a-4fd6-81cf-65e36ff9563e/content (Date of use: 26 May 2023)
[487]Notice 182 in Government Gazette 35099 of 2 March 2012.

purpose unless he or she is granted permission by the Department.[488] The Director-General of the Department of Health may, on the application, authorise the use, import and export of tissue by an applicant (who will become an authorised tissue bank).[489]
The origins of the tissue are "donors" in the Regulations, which define a donor as "a person from who[m] tissue, blood, blood products or stem cells is donated".[490] According to the Regulations, the only obligations to the donor of the tissue—as stated in Regulation 6—is for the recipient of their tissue to register their particulars and the identity and relationship of the consenting person, including their name, address and telephone number to satisfy the tissue bank's or organisations' reporting obligations.[491] Section 15 (iv) of the Regulations calls for the anonymity and privacy of the donors.[492]

3.3.2.4 Regulations relating to Stem Cell Banks

These regulations were also enacted in 2012 under section 68 of the National Health Act.[493] In the Regulations relating to stem cells,[494] stem cell banks are obligated to the donors to preserve and protect the donors' right to privacy and anonymity.[495] Informed consent is also a prerequisite for donation.[496] Regulation 3 states that no person shall use stem cells or its products for therapeutic, research or educational purposes unless they are authorised by the Health Department of Health via the Director General.[497] Regulation (5)(2)(b) requires that stem cell banks provide a health officer for the area in which the stem cell donation was supplied.[498] Regulation 7[499] outlines the additional duties of the health officer:

> (1) A health officer may, as far as stem cells or any matter relating thereto is considered -
> (a) take samples, or direct that such samples be forwarded or delivered to whom so ever or wherever she or he deems fit, in such

[488]Regulation 1 of the Regulations Relating to Tissue Banks Notice 182 in Government Gazette 35099.
[489]Regulation 3(3)(c) 1 of the Regulations Relating to Tissue Banks Notice 182 in Government Gazette 35099.
[490]Notice 182 in Government Gazette 35099 of 2 March 2012.
[491]Regulation 6 of the Regulations Relating to Tissue Banks Notice 182 in Government Gazette.
[492]Regulation 15(iv) of the Regulations Relating to Tissue Banks Notice 182 in Government Gazette.
[493]Notice 183 in Government Gazette 35099 of 2 March 2012.
[494]Stem cells are defined as cells that have both the capacity to self-generate as well as to differentiate into mature specialised cells.
[495]Regulation 10 of the Regulations Relating to Stem Cell Banks Notice 183 in Government Gazette 35099.
[496]Regulation 5 (1)(a)(viii) of the Regulations Relating to Stem Cell Banks Notice 183 in Government Gazette 35099.
[497]Regulation 3 of the Regulations Relating to Stem Cell Banks Notice 183 in Government Gazette 35099.
[498]Regulation (5)(2)(b) of the Regulations Relating to Stem Cell Banks Notice 183 in Government Gazette 35099.
[499]Regulation 7 of the Regulations Relating to Stem Cell Banks Notice 183 in Government Gazette 35099.

quantities as she or he may consider necessary and adequate for testing purposes, of tissue or any tissue product or of any device or test reagent or other material used in the testing or preparation of such tissue or tissue product;
(b) mark or seal any container with stem cell[s] or any device, test reagent or substance;
(c) request information or registers from the management of the authorised stem cell bank and interrogate any member of the staff of the authorised stem cell bank in connection with -
i) any premises, equipment or methods used or being used by the authorised stem cell bank;
ii) any tissue or tissue product or any test reagent or substance referred to in these regulations; or
iii) any applicable standards operating procedures;
(d) place under embargo or seize any stem cells; or
(e) documentation if in her or his opinion it may produce evidence of an offence in terms of the Act and these regulations.
(2) a health officer shall exhibit the written authority by virtue of which she or he was authorised, to any person affected by the exercise or performance, of any power, duty or function under the Act, when called upon to do so.

This specific Regulation effectively makes the health officer the custodian of the stem cells.

3.3.2.5 Regulations Regarding the General Control of Human Bodies, Tissue, Blood, Blood Products and Gametes

Regulation 180 was enacted in March 2012 in terms of section 68 of the National Health Act.[500] Regulation 2 requires written consent from the living person from whom tissue, blood or gametes are removed. The tissue, blood and gametes removed from a living person are considered donations to be used for medical and dental purposes or the artificial fertilisation of another person.[501]

Regulation 26[502] states that exclusive rights to the bodies of deceased persons, tissue, blood and gametes are acquired by any person who obtains the body of the deceased person or the HBMs, subject to informed consent and the provisions and restrictions of the NHA or any other law, on condition that the body, tissue, blood or gametes are used for the purposes for which they have been donated. This Regulation implies that exclusive

[500]Notice No. R. 180 in Government Gazette 35099 of 2 March 2012.
[501]Regulation 3 of the Regulations Regarding the General Control of Human Bodies, Tissue, Blood, Blood Products and Gametes in Government Gazette 35099 of 2 March 2012.
[502]Regulation 26 of the Regulations Regarding the General Control of Human Bodies, Tissue, Blood, Blood Products and Gametes in Government Gazette 35099 of 2 March 2012.

property rights are transferred from donor to the donee of HBMs, where a donee could be a researcher, doctor or research institute.[503] However, despite receiving 'exclusive rights', limitations on the donation of the HBMs are found in the requirement that these may only be donated or used for the specific purposes defined in the NHA.

The notion that coded and anonymised HBMs samples (inclusive of genetic material) ceases to be identified with the donor once donated is troublesome because the genetic information within those materials is susceptible to identification.[504]

3.3.2.6 National Material Transfer Agreement for Human Biological Materials

In 2018, the government of South Africa gazetted a Material Transfer Agreement (MTA) template for the transfer of HBMs.[505] The MTA is a guidance template document to be used by all providers and recipients of biological material for use in research or clinical trials, under the oversight of Health Research Ethics Committees.[506]

Section 3.3 of the MTA states that the provider[507] of the HBMs remains the custodian of the materials and that the donor remains the owner of the material until such materials are destroyed.[508] The significance is that this clause introduces the concept of a custodianship between the donor and the provider of the HBMs. Custodianship means the provider has a caretaking obligation to the HBMs from the initial collection of the HBMs to the publication of the research results, which is different from the legal understanding of ownership as it does not involve exclusive rights of and complete control over the HBMs in relation to proprietary rights, as would be in the case of ownership.[509] Section 4 of the MTA lists the provider's obligations, one being the obligation to obtain informed consent from the donor of the HBMs, where reasonably possible, as well as approval from the HREC for any further

[503]National Health Act No. 63. Government Gazette No. 350099 2012.
[504]Mahesh KP "Laws and regulations associated with ownership of human biological materials in South Africa" 2015 *S Afr J BL* 8(1):11–18.
[505]Proclamation No 11 Government Gazette 41781 of 20 July 2018.
[506]Proclamation No 11 Government Gazette 41781 of 20 July 2018.
[507]Provider being the providing institution of the HBM.
[508]Section 3.3 of the MTA 2018.
[509]Yassin R, Lockhart N *et al* "Custodianship as an ethical framework for biospecimen-based research" 2010 *Cancer Epidemiology, Biomarkers and Prevention: A Publication of the American Association for Cancer Research, Cosponsored by the American Society of Preventive Oncology* 19(4):1012–1015.

uses of the material. [510] Section 10 of the MTA[511] reinforces the onus on the custodian to obtain informed consent from the owner of the HBMs, which provides that "the provider must submit the informed consent form for Secondary Uses of the Material to the HREC should the need arise for Secondary Use". This section is also significant as neither the NHA nor the Regulations relating to the Use of Human Biological Materials addresses the issue of the secondary use of HBMs.

The MTA addresses the issue of benefit sharing in section 7.1[512] by requiring that "the sharing of benefits should be discussed and negotiated between the Provider and Recipient[513] before materials are transferred to the Recipient". The MTA does not mandate that benefit sharing must occur but does provide an Annexure B where the terms of a benefit sharing arrangement agreed upon by the Provider and Recipient institutes may be recorded. The MTA is the first legal document to define benefit and benefit sharing in the context of health research.[514]

I propose that the benefit sharing model that provides the best 'fit' for the benefit of all participants in health research is the Charitable Trust model, proposed by Winickoff and Winikoff. [515] A "trust" involves a fiduciary relationship in which trustees hold title to property but are obligated to keep or use the said property for the benefit of the beneficiary.[516] This model suggests that if hospitals solicit altruistic donations of HBMs, the hospitals should act as *trustees* of the HBM donations rather than brokers. This model creates a fiduciary relationship where the trustee has legal fiduciary duties over the HBMs, but must keep or use the property for the benefit of the specified party, which in the case of the HBMs, is the beneficiary/donor.[517]

[510]Section 4 of the MTA 2018.
[511]Section 10 of the MTA 2018.
[512]Section 7.1 of the MTA 2018.
[513]Recipient being the recipient institution.
[514]In the MTA, a benefit is described as "amongst others, the sharing of information; use; of research results; royalties; acknowledgement of the Provider as the source of the Materials; publication rights; transfer of technology or the process materials; and capacity building", while benefit sharing is described as "the process or act of sharing in the benefits that derive from the Project in a manner that is fair and equitable."
[515]Winickoff DE and Winickoff RN "The charitable trust as a model for genomic biobanks" 2003 *New Engl J Med* 349(12):1180–1184.
[516]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[517]Winickoff DE and Winickoff RN "The charitable trust as a model for genomic biobanks" 2003 *New Engl J Med* 349(12):1180–1184.

The gazetted MTA received some criticism from scholars whom, whilst recognising the need to respect local culture when promoting research collaborations between South Africa and international organisations and the need for fair benefit sharing, suggest that the MTA has failed to align with the broader legal environment in clarity and practicality.[518]

Despite the criticism, the MTA is a first step in the right direction.[519] South African institutions are currently involved in multi-national research with both LMICs' and HICs' institutions.[520] Considering the historical injustices brought about by lack of integrity, cultural insensitivities and unfair collaborations,[521] and the fact that previous MTAs that have been used in SA often lacked ethical safeguards and failed to address specific South African problems,[522] a standardised MTA gazetted by the National Department of Health to serve as a framework for the transfer of HBMs and related data, is a critical necessity.

3.3.3 Protection of Personal Information Act 4 of 2013

POPIA[523] was enacted on 1 July 2020 and took full effect on 1 July 2021.[524] The Act is set to give effect to section 14 of the right to privacy in the Constitution.[525] The Act has far-reaching implications for all research activities that involve the collection, processing and storage of personal information. POPIA is designed to work like other data protection regulations such as the European Union's General Data Protection Regulation (GDPR).[526] Section 2(a) of the Act states that the purpose of the Act is to:[527]

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[518]Thaldar DW, Botes M and Nienaber A "South Africa's new standard material transfer agreement: proposals for improvement and pointers for implementation" 2020 *BMC Medical Ethics* 21(1):1–13.

[519]Labuschaigne M, Dhai A *et al* "Protecting participants in health research: the South African Material transfer agreement" 2019 *S Afr Med J* 109(5):353–356.

[520]Thaldar DW, Botes M and Nienaber A "South Africa's new standard material transfer agreement: proposals for improvement and pointers for implementation" 2020 *BMC Medical Ethics* 21(1):1–13.

[521]Moodley K and Singh S "It's all about trust": reflections of researchers on the complexity and controversy surrounding biobanking in South Africa" 2016 *BMC Medical Ethics* 17(1):1–9.

[522]Mahomed S, Nahrens K, Slabbert M and Sanne I "Managing human tissue transfer across national boundaries—an approach from an institution in South Africa" 2016 *Dev World Bioeth* 16:39–35.

[523]POPIA Act 2013 https://www.gov.za/sites/default/files/gcis_document/201409/3706726-11act4of2013protectionofpersonalinforcorrect.pdf (Date of use: 22 May 2023).

[524]Mahomed S and Staunton C "Ethico-legal analysis of international sample and data sharing for genomic research during COVID-19: a South African perspective" 2021 *BioLaw* 1 Journal available at www.biodiritto.org ISNN2284–4503 (Date of use: 23 May 2023)

[525]Section 14 of The Constitution.

[526]Mahomed S and Staunton C "Ethico-legal analysis of international sample and data sharing for genomic research during COVID-19: A South African perspective" 2021 *BioLaw* 1 Journal available at www.biodiritto.org ISNN2284–4503 (Date of use: 23 May 2023).

[527]POPIA Act 2013 https://www.gov.za/sites/default/files/gcis_document/201409/3706726-11act4of2013protectionofpersonalinforcorrect.pdf (Date of use: 23 May 2023).

(a) give effect to the constitutional right to privacy, by safeguarding personal information when processed by a responsible party, subject to justifiable limitations that are aimed at:

(i) balancing the right to privacy against other rights, particularly the right of access to information; and

(i) protecting important interests, including the free flow of information within the Republic and across international borders.[528]

Physical HBM samples do not fall into the category of personal information, which is defined in POPIA as "including information relating to identifiable, living, natural person".[529] However, the data derived from the HBMs falls within the ambit of personal information in POPIA. Biobanks and/or tissue banks which store and distribute HBMs and often associated data for health research in perpetuity, are now legally obliged to adhere to the POPIA.

Section 26(a) of the POPIA prohibits a responsible party from processing personal information concerning the ethnic origin, health or biometric information of a data subject[530] unless, as stated in section 27(1), the data subject consents, and/or the processing of the personal information of the data subject is for research purposes that serve the public interest and consent cannot be obtained.[531] Section 27(1) additionally provides that guarantees have to be in place to ensure that the data processing does not adversely affect the individual privacy of the subject to a disproportionate extent.[532]

Section 29 (b) of the POPIA states that processing personal information concerning a data subject's race or ethnic origin is permitted if the processing complies with laws and other measures designed to protect or advance persons or categories of persons who have been disadvantaged by unfair discrimination.[533]

Section 32(5) of the Act stipulates that personal information concerning inherited characteristics (such as genetic or genomic information) may not be processed in respect

[528] Section 2 (a) of the POPIA Act No 4 of 2013.

[529] POPIA Act 2013 https://www.gov.za/sites/default/files/gcis_document/201409/3706726-11act4of2013protectionofpersonalinforcorrect.pdf (Date of use: 23 May 2023).

[530] For health research purposes, a data subject under the POPIA is referred to as a research participant.

[531] Section 26 and Section 27 of the POPIA Act https://www.gov.za/sites/default/files/gcis_document/201409/3706726-11act4of2013protectionofpersonalinforcorrect.pdf (Date of use: 23 May 2023).

[532] Section 27 (1) of the POPIA Act https://www.gov.za/sites/default/files/gcis_document/201409/3706726-11act4of2013protectionofpersonalinforcorrect.pdf (Date of use: 23 May 2023).

[533] Section 29 of the POPIA Act https://www.gov.za/sites/default/files/gcis_document/201409/3706726-11act4of2013protectionofpersonalinforcorrect.pdf (Date of use: 23 May 2023).

of the data subject unless a serious medical interest prevails or the data processing is necessary for historical, statistical or research activity.[534]

Thus, although the POPIA places certain restrictions on the processing of personal information which extends to data derived from HBMs, certain exceptions exist regarding the processing of personal information for research purposes.[535]

3.3.4 Intellectual Property Rights from Publicly Financed Research and Development Act (IPR Act)

The IPR Act promulgated in 2008 only came into effect in 2010.[536] The Act is based on the Bayh–Dole Act (the United States Patent and Trademark Laws of 1980).[537] The IPR Act extends only to Research and Development (R&D) that relies on public funds. The IPR Act states in section 2(1) that its aim is to[538]:

> Make provision that intellectual property emanating from publicly financed research and development is identified, protected, utilised and commercialised for the benefit of the people of the Republic, whether it be for social, economic, military or any other benefit.

The IPR Act does not define what constitutes research and development (R&D). The *Interpretation Note 11: State-Owned Enterprises and the Interface with the IPR Act*[539] of the National Intellectual Property Management Office (NIPMO) explains that because of the lack of a definition of R&D in the IPR Act, NIPMO decided to adopt the definition by the *Frascati Manual* (2015) of the Organisation for Economic Co-operation and Development (OECD).[540] In this definition, R&D include basic research, applied research and experimental development, as well as specialised healthcare research that is conducted in university hospitals.[541] Research using human biological materials is also conducted in government hospitals, university hospitals, private hospitals and private doctors rooms.

[534]Section 32(5) of the POPIA Act https://www.gov.za/sites/default/files/gcis_document/201409/3706726-11act4of2013protectionofpersonalinforcorrect.pdf (Date of use: 23 May 2023).
[535]Sections 14(2); 15(3); 18(4); 27(1) 32(5); 35(1) of POPIA.
[536]The IPR Act https://www.gov.za/sites/default/files/gcis_document/201409/33433675.pdf (Date of use: 23 May 2023).
[537]The IPR Act https://www.gov.za/sites/default/files/gcis_document/201409/33433675.pdf (Date of use: 23 May 2023).
[538]Section 2(1) of the IPR Act No 51.
[539]The IPR Act 51 https://www.gov.za/sites/default/files/gcis_document/201409/33433675.pdf (Date of use: 23 May 2023).
[540]Section 5 of the IPR Act 51 https://www.gov.za/sites/default/files/gcis_document/201409/33433675.pdf (Date of use: 23 May 2023).
[541]Definition of Research and Development as per *Frascati Manual* of the OECD https://www.oecd-ilibrary.org/docserver/9789264199040-en.pdf (Date of use: 23 May 2023).

Along with the collected samples that are to be processed and analysed, the sample donors' relevant medical data and social information are also collected. All of these activities fit into the definition of R&D.

In the IPR Act, a recipient of public funds is defined as any person, juristic or non-juristic that undertakes R&D using funding from a funding agency (the state or an organ of the state) and includes an institution.[542] Section 4 of the IPR Act provides that intellectual property resulting from publicly funded research and development shall belong to the recipient of the public funds.[543] If the recipient of the funds does not wish to retain ownership, NIPMO must be informed of the decision and reasons for such a decision. Section 4(4) elaborates that if NIPMO does not have an intention to acquire ownership of the intellectual property, the recipient must be notified of this decision, who must then provide the intellectual property creator[544] with an option to acquire ownership of and patent the intellectual property, provided that the R&D was entirely financed by public funds.[545]

Section 2(a) of the Act tasks the recipient of the public funds to assess, record and report on the benefit of publicly funded research and development for society. The South African government recognises that there should be benefit sharing between society and the recipient using public funds for R&D. The recipient is also obliged in accordance with section 2(c) of the IPR Act to identify commercialisation opportunities for intellectual property that would emanate from the publicly funded research.

Section 5(1)(a) of the Act reiterates that a recipient must:

> Put in place mechanisms for the identification, protection, development, management of intellectual property, intellectual property transactions and, where applicable, the commercialisation of intellectual property and appropriate capacity-building relating thereto.[546]

If the recipient of the funds is an institution, section 5(1)(f) furthermore provides that it should:

[542]IPR Act 51 of 2008.
[543]Section 4(1) 0f the IPR Act 2008.
[544]An ''intellectual property creator'' is defined as the person involved in the conception of intellectual property in terms of this Act and identifiable as such to obtain statutory protection and enforcement of intellectual property rights, where applicable in the IPR Act 51 of 2008.
[545]Section 4(4) (b) (a) of the IPR Act 51 of 2008.
[546]Section 5(1) (a) of the IPR Act of 2008.

> Manage revenues due to it from intellectual property transactions and the commercialisation thereof, including managing the benefit sharing arrangements with intellectual property creators at the institution.

Section 5 stresses the issue of benefit sharing arrangements between recipients of public funds and intellectual property creators. Although the focus of this Act is not the regulation of HBMs *per se*, the question arises on the position of the donors of HBMs whose contribution of their materials enabled the R&D to occur.

In section 5(10)(j), the Act requires institutions to set up mechanisms to annually assess, record and report to NIPMO on the benefits of publicly financed research conducted in that institution for society.

The IPR Act acknowledges that recipients of public funds can co-own intellectual property resulting from R&D and undertaken with public funds with a private entity or organisation, as stipulated in section 15(2) of the IPR Act.[547] The Act defines a private entity or organisation as "a private sector company, a public entity, an international research organisation, an educational institution or an international funding or donor organisation".[548] However, this co-ownership requires that stringent conditions between the parties are met, which include among others, benefit sharing agreements. The requirements listed in section 15(2) of the Act include, that (1) a contribution of resources should have occurred (such as background intellectual property brought in by the private entity); (2) the parties involved jointly contributed to the creation of the intellectual property; (3) a benefit sharing arrangement with the intellectual property creators is in place and (4) an agreement for commercialisation of the intellectual property is agreed upon by the parties.[549]

The default sole ownership by the recipient is then voided when all these requirements have been met and co-ownership of the intellectual property is possible. In the final instance, section 15(4) stipulates that any R&D that occurs at an institution and which is fully funded by a private entity or an organisation will not be seen as publicly funded R&D and would thus be exempt from the application of the IPR Act.[550]

[547]Section 15(2) of the IPR Act 51 of 2008.
[548]Section 15(5) of the IPR Act 51 of 2008.
[549]Section 15(2) of the IPR Act 51 of 2008.
[550]Section 15(4) of the IPR Act 51 of 2008.

In the era of biotechnology, research collaborations between institutions in LMICs and HICs have drastically increased.[551] Mahomed[552] points out that the exchange of human biological materials and associated data between institutions, both within and across countries, has become a prominent feature of biomedical research and biobanking. Section 12 of the IPR Act addresses issues pertaining to offshore intellectual property transactions, stating that a recipient has a duty to inform NIPMO of its intention to conclude an intellectual property transaction offshore, bearing in mind that the Republic of South Africa will benefit from this transaction. The recipient must also satisfy NIPMO that the Republic lacks sufficient capacity to develop and commercialise the intellectual property.[553]

Intellectual property creators feature very prominently in the IPR Act, as is evident from the wording of section 2(2)(d), which states that human ingenuity and creativity must be recognised and rewarded. Section 10 of the IPR Act elaborates on the benefit sharing rights of intellectual property creators in institutions but remains silent on any benefit sharing arrangement with donors of HBMs.[554] Section 10(1) specifically provides:

> Intellectual property creators at an institution and their heirs are granted a specific right to a portion of the revenues that accrue to the institution from their intellectual property in terms of this Act until such right expires.[555]

Section 10(a)(b) next details how benefits to intellectual property creators and their heirs should be calculated, namely at least 20 per cent of the revenue accruing to the institution emanating from said intellectual property for the first one million rands of revenue, or any such higher amount as the Minister may prescribe and thereafter, at least 30 per cent of the net revenue accruing to the institution. The IPR Act further provides regarding benefit sharing, that intellectual property creators must be the first call for the applicable revenue, after which the recipient can allocate the balance of the revenue as it deems fit, which should include funding for more research and development.[556] This arrangement once

[551]H3frica Consortium, Rotimi C, Abayomi A *et al* "Research capacity. Enabling the genomic revolution in Africa" 2014 *Science* 344 (6190):1346–1348.
[552]Mahomed S and Labuschaigne M "The role of research ethics committees in South Africa where human biological materials are transferred between institutions" 2019 *S Afr J Bioethics Law* 12(2):79–83.
[553]Section 12(2) IPR Act 51 of 2008.
[554]Section 10 of IPR Act 51.
[555]Section 10 of IPR Act 51.
[556]Section 10 of the IPR Act 51 of 2008.

again alludes to donors of human biological material in health research, especially in LMICs. The question rightly arising is why the donors of HBMs and their communities are not entitled to any benefits accruing from their donations in terms of the IPR Act.

3.3.5 Patent Act 57 of 1978

The age of biotechnology precipitated many biotechnology and pharmaceutical companies aggressively pursuing intellectual property rights to biological materials to protect their proprietary interests and gain profits from their research and development costs.[557] In most research relating to human biological materials, there is a need to isolate, purify, concentrate, clone and even modify the HBMs; consequently, the issue of private companies, universities and government agencies patenting HBMs is not an uncommon endeavour.[558] However, patenting HBMs and indeed, the engineered products that arise from research and development on HBMs, are highly contested issues in healthcare research, especially if their development is vital for saving lives or curing a disease.[559] Ownerships in HBMs would confer exclusive rights to the donor of the HBMs; however, as discussed earlier, this notion would contradict respect for human dignity and the inviolability of human beings.

A patent is a right granted by the government to exclude others from using, making or commercialising an invention for a limited period.[560] Patents protect intellectual property rights.[561] In South Africa, the Patent Act provides that a patent may be granted for any new invention that involves an inventive step and which is capable of being used or applied in trade, industry or agriculture.[562] Section 27(1) of the Patent Act stipulates that a patent application may be made by the inventor of the creation or by any other person who acquires the right to apply from the inventor or by both such inventor and such other

[557]Resnick DB "The human genome: common resource but not common heritage" 2005 *Frontis* 197–210.
[558]Resnick DB "The human genome: common resource but not common heritage" 2005 *Frontis* 197–210.
[559]Mahomed S 2018 *An Ethico-legal framework for the regulation of biobanks in South Africa* (Doctor of Philosophy PhD University of the Witwatersrand) Available at: http://wiredspace.wits.ac.za/handle/10539/25331.
[560]Resnick DB "The human genome: common resource but not common heritage" 2005 *Frontis* 197–210.
[561]Pouris A and Pouris A "Patents and economic development in South Africa: managing intellectual property" 2011 *South African Journal of Science* 107(11/12):24–33.
[562]Section 25(1) of the Patent Act 57 of 1978.

person.[563] Section 27(2) explains that in the absence of the agreement referred to in section 27(1), joint inventors may apply for a patent in equal, undivided shares.[564]

The Companies and Intellectual Property Commission (CICP), previously known as the Companies and Intellectual Property Registry Office (CIPRO), administers all parts of legislation related to intellectual property regulation, such as the Patent Act, and is also responsible for the registration of all intellectual property rights such as patents in South Africa.[565] Pouris and Pouris[566] rightly argue that the patent system appears to benefit the pharmaceutical and biotechnology industries in South Africa in terms of research, development and innovation. It is troubling to learn that of the 280 patents applied for by South African universities and researchers to CIPRO from 1996–2006, only 58 were protected abroad. Although some inventions require only local protection, exposing inventions abroad without protection could easily result in copyright infringements of the innovation abroad. It is worth noting that the Intellectual Property Rights for Publicly Financed Research Development Act was enacted to provide for more effective utilisation of IP emanating from publicly financed research and development.[567] However, whilst the IPR Act establishes the National Intellectual Property Management Office and the Intellectual Property Fund, it does not address issues related to CIPRO's activities, [568] meaning that researchers and their inventions could go unprotected, wasting government funds in the process.

In 2005, section 2 of the Patents Act was amended[569] to insert certain definitions and to require the applicant of a patent to furnish information relating to any role played by an indigenous biological or genetic resource or traditional knowledge.

[563]Section 27(1) of the Patent Act 57 of 1978.
[564]Section 27(2) of the Patent Act 57 of 1978.
[565]Responsibilities of the Companies and Intellectual Property Commission http://www.cipc.co.za (Date of use: 23 May 2023).
[566]Pouris A and Pouris A “Patents and economic development in South Africa: managing intellectual property” 2011 *South African Journal of Science* 107(11/12): 24–33.
[567]The IPR Act 51 of 2008.
[568]Pouris A and Pouris A “Patents and economic development in South Africa: managing intellectual property” 2011 *South African Journal of Science* 107(11/12): 24–33.
[569]Patents Amendment act 2005 https://wipolex.wipo.int/en/text/179614 (Date of use: 23 May).

In human health research, proprietary rights are often granted to the intellectual property developer rather than the owner or donor of the HBMs.[570] Although the concept of benefit sharing appears in the IPR Act, this arrangement is limited to apply between an institution and the intellectual property creators and their heirs.[571] Both the IPR Act and the Patent Act fail to provide a framework on how benefit sharing arrangements should be construed with the donors in research, as well as how development by the intellectual property creator should occur. In the current context where the number of human tissue banks and biobanks are rising sharply and have become integral to research facilities around the globe, including in South Africa,[572] the legislation does not provide for a framework for benefit sharing between research participants, investigators and investors.

3.3.6 Department of Health Ethics in Health Research Guidelines, 2015

The concept of the commodification of human biological materials is not directly addressed in the Department of Health's Ethics in Health Research Guidelines. However, section 2.1 of the Guidelines advises that all health research should consider distributive justice.[573] This section states that the risks and benefits for all role players involved in research should be fairly balanced and that the population should not be denied any benefits resulting from the research. Section 2.1 explicitly states that the donors of human biological materials—who are also the participants in human health research—and their communities should have a reasonable likelihood that they will all benefit from the research, if not immediately, then in the future.[574]

Section 3.3.7 of the Guidelines[575] addresses the secondary use of biological materials that have originally been collected for other purposes, such as diagnostics or therapeutic purposes. Researchers often bank surplus samples in tissue banks and biobanks, leading to the dilemma of having to seek new informed consent from the donor of human biological materials for further and secondary uses of the HBMs again. Section 3.3.7 recommends

[570]See IPR Act 51 of 2008 and Patent Act 57 of 1978.
[571]See Section 5 and Section 10 of the IPR Act 51 of 2008.
[572]Labuschaigne M and Mahomed S "Regulatory challenges relating to tissue banks in South Africa: impediments to accessing healthcare" 2019 *SAJBL* 12(1): 27–31.
[573]DoH Ethics in Health Research Guideline https://www.health.gov.za/up-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).
[574]Section 2.1 of the DoH 2015 Ethics in Health Research.
[575]Section 3.3.7 of the DoH 2015 Ethics in Health Research.

how to proceed with the secondary use of HBMs and data in the absence of broad consent from the donor. This requirement seemingly acknowledges that a person retains some rights to their HBMs and data.[576] Mahomed[577] points out that although the legal framework is unclear on the idea of the ownership of HBMs and intellectual property that result from the use of said HBMs and its data, a benefit sharing agreement incorporated into the MTA, coupled with the model of custodianship of HBMs would promote health research and build trust amongst the relevant stakeholders involved in a research project.

It is evident that in South African law, there is a general silence on the classification of HBMs, yet there is an unending and complex debate of which one contentious point is whether there should be a property or non-property approach towards HBMs.[578] The law also does not address the different models, such as custodianship, stewardship and trusteeship of HBMs.

The Constitution of South Africa in section 39(1) directs that when interpreting the Bill of Rights, a court tribunal or forum must consider international law and may consider foreign law.[579] For this reason, foreign judgements become relevant when human rights are interpreted. The next section will turn to some approaches by foreign courts when adjudicating issues around the legal ownership of HBMs and how benefit sharing—if any was to occur with the donor of the HBMs—is addressed.

3.4 Foreign case law

In an ideal society, health research should be altruistic and for the good of humanity, a society with free and adequate healthcare, as in some affluent nations.[580] The case of

[576]Section 3.3.7 of the DoH 2015 Ethics in Health Research.

[577]Mahomed S 2018 "*An ethico-legal framework for the regulation of biobanks in South Africa* "(PhD in Bioethics and Health Law University of the Witwatersrand 2018) Available at https://wiredspace.wits.ac.za/server/api/core/bitstreams/7b7894ae-6f5a-4fd6-81cf-65e36ff9563e/content (Date of use: 27 May 2023).

[578]Mahomed S, Nöthling-Slabbert M and Pepper MS "Ownership and human tissue-the legal conundrum: a response to Jordaan's critique" 2017 *SAMJ* 107(3): 196–198.

[579]The Constitution of South Africa https://www.justice.gov.za/legislation/constitution/pdf.html (Date of use: 23 May 2023).

[580]Lucas CJ, Schroeder D, Arnarson G, Andada P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits? Cases from Iceland, Kenya and Indonesia" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 95–127.

Henrietta Lacks, who was the first source of the immortal cell line (HeLa),[581] makes it clear that health research is often conducted at the expense of others. The HeLa tissue cells that were used in the initial culture of the cell line were obtained from Ms Henrietta Lacks in 1951 at John Hopkins Hospital by physicians who were treating her for cervical cancer. The cell line was removed without her knowledge and consent soon after she had passed away.[582] The HeLa cells, still viable to date, became invaluable to medical research. It could be argued that the inventors of the cell line acted altruistically by readily distributing the cells across the research community while the cell line and its discoveries became extremely lucrative. However, all of this happened while the Lacks family experienced poverty and had no access to healthcare.[583] This outcome is patently unfair.

Another illustrative case is that of *Moore v. Regents of the University of California*.[584] In this case, Mr John Moore, a patient with hairy cell leukaemia, had a splenectomy in 1976 as part of his treatment at the University of California Los Angeles (UCLA) Medical Centre.[585] The attending physician, Dr David Golde and his research assistant removed samples of Mr Moore's blood, bone marrow aspirate, sperm, skin, other tissues and fluid over a period of several years.[586] The physician and assistant subsequently conducted research on the samples donated by Moore, without informing Mr Moore that his cells had great monetary potential.[587] In 1979, Dr Golde established a patented cell line from Mr Moore's tissue.[588] The patent was assigned to the Regents of the University of California, as they had invested in the commercial development of the cell line and future products. Dr Golde became a paid consultant and received stock in the company that acquired the developmental rights for the cell line. When Mr Moore discovered this, he sued Dr Golde,

[581]Troug RD, Kesselheim AS and Joffe S "Paying patients for their tissue: the legacy of Henrietta Lacks" 2012 *Science* 337:37–38.
[582]Beskow LM "Lessons from HeLa cells: the ethics and policy of biospecimens" 2016 *Annu. Rev. Genom. Hum.Genet* 17:395–417.
[583]Beskow LM "Lessons from HeLa cells: the ethics and policy of biospecimens" 2016 *Annu. Rev. Genom. Hum.Genet* 17:395–417.
[584]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.
[585]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.
[586]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.
[587]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.
[588]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.

UCLA and two biotechnology companies,[589] claiming that he had a right to share in the profits generated from his HBMs, which he asserted had a potential value of approximately $3 billion.

The California Supreme Court rejected Mr Moore's property right's claim in his cells, concluding that this would hamper scientists from conducting medical research. However, the court found that Moore had a cause of action against Dr Golde for the physician's failure to obtain informed consent and for a breach of a fiduciary duty. However, in *dicta* the court observed that its decision left the issue whether the transfer of human tissue should be gift-based or market-based undecided, and that future controversies would have to be decided on a case-by-case basis.[590] As a result of the combination of the lack of case precedent, California legislation relating to the disposal of human tissue, as well as the fact that the patented cells were different from those excised from Mr Moore, Mr Moore's claim was rejected by the California Supreme Court.[591]

Greenberg v. Miami Children's Hospital Research Institute, Inc. is another case in the United States in which a court ruled that persons have no real property rights to HBMs that are donated for medical research.[592] The case involved families of children with Canavan disease.[593] These families donated tissue, blood and other HBMs to Dr Matalon, a research physician (supported by the Miami Children's Hospital), whose objective was to identify the gene responsible for Canavan disease in order to develop a prenatal diagnostic test.[594] Dr Matalon and his team used the donated tissue and relevant family histories and financial support from the families, successfully identified and isolated the gene causing Canavan disease in 1993.[595] Subsequently, the researchers patented the gene sequence and its related applications, including the prenatal diagnostic test without informing the

[589]Petrini C "Ethical and legal considerations regarding the ownership and commercial use of human biological materials and their derivatives" 2012 *Journal of Blood Medicine* 3:87–96.
[590]Lavoie J "Ownership of human tissue: life after Moore v. Regents of the University of California" 1989 *Virginia Law Review* 75(7):1363–1396.
[591]Petrini C "Ethical and legal considerations regarding the ownership and commercial use of human biological materials and their derivatives" 2012 *Journal of Blood Medicine* 3:87–96.
[592]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.
[593]Canavan disease is a gene-linked, neurological birth disorder where the white brain matter degenerates into spongy tissue.
[594]Lavoie J "Ownership of human tissue: life after Moore v. Regents of the University of California" 1989 *Virginia Law Review* 75(7):1363–1396.
[595]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.

families.[596] The families sued and maintained that they would not have donated their biological material if they had known that Dr Matalon would exploit their genetics for commercial purposes and was going to restrict the use of the research results.[597]

The Florida Court concurred that the researchers should have provided information and obtained consent but determined that any property right in blood and tissue samples "evaporates once the sample is voluntarily given to a third party".[598] The Court also found that a research product developed from HBMs is factually and legally distinct from the original donated HBMs and, as such, becomes the property of the researcher.[599] It is worth noting that the Code of Medical Ethics of the American Medical Association, which came into effect after the research (in this case) had already begun, states that all physicians involved in research using human biological materials should:

1) Disclose potential commercial applications to the tissue donor before a profit is realized on products developed from biological materials.
2) Obtain informed consent to use biological materials in research from the tissue donor. Human biological materials and their products may not be used for commercial purposes without the consent of the tissue donor.
3) Share profits from the commercial use of human biological materials with the tissue donor in accordance with lawful contractual agreements.[600]

Although these court decisions are primarily meant to enable research to continue and prevent persons from commodifying themselves, it appears unjust that others, such as the researchers, are permitted to commodify and profit from research using another person's HBMs. It is only fair that research participants should also benefit from research using their HBMs. Moreover, research needs donors and does not only rely on the input of researchers.

An additional case in which a court had to decide on the ownership of research participants' donated HBMs was *Washington University v. Catalona*.[601] This case involved Dr Catalona,

[596]Lavoie J "Ownership of human tissue: life after Moore v. Regents of the University of California" 1989 *Virginia Law Review* 75(7):1363–1396.
[597]Lavoie J "Ownership of human tissue: life after Moore v. Regents of the University of California" 1989 *Virginia Law Review* 75(7):1363–1396.
[598]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.
[599]Lavoie J "Ownership of human tissue: life after Moore v. Regents of the University of California" 1989 *Virginia Law Review* 75(7):1363–1396.
[600]Code of Medical Ethics Of the American Medical Association 7.3.9 https://www.ama-assn.org/delivering-care/ethics/commercial-use-human-biological-materials (Date of use: 23 may 2023).
[601]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.

a urologist and researcher who was employed by Washington University (WU) from 1976 to 2003. While in the employment of WU, Dr Catalona and his colleagues conducted prostate cancer research. Dr Catalona habitually asked his patients to donate HBMs such as prostate tissue, blood and DNA (removed during prostate surgery) to research.[602] Through these efforts, Dr Catalona and other attending physicians at the WU built the largest biorepository for prostate cancer research in the world, regarded as a biobank strictly reserved for research purposes. Interestingly, Dr Catalona chose to refer to this collection as the "Catalona Collection", contrary to the reference used during litigation, namely the WU genito-urinary (GU) collection.[603]

The HBM donors signed several consent forms that labelled their donations as altruistic gifts for the benefit of medical research, waiving all rights to the HBM samples donated and any product that would result from research using the samples donated to the GU Biorepository.[604] This biobank had accumulated thousands of samples and data from the donated HBMs and was operated and maintained mostly by funding and with the assistance of technical staff from WU.[605]

The dispute commenced when Dr Catalona transferred a significant number of samples to a private laboratory. WU objected to this, claiming ownership of the samples, which led to a disagreement that was followed by the termination of Dr Catalona's employment at WU.[606] Dr Catalona found new employment at the North-western School of Medicine, informed his patients of his decision and also asked for their permission to move their donated HBMs with him for the continuation of his prostate cancer research projects. Many of the patients consented, but WU refused to transfer the samples on the basis that they owned the samples and subsequently, sued Dr Catalona.[607] The Court upheld a unanimous 2007 ruling by the Eighth US Circuit Court of Appeals, which stated that prostate tissue and serum samples donated to Washington University may continue to be

[602]Petrini C "Ethical and legal considerations regarding the ownership and commercial use of human biological materials and their derivatives" 2012 *Journal of Blood Medicine* 3:87–96.
[603]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.
[604]Petrini C "Ethical and legal considerations regarding the ownership and commercial use of human biological materials and their derivatives" 2012 *Journal of Blood Medicine* 3:87–96.
[605]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.
[606]Petrini C "Ethical and legal considerations regarding the ownership and commercial use of human biological materials and their derivatives" 2012 *Journal of Blood Medicine* 3:87–96.
[607]Petrini C "Ethical and legal considerations regarding the ownership and commercial use of human biological materials and their derivatives" 2012 *Journal of Blood Medicine* 3:87–96.

used by the institution for cancer research.[608] The Court dictated that the patients had altruistically donated the HBMs for research and no longer retained any ownership rights to the samples or the authority to transfer said samples to third parties.

The Court acknowledged that the patients were within their rights to cease participating in the research by declining to answer further questions, refusing to donate any more biological samples and refusing consent for their dated samples being used in future research.[609] This ruling meant that the patients could retain some control over their donated samples and the university could not use the samples for research in perpetuity without consent from the patients.

As demonstrated by these foreign judgements, courts appear to have struggled to adapt the tradition and precedent of the law to the challenges arising from the biotechnology era. It would seem that the law recognises that (1) informed consent by research participants is a prerequisite and that information on the research and the potential commercial result using the donated samples should be a logical consequence; (2) the research participants' ownership of the donated HBMs ceases at the moment of donation and (3) the recipient of the donated HBMs has the right to commercially exploit any products that result from the research using the donated samples.[610]

However, in other instances, courts have ruled that separated body parts can be owned by an individual. In the United Kingdom, the issue of theft by surgeons at the Royal College arose in the case of *R v. Kelley* in 1998.[611] In this case, an artist, Mr Kelly, had obtained preserved dismembered body parts from the Royall College via a technical employee of the College. The artist used the body parts as moulds for sculptures that were exhibited in a London art gallery. To convict Mr Kelly and the technician of theft, the Courts had to recognise that the body parts were property. Mr Kelly and the technician countered the argument by stating that parts of corpses are not property and could therefore, not be stolen under the British Theft Act.[612] The court ruled that the body parts were fit for

[608]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.
[609]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.
[610]Petrini C "Ethical and legal considerations regarding the ownership and commercial use of human biological materials and their derivatives" 2012 *Journal of Blood Medicine* 3:87–96.
[611]Petrini C "Ethical and legal considerations regarding the ownership and commercial use of human biological materials and their derivatives" 2012 *Journal of Blood Medicine* 3:87–96.
[612]The British Theft Act 1968.

proprietary rights as they had acquired different attributes by virtue of skill since the body parts had been preserved.[613]

In another case relating to HBMs (specifically, male gametes), the Court of Appeal for England and Wales also found that proprietary rights could be assigned to sperm donors. The case was *Yearworth v North Bristol NHS Trust* [614] in which said court ruled that the six men whose sperm had been stored prior to their cancer treatment indeed owned their sperm that was negligently destroyed in the storage process.[615]

In Australia, the case of *Roche v Douglas*[616] which came about because of a paternity dispute where a DNA test was required, the Supreme Court of Western Australia had to rule on whether tissue samples obtained from a deceased person before his death for diagnostic purposes were susceptible to ownership. The court commented that the "world has moved on"[617] and ruled that tissue samples are indeed susceptible to ownership. The court explained the decision thus:

> In the wider sense, it defies reason to not regard tissue samples as property. Such samples have a real physical presence. They exist and will continue to exist until some step is taken to effect the destruction. There is no purpose to be served in ignoring physical reality. To deny that the tissue samples are property, in contrast to the paraffin in which the samples are kept or the jar in which both the samples and paraffin are stored, would be in my view to create a legal friction. There is no rational or logical justification for such a result. [618]

These cases demonstrate that the issue of the ownership of HBMs, although very complex, merits the application of the notion of the ownership of human biological materials in special circumstances. Some courts appear willing to deal with the issue of ownership on a case-by-case basis, which may establish a precedent which would allow human biological materials to be viewed as legal property over time.[619]

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[613]Petrini C "Ethical and legal considerations regarding the ownership and commercial use of human biological materials and their derivatives" 2012 *Journal of Blood Medicine* 3:87–96.
[614]Yearworth v North Bristol Trust [2009]3 WLR 118.
[615]Yearworth v North Bristol Trust [2009]3 WLR 118.
[616]*Roche v Douglas* 2000 WASC 146 (2002) 22WAR 331.
[617]*Roche v Douglas* 2000 WASC 146 (2002) 22WAR 331 paragraph 22.
[618]*Roche v Douglas* 2000 WASC 146 (2002) 22WAR 331 paragraph 24.
[619]Mahomed S "*An ethico-legal framework for the regulation of biobanks in South Africa* "(PhD University of the Witwatersrand 2018) Available at : https://wiredspace.wits.ac.za/server/api/core/bitstreams/7b7894ae-6f5a-4fd6-81cf-65e36ff9563e/content (Date of use: 26 May 2023).

3.5 Conclusion

Biotechnology is new and exciting and has endless possibilities, whereas the law always lags behind technology and operates on tradition and precedent.[620] The issues and problems around the ownership and proprietary rights of HBMs which have arisen from the commercialisation of research products that are the result of R&D using human biological materials, as discussed in this chapter, remain problematic and controversial. However, universally and in South Africa, the laws that relate to these important questions are currently inconsistent and unclear. It is also true that without distinct and proper definitions of specific human biological materials, e.g., human tissue,[621] it is impossible to provide sound legislation regarding any proprietary claims.

The law's uneasiness with the notion of ownership of the human body or human biological material may stem from the idea that the commodification of a person or their biological material offends notions of human dignity and the inviolability of the human body. However, the further uses of HBMs, which led to intellectual property rights and commercial gain, are not reconcilable with the requirement that a donor should donate their HBMs altruistically.

Regarding genomic research, Resnick[622] suggests that the human genome should be regarded as an important common resource and that everyone has a duty of stewardship and justice towards this resource, meaning we are obligated to share benefits fairly in genetic research and development, which equally applies to most HBMs. The SA MTA[623] introduces the notion of the *provider* of the human biological materials as the custodian of said materials and states that before HBMs are transferred, a benefit arrangement should be agreed upon between the *provider* and the *recipient*. A custodian is not the same as an owner who, according to the SA MTA, is the donor of the HBMs. No benefit-agreement arrangement is mandated regarding the owner of the donated HBMs.

[620]Gibson SF "The Washington University V. Catalona: determining ownership of genetic samples" 2008 *Jurimetrics* 48(2):167–192.
[621]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.
[622]Resnik DB "The human genome: common resource but not common heritage" 2005 *Frontis* 197–210.
[623]Proclamation No 11 Government Gazette 41781 of 20 July 2018.

The classification of HBMs raises complex ethical and legal issues. In the context of private biobanks and collaboration between private and/or public medical institutions, the consent framework of the charitable trust—which this research proposes—while promoting altruism in research offers to remedy the ethical and legal challenges that the notion of proprietary rights imposes on HBMs. If biobanks act as trustees of HBMs, their fiduciary duty legally requires trustees to work for the benefit of the beneficiary of the trust where the public is the beneficiary. This would accommodate all the requirements of ethical research, altruism, good governance and benefit to the public.

In the absence of legislation for a benefit sharing model to apply in South Africa, the next chapter focuses on foreign benefit sharing models to compare best practices towards designing the most suitable and informed benefit sharing template for South Africa.

CHAPTER 4

A COMPARATIVE ANALYSIS OF ETHICO-LEGAL FRAMEWORKS FOR BENEFIT SHARING IN RESEARCH USING HUMAN BIOLOGICAL MATERIALS IN THE UNITED KINGDOM, AUSTRALIA, UGANDA AND SOUTH AFRICA

4.1 Introduction

The previous chapters canvassed the nature of benefit sharing in health research, which refers to the fair distribution of benefits and burdens arising from health research and development.[624] Chapter 2 of this thesis established that there is no uniform definition of a benefit. A comparative analysis of existing definitions, presented in chapter 2, was found to be a constructive approach that may offer useful guidance. It is my submission that in the context of international human health research, the most appropriate definition of benefit sharing is the definition used in the framework of the access and use of genetic resources in terms of the CBD, which describes benefit sharing as:

> The action of giving a portion of advantages or profits derived from the use of genetic resources or traditional knowledge to resource providers in order to achieve justice in exchange.[625]

Scholars have argued that the philosophical principle behind benefit sharing in research using HBMs is straightforward, since it is a matter of justice and in whose absence exploitation could occur.[626] Legally, benefit sharing points to a technical term used to describe an exchange between an HBM source and those compensated for its use.[627] The most pertinent argument against benefit sharing is that health research should be altruistic to avoid the commodification of the self.[628]

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[624]Simm K "Benefit sharing frameworks-justifications for and against benefit sharing in human genetic research" 2007 www.uclan.ac.uk/genbenefit (Date of use: 23 May 2023).

[625]Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilisation. Secretariat of the Convention of Biological Diversity 2011 http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf (Date of use: 23 May 2023).

[626]Andanda P, Schroeder D, Chaturvedi S *et al.* "Legal frameworks for benefit sharing: from biodiversity to human genomics" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 33–64.

[627]Schroeder D "Benefit sharing: it's time for a definition" 2007 *J Med Ethics* 33:205–209.

[628]Lucas JC, Schroeder D, Anarson G *et al* "Donating human samples: who benefits?*"* in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 95–128.

Global injustices, however, dictate that the concept of altruistic research, as presented in developed countries propagating distributive justice that discourages the commodification of the self, cannot be translated to low- and middle-income countries (LMICs) without the emergence of serious exploitation issues.[629] The ever-increasing health research collaborations between HICs and LMICs,[630] largely in historically disadvantaged communities such as those found in South Africa,[631] have precipitated the need for global health research to provide fair benefits to all who contribute to said research to avoid exploitation.

Globally, no legally binding framework regarding benefit sharing in health research utilising HBMs exists, although some non-binding instruments refer to benefit sharing.[632] In 2000, the Ethics Committee of the Human Genome Organisation (HUGO) in its Statement on Benefit Sharing, endorsed the concept of benefit sharing in research using HBMs by recommending that "all humanity share in, and have access to, the benefits of genetic research".[633]

In 1997, the United Nations Educational, Scientific, and Cultural Organisation (UNESCO) issued a Universal Declaration on the Human Genome and Human Rights, which suggested that "benefits from advances in biology, genetics and medicine, concerning the human genome shall be made available to all, with due regard for the dignity and human rights of each individual".[634]

In 2005, the UNESCO Universal Declaration on Bioethics and Human Rights advocates in Article 15(1) for sharing the benefits of scientific research within the international community, emphasising specifically the need for benefit sharing with LMICs.[635]

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[629]Simm K "Benefit sharing frameworks-justifications for and against benefit sharing in human genetic research" 2007 www.uclan.ac.uk/genbenefit (Date of use: 23 May 2023).

[630]Lairumbi G, Parker M, Fitzpatrick R and English M "Forms of benefit sharing in global health research undertaken in resource poor settings: a qualitative study of stakeholders' views in Kenya" 2012 *Philosophy, Ethics and Humanities in medicine* 7(1):1–8.

[631]Christopher AJ "Apartheid and urban segregation levels in South Africa" 1990 *Urban Studies* 3:421–440.

[632]Schroeder D "Benefit sharing: it's time for a definition"2007 *J Med Ethics* 33:205–209.

[633]Knoppers BM, Chadwick R, Takebe H *et al*. "HUGO urges genetic benefit sharing" 2002 *Community Genet* 3(2): 88–92.

[634]UN Declaration on the Human Genome and Human Rights http://portal.unesco.org/en/ev.php-URL_ID=13177&URL_DO=DO_TOPIC&URL_SECTION=201.html (Date of use: 23 May 2023).

[635]UNESCO Universal Declaration on Bioethics and Human Rights https://unesdoc.unesco.org/ark:/48223/pf0000146180 (Date of use: 23 May 2023).

Despite these globally accepted frameworks, benefit sharing remains an unresolved and divisive topic.[636] Different national positions and varying degrees of concern on legislative, ethical and social frameworks between HICs and LMICs all contribute to the problematic nature of implementing national laws consistently and per international directives.[637]

This chapter seeks to compare and contrast the ethico-legal frameworks for benefit sharing in health research in South Africa with the frameworks of Uganda, the United Kingdom (UK) and Australia. The UK and Australia are used in this comparison because they are HICs and frontrunners in scientific medical research.[638] The UK played a dominant role in the Human Genome Project[639] and via the Wellcome Trust, together with the National Institutes of Health (NIH) in the United States and the African Society of Human Genetics, set up the Human Hereditary and Health in Africa (H3Africa) research initiative to promote scientific health research collaborations between HICs and LMICs.[640] Uganda provides an example of how ethico-legal benefit sharing frameworks differ between LMICS, notably for the purpose of this chapter, between Uganda and South Africa. Furthermore, both Uganda and South Africa belong to the H3Africa consortium. Moreover, the UK, South Africa, Uganda and Australia are all jurisdictions that share a colonial past and whose legal systems were influenced, in different degrees, by the English colonial legal system which not only dictated and controlled the former legal systems in South Africa, Uganda and Australia, but also had an impact on the evolution of laws in these jurisdictions.[641] These jurisdictions also provided useful models for comparison in the first 2018 doctoral study in South Africa on the legal regulation of biobanking by Mahomed.[642]

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[636]Andanda P, Schroeder D, Chaturvedi S *et al.* "Legal frameworks for benefit sharing: from biodiversity to human genomics" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 33–64.

[637]Mahomed S "Human biobanking in developed and developing countries: an ethico –legal comparative analysis of the frameworks in the United Kingdom, Australia, Uganda, and South Africa" 2021 *Cambridge Quarterly of Healthcare Ethics* 30:146–160.

[638]Mahomed S "Human biobanking in developed and developing countries: an ethico–legal comparative analysis of the frameworks in the United Kingdom, Australia, Uganda, and South Africa" 2021 *Cambridge Quarterly of Healthcare Ethics* 30:146–160.

[639]Mahomed S "Human biobanking in developed and developing countries: an ethico–legal comparative analysis of the frameworks in the United Kingdom, Australia, Uganda, and South Africa" 2021 *Cambridge Quarterly of Healthcare Ethics* 30:146–160.

[640]Dauda B and Joffe S "The benefit vision of H3Africa" 2018 *Developing World Bioeth* 18:165–170.

[641]Hyam R "Understanding the British empire." 2010 Cambridge University Press.

[642]Mahomed S "*An Ethico-legal framework for the regulation of biobanks in South Africa*." 2018 Submitted in fulfilment of the degree of Doctor of Philosophy (PhD) in Bioethics and Health Law, Steve Biko Centre of Bioethics, University of the Witwatersrand, Johannesburg, South Africa. Available at:

4.2 Ethico-legal benefit sharing frameworks for health research using HBMs

4.2.1 United Kingdom

The United Kingdom does not have a written constitution.[643] Historically, the United Kingdom may be described as a relatively stable nation whose legal framework has evolved over centuries with relative stability.[644] The UK is governed by a collection of acts, policies, regulations, common law doctrines, codes of practice, conventions, declarations and recommendations and also adheres to international law.[645]

4.2.1.1 Human Tissue Act of 2004 (HT Act)

The Human Tissue Act of 2004 (HT Act),[646] proposed in 2004, came into operation in September 2006 in the UK.[647] The Act was supposedly a response to concerns raised over incidents at Bristol Royal Infirmary and the Royal Liverpool Children's Hospital, where it was established that organs and tissue were being removed and stored without the proper consent of the children who had died. [648] The HT Act covers England, Wales and Northern Ireland, except for section 45 and Schedule 4 (which refers to non-consensual DNA analysis) which applies throughout the UK.[649] The Act sets out to regulate activities concerning the removal, storage, use and disposal of human tissue.[650] The fundamental principle of the Act relates to consent; different consent requirements apply regarding the removal and use of tissue from the deceased or the living.[651] The HT Act makes no mention of benefit sharing with the donors of human material. Section 32 of the Act which

https://wiredspace.wits.ac.za/server/api/core/bitstreams/7b7894ae-6f5a-4fd6-81cf-65e36ff9563e/content (Date of use: 26 May 2023).

[643]Constitutions organise, distribute and regulate state power at http://www.ucl.ac.uk/constitution-unit/what-uk-constitution/what-uk-constitution (Date of use: 23 May 2023).

[644]What the UK Constitution? http://www.ucl.ac.uk/constitution-unit/what-uk-constitution/what-uk-constitution (Date of use: 23 May 2023).

[645]What is the UK Constitution? http://www.ucl.ac.uk/constitution-unit/what-uk-constitution/what-uk-constitution (Date of use: 23 May 2023).

[646]UK Human Tissue Act 2004 https://www.legislation.gov.uk/ukpga/2004/30/data.pdf (Date of use: 23 May 2023).

[647]Angell A, Terrant C and Dixon-Woods M "Research involving storage and use of human tissue: how did the Human Tissue Act 2004 affect decisions by Research Ethics Committees?" 2009 *J Clin Pathol* 62(9):825–9.

[648]Explanatory Notes of the Human Tissue Act https://www.eui.eu/Projects/InternationalArtHeritageLaw/Documents/NationalLegislation/UnitedKingdom/humantissueact2004explanatorynotes.pdf (Date of use: 23 may 2023).

[649]UK Human Tissue Act 2004 https://www.legislation.gov.uk/ukpga/2004/30/data.pdf (Date of use: 23 May 2023).

[650]UK Human Tissue Authority (HTA) https://www.hta.gov.uk/guidance-professionals/hta-legislation/human-tissue-act-2004 (Date of use: 23 May 2023).

[651]UK Human Tissue Authority https://www.hta.gov.uk/guidance-professionals/hta-legislation/human-tissue-act-2004 (Date of use: 23 May 2023).

prohibits commercial dealings in human material provides in section 32(7) of the Act as follows:[652]

> References in subsections (1) and (2) to reward, in relation to the supply of any controlled material, do not include payment in money or money's worth for defraying or reimbursing—
> (a) any expenses incurred in, or in connection with, transporting, removing, preparing, preserving or storing the material,
> (b) any liability incurred in respect of—
> (i) expenses incurred by a third party in, or in connection with, any of the activities mentioned in paragraph (a), or
> (ii) a payment in relation to which subsection (6) has effect, or
> (c) any expenses or loss of earnings incurred by the person from whose body the material comes so far as reasonably and directly attributable to his supplying the material from his body.[653]

Section 54(7) of the Act states that material shall not be regarded as from a human body if it is created outside the human body[654] (such as cell lines).

4.2.1.2 The Human Tissue Authority (HTA)

The Human Tissue Act of 2004 provides for the framework of the Human Tissue Authority (HTA), a regulatory body with the mandate to regulate the removal of human tissue for a range of purposes, including research, medical treatment, education and training.[655] The HTA published seven Codes of Practice to fulfil its regulatory mandate.[656] The Code of Practice of Guiding Principles and the Fundamental Principle of Consent[657] of the HTA emphasises that the dignity of the donor should be respected at all times and where human tissue is imported, importers should try to make sure that it is from a country that has an appropriate ethical and legal framework.[658]

It is noteworthy that any medical findings that may emerge during tissue research that may be medically significant to tissue donors, should be managed by researchers in a manner

[652]Section 32 (7) of The Human Tissue Act 2004.
[653]Section 32 (7) of The Human Tissue Act 2004.
[654]Section 54 (7) of The Human Tissue Act 2004.
[655]HTA Code of Practice A https://content.hta.gov.uk/sites/default/files/2020-11/Code%20A.pdf_(Date of use: 23 May 2023).

[656]HTA Code of Practice A https://content.hta.gov.uk/sites/default/files/2020-11/Code%20A.pdf_(Date of use: 23 May 2023).
[657]HTA Code of Practice A https://content.hta.gov.uk/sites/default/files/2020-11/Code%20A.pdf_(Date of use: 23 May 2023).
[658]HTA Code of Practice A https://content.hta.gov.uk/sites/default/files/2020-11/Code%20A.pdf_(Date of use: 23 May 2023).

that respects the consent process. In this regard, section 34 of the HTA Code of Practice and Standards for Research provides that:[659]

> Findings of potential medical importance to donors may be made while undertaking human tissue research, including 'incidental findings' beyond the aims of the research. There is no single approach for the feedback of such findings. Researchers are therefore encouraged to consider how they would manage such findings and should be able to demonstrate appropriate arrangements where these are relevant, reflecting these clearly in the information used to support the consent process.[660]

4.2.1.3 The Human Research Authority (HRA)

The Human Research Authority (HRA) was established under the provisions of the Care Act 2014.[661] The HRA protects and promotes the interests of patients and the public in health and social care research.[662] It is the single body responsible for the oversight of research processes in the UK and achieves its mandate by its published Standard Operating Procedures (SOPs) which each Research Ethics Committee (REC) within the UK Health Departments' Research Ethics Service is required to adopt.[663] In the current version of the SOPs,[664] section 12.3 requires (in reference to research involving human tissue) that the REC review processes should facilitate research that is of benefit to society, within the legal framework established by statute and common law in the UK.[665]

Section 12.31 states that RECs undertaking the ethical review of Research Tissue Banks (RTBs) should note whether there are plans in place to provide donors with feedback on any clinically significant information obtained in research using their samples.[666] The SOPs also suggest that samples should not be released from RTBs to a project that would need

[659]HTA Code of Practice E https://content.hta.gov.uk/sites/default/files/2020-11/Code%20E.pdf (Date of use: 23 May 2023).

[660]Section 34 of the HTA Code of Practice and Standards E for Research page 10

[661]NHS Health Research Authority https://www.hra.nhs.uk/about-us/ (Date of use: 23 May 2023).

[662]NHS Health Research Authorityhttps://www.hra.nhs.uk/about-us/ (Date of use: 23 May 2023).

[663]NHS Research Ethics Committee Standard Operating Procedureshttps://www.hra.nhs.uk/about-us/committees-and-services/res-and-recs/research-ethics-committee-standard-operating-procedures/ (Date of use: 23 May 2023).

[664]Version 7.5.1 of the HRA SOPs for RECs which came into effect from 2 August 2021.

[665]Section 12.3 of HRA SOPs found at https://s3.eu-west-2.amazonaws.com/www.hra.nhs.uk/media/documents/RES_Standard_Operating_Procedures_Version_7.5.1_August_2021_Final_Accessible_07lVkXt.pdf (Date of use: 23 May 2023).

[666]Section 12.31 of HRA SOPs found at https://s3.eu-west-2.amazonaws.com/www.hra.nhs.uk/media/documents/RES_Standard_Operating_Procedures_Version_7.5.1_August_2021_Final_Accessible_07lVkXt.pdf (Date of use: 23 May 2023).

further data or tissue from donors, unless it is for feedback on clinically significant information.[667]

Interestingly, where applications for a collaborative research project are presented to UK RECs and the samples are from donors from another country, the UK RECs are not expected to undertake a detailed review of the consent arrangements or any other research activities undertaken by collaborators in the source country.[668]

4.2.1.4 Medical Research Council (MRC)

The Medical Research Council (MRC) funds medical research to prevent illness, produce therapies and improve human health.[669] The MRC has established its own ethical and governance framework in a series of guidelines to which its research units, institutes and their funded research projects are required to adhere.[670] In the MRC ethics series, *Good Research Practice: Principles and Guidelines*, section 2C refers to collaborative research, specifying that formal written agreements should be used to clarify and agree on key aspects, which include but are not limited to, the responsibilities, ownership, custodianship, transfer and arrangement of research data and samples (including return or disposal) for future use, as well as arrangements for handling intellectual property.[671]

The MRC's *Operational and Ethical Guidelines relating to Human Tissue and Biological Samples for Use in Research*[672] specifically state that samples donated for research are to be treated as donations although conditions may sometimes apply.[673] The MRC Guidelines promote a gift relationship between research donors and researchers and advise that the formal responsibility for custodianships of collection human biological

[667]Section 12.32(c) of HRA SOPs found at https://s3.eu-west-2.amazonaws.com/www.hra.nhs.uk/media/documents/RES_Standard_Operating_Procedures_Version_7.5.1_August_2021_Final_Accessible_07lVkXt.pdf (Date of use: 23 May 2023).

[668]Section 12.47 of HRA SOPs found at https://s3.eu-west-2.amazonaws.com/www.hra.nhs.uk/media/documents/RES_Standard_Operating_Procedures_Version_7.5.1_August_2021_Final_Accessible_07lVkXt.pdf (Date of use: 23 May 2023).

[669]The Medical Research Council (MRC) https://www.ukri.org/councils/mrc/ (Date of use: 23 May 2023).

[670]MRC principles and guidelines for good research practice https://www.ukri.org/publications/principles-and-guidelines-for-good-research-practice/ (Date of use: 23 May 2023).

[671]Section 2C of MRC Ethics Series of Good research practice: Principles and Guidelines https://www.ukri.org/publications/principles-and-guidelines-for-good-research-practice/ (Date of use: 23 May 2023).

[672]MRC Human tissue and biological samples for use in research https://www.ukri.org/publications/human-tissue-and-biological-samples-for-use-in-research/ (Date of use: 23 May 2023).

[673]Section 2 of MRC Human Tissue and Biological Samples for Use in Research: Operational and Ethical Guidelines https://www.ukri.org/publications/human-tissue-and-biological-samples-for-use-in-research/ (Date of use: 23 May 2023).

materials should rest with institutions/corporates rather than individual researchers.[674] Section 7 of these guidelines refers to financial issues in research using human biological materials and reiterates that the MRC stands by the principle that the human body and its parts cannot be commodified.[675] The MRC allows payments to be made to research participants to compensate for expenses and time but prohibits the kind of payments that could promote undue inducement.[676] This provision resembles section 60(4) of South Africa's NHA that prohibits payment for tissue donations, except for the compensation of "reasonable" costs, which point to costs relating to travel and time spent.

The MRC recognises the need to align with industry in supporting research and asserts that human biological materials do not have inherent intellectual property (IP) but that IP can arise via research that uses HBMs, which may be sold or licensed.[677] The MRC encourages clarity of arrangements when granting commercial access to human biological materials that were initially donated for research projects funded by the public or charity sectors.

While acknowledgeing that donors, where possible, must be informed when their sample or products derived from the sample may be commercialised, the MRC clarifies that donors must be informed that they are not entitled to any ensuing profits or have any IP rights generated from sample use in the academic sector.[678]

It is clear that no specific benefit sharing frameworks exist with the donor or communities in the MRC guidelines relating to health research using human biological materials.

The next section will turn to the relevant Australian ethico-legal benefit sharing frameworks relevant to research using HBMs.

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[674]Section 2 of MRC Human Tissue and Biological Samples for Use in Research: Operational and Ethical Guidelines https://www.ukri.org/publications/human-tissue-and-biological-samples-for-use-in-research/ (Date of use: 24 May 2023).

[675]Section 7 of MRC Human Tissue and Biological Samples for Use in Research: Operational and Ethical Guidelines https://www.ukri.org/publications/human-tissue-and-biological-samples-for-use-in-research/ (Date of use: 24 May 2023).

[676]Section 7 of MRC Human Tissue and Biological Samples for Use in Research: Operational and Ethical Guidelines https://www.ukri.org/publications/human-tissue-and-biological-samples-for-use-in-research/ (Date of use: 24 May 2023).

[677]Section 7 of MRC Human Tissue and Biological Samples for Use in Research: Operational and Ethical Guidelines https://www.ukri.org/publications/human-tissue-and-biological-samples-for-use-in-research/ (Date of use: 24 May 2023).

[678]Section 7 of MRC Human Tissue and Biological Samples for Use in Research: Operational and Ethical Guidelines https://www.ukri.org/publications/human-tissue-and-biological-samples-for-use-in-research/ (Date of use: 24 May 2023).

4.2.2 Australia

Australia is similar to the United Kingdom regarding its position as a high-income country (HIC) that occupies a leading position in health research.[679] Australia has a written constitution which is the supreme law of the land under which the government functions. The National Health and Medical Research Council Act 1992 (NHMRC Act) established the National Health and Medical Research Council (NHMRC),[680] whose mandate, aside from funding health and medical research in Australia, is, among others, to advise the Australian Government and facilitate networking in the research community by bringing academics and industry together, whilst also building commercial literacy among researchers and helping them to protect intellectual property.[681]

In 2007 the NHMRC, together with the Australian Research Council (ARC) and Universities of Australia, published the National Statement on Ethical Conduct in Human Research (the National Statement) applicable to all research involving human beings.[682] The National Statement was revised again in 2018.

4.2.2.1 National Statement on Ethical Conduct in Human Research (the National Statement)

The concept of benefit sharing is prevalent throughout the National Statement, which focuses on the ethical aspects of the design, review and conduct of human research. It is explicitly stated that the National Statement is not a legally binding document.[683] Nevertheless, access to research funds from the body would require compliance to the principles of the National Statement even though it is not legally binding.

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[679]Chalmers D "Biobanking and privacy laws in Australia" 2015 *Journal of Law Medicine and Ethics* 43(4):703–713.

[680]Australia National Statement on Ethical Conduct in Human Research (The Statement) https://www.nhmrc.gov.au/about-us/publications/national-statement-ethical-conduct-human-research-2007-updated-2018#block-views-block-file-attachments-content-block-1 (Date of use: 24 May 2023).

[681]Australia National Health and Medical Research Council Research Policy https://www.nhmrc.gov.au/research-policy (Date of use: 24 May 2023).

[682] The National Statement https://www.nhmrc.gov.au/about-us/publications/national-statement-ethical-conduct-human-research-2007-updated-2018#block-views-block-file-attachments-content-block-1 (Date of use: 24 May 2023).

[683]https://www.nhmrc.gov.au/about-us/publications/national-statement-ethical-conduct-human-research-2007-updated-2018#block-views-block-file-attachments-content-block-1 (Date of use: 20 October 2021).

Section 1 of the National Statement[684] refers to the values and principles of ethical conduct, one of which is justice. The National Statement affirms that distributive justice is encouraged where there is a fair distribution of the benefits and burdens of research. Section 1.4 (d) of the National Statement explains that in research that is just, there is a fair distribution of the benefits of participation in the research. Section 1.4(f) reiterates that there should be fair access to the benefits of research.[685] Section 1.11 of the National Statement refers to the value of respect and urges researchers to respect the privacy and confidentiality of research participants and also to be culturally sensitive to such research participants and honour any specific agreements made with the participants or their communities.[686]

Section 2 of the National Statement is dedicated to the themes of consent, risk and benefit.[687] In Chapter 2.1.3[688] the guidelines stipulate that some of the steps that need to be taken to acceptably mitigate risks, should include identifying the potential benefits and to whom these benefits are likely to accrue. The guidelines further stipulate that when weighing the risk-to-benefit ratio:

> Those reviewing the research should take into account any willingness by participant populations to assume greater risks because of the potential benefits to them, their families, or groups to which they belong.[689]

The guidelines also instruct that for someone to consent to participate in research, the purpose, risks and potential benefits of the research must be discussed with the participant.[690] Chapter 2.2.6 provides that before participants give consent to participate in research, information regarding any payments to participants or any expected benefits to the wider community must be communicated to them.[691]

Referring to research using human biomaterials (read together with all the other guidelines of the National Statement), chapter 3.2.12(j) advises that donors should be notified of any

[684]Section 1 of the National Statement on Ethical Conduct in Human Research of the NHMRC at 9–11.
[685]Section 1.4 of the National Statement on Ethical Conduct in Human Research of the NHMRC at 10.
[686]Section 1.11 of the National Statement on Ethical Conduct in Human Research of the NHRMC at 11.
[687]Section 2 of the National Statement on Ethical Conduct in Human Research of the NHMRC at 12–22.
[688]Chapter 2.1.3 of the National Statement on Ethical Conduct in Human Research of the NHRMC at 14.
[689]Chapter 2.1.3 of the National Statement on Ethical Conduct in Human Research of the NHRMC at 14.
[690]Chapter 2.2.2 of the National Statement on Ethical Conduct in Human Research of the NHRMC at 16.
[691]Chapter 2.2.6 (i)(j)(l) of the National Statement on Ethical Conduct in Human Research of the NHRMC at 17.

potential of commercialisation of any outcomes using their HBMs, how this would be managed and to whom the benefits, if any, would be distributed.[692]

4.2.2.1.1 Research involving marginalised communities

Chapter 4.7[693] of the National Statement pronounces on human research involving the Aboriginal and Torres Island peoples.[694] The Guidelines stress that the benefits from research involving these communities should include the advancement and capacity building of these communities.[695] Research should advance their interests and all possible benefits should be discussed and agreed to by the Aboriginal or Torres Strait Islander research stakeholders.[696] All benefits that materialise from research with participants from these communities should be distributed fairly and in a manner that is agreeable to the participants.[697]

4.2.2.1.2 Research involving international collaborations

With regard research collaborations between Australia and other countries, chapter 4.8.11[698] provides that the distribution of benefits and burdens should be fair to the participants as well as their communities and that the research should not be exploitative. The research should also consider the expectations of the participants, their communities and participants' post-research welfare.[699]

4.2.2.2 Australian Code for the Responsible Conduct of Research (the Code)

The Australian Code for the Responsible Conduct of Research (the Code) strives to encourage research to be conducted ethically, responsibly and with integrity.[700] The Code outlines the expectations for research undertaken in Australia or conducted under the

[692]Chapter 3.2.12(j) of the National Statement on Ethical Conduct in Human Research of the NHRMC at 45.
[693]Chapter 4.7 of the National Statement on Ethical Conduct in Human Research of the NHRMC at 77-79.
[694]According to Dudgeon, P, Wright M, Paradies Y *et al.* "The social, cultural and historical context of Aboriginal and Torres Strait Islander Australians" 2010 *Working together: Aboriginal and Torres Strait Islander mental health and wellbeing principles and practice*" 25–42.
These are two cultural groups that make up Indigenous Australia, now in the minority in Australia. Their colonisation marginalised the groups and they have had to struggle to claim equality and cultural recognition.
[695]Chapter 4.7.7 of the National Statement on Ethical Conduct in Human Research of the NHRMC at 78.
[696]Chapter 4.7.8 of the National Statement on Ethical Conduct in Human Research of the NHRMC at 78.
[697]Chapter 4.7.9 of the National Statement on Ethical Conduct in Human Research of the NHRMC at 79.
[698]Chapter 4.8.11 of the National Statement on Ethical Conduct in Human Research of the NHRMC at 81.
[699]Chapter 4.8.12 of the National Statement on Ethical Conduct in Human Research of the NHRMC at 81.
[700]Australia Code for the Responsible Conduct of Research https://www.nhmrc.gov.au/about-us/publications/australian-code-responsible-conduct-research-2018#block-views-block-file-attachments-content-block-1 (Date of use: 24 May 2023).

auspices of Australian institutions.[701] The Code consists of several Guides that support its agenda. One of the Guides pertains to collaborative research.[702] Section 3.1 of the Guide on Collaborative Research[703] states that institutions that become involved in a collaborative research project should ensure that an agreement is reached with all project partners that should include any plans to commercialise research outputs and any entitlements to commercial returns.

It is clear from the discussion above that Australia has made significant strides in the development of an ethico-legal framework for benefit sharing in health research using HBMs.

Having analysed the benefit sharing frameworks in the UK and Australia, two HICs that often initiate health research collaborations with LMICs, the next section will turn to a discussion of the frameworks in Uganda and South Africa.

4.2.3 Uganda

Uganda is an LMIC and like most African countries, including South Africa, its ethical and regulatory frameworks show some influence by those of HICs.[704] The impact of the ethico-legal frameworks of HICs is not always desirable, because the HIC frameworks are not always a good fit for the different contexts that apply in LMICs. These HIC frameworks may also fail to consider the traditional and cultural significance attached to human biological material found in LMICs, which in turn has an impact on LMIC participants involved in health research.

[701]Australia Code for the Responsible Conduct of Research https://www.nhmrc.gov.au/about-us/publications/australian-code-responsible-conduct-research-2018#block-views-block-file-attachments-content-block-1 (Date of use: 24 May 2023).

[702]Australia Code for the Responsible Conduct of Research https://www.nhmrc.gov.au/about-us/publications/australian-code-responsible-conduct-research-2018#block-views-block-file-attachments-content-block-1 (Date of use: 24 May 2023).

[703]Section 3.1 of the Guide on Collaborative Research at 2–3.

[704]Sathar MA and Dhai A "Laws, regulations and guidelines of developed countries, developing countries in Africa, and BRICS regions pertaining to the use of human biological material (HBM) in research" 2012 *SAJBL* 5(1):51-54.

4.2.3.1 Constitution of Uganda

The Constitution of Uganda was adopted and enacted in 1995 and is the supreme law of the land.[705] Section XX of the Constitution, in fulfilling its social and economic mandate, states that "the State shall take all practical measures to ensure the provision of basic medical services to the population".[706]

Although is no mention of health research in the Constitution, the Constitution acknowledges that Uganda's people have previously been exposed to exploitation and that their interests and well-being should be safeguarded.[707]

A closer look at the Public Health Act,[708] enacted in 1935 to consolidate the law regarding the preservation of public health, reveals that it does not comment on all matters regarding research and makes no mention of benefit sharing.

4.2.3.2 National Guidelines for Research Involving Humans as Research Participants, (National Guidelines)

The Uganda National Council for Science and Technology (UNCST), founded in 1990, aims to advise on the formulation of national policy regarding science and technology, whilst also growing and developing indigenous science and technology.

The National Guidelines for Research involving Humans as Research Participants[709] (National Guidelines) were published in 2014 by the UNCST and are the first guidelines to regulate health research in Uganda. The National Guidelines state that research participants should benefit from research and not be exploited. The oversight of research

[705]Constitution of Uganda https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/44038/90491/F206329993/UGA44038.pdf (Date of use: 24 May 2023).
[706]Section XX of The Constitution of the Republic of Uganda.
[707]Constitution of Uganda https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/44038/90491/F206329993/UGA44038.pdf (Date of use: 24 May 2023).
[708]The Public Health Act of Uganda http://library.health.go.ug/sites/default/files/resources/Public%20Health%20Act.pdf (Date of use: 24 May 2023).
[709]Uganda National Guidelines for research Involving Humans as Research Participants https://uncst.go.ug/main/wp-content/uploads/download-manager-files/Human%20Subjects%20Protection%20Guidelines%20July%202014.pdf (Date of use: 24 May 2024).

involving humans as research participants is done first at the organisational level via Research Ethics Committees (RECs) and then at the national level by UNCST, together with the Uganda National Health Research Organisation (UNHRO), for health research.[710]

4.2.3.2.1 Research involving international collaborations

As far as international collaborative research is concerned, section 4.5.4(b)[711] of the National Guidelines provides that the local Research Ethics Committee (REC) overseeing the project is responsible for the project, since the local REC is in a better position to understand the cultural sensitivities of the population.[712]

Concerning benefits, section 5.3.1[713] of the National Guidelines dictates that an informed consent form must be provided to each research participant, which should include a description of the reasonably expected resultant benefits for the participant or others,[714] a statement that if the participant withdraws from the research they will still be entitled to the said benefits,[715] and finally a statement that the participants will receive feedback on the research progress and any incidental research findings.[716]

Section 6.7 suggests that incentives offered to research participants should not be considered a research benefit but rather a recruitment incentive and should not unduly induce research participants.[717]

4.2.3.2.2 Research HBMs and ownership of human biological samples

Section 10[718] of the National Guidelines specifically applies to human materials and declares that a consent form that is separate from the enrolment consent form must be used for samples that are collected and stored for secondary use. The secondary consent

[710]Section 3.1 of the Uganda "National Guidelines" at 4.
[711]Section 4.5.4 (b) of the Uganda "National Guidelines" at 12.
[712]Section 4.5.4 (b) of the Uganda "National Guidelines" at 12.
[713]Section 5.3.1 (c) of the Uganda "National Guidelines "at 17.
[714]Section 5.3.1 (c) of the Uganda "National Guidelines" at 17.
[715]Section 5.3.1 (h) of the Uganda "National Guidelines" at 17.
[716]Section 5.3.1 (l) of the Uganda "National Guidelines" at 17.
[717]Section 6.7 of the Uganda "National Guidelines" at 22.
[718]Section 10 of the Uganda "National Guidelines" at 28.

form should include information on the potential risks and benefits of storing samples for future research.[719]

Regarding the ownership of samples, the National Guidelines recognise that samples belong to the sample donors who could withdraw the samples if samples are linked.[720] A custodianship exists between the sample donors and the recognised institution which holds the donated sample.[721] In the event that the sample is transferred between institutions, locally or internationally, the custodian must negotiate an agreement with the receiving institution in the form of a Material Transfer Agreement (MTA).[722] The MTA should have clauses stating (1) who owns any new products resulting from use of the transferred sample (if this is absent, the provider organisation assumes ownership in Uganda); (2) directions on what to do if the product of research is commercialisable (including sharing royalties); (3) a separate MTA if commercialisation occurs; (4) what technologies would be transferred to the provider organisation or country (Uganda) and (5) other benefits, such as capacity building and/or infrastructure development that the provider organisation should expect.[723]

Section 13.0(a)[724] states that when the indigenous knowledge of a community is used, the community should receive fair benefits from the utilisation of such knowledge.

4.2.3.3 National Research Biobanking Guidelines

The National Research Biobanking Guidelines were published in January 2021.[725] The guidelines aim to establish a framework for the certification and operation of biobanks in several fields (including healthcare) and to provide easy access to high-quality biospecimens and their associated data from the biobanks.[726]

[719]Section 10.2 of the Uganda "National Guidelines" at 28.
[720]Section 10.3 of the Uganda "National Guidelines" at 28.
[721]Section 10.3 of the Uganda "National Guidelines" at 28.
[722]Section 10.4 of the Uganda "National Guidelines" at 28.
[723]Section 10.4(j)(k)(l) of the Uganda "National Guidelines" at 30.
[724]Section 13.0(a) of the Uganda "National Guidelines" at 35.
[725]Uganda National Research Biobanking Guidelines https://uncst.go.ug/files/National_Biobanking_Gudelines.pdf (Date of use: 24 may 2023).
[726]Uganda National Research Biobanking Guidelines https://uncst.go.ug/files/National_Biobanking_Gudelines.pdf (Date of use: 24 May 2023).

Section 1.1[727] of the Guidelines provide that the rights and welfare of research participants and the common good are more important than the research interests of the custodian organisation and the end users of the biobank.[728]

Section 8[729] refers to ownership and custodianship as well as benefit sharing and intellectual property. Section 8.1[730] states that sample donors own their biospecimens, with the primary source institution (a recognised and registered organisation in Uganda) as the custodian of the biospecimens and having the authority, via a Material Transfer Agreement (MTA) with the sample donor, to decide how to use, transfer, store and decide on the future use of the samples while considering the rights and welfare of the sample donor.[731]

4.2.3.3.1 Intellectual property

Addressing any intellectual property that may result from research using biospecimens in Section 8.2,[732] the guidelines require the biobank and primary source institution to define an intellectual property policy which should be enforced through an MTA and/or a Data Transfer Agreement (DTA).[733] The primary source institution is to ensure that:[734]

a. There are available policies and procedures on benefit sharing in line with applicable national policies, regulationsand laws;
b. Benefits from IP are shared in different ways and should be pre-negotiatedthese include the; financial benefits, information, licensing, or transferring of technology or materials;
c. The derivatives from the donors' biological material shall be taken as new
d. products and should be considered Intellectual Property.

Thus, benefit sharing arrangements form an integral part of the Ugandan health research framework, where human materials are used for health research purposes and even which may even extend to intellectual property.

[727]Section 1.1 of the Uganda National Research Biobanking Guidelines at 1.
[728]Section 1.1 of the Uganda National Research Biobanking Guidelines at 1.
[729]Section 8 of the Uganda National Research Biobanking Guidelines at 20.
[730]Section 8.1 of the Uganda National Research Biobanking Guidelines at 20.
[731]Section 8.1 of the Uganda National Research Biobanking Guidelines at 20.
[732]Section 8.2 of the Uganda National Research Biobanking Guidelines at 20.
[733]Section 8.2 of the Uganda National Research Biobanking Guidelines at 20.
[734]Section 8.2 of the Uganda National Research Biobanking Guidelines at 20.

The next section analyses the ethico-legal framework regarding benefit sharing in health research when human biological materials are used in South Africa. Since Chapter 2 of this thesis dealt extensively with the South African ethico-legal framework pertaining to benefit sharing, the section below will comprise a summary to of the key points in order to provide context to the comparisons between the selected jurisdictions in this chapter.

4.2.4 South Africa

The Constitution of the Republic of South Africa, 1996 is the supreme law of the country.[735] The National Health Act 61 of 2003 governs all health research in the country.[736] No legally binding law speaks directly to benefit sharing in health research using human biological materials.[737] Health research involving HBMs are addressed in the Department of Health's Ethics in Health Research Guidelines of 2015, discussed next.

4.2.4.1 Department of Health Ethics in Health Research Guidelines, 2015

The Department of Health, National Ethics Guidelines[738] provide a minimal benchmark for conducting ethical and responsible research in the country. Benefit sharing is not specifically addressed in the Guidelines, however the Guidelines provide that "the population from which the participants are drawn will benefit from the research results if not immediately, then in the future".[739] The Guidelines advise that fair reimbursement for study participation is just and when recruitment is difficult, inducements may be offered to research participants.[740] The Guidelines further stipulate that when obtaining informed consent, research participants should be informed of the potential benefits of their participation, both during and after the research.[741]

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[735]The Constitution of the Republic of South Africa https://www.justice.gov.za/legislation/constitution/saconstitution-web-eng.pdf (Date of use: 24 May 2023).

[736]61 0f 2003, Chapter 9.

[737]Slabbert MN "The legal regulation of access and benefit sharing of human genetic resources in South Africa" 2011 *74 Tydskrif vir Hedendaagse Romeins-Hollandse Reg* 605–632.

[738]DoH Ethics in Health Research Guideline https://www.health.gov.za/up-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).

[739]DoH Ethics in Health Research Guidelines https://www.health.gov.za/up-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).

[740]DoH Ethics in Health Research Guidelines http://www.health.gov.za/up-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).

[741]DoH Ethics in Health Research Guidelineshttp://www.health.gov.za/up-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).

4.2.4.2 Health Professions Council of South Africa (HPCSA) Guidelines

In 2016, the Health Professions Council of South Africa (HPCSA) published revised guidelines for health practitioners and health researchers in their mandate as health professionals.[742] Booklet 13 deals with ethical guidelines for health researchers. The Guidelines caution that, considering South Africa's violent and discriminatory past, which led to the marginalisation of specific racial groups, the misuse of power in research cannot be ignored.[743] The Guidelines also state that burdens and benefits should be balanced within different population groups. Section 6.6.3 of the Guidelines proposes that at the end of a study, research participants should be entitled to benefit from the study by accessing the best proven prophylactic, diagnostic and therapeutic methods identified by such study.[744]

4.2.4.3 National Material Transfer Agreement of Human Biological Materials

In 2018, the government of South Africa gazetted a template for the National Material Transfer Agreement (MTA) of Human Biological Materials.[745] Section 7 of the MTA expressly states that "the sharing of benefits should be discussed and negotiated between the Provider and Recipient before Materials are transferred to the Recipient".[746] The MTA defines a benefit as:[747]

> Amongst others, the sharing of information; use of research results; royalties; acknowledgement of the Provider as the source of the Materials; publication rights; transfer of technology or Materials; and capacity building.

Benefit sharing is also described in the MTA as: "[…] the process or act of sharing in the benefits that derive from the Project in a manner that is fair and equitable".[748]

The SA MTA is a legally binding template that must be completed and adjusted for the individual institution's context by the providing and recipient institutes (with the HREC

[742]HPCSA mandate https://www.hpcsa.co.za/Uploads/professional_practice/ethics/Booklet_1_Guidelines_for_Good_Practice_vDec_2021.pdf (Date of use: 26 May 2023).
[743]HPCSA General Ethical Guidelines for Health Researchers https://www.hpcsa.co.za/Uploads/professional_practice/ethics/Booklet_13_Gen_Ethical_Guidelines_for_Health_Researchers.pdf (Date of use: 26 May 2023).
[744]HPCSA General Ethical Guidelines for Health Researchers https://www.hpcsa.co.za/Uploads/professional_practice/ethics/Booklet_13_Gen_Ethical_Guidelines_for_Health_Researchers.pdf (Date of use: 26 May 2023).
[745]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.
[746]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.
[747]Section 2.2 of the SA MTA, Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.
[748]Section 2.3 of the SA MTA, Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.

constituting a party to the agreement) prior to the transfer of HBMs outside South Africa's borders. The implementation of the national MTA provides a template that comprises of key elements that are legally recognised. Benefit sharing is one of these elements. However, as parties to the SA MTA may negotiate the terms of benefit sharing arrangements and as such, benefit sharing is not an absolute requirement. The SA MTA also does not provide guidance on what terms should be included in a benefit sharing agreement.

4.3 Comparative analysis

Although ethical guidelines are generally not considered legally binding, non-adherence to their principles could result in healthcare professionals being found guilty of professional misconduct. In addition, RECs may not approve research projects that dismiss ethics principles, as outlined in the Guidelines above.

In most HICs, the notion of altruistic research that attempts to avoid undue inducement[749] is still very much prevalent, as is exemplified by the ethical guidelines relating to health research in the United Kingdom.[750] In the UK, all human biological material used in health research is regarded as an altruistic donation to benefit all towards fulfilling distributive justice.[751] This also fulfils the general rule that participants relinquish ownership rights to biospecimens once they have donated samples.[752] Scholars have argued that the notion of the distributive justice of benefits is only suited to HICs where everybody would benefit equally from the results of health research. In LMICs, where there is a history of injustices in health research (often brought about by a lack of integrity), cultural insensitivity and

[749]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

[750]Section 12.3 of HRA SOPs found at https://s3.eu-west-2.amazonaws.com/www.hra.nhs.uk/media/documents/RES_Standard_Operating_Procedures_Version_7.5.1_August_2021_Final_Accessible_07lVkXt.pdf (Date of use: 23 May 2023).

[751]Section 2 of MRC Human Tissue and Biological Samples for Use in Research: Operational and Ethical Guidelines https://www.ukri.org/publications/human-tissue-and-biological-samples-for-use-in-research/ (Date of use: 23 May 2023).

[752]Mahomed S "Human biobanking in developed and developing countries: an ethico-legal comparative analysis of the frameworks in the United Kingdom, Australia, Uganda, and South Africa" 2021 *Cambridge Quarterly of Healthcare Ethics* 30:146–60.

unfair collaborations,[753] the fair-exchange model for benefit sharing fails and could, indeed, lead to exploitation.[754]

Interestingly, the Australian National Statement on Ethical Conduct in Human Research[755] has incorporated the concept of benefit sharing as one of the pillars of ethical research. The statement elaborates by stating that not only should benefit sharing arrangements be in place, but the need to identify to whom said benefits should accrue also exists.[756] Although the concept of the ownership of human biological materials is not specifically mentioned, the National Statement is unambiguous that donors of HBMs should be notified in the event of the commercialisation of outcomes using their samples and how this would be managed.[757] This is unlike the UK, where guidelines stipulate that HBMs donors are not entitled to any profits that might arise from the commercialisation of outcomes using their samples.

In Uganda, the National Guidelines state that all participants maintain ownership of their samples.[758] This statement contradicts case law, such as *Moore v. Regents of the University of California,*[759] *Greenberg v. Miami Children's Hospital Research Institute, Inc*[760] and *Washington University v. Catalona,*[761] which show the law's discomfort with classifying HBMs in terms of property and ownership.[762] In terms of common law in

[753]Moodley K and Singh S "'It's all about trust': reflections of researchers on the complexity and controversy surrounding biobanking in South Africa" 2016 *BMC Medical Ethics* 17(1): 1–9.

[754]Andanda P, Schroeder D, Chaturvedi S *et al* "Legal frameworks for benefit sharing: from biodiversity to human genomics" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

[755]Australian National Statement on Ethical Conduct in Human Researchhttps://www.nhmrc.gov.au/about-us/publications/national-statement-ethical-conduct-human-research-2007-updated-2018#block-views-block-file-attachments-content-block-1 (Date of use: 26 May 2023).

[756]Section 2 of the Australian National Statement on Ethical Conduct in Human Research at 12–15.

[757]Section 3 of the Australian National Statement on Ethical Conduct in Human Research at 23–60.

[758]Section 10.3 of the Ugandan "National Guidelines".

[759]Cited in Chapter 3 of this thesis, from Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481: 167–191. The California Supreme Court rejected Mr Moore's property rights claim to his cells, concluding that this would hamper scientists from conducting medical research.

[760]Cited In Chapter 3 of this thesis, from Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191 where the Florida Court determined that any property right to blood and tissue samples "evaporates once the sample is voluntarily given to a third party".

[761]Cited in Chapter 3 of this thesis, from Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191, whereby the Court dictated that the patients had altruistically donated the HBMs to research and no longer retained any ownership rights to the samples or the authority to transfer said samples to third parties.

[762]Nöthling-Slabbert M "Human bodies in law: arbitrary discursive constructions?" 2008 *Stellenbosch Law Review* 19(1): 71–100.

Uganda, ownership is a real right, defined on the basis of entitlements.[763] Thus, the National Guidelines state that even when participants withdraw from a study, they are still entitled to the benefits promised to them in the informed consent form.[764] The Uganda National Guidelines provide that the primary institute or organisation will hold the donors samples in trust, which will always act in the best interest of the sample donors.[765] The custodian will then draft MTAs when samples are transferred outside Uganda to other institutions/organisations that require clauses pertaining to varying benefit arrangements, including the development of a product of commercial value with the use of the donated HBMs.[766]

The National Research Biobanking Guidelines of 2021[767] reiterate that the donor of HBM samples remains the owner of a sample, who has to adhere to a custodianship relationship with a primary source institution in Uganda.[768] The primary source institution has the authority to decide the use, transfer, storage and future use of the samples, considering the rights and welfare of the sample donor. As such, a biobank will have full custody of the sample per the MTA between parties.[769]

In South Africa, similar to Uganda's position, the National Material Transfer Agreement of Human Biological Materials provides in section 3.3 that the provider of the HBMs remains the custodian of the materials and that the donor remains the owner of the material until such materials are destroyed.[770] Benefit sharing is specifically mentioned in section 7 of the MTA, which states that before human biological materials are transferred, the sharing of benefits should be discussed and negotiated.[771]

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[763]Mahomed S, Nöthling-Slabbert M and Pepper MS "The legal position on the classification of human tissue in South Africa: can tissue be owned?" 2013 *S Afr J BL* 6(1):16–20.

[764]Section 5.3.1 (h) of the Ugandan "National Guidelines".

[765]Uganda National Guidelines for Research involving Humans as Research Participants https://uncst.go.ug/main/wp-content/uploads/download-manager-files/Human%20Subjects%20Protection%20Guidelines%20July%202014.pdf (Date of use: 24 May 2023).

[766]Uganda National Guidelines for Research involving Humans as Research participants https://uncst.go.ug/main/wp-content/uploads/download-manager-files/Human%20Subjects%20Protection%20Guidelines%20July%202014.pdf (Date of use: 24 May 2023).

[767]Uganda National Biobanking Guidelines https://uncst.go.ug/files/National_Biobanking_Gudelines.pdf (Date of use: 24 May 2023).

[768]Uganda National Biobanking Guidelineshttps://uncst.go.ug/files/National_Biobanking_Gudelines.pdf (Date of use: 24 May 2023).

[769]Uganda National Biobanking Guidelines https://uncst.go.ug/files/National_Biobanking_Gudelines.pdf ((Date of use: 24 May 2023).

[770]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.

[771]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.

To conclude, whilst the UK has no framework governing benefit sharing for health research using HBMs, Australia and Uganda have explicitly included benefit sharing between donors and recipients in their ethical guidelines to promote ethical health research. The South African framework acknowledges the need for benefit sharing in health research using HBMs, yet it does not provide firm guidance or direction on how this should occur.

It is also worth noting that Australia has specific provisions regarding benefit sharing when dealing with specific communities deemed vulnerable or marginalised communities.[772] The Guidelines stipulate that in research using HBMs from marginalised communities, benefit sharing agreements should be discussed, agreed upon with the community, and also be delivered. These agreements must be for the benefit of the communities and their advancement.[773] The UK guidelines do not address research that uses HBMs from specific populations. Uganda's National Guidelines provide that when the indigenous knowledge of a community is used, the community should receive fair benefits from the utilisation of their knowledge.[774] The same National Guidelines also emphasise the need for health research to return benefits to the community and the country and to avoid exploitative research.[775]

Turning to South Africa, there is no mention of community benefits or how to address benefit sharing with marginalised communities in ethico-legal frameworks in the context of benefit sharing. South Africa has a difficult past, which resulted in the creation of vulnerable and marginalised communities.[776] This must be borne in mind and addressed when benefit sharing agreements are negotiated between HICs and vulnerable South African communities.

As far as collaborative research in the United Kingdom is concerned, the Guidelines of the Human Research Authority do not require RECs to review consent arrangements or any other research activities undertaken by collaborators in the source country.[777] On the other

[772]Chapter 4.7.7 of the National Statement on Ethical Conduct in Human Research of the NHRMC.
[773]Chapter 4.7.7 of the National Statement on Ethical Conduct in Human Research of the NHRMC.
[774]Section 13.0(a) of the Uganda "National Guidelines".
[775]Uganda National Guidelines for Research involving Humans as Research Participants https://uncst.go.ug/main/wp-content/uploads/download-manager-files/Human%20Subjects%20Protection%20Guidelines%20July%202014.pdf (Date of use: 24 May 2023).
[776]Christopher AJ "Apartheid and urban segregation levels in South Africa" 1990 *Urban Studies* 3:421–440.
[777]Section 12.47 of HRA SOPs found at https://s3.eu-west-2.amazonaws.com/www.hra.nhs.uk/media/documents/RES_Standard_Operating_Procedures_Version_7.5.1_August_2021_Final_Accessible_07lVkXt.pdf (Date of use: 24 May 2023).

hand, the MRC Principles and Guidelines require that for MRC funded research, signed agreements between research organisations and representatives of the collaborating organisation must be completed before the research commences. These agreements may include ownership, custodianship, transfer and the future use of samples.[778] In Australia, the Guidelines in the National Statement indicate that in collaborative research with other countries, the distribution of benefits and burdens should be fair to participants and communities whilst being sensitive to the needs of communities and protecting them against potential exploitation.[779] Uganda specifically requires that an MTA and/or a DTA is signed between the primary institute in Uganda and the receiving institute. This DTA and/or MTA has/have specific clauses pertaining to benefit arrangements that the primary institute or Uganda could expect.[780] South Africa requires a provider and recipient to negotiate and agree on benefit sharing before human biological material may be exchanged.[781]

With regard to intellectual property that may arise from the use of HBM, the UK maintains that sample donors have no intellectual property rights generated from research using their HBMs.[782] In its National Statement, Australia proposes that researchers should agree on the ownership of any property created, although the agreement need not be contractual.[783] Uganda requires the primary organisation which is the custodian of the HBM samples to define IP policy via an MTA/DTA which outlines how the benefits arising from IP are to be shared.[784] In South Africa, any IP generated from publicly funded research and development using HBMs is owned by the recipient of the public funds; however, co-ownership is possible with a private entity if benefit sharing arrangements are made with intellectual property creators.[785]

The different approaches to benefit sharing in the United Kingdom and Australia as HICs are interesting. The UK maintains that health research should be altruistic and Australia

[778]MRC ethics series: Good research practice: Principles and Guidelines https://www.ukri.org/wp-content/uploads/2021/08/MRC-0208212-Good-research-practice_2014.pdf (Date of use: 24 May 2023).
[779]Chapter 4.8.12 of the National Statement on Ethical Conduct in Human Research of the NHRMC.
[780]Section 8.2 of the Uganda National Research Biobanking Guidelines at 20.
[781]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.
[782]MRC ethics series: Good research practice: Principles and Guidelines ehttps://www.ukri.org/wp-content/uploads/2021/08/MRC-0208212-Good-research-practice_2014.pdf (Date of use: 24 May 2023).
[783]Chapter 3.1.44 of the National Statement on Ethical Conduct in Human Research of the NHRMC at 35.
[784]Section 8.2 of the Uganda National Research Biobanking Guidelines at 20
[785]Intellectual property rights from publicly financed research and development https://www.gov.za/sites/default/files/gcis_document/201409/33433675.pdf (Date of use: 24 May 2023).

determines that research cannot be ethical if all parties who participate in research do not benefit equally. As LMICs, both Uganda and South Africa were subjected to research injustices and unfair collaborations in the past. This historical context continues to inform efforts to ensure fair benefit sharing in health research using HBMs.

Table 1: Positions on ownership of HBMs and benefit sharing in Australia, the UK, Uganda and South Africa

Country	Ownership of HBMs	Benefit sharing legislation/guidelines
United Kingdom	All samples are considered altruistic donations	Not addressed
Australia	Not addressed	National Statement Ethical guidelines state that: i. Benefit sharing is one of the pillars of ethical research. ii. Benefit sharing arrangements must be in place in research and to whom these benefits are to be accrued. iii. Donors of HBMs are to be notified in the event of the commercialisation of outcomes using their samples, how this will be managed and to whom the benefits, if any, will be distributed. iv. When using samples from marginalised/vulnerable communities, benefit sharing arrangements should be agreed upon with the communities and should be for their advancement. v. In international collaborations, benefits and burdens should be fairly distributed and be fair to their communities
Uganda	Donors retain ownership of their HBMs. A custodianship exists between the donor and primary in Uganda that holds the sample	National Guidelines and Biobanking Guidelines state that: i. Informed consent forms should include anticipated benefits to the participants and communities. ii. Regarding the future use of stored HBMs, a secondary consent form is to be used which should describe the risks and benefits of storing samples for future research. iii. An MTA is required when samples are transferred between institutions. The MTA should have clauses on various benefit sharing arrangements iv. In the event of the commercialisation of outcomes using samples held in trust, a second MTA is to be negotiated stating what benefits Uganda or the primary institution in Uganda would be realised. v. In the event of any intellectual property that arises from research using HBMs, the biobank and primary source institution should define an intellectual property policy and this should be enforced using an MTA and/or data transfer Agreement (DTA).
South Africa	The Providing institute remains the custodian of the materials and the Donor remains the owner of the materials until such material is destroyed.	The National MTA states that before the transfer of HBMs, the sharing of benefits should be discussed and negotiated.

4.4 Conclusion

This chapter has identified one of the main arguments against benefit sharing in research as the potential for undue inducement that could lead to the exploitation of research participants.[786] Despite this concern, many scholars have argued that not distributing fair and equal benefits to all who participate in health research, constitutes a form of exploitation.[787]

None of the jurisdictions explored in this chapter have a legally binding regulation that requires benefit sharing in health research where HBMs are used. Although benefit sharing is provided for in ethical guidelines in the UK, Australia and Uganda, these are only persuasive sources and not legal rules.[788] It has been argued that "global bioethics have to contend with a regulatory crisis in terms of the existing public law silences and health inequities especially in low and middle income countries".[789] A study by De Vries *et al*[790] concludes that in a likely response to fears of exploitation regarding genomic and biobank research in LMICs, existing regulations are either absent, outdated, conservative or difficult to navigate. The lack of legislation could also be attributed to the fact that the law relies on tradition and legal precedent,[791] and must be seen to both follow tradition and precedent when formulating public policy or legislation in the age of rapidly evolving health research.

Ethical guidelines in the UK direct that all donations are considered gifts and that no benefit sharing is necessary. Conversely, the various guidelines in Australia, Uganda and South Africa all propose that benefit sharing is necessary and should be achieved by agreements or as part of an MTA/DTA. It was argued in this chapter that the notion of altruistic research is viable in HICs where the population has access to good healthcare, but to suggest that

[786]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

[787]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

[788]Mahomed S "Human biobanking in developed and developing countries: an ethico-legal comparative analysis of the frameworks in the United Kingdom, Australia, Uganda, and South Africa" 2021 *Cambridge Quarterly of Healthcare Ethics* 30:146–60.

[789]Andanda P, Schroeder D, Chaturvedi S *et al* "*Legal frameworks for benefit sharing: from biodiversity to human genomics*" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 33–64.

[790]De Vies J, Munung SN, Matimba A *et al* "Regulation of genomic and biobanking research in Africa: a content analysis of ethics guidelines, policies and procedures from 22 African countries" 2017 *BMC Medical Ethics* 18(1):1–9.

[791]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.

this should be the case in LMICs or among marginalised communities, is paternalistic and short-sighted, as most research participants in these communities live in poverty and have no or limited access to health care services.

Health research using HBMs is a dynamic and fast-evolving field, with unique ethical challenges arising in the African research context. As a result, there is a need for guidance in the legal frameworks around ethical research.

The next chapter considers an important aspect of this study, namely to interrogate what may considered as a benefit for the purpose of benefit sharing in health research, and how best all such benefits could be structured in a legal document that could assist with effectively managing benefit sharing arrangements in South Africa.

CHAPTER 5

KEY ISSUES TO BE ADDRESSED IN BENEFIT SHARING AND A PROPOSED TEMPLATE FOR BENEFIT SHARING IN SOUTH AFRICA

5.1 Introduction

Earlier chapters in this thesis have determined that the concept of sharing benefits in health research is not new and that it has become more glaringly evident in times of global health crises.[792] It has been suggested that to regulate collaborative research, the fair benefits approach should adopt a procedural strategy.[793] It is indeed shameful that to date, allegations of the use of African DNA without consent for commercial applications continues to be reported in HICs without the transfer of any benefits to LMICs.[794] To wit, during the 2019 Ebola outbreak in Western Africa, blood samples that had been collected from patients, held by American and British authorities and used for commercial development, were withheld from researchers from West African countries.[795] The current global SARS-CoV2 has further magnified the issue of research participants in LMICs rarely directly benefitting from the research in which they participate, as seen by the vaccine scarcity and vaccine hoarding by HICs, despite the fact that some of these LMICs, including South Africa, were involved in COVID-19 vaccine research and trials.[796]

It took a global pandemic such as COVID-19 to emphasise that especially in LMICs, benefit sharing should be considered as a matter of justice aimed at avoiding exploitation and protecting the vulnerable.[797] According to Cook Lucas *et al*,[798] every new global health crisis highlights the need for a solution to the exclusion of human biological materials (HBMs) from the CBD and the access and sharing of these HBMs. Nevertheless, it is

[792]Moodley K, Blockman M, Hawkridge *et al* "Hard choices: Ethical challenges in phase 1 of COVID-19 vaccine roll-out in South Africa" 2021 SAMJ 111(6):554-558.

[793]London AJ and Zollman KJS "Research at the auction block: problems for the fair benefits approach to international research" 2010 *Hastings Center Report* 40(4):34–45.

[794]Moodley K and Kleinsmidt A "Allegations of misuse of African DNA in the UK: will data protection legislation in South Africa be sufficient to prevent a recurrence?" 2021 *Developing World Bioethics* 21:125–130.

[795]Mckenna M "Colonialists are coming for blood-Literally" 2019 *Ideas* https://www.wired.com/story/ebola-epidemic-blood-samples/ (Date of use: 26 May 2023) .

[796]Moodley K, Blockman M, Hawkridge AJ *et al* "Hard choices: ethical challenges in phase 1 of COVID-19 vaccine roll-out in South Africa" 2021 *SAMJ* 111(6):554–558.

[797]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

[798]Cook Lucas JC, Schroeder D, Arnason G *et al* "Donating human samples: who benefits? Cases from Iceland, Kenya and Indonesia" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 95–127.

evident that many countries, including South Africa, lack adequate legislative structures and governance frameworks to facilitate fair benefit sharing for all who participate in health research.[799] In the absence of binding law, ethics guidelines might provide guidance akin to customary international law.[800]

The never-ending questions around the type and range of benefits, to whom the benefits should accrue and when and how they should be provided, remain obstacles to implementing benefit sharing in health research.[801] The concept of benefit sharing is also problematic because various disciplines use it without a specific definition.[802]

Sudoi *et al* [803] suggest that the use of the terms "advantage" or "profits" in the definition of benefit sharing infers that those benefits could be either monetary or non-monetary. If we accept Schroeder's[804] definition that benefit sharing is a technical term to be used as a tool to achieve justice, then it is necessary to redress the frequent injustices being committed in LMICs by HICs through exploitative research[805] and enforce benefit sharing plans and their implementation as a prominent feature in research proposals and grant applications.[806]

5.2 Legal frameworks for benefit sharing

Chapter 2 of this thesis explored the legal framework for benefit sharing in South Africa and also canvassed benefit sharing models in other jurisdictions. The objective of this chapter, which is to develop a framework for benefit sharing in health research in South Africa, will require that cross-referencing to other benefit sharing frameworks discussed in chapter 2 of this thesis may be necessary.

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[799]Chen H and Pang T "A call for global governance of biobanks" 2015 *Bull World Health Organ* 93:113–117.
[800]Andanda P, Schroeder D, Chaturvedi S, Mengesha E and Hodges T "*Legal frameworks for benefit sharing: from biodiversity to human genomic*" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 33–64.
[801]Sudoi A, De Vries J and Kamuya D "A scoping review of considerations and practices for benefit sharing in biobanking" 2021 *BMC Medical Ethics* 22(1):1–16.
[802]Schroeder D "Benefit sharing: it's time for a definition" 2007 *J Med Ethics* 33:205–209.
[803]Sudoi A, De Vries J and Kamuya D "A scoping review of considerations and practices for benefit sharing in biobanking" 2021 *BMC Medical Ethics* 22:102.
[804]Schroeder D "Benefit sharing: it's time for a definition" 2007 *J Med Ethics* 33:205–209.
[805]Evans NG, Hills K and Levine AC "How should the WHO guide access and benefit sharing during infectious disease outbreaks" 2020 *AMA Journal of Ethics* 22(1):28–35.
[806]Bedeker A, Nichols M, Allie T *et al.* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7(2): e008096.

5.2.1 Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilisation

The Nagoya Protocol,[807] a subsidiary agreement to the CBD that has been ratified by at least 163 countries, refers to access and the benefit sharing of non-human genetic resources. The Protocol aims to promote benefit sharing combined with material transfer agreements, but as discussed earlier in this thesis, excludes human biological resources and digital sequence information.[808] The Nagoya Protocol proposes a substantive list of both monetary and non-monetary benefits that could be shared.[809] Although some of the proposed benefits are not relevant to or appropriate in the context of human health research, some scholars argue that in the absence of clear international guidelines and in a world of ever advancing biotechnology where research is increasingly multifaceted and could incorporate genetic resources from plants, pathogens, animals and humans, the scope of access and benefit sharing of the CBD should expand to include human genetic resources.[810]

5.2.2 HUGO Ethics Committee Statement on Benefit Sharing

On the 9th of April 2000, the HUGO Ethics committee issued a statement on benefit sharing between concerned parties (which may include governments, academic institutions and participating communities) regarding human biological material.[811] One of their suggestions was that "profit-making entities dedicate a percentage (e.g., 1%–3%) of their annual net profit to healthcare infrastructure and/or to humanitarian efforts".[812]

[807]Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilisation. Secretariat of the Convention of Biological Diversity 2011. http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf (Date of use: 26 May 2023).

[808]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7(2):e008096.

[809]Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilisation. Secretariat of the Convention of Biological Diversity 2011. http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf (Date of use: 26 May 2023)

[810]Chaturvedi S, Crager S and Ladikas M "Promoting an inclusive approach to benefit sharing: expanding the scope of the CBD?" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 153–178.

[811]HUGO Ethics Committee Statement on Benefit Sharing https://www.eubios.info/BENSHARE.htm#:~:text=The%20HUGO%20Ethics%20Committee%20recommends,who%20participated%20in%20such%20research (Date of use: 24 May 2023).

[812]HUGO Ethics Committee on Benefit Sharing https://www.eubios.info/BENSHARE.htm#:~:text=The%20HUGO%20Ethics%20Committee%20recommends,who%20participated%20in%20such%20research. (Date of use: 20 May 2023).

5.2.3 CIOMS International Ethical Guidelines for Health-Related Research Involving Humans

The Council for International Organisations of Medical Sciences (CIOMS) updated their Guidelines in 2016, which endorse benefit sharing and advise that benefit sharing agreements[813] should be negotiated. The Guidelines do not offer any direction or guidance on how the difference in negotiating powers between stakeholders in HICs and those in LMICs should be navigated.[814]

5.2.4 San Code of Research Ethics

Specific to South Africa, the San Code of Research Ethics[815] requires that expected benefits are discussed with research participants and the community. Although the benefits could be non-monetary, they could include co-research opportunities, the transfer or sharing of skills, development of research capacity, and roles for translators and research assistants.

The commercialisation of products arising from research using human biological materials has ensured that the private sector is the main investor in health research.[816] These frameworks, although promoting benefit sharing, fail to address the issue of public and privately funded research designs. Some research is sponsored by governments and/or non-profit organisations, which, nonetheless, respond to public health needs as opposed to profit-driven research.[817] The inequities in global health between LMICs and HICs are large. To address this, HICs are called upon to make data, samples and interventions

[813]The International Ethical Guidelines for Health-related Research Involving Humans prepared by CIOMS and WHO Geneva 2016 https://cioms.ch/wp-content/uploads/2017/01/WEB-CIOMS-EthicalGuidelines.pdf (Date of use: 23 May 2023).

[814]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7(2):e008096.

[815]Chennells R and Schroeder D "The San Code of Research Ethics : Its Origins and History" T*RUST Equitable Research* 2018 http://www.globalcodeofconduct.org/wp-content/uploads/2019/02/SanCodeHistory.pdf (Date of use: 23 May 2023).

[816]Simm K "Benefit sharing frameworks–justifications for and against benefit sharing in human genetic research" 2007 A report for GenBenefit, available at: www.uclan.ac.uk/genbenefit (Date of use: 25 May 2023).

[817]Simm K "Benefit sharing frameworks –justifications for and against benefit sharing in human genetic research."2007 A report for GenBenefit, available at: www.uclan.ac.uk/genbenefit (Date of use: 25 May 2023).

available to correct past injustices and also to enable the negotiation of fair contracts for vulnerable populations.[818]

5.3 Challenges to benefit sharing

The need for benefit sharing in health research is glaringly evident,[819] yet controversy persists. For example, when the Indonesian government withheld its avian flu samples which had been distributed via the WHO's Global Influenza Surveillance Network, the government argued that despite providing the H5N1 samples or the development of specific vaccines, the resultant vaccines would be unaffordable for its citizens.[820] If benefit sharing is understood to be a mechanism to counter exploitation,[821] then a lack of trust between human biological resource providers and resource users is an obstacle preventing the implementation of fair benefit sharing between all stakeholders involved in research.[822]

Samples derived from human biological materials can be costly to store since they often require a continuous cold chain, expensive freezers and generators. As this would be costly in most LMICs, the lack of appropriate infrastructure and equipment seemingly makes it easier to ship samples to HICs.[823] Some LMICs may have the capacity to store such samples but the lack of appropriate molecular diagnostics to work with those samples is one of many obstacles hindering the implementation of equal benefit sharing between HICs and LMICs.[824]

[818]Evans NG, Hills K and Levine AC "How should the WHO guide access and benefit sharing during infectious disease outbreaks" 2020 *AMA Journal of Ethics* 22(1):28–35.

[819]Simm K "Benefit sharing frameworks–justifications for and against benefit sharing in human genetic research" 2007 A report for GenBenefit available at: www.uclan.ac.uk/genbenefit (Date of use: 25 May 2023).

[820]Sedyaningsih ER, Isfandari S, Soendoro T *et al* "Towards mutual trust, transparency and equity in virus sharing mechanism: the avian influenza case of Indonesia" 2008 *Ann Acad Med Singapore* 37:482–488.

[821]Schroeder D "Benefit sharing: it's time for a definition" 2007 *J Med Ethics* 33:205–209.

[822]Sedyaningsih ER, Isfandari S, Soendoro T *et al* "Towards mutual trust, transparency and equity in virus sharing mechanism: the avian influenza case of Indonesia" 2008 *Ann Acad Med Singapore* 37:482–488.

[823]Evans NG, Hills K and Levine AC "How should the WHO guide access and benefit sharing during infectious disease outbreaks" 2020 *AMA Journal of Ethics* 22(1):28–35.

[824]Evans NG, Hills K and Levine AC "How should the WHO guide access and benefit sharing during infectious disease outbreaks" 2020 *AMA Journal of Ethics* 22(1):28–35.

Some health research involving biobanking requires vast amounts of data and samples as well as the proper storing and sharing of this information.[825] Accessing and sharing this information is key to biobanking, but the large numbers of stakeholders involved and the power dynamics between them, as well as the question of who benefits, when and how, often present challenges.[826] Issues pertaining to the re-use of samples like consent and ownership are also obstacles to attempting to implement benefit sharing in practice.[827]

The issue of post study access also presents obstacles to the practical implementation of benefit sharing.[828] Health research using HBMs does not always result in big and/or immediate returns or viable therapeutics.[829] Many years may pass before tangible products such as therapeutics or vaccines are developed and these developments cost a considerable sum of money. A mechanism to pay for and distribute these products must be found; however, questions around how this may be achieved and who should be responsible for this could lead to unfair benefit sharing of products developed from the research.[830]

Some scholars[831] suggest that research ethics committees (RECs) in LMICs are often ineffective at providing independent oversight in the implementation of fair benefit sharing frameworks. A study conducted in 1999 to examine the effectiveness of RECs in LMICs concluded that the "major constraints identified are shortage of resources and inadequate training of the REC committee members as well as pressure from researchers and sponsors".[832] However, with reference to South Africa, Chapter 9 of the NHA states that all institutions at which health research is conducted must establish or have access to a health REC which is registered and audited by the National Health Research Ethics

[825]Sudoi A, De Vries J and Kamuya D "A scoping review of considerations and practices for benefit sharing in biobanking" 2021 *BMC Medical ethics* 22(1):1–16.
[826]Berg K "The ethics of benefit sharing" 2001 *Clin Genet* 59(4):240–243.
[827]Sudoi A, De Vries J and Kamuya D "A scoping review of considerations and practices for benefit sharing in biobanking" 2021 *BMC Medical ethics* 22:102.
[828]Schroeder D and Gefenas E "Realizing benefit sharing–the case of post-study obligations" 2012 *Bioethics* 26(6):305–314.
[829]Schroeder D and Gefenas E "Realizing benefit sharing–the case of post-study obligations" 2012 *Bioethics* 26(6):305–314.
[830]Evans NG, Hills K and Levine AC "How should the WHO guide access and benefit sharing during infectious disease outbreaks" 2020 *AMA Journal of Ethics* 22(1):28–35.
[831]Millum J "Sharing the benefits of research fairly: two approaches" 2012 *J Med Ethics* 38:219–223.
[832]Nyika A, Kilama W, Chilengi R *et al.*" Composition, training needs and independence of ethics review committees across Africa: are the gate-keepers rising to the emerging challenges?" 2009 *J Med Ethics* 35:189–193.

Council.[833] In 2019, Mahomed and Labuschaigne[834] reviewed the changing role of RECs in South Africa during past decade. They concluded that the complexity of novel and specialised research, coupled with complex and intricate research protocols funded by private sponsors across national borders, are among others some of the challenges that caused capacity and resource constraints on the part of RECs, resulting in breaches regarding the protection of participants.

Sudoi *et al*[835] identify the tensions that exist between benefit sharing and other ethical issues such as undue inducement, altruistic research and the commodification of a person, as further conceptual and practical challenges to the implementation of benefit sharing.

It is important to acknowledge that operational benefit sharing involves multiple stakeholders who must all benefit at some stage; not acknowledging this fact could impede the implementation of benefit sharing.[836] Recognising that different stakeholders are involved in research means that effective communication structures between the scientific community and relevant national and international policymakers need to be developed.[837]

The conceptual and practical problems of benefit sharing remain primarily because the present ethical and legal policies to promote benefit sharing are non-binding legislation that offer inconsistent and incomplete frameworks for benefit sharing.[838]

With specific reference to South Africa, the recently gazetted Protection of Personal Information Act (POPIA)[839] effected the legal enforcement of research participants' right to privacy regarding their data with no regard for how this could affect the use of personal information in health research in SA.[840] Health research, particularly collaborative research to develop diagnostics, treatments and respond to pandemic outbreaks is expatiated when large amounts of samples and personal data can be transferred between research

[833]National Health Act No.61 of 2013
[834]Mahomed S and Labuschaigne M "The role of research ethics committees in South Africa when human biological materials are transferred between institutions" 2019 *S Afr J Bioethics Law* 12(2):79-83.
[835]Sudoi A, De Vries J and Kamuya D "A scoping review of considerations and practices for benefit sharing in biobanking" 2021 *BMC Medical ethics* 22(1):1–16.
[836]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7(2):e008096.
[837]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7(2):e008096.
[838]Chen H and Pang T "A call for global governance of biobanks" 2015 *Bull World Health Organ* 93:113–117.
[839]South Africa. Protection of Personal Information Act No.4 of 2013.
[840]Mahomed S, Loots G and Stauton C "The role of data transfer agreements in ethically managing data sharing for research in South Africa" 2022 *S Afr J Bioethics Law* 15(1):26–30.

institutions locally or internationally.[841] Section 72(1)(e) of the POPIA allows the transfer of personal data outside South African borders if it is for the benefit of the research participant in the absence of consent from a said participant, given that if the participant could give consent, they would likely give it.[842] Mohamed *et al*[843] point out that this exemption would require that every participant is accounted for in the decision-making process and this may be impractical and even impossible where large datasets are transferred outside of South Africa.

Finally, as highlighted by Cheng and Pang,[844] the lack of HICs stakeholders' understanding of the local culture, religious beliefs and the concept of ethics in LMICs may pose further impediments to the realisation of benefit sharing.

5.4 Proposed benefit sharing models

The absence of a binding and streamlined international legal regime to direct a framework for benefit sharing in human health research becomes problematic as national governments evolve their own access and benefit sharing frameworks that might not support global research initiatives.[845] The issues of public versus private or semi-private research must be considered when designing a framework for benefit sharing in health research, as should property rights, public engagement, compensation of research participants, consent issues, data sharing, secondary use of samples and data, returning results, royalties, financial gains, other types of gain and beneficiaries.[846]

[841]Mahomed S, Loots G and Stauton C "The role of data transfer agreements in ethically managing data sharing for research in South Africa" 2022 *S Afr J Bioethics Law* 15(1):26–30.
[842]South Africa. Protection of Personal Information Act No.4 of 2013. Section 72(1)(e).
[843]Mahomed S, Loots G and Stauton C "The role of data transfer agreements in ethically managing data sharing for research in South Africa" 2022 *S Afr J Bioethics Law* 15(1):26–30.
[844] Chen H and Pang T "A call for global governance of biobanks" 2015 *Bull World Health Organ* 93:113–117.
[845]Chaturvedi S, Crager S, Ladikas M *et al* "Promoting an inclusive approach to benefit sharing: expanding the scope of the CBD?" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 153–178.
[846]Cambon-Thomsen A, Rial-Sebbag E and Knoppers BM "Trends in ethical and legal frameworks for the use of human biobanks" 2007 *Eur Respir J* 30:373–382.

5.4.1 Table 2: Types of benefits that accrue to various stakeholders in a research project[847]

	Health benefits	**Commercial/Economic benefits**	**Scientific benefits**
Individual level	Designer drugs and other individual aspects of personalised medicine	Profits to investors	Non-instrumental knowledge: Development of science and gaining of new information as a value itself, regardless of whether it is useful to humans
Communal level	Relief to disease-affected populations, etc.	Non-medical benefits to communities Capacity building	
National, state level	Efficient health care services, policy planning, etc.	Development of biotech and related sectors, new jobs, etc.; capacity building	
Global level	Eradication of disease		

Some commentators regard Table 2 above as not exhaustive of the types of benefits that could be negotiated in health research and that it is not possible to pass judgement on the deliverability of the suggested benefits. [848]

Several models of benefit sharing frameworks dominate ethical debates. The next section will turn to some of the key models.

5.4.2 Reasonable availability model

In the 1990s, the reasonable availability model for benefit sharing was proposed to prevent the exploitation of HIV research participant trials in LMICs.[849] The post study obligation of the research would be to provide post-trial vaccines and other therapeutics. The weakness of this model was that beneficiaries had to wait for benefits that might not emerge. A further criticism was the issue of who should choose what suitable benefits were to be provided

[847]Simm K "Benefit sharing frameworks –justifications for and against benefit sharing in human genetic research" 2007 A report for GenBenefit, available at: www.uclan.ac.uk/genbenefit (Date of use: 25 May 2023).

[848]Simm K "Benefit sharing frameworks–justifications for and against benefit sharing in human genetic research" 2007 A report for GenBenefit available at: www.uclan.ac.uk/genbenefit (Date of use: 25 may 2022).

[849]Participants in the 2001 "Conference on ethical aspects of research in developing countries moral standards for research in developing countries: from 'reasonable availability' to 'fair benefits'" 2004 *Hastings Center Report* 34(3):17–27.

to the LMIC host.[850] Most people in LMICs have poor access to good healthcare and cannot afford to wait long periods for interventions, unlike their counterparts in HICs.

5.4.3 Fair benefits model

To address the weaknesses in the reasonable availability model, the fair benefits model was proposed. This model challenges the notion that benefits can only arise from the results of a study and proposes that the host community could negotiate for benefits beyond those tied to the results of the study.[851] This model has been criticised for trying to turn research into an auction whereby wealthy sponsors from HICs would choose to conduct research in communities in LMICs with low negotiating power.[852]

Both the reasonable availability model and the fair benefits model concur that the underlying purpose of research is to create generalised knowledge and that benefits should accrue to all who participate in research.[853] However, both models fail to address the issue of how to determine a fair benefit and who is responsible for the oversight of protecting participants in LMICs.[854]

5.4.4 Private benefit sharing model

The private benefit sharing model mentioned in Chapter 2 of this thesis[855] applies to private biobanks or tissue banks, whereby private biotechnology companies act as brokers of tissue and health data for many researchers.[856] This system is problematic when the regulation of biobanks is inadequate, as in SA,[857] because HBMs and medical data are stored in perpetuity, without any indication of who may benefit from the use and re-use of these samples in the absence of binding legal frameworks. The problem with this model is

[850]Participants in the 2001 "Conference on ethical aspects of research in developing countries moral standards for research in developing countries: from 'reasonable availability' to 'fair benefits'" 2004 *Hastings Center Report* 34(3):17–27.

[851]Participants in the 2001 "Conference on ethical aspects of research in developing countries moral standards for research in developing countries: from 'reasonable availability' to 'fair benefits'" 2004 *Hastings Center Report* 34(3):17–27.

[852]London AJ and Zollmann K "Research at the auction block: problems for the fair benefits approach to international research" 2010 Hastings *Center Report* 40(4):34–45.

[853]Macpherson CC "Research ethics guidelines and moral obligations to developing countries: capacity-building and benefits" 2019 *Bioethics* 33:389–395.

[854]Macpherson CC "Research ethics guidelines and moral obligations to developing countries: capacity-building and benefits" 2019 *Bioethics* 33:389–395.

[855]Chapter 2, Section 2.5.1 of this thesis.

[856]Winickoff DE and Winickoff RN "The charitable trust as a model for genomic biobanks" 2003 *New Engl J Med* 349(12): 1180–1184.

[857]Labuschaigne M and Mahomed S "Regulatory challenges relating to tissue banks in South Africa: impendiments to accessing healthcare" 2019 *SAJBL* 12(1):27–31.

typically exemplified by allegations of the misuse of African DNA in the UK;[858] specifically, the allegation that a South African research site shared data and samples of DNA collected from indigenous groups in African countries, including South Africa and Botswana, in a legitimate collaboration research agreement with a university in the United States. These samples were then transferred to the Wellcome Sanger Institute for genome analysis as part of the legitimate collaboration.[859] Thereafter, the institute entered into negotiations with Thermo Fisher Scientific in an attempt to make gene chips with the African data for commercial purposes without the consent of nor an MTA from their African research partners.[860] Both Sanger and Thermo Fisher subsequently denied these allegations although one university in South Africa has since demanded the return of its DNA samples.[861]

5.4.5 Altruistic model of benefit sharing

The altruistic model of benefit sharing, described in Chapter 2 of this thesis[862] is driven by the notion that all health research should be altruistic and should be for the benefit of all.[863] This model is designed in line with the healthcare systems of HICs that benefit all, unlike the disproportionate health systems of LMICs. To propose such a model in LMICs would be tantamount to exploitation.[864] It has also been shown that even in HICs, this model is not always accepted by the population, as was the case in the State of Iceland,[865] discussed in Chapter 2 of this thesis. In Iceland, a statute on a Health Sector Database (HSD Act) was passed by the Icelandic government, allowing deCODE genetics to construct and operate a centralised database linking medical records with genealogical

[858]Moodley K and Kleinsmidt A "Allegations of misuse of African DNA in the UK: will data protection legislation in South Africa be sufficient to prevent a recurrence?" 2021 *Developing World Bioethics* 21:125–130.

[859]Njilo N "Stellenbosch University demands return of DNA samples but UK university hits back" 2019 *Timeslive* https://www.timeslive.co.za/news/south-africa/2019-10-16-stellenbosch-university-demands-return-of-dna-samples-but-uk-lab-hits-back/ (Date of use: 23 May 2023).

[860]Stokstad E "Genetics lab accused of misusing African DNA 2019 *Science* 366(6465):555-556 https://www.science.org/doi/full/10.1126/science.366.6465.555 (Date of use: 23 May 2023).

[861]Njilo N "Stellenbosch University demands return of DNA samples but UK university hits back" 2019 *Timeslive* https://www.timeslive.co.za/news/south-africa/2019-10-16-stellenbosch-university-demands-return-of-dna-samples-but-uk-lab-hits-back/ (Date of use: 23 May 2023).

[862]Chapter 2 Section 2.5.2 of this thesis.

[863]Simm K "Benefit sharing frameworks–justifications for and against benefit sharing in human genetic research" 2007 A report for GenBenefit, available at: www.uclan.ac.uk/genbenefit (Date of use: 25 May 2023).

[864]Schroeder D, Gefanas E, Chennells R *et al* "Realizing benefit sharing: is there a role for ethics review?" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 179–202.

[865]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.

and genetic information. The statute was rejected on the premise that the Icelandic government had exploited its population by claiming all medical records and by using the notion of presumed consent.[866]

5.4.6 Charitable trust model

The charitable trust model proposes a fiduciary relationship in which trustees hold title to property but are obligated to keep or use said property for the benefit of the beneficiary.[867] This benefit sharing model, discussed in Chapter 2,[868] has proved successful in cases whereby various rare disease research groups have constructed tissue banks to enable researchers to control the research design, implementation of research results and benefit sharing.[869] The United Kingdom Human Tissue Authority (HTA) also benefits from this model, as it acts as the trustee of all human tissue or human biological materials collected in the UK.[870]

I believe that a benefit sharing model, based on the model of the charitable trust model, could be adopted in South Africa. This framework recognises the various stakeholders that are part of a research project at different levels of society while simultaneously acknowledging that it is possible to have different types of fair benefits at each stakeholder level, even in the absence of a final, tangible benefit.

In recent years, new models of benefit sharing arrangements have been proposed by various stakeholders participating in health research in LMICs. The Human Hereditary and Health in Africa (H3Africa) Initiative is a North–South collaborative initiative that empowers African researchers to be competitive in genomic sciences, establishes and nurtures effective collaborations among African researchers on the African continent and generates unique data that could be used to improve both African and global health.[871] The H3Africa project is a joint initiative of the United States National Institutes of Health, the Wellcome

[866]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[867]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[868]Chapter 2 Section 2.5.3 of this thesis.
[869]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.
[870]Human Tissue Authority: The regulator for human tissue and organs https://www.hta.gov.uk/policies/human-tissue-act-2004 (Date of use: 23 May 2023).
[871]Human Heredity and Health in Africa https://h3africa.org/ (Date of use: 24 May 2023).

Trust and the African Society of Human Genetics[872] that endorses capacity building as the primary obligation of its research agenda.[873] The H3Africa's envisioned benefit sharing model moves away from the premise espoused by other benefit sharing models, namely that the primary goal of research is to generate generalisable knowledge, towards the notion that the primary goal of research should be capacity building.[874]

5.4.7 H3Africa's capacity-building model

The H3Africa project maintains that supporting infrastructure and training researchers is the main goal of the project to support genomics research for the benefit of African populations and societies.[875] The model proposes that H3Africa achieves its primary research objectives of building African capacity and infrastructure via five mechanisms: providing exclusive grants to researchers affiliated with African institutions; training and educating young African researchers; maintaining the leadership of H3Africa among African researchers; prioritising data analysis and publication to African researchers and developing African bioinformatics infrastructures and networks.[876]

While there is strength in the proposed model, it fundamentally rejects the premise that the primary purpose of research in LMICs is to create generalised knowledge; instead, it embraces the notion that the primary and immediate goal of all research is capacity building.[877] Its weakness resides in the uncertainty of sustaining research beyond the NIH-Wellcome Trust funding period.[878] It is worth noting that Dauda and Joffe question whether this H3Africa benefit model fully represents all the stakeholders involved in the H3Africa project with regard to benefit sharing.[879]

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[872]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing World Bioethics* 18:165–170.

[873]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing World Bioethics* 18:165–170.

[874]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing World Bioethics* 18:165–7170.

[875]H3Africa Working Group "Harnessing genomic technologies toward improving health in Africa: opportunities and challenges" 2011 *H3Africa White Paper. Washington, DC: National Institutes of Health.*

[876]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *developing world bioethics* 18:165–170.

[877] Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *developing world bioethics* 18:165–170.

[878]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *developing world bioethics* 18:165–170.

[879] Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *developing world bioethics* 18:165–170.

Interestingly, H3Africa projects are mostly collaborations between the most advanced academic institutions in Africa that already boast great African researchers and some of the best infrastructure in Africa. Only the primary investigator of a project needs to be associated with an African institution; further, the priority of data analysis and publication to African researchers is exclusive for a brief period. The aim of H3Africa is noble, but if young African researchers are taken to HICs that have the best infrastructure in the world for no more than 24 months and then return to their LMICs, their development and research are often stunted and it matters not if they have priority with data analysis and publication. H3Africa achieves capacity building but not at the level where this could be their primary goal for research.

Table 3 below details the benefit sharing models that are most likely to be in use in LMICs, as pointed out by Dauda and Joffe.[880]

5.4.8 Table 3: Benefit sharing models limited to LMICs[881]

Benefit model	**Primary goal of research**	**Conception of benefits**
Reasonable availability	Generalisable knowledge	Products from the research are appropriate benefits to the community
Fair benefit	Generalisable knowledge	Community can negotiate for fair benefits, including but not limited to products derived from the research, human and infrastructure capacity, etc.
H3Africa	Capacity building	Capacity building for research and health improvement is the intrinsic purpose of programme

Table 2 illustrates how the H3Africa framework differs from other models that are used in research in LMICs. The H3Africa framework moves away from the traditional notion that the primary goal of all research is to obtain generalisable knowledge to the primary goal of research for the sake of capacity building.

[880]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *developing world bioethics* 18:165–170.

[881]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing World Bioethics* 18:165–170.

5.4.9 Ethical benefit sharing model that includes multiple stakeholder benefits

Bedeker *et al*[882] suggest an alternate framework to promote ethical benefit sharing in health research that attempts to cater to the multiple stakeholders that are usually involved in research projects. Acknowledging that it is often difficult to operationalise benefit sharing within research programmes, they propose a two-dimensional framework that would enable research stakeholders to identify opportunities in research programmes.[883] In the first dimension of the model, a socioecological model is used to identify stakeholders involved in the research project at the micro-, meso- and macro-level. The second dimension identifies nine different types of benefit sharing that may be achieved during a research programme.[884]

This proposed framework by Bedeker *et al*[885] recognises the fact that a research project includes a multi-faceted team and that benefits to various stakeholders can accrue in varying forms at different times during the research project, as shown in Table 4 below. This suggested framework is progressive as it identifies to whom, when and what kind of benefits could be accrued during a research project. The framework suggested by Bedeker *et al* encourages using English as a common language that all participants involved in a research project can understand, since scientific language may not appeal to all the stakeholders.[886] The current study concurs with this suggestion, as some scientific terminology can be hard to grasp, leading to a lack of comprehension by participants.

[882]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7:e008096.
[883]Bedeker A, Nichols M, Allie T *et al* 2022 *BMJ Global Health* 7:e008096.
[884]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7:e008096.
[885]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7:e008096.
[886]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7:e008096.

5.4.10 Table 4: Summary of the elements of the two-dimensional benefit sharing framework[887]

Dimension 1: Stakeholders	**Dimension 2: Benefit sharing categories**
Macro-level stakeholders These stakeholders generally make decisions and provide services at a national or higher level and include global and regional organisations, national organisations, governments, policymakers, regulatory bodies and organisations, legislators and public health officials. For example, the WHO, the African Union or the South African government. **Meso-level stakeholders** These stakeholders may impact provincial, state, municipal or institutional levels. They may include some larger community groups. Examples include academic institutions, ethics review boards, particular population groups, provincial governments, provincial health services, funders, educators, biotech or private health service companies, institutions and facilities. **Micro-level stakeholders** These are individuals, families or small community groups who operate at a personal or interpersonal level. For example, members of the general population, research participants and their families, researchers and students, healthcare providers, patients, community leaders and community advisory boards.	**Financial:** Direct monetary gain by stakeholders. **Health and wellbeing:** Improved individual and/or population health and wellbeing of stakeholders. **Infrastructure:** Built or logistical infrastructure that benefits stakeholders. **Equipment**: Specialised equipment used by stakeholders to conduct their work. **Skills capacity**: Learnt specialised skills to undertake tasks and conduct work. **Knowledge:** Specialist knowledge that improves how stakeholders solve problems, undertake tasks and conduct work. **Services capacity**: Capacity for stakeholders to provide certain services to the public and general population. **Career development**: Opportunities for stakeholders to establish employment security and/or progress in their careers. **Attribution and recognition**: Appropriate acknowledgement and advertising of inputs and contributions from stakeholders.

Some scholars[888] have advocated for the Convention on Biological Diversity (CBD) to be the main treaty at the global level, to direct the advancement of benefit sharing frameworks and that it should be expanded to include human biological materials like genetic resources. However, to date, despite the 168 signatories to the CBD[889] and the ratification of the Nagoya Protocol by 136 Parties,[890] the issue of access and benefit sharing is still a major stumbling block at stalled negotiations on trade-related aspects of intellectually property rights (TRIPs) at the World Trade Organisation (WTO).[891]

[887]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7:e008096.

[888]Chaturvedi S, Crager S, Ladikas M *et al* "Promoting an Inclusive approach to benefit sharing: expanding the scope of the CBD?" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 153–178.

[889]Convention on Biological Diversity https://www.cbd.int/information/parties.shtml#tab=0 (Date of use: 24 May 2023).

[890]Convention on Biological Diversity https://www.cbd.int/information/parties.shtml#tab=2 (Date of use: 24 May 2023).

[891]Chaturvedi S, Crager S, Ladikas M *et al "*Promoting an inclusive approach to benefit sharing: expanding the scope of the CBD?" In Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 153–178.

5.5 Proposed model for benefit sharing framework for health research in South Africa

Unfortunately, although there has been an acknowledgement of the need to include benefit sharing in research programmes, the legal translation and the practical implementation of benefit sharing have been slow globally.[892] With particular reference to South Africa, the challenge is to find a benefit sharing model that tempers (not diminishes) commercial interests, redresses economic imbalance and gives research participants fairer and more active roles in influencing the sharing of benefits.[893] It is also important that ethical principles of the model should accommodate changing scientific principles which involve the sharing and secondary use of human biological resources and data, locally and globally, as well as the associated changes in consent.[894]

The most pertinent questions that must be addressed when evaluating benefit sharing in health research are the ownership of human biological materials,[895] how and to whom benefits should accrue and what comprises a fair benefit.[896]

This study proposes for the donors of HBMs and/or data to transfer the custodianship of said donations to a trust, as the primary institution that obtains the donated materials, set up to protect and safeguard said materials. The transfer should be executed via a process of informed consent with the encouragement of continuous communication between the two parties to enable effortless negotiations on any future use of the donated materials. The trust is then authorised to sign the current MTA[897] with an end user (the recipient). The MTA should be seen to benefit the beneficiary of the trust via the addition of a benefit sharing agreement as an annexure to the currently gazetted MTA.

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[892]Bedeker A, Nichols M, Allie T *et al* “A framework for the promotion of ethical benefit sharing in health research” 2022 *BMJ Global Health* 7:e008096.

[893]Slabbert, MN "The legal regulation of access and benefit sharing with regard to human genetic resources in South Africa" 2011 *J. Contmpt Roman–Dutch Law* 74: 605.

[894]De Vries J, Munung SN, Matimba A *et al* "Regulation of genomic and biobanking research in Africa: a content analysis of ethics guidelines, policies and procedures from 22 African countries" 2017 *BMC Medical Ethics* 18(1): 1–9.

[895]Mahomed S, Nöthling-Slabbert M and Pepper MS “The legal position on the classification of human tissue in South Africa: can tissue be owned?” 2013 *S Afr J BL* 6(1):16–20.

[896]Simm K “Benefit sharing frameworks–justifications for and against benefit sharing in human genetic research” 2007 A report for GenBenefit, available at: www.uclan.ac.uk/genbenefit (Date of use: 24 May 2023).

[897]South Africa Material Transfer Agreement for Human Biological Materials Government Notice 719 Government Gazette 41781 of 20 July 2018.

In order to understand what the general purpose of a trust is, it is necessary to briefly explain the nature and objectives of a trust in South Africa. A trust is a legal entity which is created to hold assests fot the benefit of certain persons or entities.[898] In South Africa, trusts are regulated by the Trust Protocol Control Act 57 of 1988[899] and the General Laws (Anti-Money Laundering and Combating Terrorism Financing) Amendment Act of 2022,[900] which amended the aforementioned Act. Assets can be transferred into a Trust by sale, donation or upon death in terms of will.[901] South African law recognises three types of trust,[902] namely an "ownership trust" whereby the founder or settlor transfers ownership of assets or property to a trustee(s) (in fiduciary capacity) to be held for the benefit of defined or determinable beneficiaries of the trust;[903] a "bewind trust", where a founder or settlor transfers ownership of assets or property to beneficiaries of the trust, but control over the assets or property is give to the trustee(s);[904] and a "curatorship trust", which is similar to a "bewind trust", except that the assets are administered on behalf of a beneficiary who does not have the capacity to manage his/her affairs.[905]

A valid trust requires, among others, that it is set up in writing in the trust instrument; that there is a clear identification of trust property; the object of trust must be lawful and identified; there must be a binding obligation on the trustees (who are authorised and capable) to administer the trust; finally, the beneficiaries must be clearly identified.[906]

It is important to note that some scholars[907] have suggested the adoption of a Data Transfer Agreement (DTA), in addition to the MTA, to ethically manage data-sharing

[898]https://www.bdo.co.za/getmedia/1ed18ab6-f01e-4a62-83f2-ce1d315d8898/bdo-trust#:~:text=The%20Trust%20Property%20Control%20Act,of%20certain%20persons%20or%20entities (Date of use: 10 0ctober 2023).
[899]https://www.justice.gov.za/legislation/acts/1988-57.pdf (Date of use: 10 October 2023).
[900]https://www.gov.za/documents/general-laws-anti-money-laundering-and-combating-terrorism-financing-amendment-act-22-2022 (Date of use: 10 October 2023).
[901]https://www.bdo.co.za/getmedia/1ed18ab6-f01e-4a62-83f2-ce1d315d8898/bdo-trust#:~:text=The%20Trust%20Property%20Control%20Act,of%20certain%20persons%20or%20entities (Date of use : 10 October 2023).
[902] https://www.bdo.co.za/getmedia/1ed18ab6-f01e-4a62-83f2-ce1d315d8898/bdo-trust#:~:text=The%20Trust%20Property%20Control%20Act,of%20certain%20persons%20or%20entities (Date of use: 10 October 2023).
[903]https://www.sars.gov.za/businesses-and-employers/trusts/types-of-trust/ (Date of use: 10 October 2023).
[904]https://www.sars.gov.za/businesses-and-employers/trusts/types-of-trust/ (date of use: 10 October 2023).
[905]https://www.bdo.co.za/getmedia/1ed18ab6-f01e-4a62-83f2-ce1d315d8898/bdo-trust#:~:text=The%20Trust%20Property%20Control%20Act,of%20certain%20persons%20or%20entities (Date of use: 10 October 2023).
[906]https://www.bdo.co.za/getmedia/1ed18ab6-f01e-4a62-83f2-ce1d315d8898/bdo-trust#:~:text=The%20Trust%20Property%20Control%20Act,of%20certain%20persons%20or%20entities (Date of use: 10 October 2023).
[907]Mahomed S, Loots G and Stauton C "The role of Data Transfer Agreements (DTA) in ethically managing data sharing for research in South Africa" 2022 *S Afr Bioethics Law* 15(1):26–30.

research in South Africa. Efforts are underway in South Africa to discuss the development of a national DTA for health research.[908] As this remains an ongoing consultative process,[909] it remains to be seen if the DTA should be separate from the MTA or if there is a possibility of integrating the proposed DTA with the current MTA.[910] At the time of writing of this thesis, the National Department of Health has tasked the National Health Research Ethics Council to oversee the revision of the current MTA.[911]

Annexure A below describes the framework for the benefit sharing agreement that is proposed in this thesis.

5.5.1 Annexure A: Proposed benefit sharing agreement framework

Benefit sharing agreement

The proposed benefit sharing agreement must be signed by the Trust and the Recipient/End User.

Definitions

"Beneficiary" refers to the sample and/or data donor who retains ownership rights to these materials unless the donor chooses to be de-linked from the materials or the materials are destroyed.

"Trust" refers to the primary institution receiving the donated HBMs and/or data.

The Trust may, but is not limited to, an academic institution or such affiliated institutions that are not entirely private entities to allow transparency in the decisions of the board of trustees.

"Board of trustees" refers to a group of individuals who are appointed or elected to manage and have authority over the use of the HBMs and/or data held in trust.

The Trust comprises Trustees who may, but are not limited to:

- Scientists who are health professionals and/or academic research scientists familiar with the topic of health research.
- Sociologists who could act as a liaison between HBM donors and other trustees with specific relevance to the issues of consent and maintaining open lines of communication.
- Prominent community members selected by the community to represent their interests. If the respective research is to use HBMs and/or data from a specific minority or marginalised community or group, then the people who are chosen by that community or group to represent them should serve on the board of trustees.

[908] A webinar titled "Ethically managing data transfers for research in SA" organised by the SA Medical Research Council, in collaboration with the Department of Science & Innovation of South Africa was held on Jun 23, 2022 to deliberate the way forward for a National DTA. https://www.assaf.org.za/wp-content/uploads/2022/06/22412-Data-Transfer-Webinar-Programme-final.pdf (Date of use: 24 May 2023).

[909] Mahomed S, Loots G and Stauton C suggest that the enforcement of the Protection of Personal Information Act No 4 of 2013 in July 2021 while safeguarding the right to privacy of research participants, hinders other rights which ought to be considered and safeguarded like the right to non-discrimination, the right to dignity and the right to enjoy the benefits of scientific progress, which could be accommodated via a DTA.

[910] Mahomed S, Loots G and Stauton C "The role of data transfer agreements (DTA) in ethically managing data sharing for research in South Africa" 2022 *S Afr Bioethics Law* 15(1):26–30.

[911] Discussed with the NHREC during a quarterly meeting in 2022 by the Chief Director of Medical Forensic Services, Ms Pakiso Netshidzivhani, communicated to the REC community in South Africa.

- An elected donor to serve on the board of trustees to promote transparency of negotiation processes.

The functions of the Trust are, but are not limited to:

i. Forming a Research Ethics Committee (REC) to vet proposed research projects from stakeholders wishing to utilise the HBMs held by the Trust.

ii. The election of a representative who would be the responsible person to negotiate its terms.

ii. The explanation and education of the HBMs donors regarding the use of their donated materials, the research objectives, expected research outcomes and potential benefits if any, that would accrue to the donors and/or their communities. Using language or visual aids that are appropriate for flawless communication with the donor.

iii. In consultation with all stakeholders of a research project, discuss the fairness of the level or amount of benefit proportional to the specific risk taken.

iv. In consultation with the donors of the samples, determine whether to link or de-link samples and document the decision. This will enable donors to withdraw their samples at any time if they are linked.

v. Advising the HBM donors of their rights and the right to withdraw their consent for any research project using their linked donated samples.

vi. Negotiating and agreeing to MTAs that are favourable to the beneficiary of the Trust with entities that would use the donated human biological materials.

vii. Having a continuous relationship with donors as opposed to one-off signatory agreements, which would enable the Trust to easily obtain secondary consent if new projects arise.

viii. Communicating with the donor/beneficiary about any possible commercialisation of products arising from the use of their donated samples in specific research projects and explanation of how this would benefit the donor, if at all.

ix. In the event of commercialisation, the Trust can enter into another MTA with the specific stakeholder on behalf of the beneficiary, which would map the way forward as to what specific benefits would accrue, to whom and when.

The range of benefits listed below may accrue among different stakeholders during a proposed research project and it is the duty of the Trust to negotiate in good faith with the recipient of the HBMs for the benefit of all. In this context:

'Individual' level refers to individuals, small specific groups of people or family members.
'Community' level refers to larger collections of persons who have certain interests or attitudes in common like academic institutions, specific population groups and/or provincial governments or provincial health departments.
'National level' refers to bodies that make decisions that apply to the entire country and affect all South African peoples.
'Marginalised communities' refers to a group of people who have historically been disadvantaged by the State.

The End User/Recipient of the HBMs should specifically state which benefits will accrue and to whom:

Expected benefits	**Yes**	**No**
Individual level • Monetary compensation (direct)		

• Monetary compensation (in stipend, grocery or voucher, specify) • Access to healthcare, knowledge • Access to personalised medicine • Inclusion in research papers • Capacity development • Royalties • Other benefits (specify)		
Community level • Monetary (funding or grants for specific community projects) • Infrastructure development • Capacity development • Advanced equipment and training in its usage • Strengthening of local RECs via knowledge transmission • International collaborations and recognition of local researchers in publications • Technology transfer • Personalised Medicine for a specific group • Milestone Payments • Royalties • Other benefits (specify)		
National level • Access to resources • Infrastructure development • Creation of Centers of Excellence for Research • Information • In-country Manufacture of specific drugs and/or vaccines • Technology transfer • Specialist equipment with local training of service engineers • Specialist in Academia and Collaboration research • Policy Guidance • Other benefits (specify)		
Marginalised Communities • Monetary (funds or grants for the community) • Infrastructure development • Personalised medicine • Royalties • Other benefits (specify)		

In the case of monetary compensation, the expected amount must be listed.

5.6 Conclusion

Health research collaborations between HICs and LMICs are often characterised by inequitable and/or neo-colonial practices and power imbalances that plague ongoing research.[912] While it stands true that the overall goal of health research is to attain global health and wellness for all,[913] health research using HBMs cannot occur in an exploitative environment that takes unfair advantage of people's vulnerabilities.[914] Benefit sharing should be a tool for guarding against exploitation and not the basis of a strategy to address urgent global health needs or resolve inherent issues of global distributive justice.[915]

With regard to health research using HBMs, Africa is in a unique position because the African genome is genetically more diverse than those of other races, meaning that African human genes may contain undiscovered disease-causing variants.[916] The nature of genomic research and biobanking research challenges traditional methods of research because it requires greater openness, the sharing of resources, collaborations between scientists from the Global North and Global South and the re-use of substantial amounts of samples and data.[917] The requirements of this specific health research challenge the traditional ideas of informed consent and data privacy.[918] There is also the persistent question of the ownership of HBMs and in South Africa, this issue remains unsettled and non-specific.[919] The enactment of the Protection of Personal Information Act (POPIA) [920]

[912]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7:e008096.

[913]Hollis A, Pogge T and Schroeder D "Beyond benefit sharing: towards realising the human rights to health" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 203–216.

[914]Millum J "Sharing the benefits of research fairly: two approaches" 2012 *J Med Ethics* 38:219–223.

[915]Hollis A, Pogge T and Schroeder D "Beyond benefit sharing: towards realising the human rights to health" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 203–216.

[916]African populations have higher numbers of average variant single nucleotide polymorphisms (SNP) sites at 3.3 million per individual, compared to Europeans with 2.9 million and Japanese/Chinese with 2.8 million per individual. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1462113/ (Date of use: 26 May 2023).

[917]De Vries J, Munung SN, Matimba A *et al* "Regulation of genomic and biobanking research in Africa: a content analysis of ethics guidelines, policies and procedures from 22 African countries" *BMC Medical Ethics* 18.1 (2017): 1–9.

[918]Moodley K and Kleinsmidt A "Allegations of misuse of African DNA in the UK: will data protection legislation in South Africa be sufficient to prevent a recurrence?" 2021 *Developing World Bioethics* 21(3):125–13.

[919]Mahomed S "Human biobanking in developed and developing countries: an ethico-legal comparative analysis of the frameworks in the United Kingdom, Australia, Uganda, and South Africa" 2021 *Cambridge Quarterly of Healthcare Ethics* 30(1):146–60.

[920] POPIA was enacted on 1 July 2020. The Act enables the Constitutional right to privacy. All data collected under medical practice and research, unless anonymised, is protected by this Act.

has raised the question of whether genetic samples can be completely anonymised by researchers.[921]

In this chapter, I have argued that the establishment of a charitable trust for HBMs in the context of benefit sharing in health research could address some of these pertinent questions. In terms of this model, academic medical centres and/or research institutions would cease to be brokers of the HBMs and instead become custodians of the samples. The trust will promote compliance with data privacy and informed consent requirements without compromising its value as an information-rich HBM supplier.[922] The trust could serve as a scientific reserve and social cohesion agent among the various stakeholders involved in specific research projects. Moreover, a trust will be in the ideal position to create and facilitate continuous communication channels with the donor community, researchers, policymakers and teaching hospitals for fostering trust in health research and its benefits for all stakeholders involved.

[921]Moodley K and Kleinsmidt A "Allegations of misuse of African DNA in the UK: will data protection legislation in South Africa be sufficient to prevent a recurrence?" 2021 *Developing World Bioethics* 21(3):125–13.

[922]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The significant increase in health research in low- and middle-income countries (LMICs)[923] over the past few decades, sponsored (in part) by institutes in HICs and coupled with the historical exploitation of research participants in the African setting,[924] demands that the issue of benefit sharing between HICs and LMICs that collaborate in research to be taken seriously. This explosion in health research in LMICs, combined with the global commercialisation of health research products sometimes, via privately funded businesses,[925] calls for the issue of benefit sharing in research using human biological resources to be addressed.

There have been several cases of exploitation in research, as demonstrated in Indonesia.[926] During the height of a global avian flu pandemic between 2005 and 2006, Indonesia provided the World Health Organisation (WHO) with avian flu samples[927] which were subsequently used without the requisite permissions. The WHO shared the Indonesian samples with various US laboratories and Hong Kong University for vaccine production purposes.[928] Subsequently, a rift emerged between the WHO and Indonesia when Indonesia discovered that non-Indonesian researchers and their firms in HICs were filing patent applications using the Indonesian virus samples without permission from the

[923]Lairumbi G, Parker M, Fitzpatrick R and English M "Forms of benefit sharing in global health research undertaken in resource poor settings: a qualitative study of stakeholders' views in Kenya" 2012 *Philosophy, Ethics, and Humanities in Medicine* 7(1):1–8.

[924]Staunton C and Moodley K "Data mining and biological sample exportation from South Africa: a new wave of bioexploitation under the guise of clinical care?" 2016 *South African Medical Journal* 106(2):136–138.

[925]Evans NG, Hills K and Levine AC "How should the WHO guide access and benefit sharing during infectious disease outbreaks" 2020 AMA Journal of Ethics 22 (1):28-35.

[926]Cook Lucas J, Schroeder D, Arnarson G, Andada P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits? Cases from Iceland, Kenya and Indonesia" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 95–127.

[927]Cook Lucas J, Schroeder D, Arnarson G, Andada P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits? Cases from Iceland, Kenya and Indonesia" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 95–127.

[928]Cook Lucas J, Schroeder D, Arnarson G, Andada P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits? Cases from Iceland, Kenya and Indonesia" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 95–127.

Indonesian government.[929] The use of HBM samples from LMICs by private firms to develop therapeutics such as vaccines, usually in HICs, which are then sold back to LMICs—often at inflated prices or not made available at all—is a reality which requires scrutiny.

The issue of benefit sharing in health research remains controversial yet pertinent. There is an argument that all health research ought to be altruistic in the quest for generalised knowledge,[930] but it cannot be ignored that health research conducted in (LMICs) like South Africa is frequently undertaken in communities that have previously been exploited by HICs through colonialism or discriminatory and segregation systems like Apartheid.[931]

The arguments against benefit sharing in such communities become invalid when regarding the idea of benefit sharing in LMICs as justice in exchange, to address the wrongs of unfair research collaborations. This research has long been and is being perpetuated in the form of 'helicopter' or 'parachute' research and the ongoing controversies around human biological samples from these regions, including South Africa, illegally being used for research in HICs.[932] The move towards equitable benefit sharing is gaining momentum in the international arena, as it appears in many national and International ethics guidelines since 2005,[933] such as the Convention of Biological Diversity (CBD), the HUGO Committee Statement on benefit sharing, the Declaration of Helsinki (WMA 2008) and the UNESCO Universal Declaration on Bioethics and Human Rights (UNESCO 2005).[934] Despite these guidelines, the unjust use of HBMs originating from LMICs by HICs is still ongoing[935] because national laws decline to address what constitutes an appropriate benefit within the ever-evolving field of human health research and biotechnology.

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[929]Cook Lucas J, Schroeder D, Arnarson G, Andada P, Kimani J, Fournier V and Krishnamurthy M "Donating human samples: who benefits? Cases from Iceland, Kenya and Indonesia" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 95–127.

[930]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing World Bioeth* 18:165–170.

[931]Christopher AJ "Apartheid and urban segregation levels in South Africa" 1990 *Urban Studies* 3:421–440.

[932]Staunton C and Moodley K "Data mining and biological sample exportation from South Africa: a new wave of bioexploitation under the guise of clinical care?" 2016 *South African Medical Journal* 106(2):136–138.

[933]These Guidelines are covered extensively in Chapter 2 of this thesis.

[934]Schroeder D and Lucas CJ "Towards best practice for benefit sharing involving access to human biological resources: conclusions and recommendations" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 217–230.

[935]Staunton C and Moodley K "Data mining and biological sample exportation from South Africa: a new wave of bioexploitation under the guise of clinical care?" 2016 *South African Medical Journal* 106(2):136–138.

This final chapter addresses the questions raised as study objectives and provides recommendations, where appropriate, based on the conclusions made in the relevant chapters. The study also proposes a draft benefit sharing agreement which could accompany MTAs whenever human biological materials are transferred for the purpose of research. This draft agreement appears as Annexure A to chapter 5 above.

6.2 Recommendations

6.2.1. Benefit and benefit sharing in the context of health research: underlying ethico-legal norms

The concept of benefit sharing remains controversial for many reasons. One such reason is the lack of clarity around what defines a benefit and what a benefit should comprise. Regarding non-human genetic resources, the Nagoya Protocol suggests that a benefit may include both non-monetary and monetary benefits.[936] This thesis has determined that in human health research, the intricacies of what a benefit truly entails are seldom expressed.[937] The notion of fair benefit in the context of human biological material is often put forward, but in truth, no concise definition of what this phrase essentially entails, exists. This lack of a comprehensive definition means it is often used to suit the narrative of a specific situation.[938]

I propose that to answer the notion of fair benefit there needs to be an agreement of what the benefit entails between a resource provider, a providing institution and a recipient institution. To achieve this, the providing institution of any HBMs would become a Trustee of the materials for the HBM donor/beneficiary and negotiate in good faith for the fair benefits with the HBM recipient.

Altruistic research is not possible if it has been conducted via unfair collaborations where the burdens and benefits of research are not equally shared and in LMICs that historically

[936]Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilisation. Secretariat of the Convention of Biological Diversity, 2011 http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf (date of use: 24 May 2023).
[937]See Chapter 2 of this thesis.
[938]Dauda B and Dierickx K "Benefit sharing: an exploration on the contextual discourse of a changing concept" 2013 *BMC Medical Ethics* 14(1):1–8.

have been subject to exploitation and collaborators who lack integrity and display cultural insensitivities.[939]

The failure to conclusively define the term 'benefit sharing', with whom and when said benefits should accrue in a research project has led to some collaborators taking advantage of the situation by ignoring the concept of benefit sharing or not sharing benefits fairly.[940] I propose that for the sake of uniformity, the definition of benefit sharing used in the Convention of Biological Diversity (CBD) framework for access and use of genetic resources[941] should be adopted for use in the context of international human health research, as it incorporates the notion that benefit sharing with resource providers is necessary. This can be extended to apply to research participants and their respective communities, as the definition adheres to the philosophical principle that benefit sharing is meant to achieve justice in exchange for providing resources.

There are no binding legal norms that inform the concept of benefit sharing in the context of human health research using HBMs. This probably stems from the law's uneasiness with the commodification of the self and the obvious unequal bargaining powers that are evident between collaborators from HICs and those from LMICs. This often emerges in instances where research is funded by institutions from the Global North. However, as discussed in this study, there are a multitude of guidelines that address benefit sharing worldwide.[942]

Specific to South Africa, the Department of Health (DoH) National Ethics Guidelines stipulate that it is expected that research participants and their communities would benefit from participating in research at some point,[943] yet the Guidelines do not elaborate on when and how this should occur. Although the HPSCA Guidelines also call for benefit sharing with research participants and the balancing of burdens and benefits, they allude to the

[939]Moodley K and Singh S "It's all about trust": reflections of researchers on the complexity and controversy surrounding biobanking in South Africa" 2016 *BMC Medical Ethics* 17(1):1–9.

[940]Xiong L and Wang Y "Harvard University's genetic research in China is illegal" 2002 *Outlook Weekly* 15:48–50.

[941]According to the CBD framework, benefit sharing is defined as "the action of giving a portion of advantages or profits derived from the use of genetic resources or traditional knowledge to resource providers in order to achieve justice in exchange".

[942]Chapter 2.3 of this thesis speaks to these Guidelines, the CBD, the Declaration of Helsinki and the UNESCO Declaration on Bioethics and Human Rights and the HUGO Committee Statement on benefit sharing.

[943]Department of Health National Ethics Guidelines https://www.health.gov.za/wp-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).

need for benefit sharing without further direction.[944] The National MTA template requires benefit sharing to be negotiated via an agreement between research collaborators prior to the commencement of a research project.[945] While there is recognition of the concept of benefit sharing and what a benefit entails, the list needs to be expanded and explain to whom these benefits should accrue when translated into practice.

The idea that the notion of benefit sharing defeats altruism in human health research conducted in LMICs cannot stand. If the injustices of the past against historically marginalised peoples are to be corrected, then benefit sharing must occur. The notion that benefit sharing should not occur because of fears about the undue inducement of vulnerable research participants in LMICs is intrinsically condescending because it negates the checks and balances that exist in the ethical oversight provided by Research Ethics Committees (RECs). Moreover, this belief perpetuates the exploitation of research participants and their communities because it would heighten the risk of such individuals participating in research without benefiting from it. For everyone in the world to attain the highest possible state of health for all—which is a human right—then it is only fitting to promote fair collaborations between HICs and LMICs, whereby the burdens and benefits of the research are equally shared.

6.2.2 Historical concept of benefit sharing

Globally, the term benefit sharing has been used as a technical term in human and non-human genetic research to explain the compensation and/or reward for the provider of the resource by the user of the resources.[946] In terms of justice, a fair benefit would fall under the principles of justice.[947]

The notion of benefit sharing emerged from the principle of *distributive justice* that has its foundations in the concept of *res communis.*[948] This concept proposes that all resources obtained from common heritage belong to all humankind and must be shared equally to help balance the inequity between HICs and LMICs and clarifies that a benefit need not

[944]HPCSA General Ethical Guidelines for Health Researchers https://www.hpcsa.co.za/Uploads/professional_practice/ethics/Booklet_13_Gen_Ethical_Guidelines_for_Health_Researchers.pdf (Date of use: 25 May 2023).
[945]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.
[946]Schroeder D and Lassen-Diaz C "Sharing the benefits of genetic resources: from biodiversity to human genetics" 2006 *Dev World Bioethics* 6: 135–143.
[947]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.
[948]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing world bioeth* 18:165–170.

always be tangible.[949] This study concurs with this viewpoint since technology transfer and capacity building are benefits that are very useful in LMICs.

In the context of the access to and sharing of non-human genetic resources, the CBD—though acknowledging that the conservation of biodiversity is a universal concern—holds that the genetic resources of individual countries are sovereign, invoking benefit sharing as a principle of international law in the Nagoya Protocol, a supplementary agreement to the CBD, to promote fair and equitable sharing arising from the use of a nation's resources.[950] This exchange, which operates for the mutual benefit of the resource provider and the resource user, is *justice in exchange*, which gave rise to the notion of fair benefit sharing.

The concept of benefit sharing emerged towards the end of the 20th century and purports to serve to enact justice.[951] Recognising that scientific advancement without benefit sharing is unjust[952] has developed as the foundational principle informing the philosophical principle of benefit sharing. However, even though the idea of benefit sharing exists, it is not always realised and when this does not transpire, it could be argued that injustice and the possible exploitation of a party have occurred.[953]

As regards human biological resources, no precedent for the concept of benefit sharing in human health research exists, presumably because this defeats the fundamental notion that altruism should drive all health research, compounded by the murky topic of the ownership of human biological resources.[954] The argument against benefit sharing also points out that it may lead to the undue inducement of participants in a study and that the

[949]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing world bioeth* 18:165–170.

[950]Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilisation. Secretariat of the Convention of Biological Diversity, 2011 http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf (date of use: 23 May 2023).

[951]Anarson G and Schroeder D "Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

[952]The notion of benefit sharing has been accepted in many national and international guidelines because of its inclusion in the CBD, the Declaration of Helsinki (WMA 2008) and the UNESCO Universal Declaration on Bioethics and Human Rights (UNESCO 2005).

[953]Schroeder D and Cook Lucas J "Towards best practice for benefit sharing involving access to human biological resources: conclusions and recommendations" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 217–230.

[954]Mahomed S and Sanne I "Benefit sharing in health research" 2015 *S Afr J BL* 8(Suppl 1):60–64.

more vulnerable a population, the more likely this undue inducement will result in exploitation of the population.[955]

The law dictates that the human body and its parts are *res extra commercium* and cannot be commodified. This has led to many challenges for the concept of benefit sharing in human health research. However, many organisations have emphasised the need for benefit sharing in health research with UNESCO, the HUGO Committee, the WMA and CIOMS all pushing the agenda for benefit sharing, albeit without elaborating on how and with whom benefit sharing should occur.[956]

In relation to benefit sharing for non-human biological resources in South Africa specifically, the country is a signatory of the Nagoya Protocol and is bound by international law via this mandate, which unambiguously regulates the access to and benefit sharing of non-human genetic resources. The Biodiversity Act 10 of 2004[957] elaborates on how a benefit sharing agreement should be designed and what it should contain when using South African non-human biological resources.[958] The San Code of Ethics[959] deals directly with how benefit sharing agreements should be drafted when dealing with non-human resources that originate from San communities.[960]

There is no legally binding statute within the South African law concerning benefit sharing for health research using human biological materials, apart from the national Material Transfer Agreement (MTA)[961] template which defines what a benefit may constitute and calls for a benefit sharing agreement between parties before any transfer of HBMs takes place.[962] Numerous national guidelines speak to the need for benefit sharing in health

[955]Schroeder D and Cook Lucas J "Towards best practice for benefit sharing involving access to human biological resources: conclusions and recommendations" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 217–230.

[956]Section 2.2.3 of this thesis extensively details these statements.

[957]Republic of South Africa. Biodiversity Act 10. Government Gazette 2004.

[958]Chapter 2.2.4 of this thesis elaborates on the Biodiversity Act 10 of 2004.

[959]The San people of South Africa are natives of the Kalahari Desert and have suffered years of marginalisation. Following a disastrous attempt by Phytofarm and Unilever to patent their traditional *Hoodia gordonni* plant without the San communities' consent, San leaders formed the Working Group for Indigenous Minorities in South Africa, which, together with NGOs and the CSIR developed the San Code of Ethics to negotiate benefit sharing arrangements to benefit the San people.

[960]The San people and the Hoodia plant available at: https://gfbr.global/wp-content/uploads/2015/09/Fifth_Casestudy4.pdf (Date of use: 26 May 2023).

[961]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.

[962]Section 2.3 of the National MTA.

research using HBMs, namely the Department of Health's Ethics in Health Research Guidelines,[963] the HPCSA Guidelines[964] and the National MTA template.

6.2.3 Review and evaluation of existing ethical and legal frameworks relevant to South Africa

6.2.3.1 Ownership of HBMs in South Africa

The question of the ownership of HBMs in South Africa is possibly one of the more troubling issues for the implementation of benefit sharing since the notion requires the identification of who should share in the benefits that arise from human health research. Without addressing the issue of the ownership of HBMs, it is almost impossible to address benefit sharing in health research in South Africa. The concept of human dignity outlined in the Bill of Rights of the Constitution of South Africa demands that every human being has intrinsic value and thus, should not be commodified because this violates their dignity and intrinsic worth.[965] This principle is enforced by the National Health Act (NHA),[966] which prohibits the sale of and trade of human tissue. The law seems silent on the notion of a person treating their HBMs as property yet becomes vocal on the issue of intellectual property emanating from research using HBMs, supposedly to promote research. This stems from the concept of separated bodily materials being deemed *res nullius* until brought under the control of the first individual who obtains said HBMs, is capable of gaining proprietary rights and in some cases, a right of ownership if the recipient individual processes the HBM in some way. The commercialisation of products emanating from health research gives rise to complex legal, ethical and philosophical questions because some schools of thought maintain that donors of HBM have ownership rights to their samples in perpetuity, while other scholars maintain that donors cannot be given proprietary rights to their HBM samples as this would enable the commodification of the samples and, in turn, hinder research.[967]

[963]Department of Health National Ethics Guidelines http://www.health.gov.za/wp-content/uploads/2022/05/NHREC-DoH-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 23 May 2023).

[964]HPCSA General Ethical Guidelines for health Researchers https://www.hpcsa.co.za/Uploads/professional_practice/ethics/Booklet_13_Gen_Ethical_Guidelines_for_Health_Researchers.pdf (Date of use: 26 May 2023).

[965]The Constitution of South Africa 1996.

[966]61 0f 2003, Chapter 9.

[967]Gibson SF "The Washington University v Catalona: determining ownership of genetic samples" 2008 *Jurimetrics J* 481:167–191.

The question of the ownership of HBMs needs to be addressed or clarified; moreover, to promote health research further, it must happen in a context where cultural values are respected to foster trust with communities that donate HBMs for research. This researcher proposes that for fair benefit sharing to occur, all those involved in research ought to benefit and that the notion of ownership should not hinder the sharing of benefits among all stakeholders. This could be addressed by a custodianship relationship between the HBM donor and the first recipient of the donated HBMs, whereby the recipient becomes a charitable trust that acts in the best interest of its beneficiary/HBM donor.

6.2.3.2 National Health Act 61 of 2003 and relevant Regulations

In South Africa, all health research is governed by the NHA.[968] The NHA and its various Regulations are not streamlined when it comes to certain definitions, for example, of tissue and human biological materials that are relevant to human health research. Consequently, this leads to a failure to legally classify specific HBMs. If a unified legal definition remains non-existent, the creation of commercial products using human tissue may flourish.

There is no mention of benefit sharing in the Regulations relating to the use of HBMs.[969] These Regulations stipulate that informed consent is required for the removal of HBM from living and deceased persons for research while not addressing the issue of consent relating to any future use of the extracted HBMs. This abstention to articulate the matter means that the ownership of the extracted HBMs is left open-ended; it complicates benefit sharing and furthermore, does not clarify to whom benefits should accrue.

The Regulations Relating to the Artificial Fertilisation of Persons[970] expressly provide for the ownership of gametes and the product of the gametes, namely that whoever has possession of the gametes used in the process of the artificial fertilisation is considered the owner of the HBMs. This is an anomaly in the legal framework as this is the closest South African law comes to acknowledging proprietary rights in HBMs, ostensibly to make the process of artificial fertilisation less cumbersome.

The concept of custodianship is introduced in the Regulations Relating to Stem Cell banks,[971] whereby informed consent is a prerequisite for the donation of stem cells to a

[968]61 0f 2003, Chapter 9.
[969]Proclamation No 11 Government Gazette 35081 of 27 February 2012.
[970]Notice 1165 in Government Gazette 40312 of 30 September 2015.
[971]Notice 183 in Government Gazette 35099 of 2 March 2012.

biobank. In turn, donors are anonymised but said stem cells cannot be used for any purpose without the authority of the National Health Department via the Director General (DG). The DG then appoints health officers to act on its behalf, essentially granting them custodianship of the stem cells.

In the Regulations Regarding the General Control of Human Bodies, Tissue, Blood, Blood Products and Gametes,[972] the prerequisite for informed consent to obtain the donation of specific HBM from a living donor is reiterated, i.e., the donor retains no rights to the donated HBM. Donations from the bodies of deceased persons require the recipient of the HBM to use it exclusively for the purposes it has been donated for, suggesting that the deceased donor retains some control over the HBMs.

The NHA and its Regulations do not address consent for the secondary use of samples nor does it speak to benefit sharing since this would require identifying to whom benefits should accrue when using HBMs in health research. Until the issues of ownership and informed consent to the secondary use of samples are unambiguously addressed in the legal framework, the fair and equitable implementation of benefit sharing will not be possible.

6.2.3.3 National Material Transfer Agreement for Human Biological Materials

The MTA's[973] recognition of donors' ownership of HBMs until such HBMs are destroyed, as well as an acknowledgement of the provider[974] of the materials as the custodian of the materials are legally pre-eminent in South Africa.[975] This clause in the MTA[976] is significant because it introduces the notion of custodianship between the donor of the HBM and the first recipient of the donation, who becomes the provider of the HBM, making it easier to identify to whom and with whom benefits can be shared when using donated HBM. It is also the first legal document to define the terms *benefit* and *benefit sharing*.[977] The MTA further points out the need for a benefit sharing arrangement that must be agreed upon by

[972]Notice No. R. 180 in Government Gazette 35099 of 2 March 2012.
[973]Proclamation No 11 Government Gazette 41781 of 20 July 2018.
[974]Provider being the providing institution of the HBM.
[975]Proclamation No 11 Government Gazette 41781 of 20 July 2018.
[976]Section 3.3 of the MTA 2018.
[977]In the MTA, a benefit is described as "amongst others, the sharing of information; use[;] of research results; royalties; acknowledgement of the Provider as the source of the Materials; publication rights; transfer of technology or the process materials; and capacity building", while benefit sharing is described as "the process or act of sharing in the benefits that derive from the Project in a manner that is fair and equitable".

the provider and recipient[978] before the HBMs are transferred. However, as solely a template, the SA MTA might be changed by parties to suit their specific contexts, provided that the principles within it are respected. It is unclear how this would be monitored in the case of benefit sharing. Thus, the need for a South African benefit sharing agreement which sets out actual clauses that must be considered during the negotiation process is crucial. Annexure B of the national MTA provides for a section of the benefit sharing agreement that may be negotiated between the provider and the recipient of the HBM.[979] There is no provision for a benefit sharing arrangement between the donor and the provider.

The MTA has been criticised by scholars who suggest it has failed to align with the broader legal environment in clarity and practicality.[980] Nevertheless, other academics point out that it is a step in the right direction.[981]

6.2.3.4 Protection of Personal Information Act 4 of 2013 (POPIA Act)

The POPIA[982] was enacted to guarantee all South Africans the constitutional right to privacy. HBM samples do not fall under the category of personal information but the data derived from the samples fall under the category of personal information, meaning the data and information stored in tissue banks and/or biobanks in South Africa are protected under the POPIA. The Act prohibits a responsible party from processing personal information concerning the ethnic origin, health or biometric information of data subjects without informed consent or necessitated by service to the public.[983]

The Act does not define benefit sharing or mandate its application in the context of health research, but any such research will undoubtedly lead to the need for data-sharing agreements that would provide an opportunity for benefit sharing agreements to be negotiated when using data derived from HBMs held in South African tissue banks and/or biobanks.

[978]Recipient being the recipient institution.
[979]Annexure B of the MTA Proclamation No 11 Government Gazette 41781 of 20 July 2018.
[980]Thaldar DW, Botes M and Nienaber A "South Africa's new standard material transfer agreement: proposals for improvement and pointers for implementation" 2020 *BMC Medical Ethics* 21(1):1–13.
[981]Labuschaigne M, Dhai A *et al* "Protecting participants in health research: the South African Material Transfer Agreement" 2019 *S Afr Med J* 109(5):353–356.
[982]POPIA Act 2013 https://www.gov.za/sites/default/files/gcis_document/201409/3706726-11act4of2013protectionofpersonalinforcorrect.pdf (Date of use: 26 May 2023).
[983]Section 26 and Section 27 of the POPIA. https://www.gov.za/sites/default/files/gcis_document/201409/3706726-11act4of2013protectionofpersonalinforcorrect.pdf (Date of use: 26 May 2023)

To this end, the ASSAf is in the process of developing a code of conduct for the research sector (including the health research sector), which will provide more guidance on how personal data should be processed and shared.[984] Notably, under POPIA, one of the grounds for transferring personal information internationally includes where it is for the benefit of the participant and consent to the transfer is not reasonably practicable to obtain, recognising that if it were reasonably practicable, the data subject would be likely to provide it.[985] This premise requires that the transfer would be for the benefit of each data subject. Although it may be criticised for being almost impossible to achieve when large datasets are transferred for research purposes, the POPIA indeed acknowledges the benefit of data subjects when their personal information is shared through collaborative efforts, thus strengthening the argument for entering into benefit sharing arrangements.

6.2.3.5 Intellectual Property Rights from Publicly Funded Research and Development Act

While the ownership of HBMs is not clear in South African law, the law takes a different position in the case of intellectual property emanating from research using HBMs. The IPR Act applies to publicly funded Research and Development (R&D).[986] It stipulates that intellectual property emanating from publicly funded research projects must be identified, protected, used and commercialised for all South Africans. The owner of the intellectual property remains the recipient of the public funds. Benefit sharing arrangements are encouraged between the recipients of the public funds and the intellectual property creators.[987] The IPR Act states that the recipients of public funds can co-own intellectual property with private entities, provided stringent conditions have been met, one of which is the establishment of a benefit sharing agreement.[988] The HBM participants/donors are protected by laws and ethical guidelines that are, however, absent from the negotiation processes that could allow for benefits to accrue directly to them and/or their communities. It would be useful if a benefit sharing agreement is negotiated with the donors of the HBM and the providing institution/local researcher before a REC approve a research project,

[984]Rachel A, Fola A, Dominique A *et al* "POPIA code of conduct for research" 2021 *S Afr J Sci* 117(5-6):1–12.
[985]Section 72 (1)(e) of the POPIA Act https://www.gov.za/sites/default/files/gcis_document/201409/3706726-11act4of2013protectionofpersonalinforcorrect.pdf (Date of use: 26 May 2023).
[986]IPR Act for Publicly Funded R & D https://www.gov.za/sites/default/files/gcis_document/201409/33433675.pdf (Date of use: 26 May 2023).
[987]Section 5 of the IPR Act 51 of 2008.
[988]Section 15(2) of the IPR Act 51 of 2008.

whereby the REC would follow up and ensure that the negotiated benefits are indeed accrued in the event of the development of viable intellectual property.

6.2.3.6 Patent Act 57 of 1978

The Patent Act 57 of 1978 provides for registering and granting letters of patent for inventions to protect intellectual property rights.[989] In the age of biotechnology and advances in technology, many biotechnology and pharmaceutical companies pursue patents for their inventions to protect their proprietary interests and gain profits. The Companies and Intellectual Property Commission (CICP) registers all patents in South Africa.[990] According to Pouris and Pouris,[991] in South Africa, it is often the case that patents in the biotechnology and pharmaceutical industries have been granted to protect the research, development and innovation by South African universities and researchers' locally but due to cost constraints, patents are usually not filed internationally. The registration approach to lodging a patent in South Africa makes it one of the least costly countries to do so since foreign inventors are able to protect their inventions very inexpensively, disadvantaging local researchers.[992]

Similar to the IPR Act, proprietary rights are often granted to the intellectual property developer and so, the Patent Act makes no provision for benefit sharing with the donors of HBMs[993] for research and development (R&D) in human health research using the results from donated HBMs in patented innovations in biotechnology and engineered products. The patenting of these products can be highly contentious in healthcare research if their creation is vital to saving lives or curing diseases.[994]

In most LMICs, donors of HBMs rarely have access to the patented end products; moreover, when public funds are used to fund the R&D of these patented innovations, it is only expected that some form of benefit sharing arrangement should be in place between the HBM donors and researcher and/or university receiving the public funds.

[989]Act No. 57 Government Gazette 6012 0f 17 May 1978.
[990]Companies and Intellectual property Commission http://www.cipc.co.za (Date of use: 26 May 2023).
[991]Pouris A and Pouris A "Patents and economic development in South Africa: managing intellectual property" 2011 *South African Journal of Science* 107(11/12):24–33.
[992]Pouris A and Pouris A "Patents and economic development in South Africa: managing intellectual property" 2011 *South African Journal of Science* 107(11/12):24–33.
[993]Patent Act 57 of 1978.
[994]Mahomed S "An ethico-legal framework for the regulation of biobanks in South Africa" (PhD in Bioethics and Health Law University of the Witwatersrand 2018) Available at: http://wiredspace.wits.ac.za/handle/10539/25331.

6.2.4 Department of Health Guidelines for Ethics in Health Research, 2015

The DoH Guidelines[995] propose that all health research should show distributive justice and all who participate in health research should benefit from the research.[996] The Guidelines state that donors of HBM and their communities should, at some point, benefit from the research. The Guidelines do not expand on what benefits, with whom and how benefit sharing should occur.

6.2.5 Existing regional and international benefit sharing frameworks

In the absence of legislation on a benefit sharing model that could be applied in South Africa, this study critically analysed foreign benefit sharing models to determine how best to design a benefit sharing model for use in South Africa. Globally, onlyno legally binding framework Despite these internationally accepted directives, benefit sharing is still a divisive topic between HICs as there are different levels of concern on legislative, ethical and social frameworks. This cannot easily be addressed at a national level as it requires governments to communicate and effect policies that would standardise the receptiveness of guidelines.

To analyse different benefit sharing frameworks, the study compared the relevant frameworks utilised in the United Kingdom and Australia since they are examples of HICs that are frontrunners in health research. Uganda, an LMIC similar to South Africa, was also selected for legal comparison since Uganda has a prominent health research presence globally. These countries also share a colonial history and some similarities in their legal structures and systems.

6.2.5.1 United Kingdom

The UK is a HIC that generally provides high-quality healthcare to all its citizens. The concept of benefit sharing is non-existent in health research involving HBMs because all donations for health research are considered altruistic.[997] Informed consent is a

[995]DoH National guidelines for Ethics in Health Research https://www.health.gov.za/wp-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 26 May 2023).

[996]Section 2.1 of the DoH 2015 Ethics in Health Research.

[997]Section 2 of MRC Human Tissue and Biological Samples for Use in Research: Operational and Ethical Guidelines https://www.ukri.org/publications/human-tissue-and-biological-samples-for-use-in-research/ (Date of use: 26 May 2023).

fundamental principle of the Human Tissue Act (HT Act) of 2004[998] which regulates the storage, use and disposal of human tissue. The HT Act expressly prohibits the commodification of human material and states that any HBM altered outside the body should not be deemed as originating from a human body (such as cell lines).[999]

The Human Tissue Authority (HTA)[1000] recommends that where potentially important medical information is found in the process of research, feedback to donors is encouraged and this should be reflected by researchers to donors during the consent process.[1001]

The Human Research Authority (HRA)[1002] directs research ethics committees (RECs) on research involving human tissue and facilitates research that is beneficial to society within the legal framework of the UK. The HRA must indicate whether there are plans to inform donors of any clinically significant findings. In the event of any collaborative research, UK RECs are not obliged to review consent agreements from outside of the UK nor any other agreements made by the collaborating partners.[1003]

The Medical Research Council's Ethical Guidelines[1004] on research practices regarding collaborative research stipulate the need for a formal written agreement between parties regarding ownership, custodianship, responsibilities, future use of samples and handling of intellectual property. The MRC's Operational and Ethical Guidelines relating to Human Tissue and Biological samples for Use in Research provide that all donations are altruistic (with some exceptions) and encourage that the custodianship of the donated material should rest with the institutions/corporations rather than individual researchers.[1005] In its guidelines, the MRC specifically prohibits the commodification of the human body and insists that research participants can only be paid for their time and expenses to prevent undue inducement. The MRC Guidelines acknowledge that intellectual property could

[998]Human Tissue Act 2004 https://www.legislation.gov.uk/ukpga/2004/30/data.pdf (Date of use: 26 May 2023).
[999]Section 54(7) of the Human Tissue Act 2004.
[1000]Human Tissue Authority Code of Practice A https://content.hta.gov.uk/sites/default/files/2020-11/Code%20A.pdf (Date of use: 26 May 2023).
[1001]Section 34 of the HTA Code of Practice and Standards for Research page 10. https://content.hta.gov.uk/sites/default/files/2020-11/Code%20E.pdf (Date of use 26 may 2023).
[1002]NHS Health Research Authority https://www.hra.nhs.uk/about-us/ (Date of use: 26 May 2023).
[1003]Section 12.47 of HRA SOPs found at https://s3.eu-west-2.amazonaws.com/www.hra.nhs.uk/media/documents/RES_Standard_Operating_Procedures_Version_7.5.1_August_2021_Final_Accessible_07lVkXt.pdf (Date of use: 26 May 2023).
[1004]Medical Research Council https://www.ukri.org/councils/mrc/ (Date of use: 26 May 2023).
[1005]Section 2 of MRC Human Tissue and Biological Samples for Use in Research: Operational and Ethical Guidelines https://www.ukri.org/publications/human-tissue-and-biological-samples-for-use-in-research/ (Date of use: 26 May 2023).

arise from research using HBMs. In addition, the guidelines elucidate that although donors must be informed of the IP development and possible commercialisation where possible, HBM donors must be told that they are not entitled to any profits or IP rights that are generated from their donated samples and being used in academic settings. [1006]

No legally binding framework for benefit sharing with donors of HBM in the UK exists although the concept of custodianship is prevalent in the various guidelines.As a HIC altruistic research is promoted in the UK as it likely that most of their citizens will share in the benefits of all research. South Africa cannot afford this approach to health research; being an LMIC, the attainment of therapeutics and the equal distribution of benefits that may arise from human health research to all its citizens is not guaranteed. The explosion in health research that precipitated an increase in North–South collaborations forces LMICs to enforce benefit sharing agreements not only to remedy past exploitative collaborations but also to be balanced with the public interest and respect for local traditions.[1007]

6.2.5.2 Australia

Australia—like the UK—is a high-income country whose citizens have access to high-quality healthcare. Australia is also at the forefront of health research; the National Statement on Ethical Conduct in Human Research (the National Statement) applies to all research involving human beings.[1008] The National Statement is not legally binding but access to research funds from the National Health and Medical Research Council (NHMRC) requires compliance with the Principles of the National Statement.[1009]

The question of the ownership of HBMs is not addressed at all in the National Statement but the concept of benefit sharing is deemed to be one of the pillars of ethical research throughout the document. The Guidelines state that benefit sharing arrangements must be in place during a research project and to whom and with whom these benefits accrue must

[1006]Section 7 of MRC Human Tissue and Biological Samples for Use in Research: Operational and Ethical Guidelines https://www.ukri.org/publications/human-tissue-and-biological-samples-for-use-in-research/ (Date of use: 26 May 2023).

[1007]Slabbert M "The legal regulation of access and benefit sharing of human genetic resources in South Africa" 2011 *74 Tydskrif vir Hedendaagse Romeins-Hollandse Reg* 605–632.

[1008]National Statement on Ethical Conduct in Human Research https://www.nhmrc.gov.au/about-us/publications/national-statement-ethical-conduct-human-research-2007-updated-2018#block-views-block-file-attachments-content-block-1 (Date of use: 26 May 2023).

[1009]National Statement on Ethical Conduct in Human Research https://www.nhmrc.gov.au/about-us/publications/national-statement-ethical-conduct-human-research-2007-updated-2018#block-views-block-file-attachments-content-block-1 (Date of use: 26 May 2023).

be clear. The Guidelines also state that in the event that commercialisation occurs, the HBMs donors should be notified and discussions must ensue on how this is to be managed and how the benefits, if any, will be distributed.[1010]

Regarding research involving marginalised communities, specifically the Aboriginal and Torres Island peoples, the National Statement requires that benefit sharing agreements should be agreed upon with these specific communities and should be for the advancement and capacity building of the peoples in the community.[1011]

Regarding collaborative research with other countries, the National Statement advocates for the fair distribution of benefits and burdens between the collaborators in a collaboration that is not exploitative.[1012]

The National Statement declares that benefit sharing is a pillar of ethical research and that all health research must be seen to comply in order to obtain funding from the Australian government. Furthermore, donors are entitled to benefit from any commercialisation that may result from their donated HBM. The National Statement directs that benefit sharing should occur via agreements or as part of a Material/Data Transfer Agreement.[1013] The South African MTA for Human Biological Materials also calls for the negotiation of benefits before the commencement of a research project; however, no benefit sharing agreement is required between the donor and the institution that receives the donated HBM.[1014]

6.2.5.3 Uganda

Uganda is an LMIC like South Africa as well as one of the few countries at the forefront of research collaborations with HICs in Africa.

The National Guidelines for Research Involving Humans as research participants (National Guidelines)[1015] and the National Research Biobanking Guidelines[1016] regulate health research in Uganda. In Uganda, donors retain ownership of their donated HBMs if the latter

[1010]Section 1 of the National Statement https://www.nhmrc.gov.au/about-us/publications/national-statement-ethical-conduct-human-research-2007-updated-2018#block-views-block-file-attachments-content-block-1 (Date of use: 26 May 2023).
[1011]Chapter 4.7 of the National Statement on Ethical Conduct in Human Research of the NHRMC at 77–79.
[1012]Chapter 4 of the National Statement on Ethical Conduct in Human Research of the NHRMC at 77–79.
[1013]Chapter 4 of the National Statement on Ethical Conduct in Human Research of the NHRMC at 77–79.
[1014]Proclamation No 11 Government Gazette 41781 of 20 July 2018.
[1015]National Guidelines of Research Involving Human as Research Participants https://iuea.ac.ug/sitepad-data/uploads/2021/03/Human-Subjects-Protection-Guidelines-July-2014.pdf (Date of use: 26 May 2023).
[1016]National Research Biobanking Guidelines https://uncst.go.ug/files/National_Biobanking_Gudelines.pdf (Date of use: 26 may 2023).

are linked to the donor and a custodianship exists between the HBM donor and the primary receiving institute in Uganda.[1017] The National Guidelines and Biobank Guidelines state that research participants should benefit from research and must not be exploited. In both guidelines, a material transfer agreement (MTA) must be negotiated between the custodian of the HBM and the receiving institution if donated HBMs are transferred between institutions, either locally or internationally.[1018] The MTA should have clauses pertaining to benefit sharing arrangements, stating what benefits like capacity building and/or infrastructure development are likely to accrue. In the event of commercialisation using the samples held in trust, a second MTA needs to be negotiated, stating what benefits for Uganda or the primary institution in Uganda would be realised.[1019]

Regarding intellectual property that could potentially emanate from the use of HBMs stored in trust, the biobank and primary source institution should define an intellectual property policy that should be enforced by an MTA and/or a data transfer agreement (DTA).[1020]

Uganda has entrenched benefit sharing agreements in their law. Being an LMIC, Uganda has a similar history to South Africa's, which gave rise to an unequal society in which good healthcare was not available to all. There is a need for a legal framework to protect donors and local institutions and/or communities concerning advancements in scientific research which could benefit all.

6.2.6 Key elements in developing a benefit sharing agreement for health research in South Africa

Many countries, including South Africa, lack legislative structures and governance frameworks to facilitate fair benefit sharing to all stakeholders involved in health research.[1021] Every new global health crisis highlights the need for the fair benefit sharing of HBMs samples between LMICs and HICs, to avoid exploitation and protect the vulnerable.[1022] In the absence of legally binding law to guide benefit sharing frameworks, ethical guidelines can be used, although the reviewed ethical guidelines suggest that some

[1017]Section 10.3 of the Uganda "National Guidelines" at 28.
[1018]Section 10.4 of the Uganda "National Guidelines" at 28.
[1019]Section 10.4(j)(k)(l) of the Uganda "National Guidelines" at 30.
[1020]Section 8.2 of the Uganda National Research Biobanking Guidelines at 20.
[1021]Chen H and Pang T "A call for global governance of biobanks" 2015 *Bull World Health Organ* 93:113–117.
[1022]Mckenna M "Colonialists are coming for blood-Literally" 2019 *Ideas* found at: https://www.wired.com/story/ebola-epidemic-blood-samples/ (Date of use: 26 May 2023).

guidelines are absent, outdated, conservative or difficult to navigate.[1023] To arrive at a suitable template for benefit sharing in health research in SA, this study refers to pre-legal frameworks previously discussed in this thesis.[1024]

6.2.6.1 Legal frameworks for benefit sharing

The Nagoya Protocol[1025] refers to access to and the benefit sharing of non-human genetic resources but excludes HBMs and digital sequence information.[1026] The Nagoya Protocol proposes a comprehensive list of benefits, both monetary and non-monetary that could be included in benefit sharing arrangements.[1027] Some scholars have advocated that the scope of access and benefit sharing of the CBD via supplementary Nagoya Protocol should be expanded to include HBMs.[1028] The HUGO Ethics Committee issued a statement in 2002 on benefit sharing regarding HBMs[1029]The Council for International Organisations and Medical Sciences (CIOMS) updated their Guidelines for Health-related Research involving Humans in 2015, advocating for negotiated benefit sharing between LMICs and HICs in health research.[1030]

These international legal frameworks and guidelines to which South Africa subscribe are upheld as principles of international customary law but do not take into account the obvious difference in negotiating powers between stakeholders in HICs and those in LMICs. [1031]

[1023]De Vries J, Munung SN, Matimba A *et al.* "Regulation of genomic and biobanking research in Africa: a content analysis of ethics guidelines, policies and procedures from 22 African countries" 2017 *BMC Medical Ethic*s 18(1):1–9.

[1024] Discussed in Chapter 2 of this thesis.

[1025] Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilisation. Secretariat of the Convention of Biological Diversity, 2011. http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf (date of use: 26 may 2023).

[1026]Bedeker A, Nichols M, Allie T *et al.* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7(2):e008096.

[1027]Chapter 2.1.1 of this thesis covers the list.

[1028]Chaturvedi S, Crager S, Ladikas M "Promoting an inclusive approach to benefit sharing: expanding the scope of the CBD?" in Schroeder D and Cook Lucas J (eds) *Benefit Sharing From Biodiversity to Human Genetics* (Springer Science 2013) 153–178.

[1029]HUGO Statement on Benefit Sharing https://www.eubios.info/BENSHARE.htm#:~:text=The%20HUGO%20Ethics%20Committee%20recommends,who%20participated%20in%20such%20research (Date of use: 23 May 2023).

[1030]CIOMS and WHO International Ethical Guidelines for health research Involving Humans https://cioms.ch/wp-content/uploads/2017/01/WEB-CIOMS-EthicalGuidelines.pdf (Date of use: 26 May 2023).

[1031]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7(2):e008096.

Specific to South Africa, the San Code of Research Ethics[1032] and the National MTA of Human Biological Materials[1033] call for benefit sharing. The MTA leaves the benefit sharing agreement to be negotiated between the provider and recipient of the HBM. The National MTA[1034] states what possible benefits could accrue, but the list needs to be expanded and to be more specific on to whom the benefits should accrue to accommodate the various stakeholders in a research project.

These frameworks discussed above indeed promote benefit sharing yet fail to address the issue of publicly and privately funded research design in a world where the private sector has become the biggest investor in health research due to the commercialisation of research products.[1035] Therefore, it is necessary to have specific benefit sharing agreements at hand to enable vulnerable populations to negotiate fair contracts.[1036]

6.2.6.2 Challenges to benefit sharing

Despite global efforts to promote benefit sharing,[1037] benefit sharing plans and implementation rarely feature in research programmes, grant applications or the requirements of research ethics committees.[1038] The need for benefit sharing in health research is a concept that is agreed on by many research stakeholders, yet controversy persists.[1039]

The lack of trust and integrity between providers and resource users and disrespect of other cultures are seemingly obvious problems in the implementation of fair benefit sharing arrangements.[1040] The lack of infrastructure, equipment and electricity in LMICs means that some HBMs which need to be stored with a continuous cold chain are then shipped to HICs because it is costly to store them in the LMIC. This has led to some researchers

[1032]This pertains specifically to the San communities that require any monetary or non-monetary benefits to be discussed with the research participants and/or the community.
[1033]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.
[1034]Proclamation No 719 *Government Gazette* 41781 of 20 July 2018.
[1035]Simm K "Benefit sharing frameworks–justifications for and against benefit sharing in human genetic research" 2007 A report for GenBenefit, available at: www.uclan.ac.uk/genbenefit (Date of use: 26 May 2023).
[1036]Evans NG, Hills K and Levine AC "How should the WHO guide access and benefit sharing during infectious disease outbreaks" 2020 *AMA Journal of Ethics* 22(1):28–35.
[1037]Chapter 2 of this thesis.
[1038]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7(2):e008096.
[1039]Sedyaningsih ER, Isfandari S, Soendoro T *et al* "Towards mutual trust, transparency and equity in virus sharing mechanism: the avian influenza case of Indonesia" 2008 *Ann Acad Med Singapore* 37:482–488.
[1040]Moodley K and Singh S "It's all about trust: reflections of researchers on the complexity and controversy surrounding biobanking in South Africa" 2016 *BMC Medical Ethics* 17(1):1–9.

in HICs withholding samples,[1041] which contributes to situations where fair benefit sharing is hindered.[1042] The large number of stakeholders involved and the power dynamics between them, as well as the question of who benefits, when and how, present challenges to the implementation of benefit sharing agreements.[1043] In South Africa, the enactment of the POPIA[1044] gives research participants legal rights to their data, which could cause difficulties for health research and benefit sharing agreements. This is because transferring personal data outside of South African borders must be for the benefit of the research participant, whereby in the absence of consent from the participant, given that if they could give consent, they would.[1045] Moreover, consulting a large number of participants when large numbers of data need to be transferred out of SA is impractical and almost impossible to achieve. Other challenges to fair benefit agreements and their implementation include, but are not limited to, post study access.[1046] It has been suggested that some research ethics committees in LMICs are inadequately trained and often lack the resources to be effective and subsequently, are pressured by researchers and sponsors, thereby contributing to the lack of the implementation of fair benefit sharing agreements.[1047] Multiple stakeholders are involved in research projects and must all benefit at some stage of the project; hence, there is a need for effective communication between the scientific community and the relevant national and international policymakers.[1048]

6.2.6.3 Proposed benefit sharing models

The failure to implement benefit sharing arrangements is due to non-binding legislation that provides inconsistent and incomplete frameworks for benefit sharing.[1049] Accordingly, the result of this scenario is often that national governments develop their own access and

[1041]Mckenna M "Colonialists are coming for blood-Literally" 2019 *Ideas* found at: https://www.wired.com/story/ebola-epidemic-blood-samples/ (Date of use: 26 May 2023).
[1042]Evans NG, Hills K and Levine AC "How should the WHO guide access and benefit sharing during infectious disease outbreaks" 2020 *AMA Journal of Ethics* 22(1):28–35.
[1043]Berg K "The ethics of benefit sharing" 2001 *Clin Genet* 59(4):240–243.
[1044]South Africa Protection of Personal Information Act No 4. Of 2013.
[1045]Section 72(1) of the POPIA.
[1046]Schroeder D and Gefenas E "Realizing benefit sharing-the case of post-study obligations" 2012 *Bioethics* 26(6):305–314.
[1047]Nyika A, Kilama W, Chilengi R *et al* "Composition, training needs and independence of ethics review committees across Africa: are the gate-keepers rising to the emerging challenges?" 2009 *J Med Ethics* 35:189–193.
[1048]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7(2):e008096.
[1049]Chen H and Pang T "A call for global governance of biobanks" 2015 *Bull World Health Organ* 93:113–117.

benefit sharing frameworks that might not support global research initiatives.[1050] When designing a framework for health research, many issues must be considered, such as the funding of the research (public vs private vs semi-private), property rights, public engagement, compensation for research participants, consent issues, data sharing, the secondary use of samples and data returning results, royalties, financial gains and other types of gain and benefits.[1051]

Several models of benefit sharing frameworks dominate ethical debates.[1052] The private benefit sharing model[1053] applies to privately owned biobanks or tissue banks where private biotechnology companies act as brokers of the HBMs and health data for multiple researchers.[1054] This system presents challenges in countries like SA where there is little regulation of biobanks or tissue banks.[1055] To date, there have been incidences when such private research sites shared data and samples with research sites in HICs without the necessary oversight and consent.[1056]

The altruistic model of benefit sharing[1057] is based on the notion that all health research ought to be altruistic in nature to generate generalised knowledge that could be used for the benefit of all.[1058] This model would not work in SA, an LMIC with an unequal healthcare system that disadvantages most of the population. The healthcare systems of HICs benefit all; therefore, to propose such a system in SA would be exploitative.[1059]

[1050]Chaturvedi S, Crager S, Ladikas M *et al* "Promoting an inclusive approach to benefit sharing: expanding the scope of the CBD?" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 153–178.

[1051]Cambon-Thomsen A, Rial-Sebbag E and Knoppers BM "Trends in ethical and legal frameworks for the use of human biobanks" 2007 *Eur Respir J* 30:373–382.

[1052]Chapter 5, Section .3.1 of this thesis.

[1053]Chapter 2, Section 2.5.1 of this thesis.

[1054] Winickoff DE and Winickoff RN "The charitable trust as a model for genomic biobanks" 2003 *New Engl J Med* 349(12): 1180–1184.

[1055]Labuschaigne M and Mahomed S "Regulatory challenges relating to tissue banks in South Africa: impendiments to accessing health care" 2019 *SAJBL* 12(1):27–31.

[1056]Moodley K and Kleinsmidt A "Allegations of misuse of African DNA in the UK: will data protection legislation in South Africa be sufficient to prevent a recurrence?" 2021 *Developing World Bioethics* 21:125–130.

[1057]Chapter 2 Section 2.5.2 of this thesis.

[1058]Simm K "Benefit sharing frameworks–justifications for and against benefit sharing in human genetic research" 2007 A report for GenBenefit, available at: www.uclan.ac.uk/genbenefit (Date of use: 26 May 2023).

[1059]Schroeder D, Gefanas E, Chennells R *et al* " Realizing benefit sharing: is there a role for ethics review?" in Schroeder D and Cook Lucas J (eds) *Benefit sharing from biodiversity to human genetics* (Springer Science 2013) 179–202.

The reasonable availability benefit sharing model was proposed to prevent the exploitation of research participants in HIV trials in LMICs in the 1990s.[1060] This model's weakness resides in the fact that a viable benefit might never be developed and if it were, who would decide on a suitable benefit for the research participants in the LMICs.[1061]

The fair benefits model for benefit sharing has been suggested to address the failures of the reasonable availability model. It stipulates that the host community/participants of the research can negotiate for benefits beyond those resulting from the research project.[1062] The model has been criticised for promoting unjust research, whereby rich sponsors from HICs could choose to conduct research in poor communities with low negotiating powers in LMICs.[1063]

The reasonable availability and fair benefits models concur that the primary purpose of research is to create generalised knowledge and benefits should accrue to those that participate in research.[1064] However, both models fail to address what entails a fair benefit, who decides that and who is responsible for protecting research participants from exploitation in LMICs.[1065]

The charitable trust model[1066] proposes a fiduciary relationship in which trustees hold title to the property but are obligated to keep or use the property for the benefit of the beneficiary.[1067] This model has been successful in cases were rare disease researchers have constructed tissue banks to enable researchers to control research design, the implementation of research results and benefit sharing.[1068] The Human Tissue Authority

[1060]Participants in the 2001 Conference on Ethical Aspects of Research in Developing Countries Moral standards for research in developing countries: from 'reasonable availability' to 'fair benefits' 2004 *Hastings Center Report* 34(3):17–27.

[1061]Participants in the 2001 Conference on Ethical Aspects of Research in Developing Countries Moral standards for research in developing countries: from 'reasonable availability' to 'fair benefits' 2004 *Hastings Center Report* 34(3):17–27.

[1062]Participants in the 2001 Conference on Ethical Aspects of Research in Developing Countries Moral standards for research in developing countries: from 'reasonable availability' to 'fair benefits' 2004 *Hastings Center Report* 34(3):17–27.

[1063]London AJ and Zollmann K "Research at the auction block: problems for the fair benefits approach to international research" 2010 *Hastings Center Report* 40(4):34–45.

[1064]Macpherson CC "Research ethics guidelines and moral obligations to developing countries: capacity-building and benefits" 2019 *Bioethics* 33:389–395.

[1065]Macpherson CC "Research ethics guidelines and moral obligations to developing countries: capacity-building and benefits" 2019 *Bioethics* 33:389–395.

[1066]Chapter 2 Section 2.5.3 of this thesis.

[1067]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.

[1068]Winickoff D "Governing population genomics: law, bioethics, and biopolitics in three case studies" 2003 *Jurimetrics* 43(2):187–228.

(HTA) of the UK also uses this model since it acts as the trustee of all human tissue and HBMs collected in the UK.[1069]

In recent years, more models of benefit sharing have been introduced by various stakeholders active in health research in LMICs.

The H3Africa[1070] research consortium has proposed a benefit sharing model in which the primary goal of research is founded on capacity building in LMICs, whereby capacity building and health improvement are the bases of research projects.[1071] Its weakness resides in the uncertainty of sustaining research and building capacity beyond the NIH-Wellcome Trust funding period.[1072]

Bedeker *et al*[1073] propose an ethical benefit sharing model that would allow for benefits to accrue to multiple stakeholders. To promote ethical benefit sharing, the authors propose a two-dimensional framework that would enable research stakeholders to identify opportunities in research programmes and thereby, cater to all of the multiple stakeholders involved in a research project.[1074]

Some scholars[1075] have suggested that the CBD should be the main treaty to influence a benefit sharing model for human biological materials such as genetic resources. However, to date, the issue of access and benefit sharing remains a major stumbling block in negotiations on trade-related aspects of intellectual property rights (TRIPs) at the World Trade Organisation (WTO).[1076]

[1069]UK Human Tissue Act https://www.hta.gov.uk/policies/human-tissue-act-2004 (Date of use: 26 May 2023).
[1070]Human Heredity & Health in Africa https://h3africa.org/ (Date of use: 26 May 2023).
[1071]Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing World Bioethics* 18:165–170.
[1072] Dauda B and Joffe S "The benefit sharing vision of H3Africa" 2018 *Developing World Bioethics* 18:165–170.
[1073]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7(2):e008096.
[1074]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7(2):e008096.
[1075]Chaturvedi S, Crager S, Ladikas M *et al* "Promoting an inclusive approach to benefit sharing: expanding the scope of the CBD?" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 153–178.
[1076]Chaturvedi S, Crager S, Ladikas M *et al* "Promoting an inclusive approach to benefit sharing: expanding the scope of the CBD?" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 153–178.

6.2.6.4 Proposed model for a benefit sharing agreement for human health research in South Africa

Globally, the incorporation of legally binding benefit sharing frameworks and their translation into practical implementation has been slow.[1077] In South Africa specifically, the challenge is to find a benefit sharing model that balances relevant interests, redresses economic imbalance and provides research participants fairer and more active roles in influencing the sharing of benefits.[1078] The ethical principles of the model should also accommodate fast-changing scientific principles.[1079] Furthermore, the model must have room to accommodate multiple stakeholders in a research project and to communicate effectively in a language that is common to all involved in the research.[1080]

In Chapter 5 of this thesis,[1081] the researcher suggested a benefit sharing agreement for health research in South Africa based on the charitable trust model for benefit sharing.[1082]

This study proposes that the donor of HBMs and/or data transfers the custodianship of said donations to a trust (the primary institution that obtains the donated materials), which is set up to protect and safeguard said materials. The transfer should be effected via the process of informed consent, with the encouragement of the need for continuous communication between the two parties to enable ease of negotiations on the future use of the donated materials. The trust is then authorised to sign the existing MTA[1083] with an end user (Recipient). The MTA should be seen to benefit the beneficiary of the trust via the addition of a benefit sharing agreement as an annexure to the MTA.

6.4 Conclusion

As expressed earlier in this thesis, while the law must be seen to follow tradition and legal precedent when formulating public policy or legislation, it should also be responsive to changes requiring legal regulation. It is evident that after analysing the ethico-legal

[1077]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7(2):e008096.
[1078]Slabbert, MN "The legal regulation of access and benefit sharing with regard to human genetic resources in South Africa" 2011 *J. Contmpt Roman Dutch Law* 74: 605.
[1079]These include the sharing and secondary use of data and human biological materials locally and globally and changes in consent.
[1080]Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7(2):e008096.
[1081]Chapter 5 of this thesis.
[1082]Attached to this Chapter as Annexure B.
[1083]South Africa Material Transfer Agreement for Human Biological Materials Government Notice 719. Government Gazette 41781 of 20 July 2018.

framework for benefit sharing in South Africa, the legislation is found lacking. If LMICs are to achieve justice in exchange, it is necessary to right the wrongs committed by HICs in LMICs through exploitative research and also enforce that benefit sharing plans and implementations should feature in research proposals and grant applications and be a requirement in health research involving HBMs in certain instances.

The Recent global COVID-19 health crisis and the alleged misuse of African DNA in the UK[1084] have highlighted the need for benefit sharing between HICs and LMICs.Benefit sharing can no longer be looked upon as a notion that will encourage undue inducement of research participants when said participants have no access to life-saving therapeutics, capacity development or infrastructure development, in which case this is akin to exploitation and a failure of justice. The case of the Welcome Sanger Institute should serve as a cautionary tale to researchers and institutions in LMICs that enter into collaborations with researchers in HICs. During this research, it was alleged by some universities in South Africa that the Welcome Sanger Institute commercialised a gene chip using DNA donated by South African and other African donors without following the proper consent processes.

The lack of cultural sensitivity, such as in the example above leads to a lack of trust in communities that value and attach great importance to blood and tissue collected for use as research samples. COVID-19 vaccine hesitancy can be partially blamed on the inability of researchers to cement initial trust in communities.[1085]

It is also important to recognise that research projects involve multiple stakeholders with different expectations of what benefits ought to accrue to them at various stages of the research project. A trust would solve such issues since it would communicate to various stakeholders simultaneously in negotiating their expectations, using a language that is understood across the different negotiating forums, whether the scientific community or relevant national and international policymakers.

Adopting the charitable trust model, proposed in chapter 5 of this thesis, would make the first recipients of HBMs the trustees of the HBMs instead of brokers having legal fiduciary

[1084] Moodley K and Kleismidt A "Allegations of misuse of African DNA in the UK: Will data protection legislation in South Africa be sufficient to prevent recurrence" 2021 Developing World Bioethics 21:125-30.
[1085] Bedeker A, Nichols M, Allie T *et al* "A framework for the promotion of ethical benefit sharing in health research" 2022 *BMJ Global Health* 7(2):e008096.

duties over the HBMs, whilst permitting the use of the donated HBMs in a way that benefits the donor as a beneficiary of the trust.

BIBLIOGRAPHY

7.1 Books

Anarson and Schroeder *Philosophical principles*.
Anarson G and Schroeder D “Exploring central philosophical concepts in benefit sharing: vulnerability, exploitation and undue inducement” in Schroeder D and Cook Lucas JC (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 9–32.

Andanda *et al Legal frameworks for benefit sharing* 34.
Andanda P *et al* “Legal frameworks for benefit sharing: from biodiversity to human genomics” in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 33–64.

Basler *Common heritage*.
Basler K *The concept of the common heritage of mankind in International law* (Nijhoff Publishers 1998).

Chaturvedi *et al Inclusive approach to benefit sharing*
Chaturvedi S *et al* “Promoting an inclusive approach to benefit sharing: expanding the scope of the CBD” in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 153–178.

Chennelis and Steenkamp *International genomics*.
Chennelis R and Steenkamp A “International genomics research involving the San people” in Schroeder D, Cook Lucas J *et al* (eds) *Ethics dumping, case studies from north-south research collaborations* (Springer International Publishing 2018) 15–22.

Dictionaries, Oxford. *Concise Oxford English Dictionary: CD-ROM edition, Windows/Mac Individual User Version 1.0*. (Oxford University Press 2011).

Halewood and Nnadozie *Priority to commons*.

Halewood M and Nnadozie K “Giving priority to the commons: the international treaty on plant genetic resources for food and agriculture” in Tansey G and Rajotte T (eds) *The future control of food* (London, Earthscan 2008).

Hollis, Pogge and Schroeder *Beyond benefit sharing*.

Hollis A, Pogge T and Schroeder D “Beyond benefit sharing: towards realising the human rights to health” in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 203–216.

Hyam *British Empire*.

Hyam R *Understanding the British empire* (Cambridge University Press 2010).

Lucas *et al Who benefits?*

Lucas CJ *et al* “Donating human samples: who benefits? Cases from Iceland, Kenya and Indonesia” in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 95–127.

Macklin *Double standards*.

Macklin R *Double standards in medical research in developing countries* Volume 2 (Cambridge University Press 2004).

Schroeder and Cook Lucas *Benefit sharing*.

Schroeder D and Cook Lucas J “Benefit sharing: from biodiversity to human genetics—an introduction” in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 1–8.

Schroeder and Cook Lucas *Best Practice*.

Schroeder D and Cook Lucas J “Towards best practice for benefit sharing involving access to human biological resources: conclusions and recommendations” in Schroeder

D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 217–230.

Suzman *Regional assessment* 4.

Suzman J *An introduction to the regional assessment of the status of the San in Southern Africa* (Windhoek: Legal Assistance Centre 2001) 4.

Schroeder *et al Realising benefit sharing*

Schroeder D *et al* "Realising benefit sharing: is there a role for ethics review?" in Schroeder D and Cook Lucas J (eds) *Benefit sharing: from biodiversity to human genetics* (Springer Science 2013) 179–202.

Van der Walt and Pienaar *Property*.

Van der Walt AJ and Pienaar GJ *Introduction to the Law of Property* 7th ed (Juta 2017) 43–56.

Zhao and Zhang *Collaborative genetic research*.

Zhao Y and Zhang W "An international collaborative genetic research project conducted in China" in Schroeder D, Cook Lucas J *et al* (eds) *Ethics dumping, case studies from North-South research collaborations* (Springer International Publishing: Cham 2018) 71–80.

7.2 Case Law

Yearworth v North Bristol Trust 2009 (3) WLR 118

Roche v Douglas 2000 WASC (146) 2002 (22) WAR 331

Greenberg v. Miami Children's Hospital Research Institute 264 F. Supp. 2d D. Fla. (2003)

7.3 Dissertations and Theses

Chennels *Equitable access*.

Chennells RS *Equitable access to human biological resources in developing countries: benefit sharing without undue inducement* (PhD thesis School of Health: University of Central Lancashire 2014).

Mahomed *Ethico-legal framework*.

Mahomed S *An ethico-legal framework for the regulation of biobanks in South Africa* (PhD thesis Steve Biko Centre of Bioethics: University of the Witwatersrand PhD thesis 2018) Available at: https://wiredspace.wits.ac.za/server/api/core/bitstreams/7b7894ae-6f5a-4fd6-81cf-65e36ff9563e/content (Date of use: 26 May 2023).

Moodley *Legitimac*y

Moodley K *Legitimacy, trust and governance in biobanking in South Africa* (MBA thesis University of Cape Town 2015)

7.4 Journal Articles

Anarson and Van Niekerk 2009 *Cambridge Quarterly of Healthcare Ethics*.

Anarson G and Van Niekerk A "Undue fear of inducements in research in developing countries" 2009 *Cambridge Quarterly of Healthcare Ethics* 18(2):122–129.

Angell, Terrant and Dixon-Woods 2009 *J Clin Pathol*.

Angell A, Terrant C and Dixon-Woods M "Research involving storage and use of human tissue: how did the Human Tissue Act 2004 affect decisions by Research Ethics Committees?" 2009 *J Clin Pathol* 62(9):825–9.

Aramoana and Koea 2020 *JCO Global Oncology*.

Aramoana, J and Koea, J “An integrative review of the barriers to indigenous peoples’ participation in biobanking and genomic research” 2020 *JCO Global Oncology* 6:83–91.

Ballantyne 2010 *Am J Bioeth*.

Ballantyne AJ “How to do research fairly in an unjust world” 2010 *Am J Bioeth* 10:26–35.

Bedeker *et al* 2022 *BMJ Global Health*.

Bedeker A *et al* “A framework for the promotion of ethical benefit sharing in health research” 2022 *BMJ Global Health* 7(2): e008096.

Berg 2001 *Clin Genet*.

Berg K “The ethics of benefit sharing” 2001 *Clin Genet* 59:240–243.

Beskow 2016 *Annu. Rev. Genom. Hum.Genet*.

Beskow LM “Lessons from HeLa cells: the ethics and policy of biospecimens” 2016 *Annu. Rev. Genom. Hum.Genet* 17:395–417.

Beyleveld and Bronsword 1998 *Modern Law Review*.

Beyleveld D and Bronsword R “Human signity, human rights, and human genetics” 1998 *Modern Law Review* 61(5): 661–680.

Bjorkman and Hansson 2006 *J Med Ethics*.

Bjorkman B and Hansson SO “Bodily rights and property rights” *2006 J Med Ethics* 32:209–214.

Cambon-Thomsen, Rial-Sebbag and Knoppers 2007 *Eur Respir J*.

Cambon-Thomsen A, Rial-Sebbag E and Knoppers BM “Trends in ethical and legal frameworks for the use of human biobanks” 2007 *Eur Respir J* 30:373–382.

Chalmers 2015 *Journal of Law Medicine and Ethics*.

Chalmers D “Biobanking and privacy laws in Australia” 2015 *Journal of Law Medicine and Ethics* 43(4):703–713.

Chen and Pang 2015 *Bull World Health Organ*.

Chen H and Pang T “A call for global governance of biobanks” 2015 *Bull World Health Organ* 93:113–117.

Christopher 1990 *Urban Studies*.

Christopher AJ “Apartheid and urban segregation levels in South Africa” 1990 *Urban Studies* 3:421–440.

Dauda and Joffe 2018 *Developing World Bioethics*.

Dauda B and Joffe S “The benefit sharing vision of H3Africa” 2018 *Developing World Bioeth* 18:165–170.

De Jonge and Korthals 2006 *Developing World Bioethics*.

De Jonge B and Korthals M “Vicissitudes of benefit sharing of crop genetic resources: downstream and upstream” 2006 *Dev World Bioeth* 6: 144–157.

Dauda and Dierickx 2013 *BMC Medical Ethics*.

Dauda B and Dierickx K “Benefit sharing: an exploration on the contextual discourse of a changing concept” 2013 *BMC Medical Ethics* 14(1):1–8.

Dauda and Joffe 2018 *Developing World Bioethics*.

Dauda B and Joffe S “The benefit sharing vision of H3Africa” 2018 *Developing World Bioethics* 18(2):165–170.

De Vries *et al* 2017 *BMC Medical Ethics*.
De Vries J, Munung SN, Matimba A *et al* “Regulation of genomic and biobanking research in Africa: a content analysis of ethics guidelines, policies and procedures from 22 African countries” 2017 *BMC Medical Ethics* 18(1):1–9.

Dhai 2012 *SAJBL*.
Dhai A “Vulnerability exploited and a population betrayed” 2012 *SAJBL* 5(2):62–63.

Dhai, Mahomed and Sanne 2015 *S Afr J BL*.
Dhai A, Mahomed S and Sanne I “Biobank and human health research: balancing progress and protections” 2015 *S Afr J BL* 9:55–59.

Dudgeon *et al* 2010 *Working together*.
Dudgeon P, Wright M, Paradies Y ***et al*** *“*The social, cultural and historical context of Aboriginal and Torres Strait Islander Australians” 2010 *Working together: Aboriginal and Torres Strait Islander mental health and wellbeing principles and practice*” 25–42

Emmanuel *et al* 2004 *J Infect Dis*.
Emmanuel EJ, Wendler D, Killen J *et al* “What makes clinical research in developing countries ethical? The benchmarks of ethical research” 2004 *J Infect Dis* 189:930–937.

Emmanuel, Currie and Herman 2005 *The Lancet*.
Emmanuel EJ, Currie XE and Herman A “Undue inducement in clinical research in developing countries: is it a worry?” 2005 *The Lancet* 366:336–340.

Evans, Hills and Levine 2020 *AMA Journal of Ethics*.
Evans NG, Hills K and Levine AC “How should the WHO guide access and benefit sharing during infectious disease outbreaks” 2020 *AMA Journal of Ethics* 22(1):28–35.

Fullerton *et al* 2010 *Science Translational Medicine*.
Fullerton SM, Nicholas RA, Guzauskas G *et al* “Meeting the governance challenges of next-generation biorepository research” 2010 *Science Translational Medicine 2*(15): 15cm3–15cm3.

Gerstetter *et al* 2007 *The Journal of World Intellectual Property*.
Gerstetter C, Gorlach B, Neumann K *et al* “The international treaty on plant genetic resources for food and agriculture within the current legal regime complex on plant genetic resources” 2007 *The Journal of World Intellectual Property* 10(3/4): 259–283.

Gibson 2008 *Jurimetrics*.
Gibson SF “The Washington University v Catalona: determining ownership of genetic samples” 2008 *Jurimetrics J* 481:167–191.

Guardasani *et al* 2015 *Nature*.
Guardasani D, Carstensen T, Tekola-Ayele FR, *et al* “The African Genome Variation Project shapes medical genetics in Africa” 2015 *Nature* 517:327–32.

HUGO 2000 *Clinical Genetics*.
HUGO Ethics Committee: “HUGO urges genetic benefit sharing” 2000 *Clinical Genetics* 58:364–366.

Hurst 2008 *Bioethics*.
Hurst S “Vulnerability in research and healthcare; describing the elephant in the room?” 2008 *Bioethics* 22:191–202.

Jeffers 2001 *Advances in Nursing Science*.
Jeffers BR “Human biological materials in research: ethical issues and the role of stewardship in minimizing research risks” 2001 *Adv. Nurs. Sci 24*(2):32–46

Knoppers *et al* 2002 *Community Genet*.
Knoppers BM, Chadwick R, Takebe H *et al* “HUGO urges genetic benefit sharing” 2002 *Community Genet* 3(2): 88–92.

Labuschaigne *et al* 2019 *S Afr Med J*.
Labuschaigne M, Dhai A, Mahomed S *et al* “Protecting participants in health research: the South African Material Transfer Agreement” 2019 *S Afr Med J* 109(5):353–356.

Labuschaigne and Mahomed 2019 *SAJBL*.
Labuschaigne M and Mahomed S “Regulatory challenges relating to tissue banks in South Africa: impediments to accessing health care” 2019 S*AJBL* 12(1):27–31.

Lairumbi *et al* 2012 *Philosophy, Ethics, and Humanities' in Medicine*.
Lairumbi G, Parker M, Fitzpatrick R *et al* “Forms of benefit sharing in global health research undertaken in resource poor settings: a qualitative study of stakeholders' views in Kenya” 2012 *Philosophy, Ethics, and Humanities in Medicine* 7(1):1–8.

Lavoie 1989 *Virginia Law Review*.
Lavoie J “Ownership of human tissue: life after Moore v. Regents of the University of California” 1989 *Virginia Law Review* 75(7):1363–1396.

Ledford 2010 *Nature*.
Ledford H "Africa yields two full human genomes” 2010 *Nature* 463:857.

Lee 2019 *Bioethics.*
Lee E“Our flawed approach to undue inducement in medical research” 2019 *Bioethics* 33:13-18.

Levine *et al* 2004 *American Journal of Bioethics*
Levine C, Faden R, Grady C *et al* “The limitations of 'vulnerability' as protection for human research participants*”* 2004 *AJOB* 4(3):44–49.

Lie 2010 *Hastings Center Report*.
Lie R “Fair benefit approach revisited*”* 2010 *Hastings Cent rep.* 40(4):3.

London and Zollman 2010 *Hastings Center Report*.
London AJ and Zollman KJS “Research at the auction block: problems for the fair benefits approach to international research” 2010 *Hastings Center Report* 40(4):34–45.

Macklin 2003 *Bioethics*.
Macklin R “Bioethics, vulnerability and protection” 2003 *Bioethics 17*(5-6):472–486.

Macpherson 2019 *Bioethics*.
Macpherson CC “Research ethics guidelines and moral obligations to developing countries: capacity-building and benefits” 2019 *Bioethics* 33:389–395.

Mahesh 2015 S *Afr J BL*.
Mahesh KP “Laws and regulations associated with ownership of human biological material in South Africa” 2015 *S Afr J BL* 15:8(1)11–18.

Mahomed 2021 *Cambridge Quarterly of Healthcare Ethics*.
Mahomed S “Human Biobanking in Developed and Developing Countries: An Ethico – Legal Comparative Analysis of the Frameworks in the United Kingdom, Australia, Uganda, and South Africa” 2021 *Cambridge Quarterly of Healthcare Ethics* 30:146–160.

Mahomed and Labuschaigne 2019 *S Afr J Bioethics Law*.
Mahomed S and Labuschaigne M “The role of research ethics committees in South Africa where human biological materials are transferred between institutions” 2019 *S Afr J Bioethics Law* 12(2):79–83.

Mahomed, Loots and Stauton 2022 *S Afr Bioethics Law*.
Mahomed S, Loots G and Stauton C “The role of data transfer agreements (DTA) in ethically managing data sharing for research in South Africa” 2022 *S Afr Bioethics Law* 15(1):26–30.

Mahomed, Nöthling-Slabbert and Pepper 2013 *S Afr J BL*.
Mahomed S, Nöthling-Slabbert M and Pepper MS “The legal position on the classification of human tissue in South Africa: can tissue be owned?” 2013 *S Afr J BL* 6(1):16–20.

Mahomed *et al* 2016 *Dev World Bioeth*.
Mahomed S, Nahrens K, Slabbert M *et al* “Managing human tissue transfer across national boundaries—an approach from an institution in South Africa” 2016 *Dev World Bioeth* 16:39–35.

Mahomed, Nöthling-Slabbert and Pepper 2017 *SAMJ*.
Mahomed S, Nöthling-Slabbert M and Pepper MS “Ownership and human tissue-the legal conundrum: a response to Jordaan’s critique” 2017 *SAMJ* 107(3): 196–198.

Mohamed and Sanne 2015 *S Afr J BL*.
Mohamed S and Sanne I “Benefit sharing in health research” 2015 *S Afr J BL* 8:60–64.

Mahomed and Staunton 2021 *BioLaw*.
Mahomed S and Staunton C “Ethico-legal analysis of international sample and data sharing for genomic research during COVID-19: a South African perspective” 2021 *BioLaw* 1 Journal available at www.biodiritto.org ISNN2284-4503.

Mayer 2007 *Journal of Applied Philosophy*.
Mayer R “What’s wrong with exploitation?” 2007 *Journal of Applied Philosophy* 24(2):137–150.

Millum 2012 *J Med Ethics*.
Millum J “Sharing the benefits of research fairly: two approaches” 2012 *J Med Ethics* 38:219–223.

Mngadi *et al* 2017 *J Med Ethics*.
Mngadi KT, Singh JA, Mansoor L and Wassenaar DR “Undue inducement:a case study in CAPRISA 008” 2017 *J Med Ethics* 43:824-828.

Moodley *et al* 2021 *SAMJ* 111.
Moodley K, Blockman M, Hawkridge AJ *et al*., “Hard choices: Ethical challenges in phase 1 of COVID-19 vaccine roll-out in South Africa” 2021 *SAMJ* 111(6):554–558.

Moodley and Kleinsmidt 2021 *Developing World Bioethics*.
Moodley K and Kleinsmidt A “Allegations of misuse of African DNA in the UK: will data protection legislation in South Africa be sufficient to prevent a recurrence?” 2021 *Developing World Bioethics* 21:125–130.

Moodley and Singh 2016 *BMC Medical Ethics*.
Moodley K and Singh S “’It’s all about trust’: reflections of researchers on the complexity and controversy surrounding biobanking in South Africa” 2016 *BMC Medical Ethics* 17(1):1–9.

Nienaber 2011 *CILSA*.
Nienaber A “Consent to and authorisation of the export and use of human biological specimens for future research–perspectives from three African countries” 2011 *CILSA* 63:225–254.

Nöthling-Slabbert 2008 *Stellenbosch Law Review*.
Nöthling-Slabbert M “Human bodies in law: arbitrary discursive constructions?” 2008 *Stellenbosch Law Review* 19(1): 71–100.

Nyika *et al* 2009 *J Med Ethics*.
Nyika A, Kilama W, Chilengi R *et al* “Composition, training needs and independence of ethics review committees across Africa: are the gate-keepers rising to the emerging challenges?” 2009 *J Med Ethics* 35:189–193.

O’Daniel and Haga 2011 Public *Health Genomics*.
O’Daniel J and Haga SB “Public perspectives on returning genetics and genomics research results” 2011 Public *Health Genomics* 14(6):346–55.

Participants 2004 *Hastings Center Report*.
Participants in the 2001 “Conference on Ethical Aspects of Research in Developing Countries Moral standards for Research in Developing Countries: from ‘reasonable availability’ to ‘fair benefits’” 2004 *Hastings Center Report* 34(3):17–27.

Petrini 2012 *Journal of Blood Medicine*.
Petrini C “Ethical and legal considerations regarding the ownership and commercial use of human biological materials and their derivatives” 2012 *Journal of Blood Medicine* 3:87–96.

Petrini and Ricciardi 2018 *Annali dell'Istituto Superiore di Sanitā.*
Petrini C, and Ricciardi W “The Convention on Human Rights and Biomedicine twenty years later: a look at the past and a step towards the futur” 2018 *Annali dell'Istituto Superiore di Sanitā* 1(54)(3):17.

Pouris and Pouris 2011 *South African Journal of Science*.
Pouris A and Pouris A “Patents and economic development in South Africa: managing intellectual property” 2011 *South African Journal of Science* 107(11/12):24–33.

Rachel *et al* 2021 *S Afr J Sci*.
Rachel *et al* “POPIA code of conduct for research” 2021 *S Afr J Sci* 117(5-6):1–12.

Resnick 1998 *Journal of Medical Ethics*.
Resnick DB “The commodification of human reproductive material” 1998 *Journal of Medical Ethics* 24:388–393.

Resnick 2005 *Frontis*.
Resnick DB “The human genome: common resource but not common heritage” 2005 *Frontis* 197–210.

H3Africa Consortium *et al* 2014 *Science*.
H3Africa Consortium, Rotimi C, Abayomi A *et al* “Research capacity. Enabling the genomic revolution in Africa” 2014 *Science* 344 (6190):1346–1348.

Sathar and Dhai 2012 *SAJBL*.
Sathar MA and Dhai A “Laws, regulations and guidelines of developed countries, developing countries in Africa, and BRICS regions pertaining to the use of human biological material (HBM) in research” 2012 *SAJBL* 5(1):51–54.

Sathar, Dhai and Van der Linde 2014 *Dev World Bioethics*.
Sathar A, Dhai A and Van der Linde S “Collaborative international research: ethical and regulatory issues pertaining to human biological materials at a South African institutional research ethics committee” 2014 *Dev World Bioethics* Vol 14:150–157.

Schroeder 2006 *J Med Ethics*.
Schroeder D “Benefit sharing: it’s time for a definition” 2006 *J Med Ethics* 205–209.

Schroeder and Lassen–Diaz 2006 *Dev World Bioeth*.
Schroeder D and Lassen-Diaz C “Sharing the benefits of genetic resources: from biodiversity to human genetics” 2006 *Dev World Bioeth* 5(3):135–143.

Schroeder and Gefanas 2009 *Cambridge Quarterly of Healthcare Ethics*.
Schroeder D and Gefanas E “Vulnerability: too vague and too broad?” 2009 *Cambridge Quarterly of Healthcare Ethics* 18:113–121.

Schroeder and Gefanas 2012 *Bioethics*.
Schroeder D and Gefenas E “Realizing benefit sharing-the case of post-study obligations” 2012 *Bioethics* 26(6):305–314.

Schuklenk and Kleinsmidt 2006 *Developing World Bioethics*.
Schuklenk U and Kleinsmidt A “North-South benefit sharing arrangements in bioprospecting and genetic research: a critical ethical and legal analysis” 2006 *Developing World Bioethics* 1471–8731.

Schwartz 1995 *Nous*.
Schwartz J “What’s wrong with exploitation?” 1995 *Nous* 29(2):158–188.

Sedyaningsih *et al* 2008 *Ann Acad Med Singap*.
Sedyaningsih ER, Isfandari S, Soendoro T *et al* “Towards mutual trust, transparency and equity in virus sharing mechanism: the avian influenza case of Indonesia” 2008 *Ann Acad Med Singap* 37(6):482–488.

Simm 2005 *Genomics, Society and Policy*.
Simm K “Benefit sharing: an inquiry regarding the meaning and limits of the concept in human genetic research” 2005 *Genomics, Society and Policy* 1(2):29–40.

Simm 2007 *Nature Reviews Genetics*.
Simm K “Benefit sharing: a look at the history of an ethics concern” 2007 *Nat Rev Genet* 8(7):496–496.

Skene 2002 *Nature Reviews Genetics*.
Skene L “Ownership of human tissue and the law” 2002 *Nature Reviews Genetics* 3:145–147.

Slabbert 2011*Tydskrif vir Hedendaagse Romeins-Hollandse*.
Slabbert MN “The legal regulation of access and benefit sharing of human genetic resources in South Africa” 2011 *74 Tydskrif vir Hedendaagse Romeins-Hollandse Reg* 605–632.

Slabbert and Pepper 2011*Tydskrif vir Hedendaagse Romeins-Hollandse*.
Slabbert MN and Pepper MS “’A room of our own?’ Legal lacunae regarding genomic sovereignty in South Africa” 2011 *73 Tydskrif vir Hedendaagse Romeins-Hollandse Reg* 432–50.

Staunton and Moodley 2016 *South African Medical Journal*.
Staunton C and Moodley K "Data mining and biological sample exportation from South Africa: a new wave of bioexploitation under the guise of clinical care?" 2016 *South African Medical Journal* 106(2):136–138.

Sudoi, De Vries and Kamuya 2021 *BMC Medical Ethics*.
Sudoi A, De Vries J and Kamuya D “A scoping review of considerations and practices for benefit sharing in biobanking” 2021 *BMC Medical ethics* 22(1):1–16.

Swain and Marusyk 1990 *Hastings Centre Report*.
Swain MS and Marusyk RW “An alternative to property rights in human tissue” 1990 *Hastings Centre Report* 20(5):12–16.

Thaldar, Botes and Nienaber 2020 *BMC Medical Ethics*
Thaldar DW, Botes M and Nienaber A “South Africa’s new standard material transfer agreement: proposals for improvement and pointers for implementation” 2020 *BMC Medical Ethics* 21(1):1–13

Thaldar and Shozi 2021 *South African Law Journal*.
Thaldar DW and Shozi B “The legal status of human biological material used for research” 2021 *South African Law Journal*.

Tishkoff *et al* 2009 *Science*.
Tishkoff *et al* “The genetic structure and history of Africans and African Americans” 2009 *Science* 324:1035–44.

Troug, Kesselheim and Joffe 2012 *Science*.
Troug RD, Kesselheim AS and Joffe S “Paying patients for their tissue: the legacy of Henrietta Lacks” 2012 *Science* 337:37–38.

Winickoff 2003 *Jurimetrics*.
Winickoff D “Governing population genomics: law, bioethics, and biopolitics in three case studies” 2003 *Jurimetrics* 43(2):187–228.

Winickoff and Winickoff 2003 *New Engl J Med*.
Winickoff DE and Winickoff RN “The charitable trust as a model for genomic biobanks” 2003 *New Engl J Med* 349(12):1180–1184.

Wolitz, Emanuel and Shah 2009 *Lancet*.
Wolitz R, Emanuel EJ and Shah S “Rethinking the responsiveness requirements for international research” 2009 *Lancet* 2374: 847–49.

Wood 1995 *Social Philosophy and Policy*.
Wood A “Exploitation” 1995 *Social Philosophy and Policy* 12(2):136–158.

Yassin *et al* 2010 *Cancer Epidemiology Biomarkers Prev*.
Yassin R, Lockhart N, Del Riego MG *et al* “Custodianship as an ethical framework for biospecimen-based research” 2010 *Cancer Epidemiology Biomarkers Prev* 19(4):1012–1015.

7.5 South African legislation (Acts of Parliament and Regulations)

1. Biodiversity Act 10 of 2004.
2. Constitution of the Republic of South Africa, 1996.
3. General Law (Anti-Money Laundering and Combating Terrorism Financing) Amendement Act of 2022.
4. Intellectual Property Rights for Publically Financed Research and Development Act 51 of 2008.
5. National Health Act 61 of 2003.
6. National Material Transfer Agreement of Human Biological Materials of 2018.
7. Patents Act 57 of 1978.
8. Patents Amendment Act 20 of 2005.
9. Trust Property Control Act 57 of 1988.
10. Protection of Personal Information Act 4 of 2013.
11. Regulations relating to the Artificial fertilisation of persons. GN R 175 in Government Gazette 35099 of 2 March 2012.
12. Regulations relating to the use of human biological material. GN R 177 in Government Gazette 35099 of 2 March 2012.
13. Regulations relating to the general control of human bodies, tissue, blood, bloodproducts and gametes. GN R 180 in Government Gazette 35099 of 2 March 2012.
14. Regulations relating to Tissue banks. GN R 182 in Government Gazette 35099

15. of 2 March 2012.
16. Regulations relating to Stem Cell banks. GN R 183 in Government Gazette 35099 of 2 March 2012.
17. San Code of Research Ethics

7.6 South African policies and guidelines

1. HPCSA “Guidelines for Good Practice in Health Care Professions: Guidelines on Over servicing, Perverse Incentives and Related Matters” September 2016 Booklet 11.
2. HPCSA “Guidelines for Good Practice in Health Care Professions: General Ethical Guideline for Health Researchers.” September 2016 Booklet 13.
3. HPCSA “Guidelines for Good Practice in Health Care Professions: General Ethical Guidelines for Biotechnology Research in South Africa.” 2008.
4. National Department of Health. 2015. “Ethics in Health Research: Principles, Processes and Structures.”

7.7 Foreign legislation

United Kingdom

British Theft Act 1968
Care Act 2014
Human Tissue Act 2004 (United Kingdom).

Uganda

Constitution of the Republic of Uganda, 1995.
Public Health Act 1935 (Uganda).

Australia

National Health and Medical Research Council Act 1992

7.8 Foreign guidelines

Australian Government, NHMRC. National Statement on Ethical Conduct in Human Research 2007 (updated in 2018)

https://www.nhmrc.gov.au/research-policy (Date of use: 26 May 2023).

https://www.nhmrc.gov.au/about-us/publications/national-statement-ethical-conduct-human-research-2007-updated-2018#block-views-block-file-attachments-content-block-1 (Date of use: 26 May 2023).

Australian Code for the Responsible Conduct of Research. https://www.nhmrc.gov.au/about-us/publications/australian-code-responsible-conduct-research-2018#block-views-block-file-attachments-content-block-1 (Date of use: 26 May 2023).

Human Tissue Authority (UK) Code of Practice of Guiding Principles and the Fundamental Principle of Consent https://content.hta.gov.uk/sites/default/files/2020-11/Code%20A.pdf (Date of use: 26 May 2023).

Human Tissue Authority (UK) Code of Practice and Standards for Research https://content.hta.gov.uk/sites/default/files/2020-11/Code%20A.pdf_(Date of use: 26 May 2023).

Human Research Authority (UK) Standard Operating Procedures https://s3.eu-west-2.amazonaws.com/www.hra.nhs.uk/media/documents/RES_Standard_Operating_Procedures_Version_7.5.1_August_2021_Final_Accessible_07lVkXt.pdf (Date of use: 26 May 2023).

Ministry of Health. National Kenyan Guidelines for Research and Development of HIV/AIDS Vaccines. Appendix 5: Biological Material Transfer Agreement. Kenya: Ministry of Health 2005. https://www.globalgiving.org/pfil/1108/projdoc.pdf (Date of use: 26 May 2023).

Medical Research Council (UK) Good Research Practice: Principles and Guidelines https://www.ukri.org/publications/principles-and-guidelines-for-good-research-practice/ (Date of use: 26 May 2023).

Medical Research Council (UK) Operational and Ethical Guidelines relating to Human Tissue and Biological Samples for Use in Research https://www.ukri.org/publications/human-tissue-and-biological-samples-for-use-in-research/ (Date of use: 26 May 2023).

Uganda's National Guidelines for research Involving Humans as Research Participants https://uncst.go.ug/main/wp-content/uploads/download-manager-files/Human%20Subjects%20Protection%20Guidelines%20July%202014.pdf (Date of use: 26 May 2023).

Uganda's National Research Biobanking Guidelines https://uncst.go.ug/files/National_Biobanking_Gudelines.pdf (Date of use: 26 May 2023).

7.9 International and regional instruments and guidelines

Council for International Organisations of Medical Sciences in collaboration with the World Health Organisation, *International Ethical Guidelines for Health-related Research Involving Humans*, Geneva 2016.

Council of Europe Convention for the protection of human rights and dignity of human beings with regards to the application of biology and medicine: Convention of Human Rights and Biomedicine. https://rm.coe.int/168007cf98 (Date of use: 10 October 2023).

Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation. Convention on Biological Diversity 2011.

United Nations Convention on Biological Diversity (1992).

United Nations Convention on Law of the Sea (1982).

United Nations Educational, Scientific and Cultural Organization's International

Declaration on Human Genetic Data (2003).

United Nations Educational, Scientific and Cultural Organisation's (UNESCO's) Universal Declaration on the Human Genome and Human Rights (1997).

United Nations Educational, Scientific and Cultural Organisation's (UNESCO's) Universal Declaration on Bioethics and Human Rights (2005).

World Health Organisation's Guideline for Obtaining Informed Consent for the Procurement and Use of Human Tissues, Cells and Fluids in Research (2003).

World Medical Association Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects adopted by the 18th WMA General Assembly, Helsinki, Finland, June 1964 and amended by the 64th WMA General Assembly, Fortaleza, Brazil, October 2013.

World Medical Association Declaration of Taipei on Ethical considerations regarding Health Databases and Biobanks adopted by the 53rd WMA General Assembly, Washington, DC, USA, October 2002 and revised by the 67th WMA General Assembly, Taipei, Taiwan, October 2016.

7.10 Internet sources

Andada P and Cook Lucas J "Majengo HIV/AIDS Research Case. A Report for GenBenefit, 2007" https://clok.uclan.ac.uk/16039/1/TRUST-664771-Paradigmatic-Case-Studies-WP1-Final.pdf (Date of use: 26 May 2023).

Australian National Statement on Ethical conduct in Human Researh https://www.nhmrc.gov.au/about-us/publications/national-statement-ethical-conduct-human-research-2007-updated-2018#block-views-block-file-attachments-content-block-1 (Date of use: 27 May 2023).

Bandewar et al “The origins of a research community in the Majengo observational cohort study” https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-10-630 (Date of use: 27 May 2023).

BDO Wealth advisers “Trusts: All you need to know” https://www.bdo.co.za/getmedia/1ed18ab6-f01e-4a62-83f2-ce1d315d8898/bdo-trust#:~:text=The%20Trust%20Property%20Control%20Act,of%20certain%20persons%20or%20entities. (Date of use: 10 October 2023).

Chennells R and Schroeder D “The San Code of Research Ethics: Its Origins and History” available at: http://www.globalcodeofconduct.org/wp-content/uploads/2019/02/SanCodeHistory.pdf (Date of use: 27 May 2023).

Commercial Use of Human Biological Materials, American Medical Association, Code of Medical Ethics https://www.ama-assn.org/delivering-care/ethics/commercial-use-human-biological-materials (Date of use: 27 May 2023).

Companies and Intellectual Property Commission http://www.cipc.co.za (Date of use: 27 May 2023).

Company profile of Ardais Corp as listed by Bloomberg https://www.bloomberg.com/profile/company/551614Z:US (Date of use: 27 May 2023).

Constitution of Uganda https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/44038/90491/F206329993/UGA44038.pdf (Date of use: 27 May 2023).

Global Forum for Health Research The 10/90 report on health research 2000.Geneva: Switzerland https://apps.who.int/iris/bitstream/handle/10665/66474/Global_Forum_for_Health_Research_eng.pdf?sequence=1&isAllowed=y (Date of use: 10 October 2023).

Health Professional Council of South Africa: Professional Practise Ethics Booklet 13. General Ethical Guidelines for Health Researchers https://www.hpcsa.co.za/Uploads/professional_practice/ethics/Booklet_13_Gen_Ethical_Guidelines_for_Health_Researchers.pdf (Date of use: 27 May 2023).

Hexa Research. Tissue Engineering Market Analysis, Market Size, Application analysis, regional outlook, Competitive strategies and Forecasts, 2016—2024. Felton, CA: Hexa Research, 2015 http//www.hexaresearch.com/research-report/tissue-engineering-market (Date of use: 27 May 2023).

HUGO Ethics Committee Statement on Benefit Sharing https://www.eubios.info/BENSHARE.htm#:~:text=The%20HUGO%20Ethics%20Committee%20recommends,the%20issue%20of%20benefit%2Dsharing (Date of use: 27 May 2023).

Human Genetics and Genomics in South Africa: Ethical Legal and Social Implications published by Academy of Science of South Africa http://bit.ly/3sH15hH (Date of use: 27 May 2023).

Human Genome Organisation (HUGO) http://www.hugo-international.org/history (Date of use 27 May 2023).

Human Heredity and Health in Africa3 https://h3africa.org/ (Date of use: 27 May 2023).

Human Tissue Authority: Code of Practice A Guiding Principles and the Fundamental Principle of Consent https://content.hta.gov.uk/sites/default/files/2020-11/Code%20A.pdf (Date of use: 27 May 2023).

International Science Council: membership of Uganda https://council.science/member/uganda-uganda-national-council-for-science-and-technology-uncst/ (Date of use: 27 May 2023).

Laube and Moss “Pseudoxanthoma elasticum” 2005 Arch Dis Child 90:754-756 available at: https://adc.bmj.com/content/archdischild/90/7/754.full.pdf (Date of use: 27 May 2023).

Allied Marker Research “Molecular Diagnostic Market Research” available at https://www.alliedmarketresearch.com/molecular-diagnostics-market (Date of use: 20 September 2023).

Mckenna M “Colonialists are coming for blood-Literally” 2019 *Wired* https://www.wired.com/story/ebola-epidemic-blood-samples/ (Date of use: 27 May 2023).

Njilo N “Stellenbosch University demands return of DNA samples-but UK Lab hits back” 2019 *Timeslive* available at: https://www.timeslive.co.za/news/south-africa/2019-10-16-stellenbosch-university-demands-return-of-dna-samples-but-uk-lab-hits-back/ (Date of use: 27 May 2023).

OECD Frascati Manual available at: https://www.oecd-ilibrary.org/docserver/9789264199040-en.pdf (Date of use: 27 May 2023).

Resnik D “The human genome: common resource but not common heritage” available at: https://www.researchgate.net/publication/255581513_The_human_genome_common_resource_but_not_common_heritage (Date of use: 27 May 2023).

Simm K “Benefit sharing frameworks—justifications for and against benefit sharing in human genetic research” 2007 www.uclan.ac.uk/genbenefit (Date of use: 27 May 2023).

South African Constitution https://www.justice.gov.za/legislation/constitution/pdf.html (Date of use: 27 May 2023).

South Africa. Department of Health Ethics in Health Research Guidelines https://www.health.gov.za/wp-content/uploads/2022/05/NHREC-DoH-2015-Ethics-in-Health-Research-Guidelines-1.pdf (Date of use: 27 May 2023).

South African General Laws (Anti-Money Laundering and Combating TerrorismFinancing) Ammendment Act 22 of 2022 https://www.gov.za/documents/general-laws-anti-money-laundering-and-combating-terrorism-financing-amendment-act-22-2022 (Date of use:10 October 2023).

South Africa Government Protection of Personal Informant Act 2013 https://www.gov.za/sites/default/files/gcis_document/201409/3706726-11act4of2013protectionofpersonalinforcorrect.pdf (Date of use: 27 May 2023).

South Africa Patents Amendment Act 2005 https://wipolex.wipo.int/en/text/179614 (Date of use: 27 May 2023).

South African Trust Property Control Act 57 of 1998 https://www.gov.za/sites/default/files/gcis_document/201505/act-57-1988_0.pdf (Date of use:10 October 2023).

South African Revenue Service https://www.sars.gov.za/businesses-and-employers/trusts/types-of-trust/ (Date of access: 9 October 2023)

Stokstad E “Genetic lab accused of misusing African DNA” 2019 Science 366(6465):555-556 available at: https://www.science.org/doi/full/10.1126/science.366.6465.555 (Date of use: 27 May 2023).

The Convention on Biological Diversity 2002: Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their utilization, https://www.cbd.int/doc/publications/cbd-bonn-gdls-en.pdf (Date of use: 27 May 2023).

The Public Health Act of Uganda http://library.health.go.ug/sites/default/files/resources/Public%20Health%20Act.pdf (Date of use: 27 May 2023).

The San people and the Hoodia plant available at: https://gfbr.global/wp-content/uploads/2015/09/Fifth_Casestudy4.pdf (Date of use: 26 May 2023).

Thambisetty S “Human genome patents and developing countries” available at: http://www.iprcommission.org/papers/pdfs/study_papers/10_human_genome_patents.pdf (Date of use: 27 May 2023).

Uganda National Council for Science and Technology https://www.uncst.go.ug (Date of use: 27 May 2023).

Uganda National Council for Science and Technology: National Research Biobanking Guidelines https://uncst.go.ug/files/National_Biobanking_Gudelines.pdf (Date of use: 27 May 2023).

Uganda National Guidelines for Research involving Humans as Research Participants https://uncst.go.ug/main/wp-content/uploads/download-manager-files/Human%20Subjects%20Protection%20Guidelines%20July%202014.pdf (Date of use: 27 May 2023).

UK Constitution http://www.ucl.ac.uk/constitution-unit/what-uk-constitution/what-uk-constitution (Date of use: 27 May 2023).

United Kingdom Human Tissue Act 2004 Explanatory Notes https://www.eui.eu/Projects/InternationalArtHeritageLaw/Documents/NationalLegislation/UnitedKingdom/humantissueact2004explanatorynotes.pdf (Date of use: 27 May 2023).

United Kingdom Human Tissue Act 2004 https://www.hta.gov.uk/policies/human-tissue-act-2004 (Date of use: 27 May 2023).

United Kingdom NHS Health Research Authority Research Ethics Committee: Standard Operating Procedures https://www.hra.nhs.uk/about-us/committees-and-services/res-and-recs/research-ethics-committee-standard-operating-procedures/ (Date of use: 27 May 2023).

UK Health Department Research Ethics Services: Standard Operating Procedures for Research Ethics Committees https://s3.eu-west-2.amazonaws.com/www.hra.nhs.uk/media/documents/RES_Standard_Operating_Procedures_Version_7.5.1_August_2021_Final_Accessible_07lVkXt.pdf (Date of use: 27 May 2023).

UK Medical Research Council (MRC) https://www.ukri.org/councils/mrc/Date of use: 27 May 2023).

UK MRC Principles and guidelines for good research practice https://www.ukri.org/publications/principles-and-guidelines-for-good-research-practice/ (Date of use: 27 May 2023).

UK MRC Human tissue and biological samples for use in researchhttps://www.ukri.org/publications/human-tissue-and-biological-samples-for-use-in-research/ (Date of use: 27 May 2023).

United Nations Convention on the Law of the Sea https://www.imo.org/en/ourwork/legal/pages/unitednationsconventiononthelawofthesea.aspx#:~:text=The%20United%20Nations%20Convention%20on,the%20oceans%20and%20their%20resources. (Date of use: 27 May 2023).

UNESCO Universal Declaration on Bioethics and Human Rights https://unesdoc.unesco.org/ark:/48223/pf0000146180 (Date of use: 27 May 2023).

United Nations Universal Declaration of Human Rights https://www.un.org/en/about-us/universal-declaration-of-human-rights (Date of use: 23 May 2023).

Visiongain 2009 In vitro diagnostics: Market analysis 2009–2024 https://www.visiongain.com (Date of use: 27 May 2023).

Worldbank reports on South Africa
https://thedocs.worldbank.org/en/doc/bae48ff2fefc5a869546775b3f010735-0500062021/related/mpo-zaf.pdf (Date of use: 10 October 2023).

https://databankfiles.worldbank.org/public/ddpext_download/poverty/987B9C90-CB9F-4D93-AE8C-750588BF00QA/current/Global_POVEQ_ZAF.pdf (Date of use :10 October 2023).

World Medical Association of Helsinki. Ethical Principles for Medical Research Involving Human Subjects https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/ (Date of use: 27 May 2023).
Yu Ni, Chen F, Ota S et al “Larger genetic differences within africans than between Africans and Eurasians”2002 Genetics available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1462113/ (Date of use: 27 May 2023).

7.11 Newspaper articles

Pomfret and Nelson 2018-12-20

Pomfret J and Nelson D “An isolated region’s genetic mother lode” 2000-12-20 https://www.washingtonpost.com/archive/politics/2000/12/20/an-isolated-regions-genetic-mother-lode/4280cf1f-ae9c-42f7-b132-9ddbe26e502f/ (Date of use: 27 May 2023).

Xiong and Wang 2002 *Outlook weekly*

Xiong L and Wang Y “Harvard University’s genetic research in China is illegal”2002 *Outlook Weekly* 15:48-50

7.12 Miscellaneous sources

A webinar titled “Ethically managing data transfers for research in SA” organised by the SA Medical Research Council, in collaboration with the Department of Science & Innovation of South Africa was held Jun 23, 2022 to deliberate the way forward for a National DTA. https://www.assaf.org.za/wp-content/uploads/2022/06/22412-Data-Transfer-Webinar-Programme-final.pdf (Date of use: 27 may 2023).

H3Africa Working Group. "Harnessing genomic technologies toward improving health in Africa: Opportunities and challenges" 2011 *H3Africa White Paper. Washington, DC: National Institutes of Health.*

7.13 Ethical clearance certificate

UNISA university of south africa

UNISA 2020 ETHICS REVIEW COMMITTEE

Date: 2020:08:12

ERC Reference No: ST87
Name: P Chunda-Sinombe

Dear Ms P Chunda-Sinombe

Decision: Ethics Approval from 2020:08:12 to 2023:08:12

Researcher: Ms P Chunda-Sinombe

Supervisor(s): Prof M Labuschaigne & Prof S Mahomed

An ethico-legal analysis of benefit-sharing for health research in South Africa

Qualification: PhD in Law

Thank you for the application for research ethics clearance by the Unisa 2020 Ethics Review Committee for the above mentioned research. Ethics approval is granted for 3 years.

*The **Negligible risk application** was **reviewed** by the CLAW Ethics Review Committee on 12 August 2020 in compliance with the Unisa Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.*

The proposed research may now commence with the provisions that:

1. **The researcher will ensure that the research project adheres to the relevant guidelines set out in the Unisa Covid-19 position statement on research ethics attached. Provisional authorisation is granted.**

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2. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
3. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the CLAW Committee.
4. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
5. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing, accompanied by a progress report.
6. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
7. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data require additional ethics clearance.
8. No field work activities may continue after the expiry date **2023:08:12**. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

The reference number ST 87-2020 should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.

Yours sincerely,

Prof T Budhram
Chair of CLAW ERC
E-mail: budhrt@unisa.ac.za
Tel: (012) 433-9462

Prof M Basdeo
Executive Dean : CLAW
E-mail: MBasdeo@unisa.ac.za
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7.14 Digital receipt (Turnitin)

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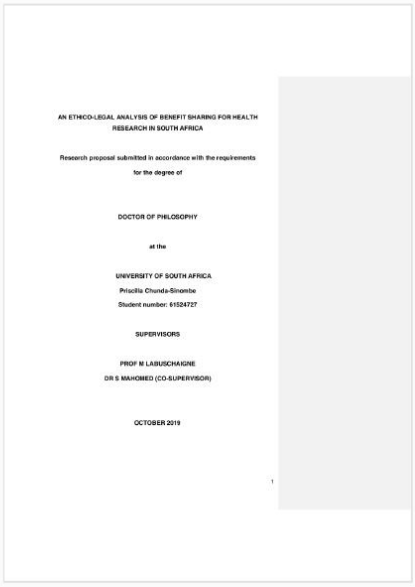

AN ETHICO-LEGAL ANALYSIS OF BENEFIT SHARING FOR HEALTH RESEARCH IN SOUTH AFRICA

Research proposal submitted in accordance with the requirements for the degree of

DOCTOR OF PHILOSOPHY

at the

UNIVERSITY OF SOUTH AFRICA

Priscilla Chunda-Sinombe

Student number: 61524727

SUPERVISORS

PROF M LABUSCHAIGNE

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OCTOBER 2019