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Introduction

Cameroon, a former German colony (1884–1914) and subsequently a United Nations mandated territory entrusted partly to France and partly to Great Britain, is a Central African country with a population of approximately 20 million inhabitants (EDS, 2004) of which about 50 % are youth. Cameroon is a multiethnic, multicultural, and multilingual country (Tangwa, 1999), having English and French as its official languages, with French clearly predominating. The section of Cameroon that had come under French administration (about $\frac{3}{4}$ of the total

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population and land mass), following the departure of its German colonizers in 1914, had its independence in January 1960, while that under British administration (about $\frac{1}{4}$ of the total population and land mass) had its own independence in October 1961 at the same time that it reunified, following an 11 February 1961 United Nations–conducted plebiscite, with the French section. Cameroon shares territorial boundaries with the following other African countries: Nigeria, Chad, Central African Republic, Republic of the Congo (Brazzaville), Gabon, and Equatorial Guinea. Because of its great representative diversity, Cameroon is often referred to as “Africa in Miniature.” The country has enjoyed political stability since the mid 1960s but the governing system is not easy to characterize using objective data and parameters. It might be described as a dictatorship slowly attempting to transform into a democracy. Cameroon’s current ruler has been in power continuously for three decades and counting, in spite (or perhaps because) of the existence of over 200 opposition political parties and regular “democratic” elections. Cameroon is a country of many contradictions. It has remarkable biodiversity and enormous material and human resources, yet it ranks among the less developed of sub-Saharan African countries. The road infrastructure has experienced little change or improvement in the last three decades; youth unemployment and underemployment combined, by conservative estimates, is around 30 % and electricity and pipe-borne water are a luxury in nearly all of its towns and villages; urbanization and rural–urban migration have been quite intensive in the last three decades and several towns now have a population of over one million inhabitants; and yet, none of Cameroon’s cities, including the capital city, Yaounde, has street names, let alone street numbers; and yet again, Cameroon’s political elite count among the wealthiest and most highly educated on the African continent.

Disease Burden

Cameroon’s great diversities and representativeness can be said to extend to the disease profile of the country. As in most other African countries south of the Sahara, a number of both communicable and noncommunicable diseases are endemic in Cameroon, of which malaria, drug-resistant tuberculosis, and HIV/AIDS are currently a major concern in the health sector because of their high prevalence and deadly nature. According to the Global Health Observatory of the World Health Organization (www.afro.who.int/index.php?option=com_docman&task=doc_download&gid=26&Itemid=2111, accessed 24 April 2011), 17.1 % of the population of Cameroon live below the poverty line (less than \$1 a day). The infant mortality rate stands at 87 per 1,000 live births and the under 5 mortality rate at 149 per 1,000 live births. The major causes of death in children under 5 include neonatal-related causes, malaria, pneumonia, and diarrhea. The maternal mortality ratio for Cameroon is 730 per 100,000 live births.

This disease profile shows clearly some of the disease burden of Cameroon that should be the concern of public health authorities and researchers alike. For most of

the diseases mentioned above, the public health authorities in Cameroon do have long-term programs aimed at eradication or at least containment and general improvement of the situation, and there has been a significant increase in health research activity in the country in the last two decades or so, during which time a number of advanced medical technologies, such as endoscopic surgery or in vitro fertilization (Tangwa, 2002, p. 56), have been experimented or introduced. But the whole health situation of Cameroon raises ethical problems and challenges at several levels that may not be quite evident for the time being. For example, the introduction of sophisticated expensive technologies in a few urban centers of a country where potable water is still a rarity and where primary health-care diseases like cholera and meningitis still exist in epidemic proportions, or carrying out diverse intensive medical researches on human beings in a situation where prior ethical review of such research, let alone research governance and regulation, are still problematic (Tangwa & Munung, 2011) clearly raise ethical problems and challenges that need immediate and sustained attention.

Overview of the State of Bioethics

Like most developing countries, Cameroon is still in the process of embracing modern concepts and practice of bioethics, and the rate of progress is rather modest. Despite the multidisciplinary nature of bioethics, very few academic institutions in Cameroon have embraced it as a permanent subject on the curriculum and there are very few initiatives with an interest solely in bioethics. The increased incidence of health-related research, progress in molecular biology, research on genetically modified organisms (GMOs), particularly in the agricultural sector, the presence of fertility clinics, etc., have so far failed to generate or stimulate in Cameroon the sort of lively discourse, controversies, and debates that could lead to appropriate regulation and legislation as have been witnessed in other countries.

Traditional medical ethics is the only branch of bioethics with which many medical professionals in Cameroon are somewhat familiar. The first medical school in Cameroon (Centre Universitaire des Sciences de la Santé – CUSS) was created in 1969. Today (2012) a number of medical schools, both public and private, exist in different higher institutions of learning. But the contact of medical students with bioethics in Cameroon, up to the present, is more or less limited to the occasional lecture or seminar and those portions of traditional medical ethics related to the Hippocratic and Nightingalean Codes. At graduation, students of the Faculty of Medicine and Biomedical Sciences of the University of Yaounde 1 (formerly CUSS) take the following oath:

En présence des maîtres de cette école, de mes chers condisciples et devant l'effigie d'Hippocrate. Je promets et je jure d'être fidèle aux lois de l'honneur et la probité dans l'exercice de la médecine. Je donnerai mes soins gratuits à l'indigent et n'exigerai jamais un salaire au-dessus de mon travail. Je ne permettrai pas que des considérations de religion, de nation, de race viennent s'interposer entre mon devoir et mes patients. Admis à l'intérieur des maisons, mes yeux ne verront pas ce qui s'y passe, ma langue

taira les secrets qui me seront confiés et mon état ne servira pas à corrompre les mœurs ou à favoriser le crime. Respectueux et reconnaissant envers mes maîtres, je rendrai à leurs enfants l'instruction que j'ai reçue de leur père. Que les hommes m'accordent leur estime si je suis fidele à mes promesses: Que je sois couvert d'opprobre et méprisé de mes condisciples si j'y manque!

In the presence of the teachers of this school, my dear fellow students and in front of Hippocrates' effigy, I promise and swear to be loyal to the laws of honour and probity in the practice of medicine. I will freely care for the poor and will never demand pay that exceeds my work. I will not allow matters of religion, nation and race to interfere with my duty and my patients. If I get into a house, my eyes will not see what is happening there, my tongue will not reveal the secrets which are confided to me and my presence will neither break manners nor favour crime. Respectful and grateful to my teachers, I will impart to their offspring the knowledge I have acquired from their father. May people respect me if I keep my promises: May opprobrium be heaped on me and my fellow students despise me if I fail! [English translation by the translation unit of the AMANET Sub-Hub (ASH), Yaounde].

The version of the Florence Nightingale Oath, as modified by the Cameroon Nurses Association and which is read by nurses during convocation ceremonies reads:

I solemnly swear before GOD and in the presence of this assembly, to faithfully carry out and fulfill the duties of my profession. I shall not willfully take or administer any dangerous drug. I shall do my best to improve the level of my profession.

I shall keep in total confidence anything private that will be confided to me and all the secrets of the family, as well as those of the services made known to me. I shall do my best to faithfully collaborate with other members of the health team and see to the well-being of those left under my care.

So help me God

Even as attempted adaptations and modernized versions, the text of these Codes harbor many archaic elements and important gaps that would surely have been addressed were there adequate consciousness of the current global state of the art of medical ethics, nursing ethics, or bioethics in general. It is instructive to compare the version of the Hippocratic Oath above with, for example, the version used by the Faculty of Medicine of the University of Bristol, UK, or that written in 1964 by Louis Lansagna, academic Dean of the School of Medicine, Tufts University, used by many other medical schools the world over. These other adaptations are succinct and free from both archaic ideas and language.

Biotechnology, molecular biology, bioinformatics, and genetic and genomic studies are not completely unknown in Cameroon, as they have recently been introduced at several institutions in connection with programs or projects in the health, agriculture, or environmental sectors. Some Cameroonian researchers and research institutions are taking the initiative in some of these novel and important fields of research, either alone or in collaboration with northern colleagues and institutions, as can be gleaned from some of the publications emanating from the country.

However, these novel fields of research raise equally novel ethical problems and challenges. There are, for example, ethical questions and issues that are related to research that uses bioinformatics tools (Marturano, 2009a, b) and others that are

related to genetic and genomic research (De Vries et al., 2011; Dubochet, 2009; Roche, 2009; Trinidad et al., 2010). Some of these problems, in the case of Cameroon, have recently been highlighted in a published paper on the ethical aspects of human genetic studies in sub-Saharan Africa (Wonkam, Kenfack, Muna, & Ouwe-Missi-Oukem-Boyer, 2011).

In 2003, Cameroon's Ministry of Environment and Nature Protection proposed a law (Law N° 2003/006 of 21 April 2003) that had been adopted by Cameroon's Parliament or National Assembly. This law focuses on "Safety Regulations Governing Modern Biotechnology in Cameroon" and has as main objectives the following:

- To regulate the safety, development, use, manipulation, and cross-border movement of genetically modified organisms that may negatively affect human and animal health, biodiversity, and the environment
- To ensure safety and ethics in modern biotechnological research and development and lay down the procedure for cross-border movement of genetically modified organisms
- To provide mechanisms for assessing, managing, communicating, and controlling the risks inherent in the use of genetically modified organisms or those having new traits as a result of modern biotechnological activity that may negatively affect the environment. . . ."

This law addresses a number of issues in the area of biotechnology including a chapter on "Approval and Authorization." This section states that any research activity, development, production, or manipulation of genetically modified organisms (GMOs) shall be subject to approval by a competent national administration whose decisions are taken within a national committee made up of services and concerned bodies. The "competent national administration" and the "national committee" are not specified nor are the "collaborating services" named. In any case, this law covers only the agricultural domain and does not address genetic technology and manipulations in the domain of human health and health research. Moreover, it is not evident that this law is enforced and it is doubtful that the majority of researchers and users of GMOs in Cameroon are even aware of the existence of this law.

A section of the above law addresses the socioeconomic concerns connected with the use of GMOs. It requires that, before the deliberate release of GMOs into the environment, a thorough study of their ethical and socioeconomic impact on the local population be conducted by a competent authority. This shows, at least, some general awareness that ethical issues/problems are linked with biotechnology but the method and detailed procedures for dealing with them are nowhere specified.

Assisted Reproduction

The WHO estimates that one in four of ever-married women of reproductive age in most developing countries are infertile because of primary or secondary infertility (WHO-DHS, 2004). However, the country statistics for Cameroon fails to report on the infertility rate of the country and rather reports on the fertility rate, which stands at

approximately five children per woman in 2004 (http://www.afro.who.int/index.php?option=com_docman&task=doc_download&gid=26&Itemid=2111). The problem of infertility in Cameroon and Africa in general is an important one especially as people increasingly are taking biological parenthood much more seriously than in the traditional past. This poses social pressures on infertile couples, often leading to a frantic desire to have their own biological child(ren) by all means. In Africa, infertility is considered a curse and having children is still the main reason for marriage and a good reason for polygamy (Tangwa, 2002). As a result, some Cameroonians would surely be celebrating the discovery of in vitro fertilization. Generally speaking, assisted reproduction is not new in the Cameroon context, as it is an important cultural aspect of most tribes or ethnicities. However, this is assisted reproduction mostly in the form of, say, a brother or close relative helping an impotent or infertile kindred by having children for him with his wife or a wife getting a second wife for her husband, if she believes herself to be responsible for their childlessness (Tangwa, 2008). However, “in vitro fertilization,” “frozen gametes,” “surrogate mother,” “hired womb,” and “postmortem parenthood” remain new concepts and vocabularies almost unheard of by many in Cameroon. Though the treatment of infertility is not yet included in Cameroon’s health priorities, Cameroon witnessed the introduction of a fertility clinic in the health sector as early as 1972 and, by 14 April 1998, the first success story of clinically assisted reproduction was registered with the birth of Tommy, the first “test tube” baby born in the central African subregion (<http://www.cliniqueodyssee.com/2fivpress.htm> – accessed 29 April 2011).

It is interesting to note that IVF, for example, which has generated so much debate and even litigation in other parts of the world, could be so quietly introduced in Cameroon. Although IVF certainly solves an important societal problem (infertility), it raises a plethora of ethical concerns, especially for traditional cultures, ranging across considerations related to artificiality, justice, autonomy, risk/benefit ratio, status of the embryo, etc., awareness of which would be incompatible with indifference. At the moment, the law in Cameroon remains silent on these issues and there is little or no discussion on the ethics of these technologies. Some of the reasons for this state of affairs may be related to the fact that such discussion would traditionally be considered taboo in some areas and, in any case, IVF is a service that is unaffordable to the vast majority of those who may need it.

Health Research Ethics

As of 2010, research studies on HIV/AIDS in Cameroon had given rise to a total of 2011 scientific publications (which is partly attributable to the fact that there exist a variety of HIV strains in Cameroon (Peeters, Toure-Kane, & Nkengasong, 2003) which the international research community finds fascinating. However, health-related research in Cameroon is not limited to HIV but includes other communicable and noncommunicable diseases, as most of these diseases are endemic in Cameroon. Most of this health-related research is, however, externally funded (Nyasse, 2005).

With the ever increasing research activity going on in Cameroon (Tangwa, 2007), one would expect that research ethics should also be gaining ground in the country. And, compared to the other branches of bioethics, research ethics can indeed be said to be relatively more developed in Cameroon, but still in general terms rather rudimentary, when compared to the state of research ethics in the developed world or in other African countries, such as South Africa, Ghana, Kenya, or Tanzania. Currently, there are initiatives aimed at building capacity in research ethics for both members of research ethics committees and researchers involved in health-related research. Most of the training in research ethics in Cameroon has been done directly or indirectly (through funding) by the African Malaria Network Trust (AMANET) and the European and Developing Countries Clinical Trials Partnership (EDCTP). A recent Initiative, the Central African Network for Tuberculosis, HIV/AIDS and Malaria (CANTAM) has as one of its objectives to build capacity in clinical trials and ethics in the Central African subregion. Other initiatives concerned with capacity building in research ethics include the Cameroon Bioethics Initiative (CAMBIN), the Cameroon Bioethics Society (CBS), and the Réseau sur l'éthique, le Droit et le SIDA, (REDS), Cameroon.

But in spite of these efforts at capacity building in research ethics and awareness creation, Cameroon's Minister of Public Health, as recently as February 2011, in a circular letter addressed to all stakeholders in health research, could justifiably still open his letter with the following statement:

“Mon attention a été attirée sur le fait que malgré les différentes instructions relatives à la mise en oeuvre de projets de recherche en santé au Cameroun, un grand nombre d'activités de recherche continuent d'être menées dans vos différentes structures sans autorisation préalable du MINSANTE.” [My attention has been drawn to the fact that, in spite of the various instructions regarding the implementation of health research projects in Cameroon, a good number of research activities continue to be carried out in your various structures without the prior authorization of the Ministry of Health]. (Lettre-Circulaire No. D36-13/LC/MINSANTE/SG/DROS/YC). The minister here is, of course, primarily concerned about administrative authorization of health research, but this should go hand in glove with ethics clearance, which is even more important for such research, but things are evidently not yet perfectly united in Cameroon for a human-subjects research environment free from serious ethical concerns. Efforts are currently underway in the Ministry of Public Health to formulate clearer guidelines related to the creation and functioning of research ethics committees which fall under its administrative jurisdiction. But, while this is a very welcome development, it is in principle still a far cry from what is urgently needed, namely, overall country regulation and guidance of biomedical research, especially human subjects research (Tangwa & Munung, 2011).

Animal Ethics

Very little or nothing is heard about animal ethics in Cameroon in spite of the fact that a number of research laboratories use animals such as mice, rats, rabbits, and

nonhuman primates for experimental purposes. There are no animal research ethics committees in Cameroon, and human research ethics committees are scarcely ever concerned about the welfare of animals used in research.

However, some Cameroon-based researchers in the biosciences are increasingly using methods like computer simulations and bacteria and cell culture techniques, and a few laboratories are already working toward the production of monoclonal antibodies (Cho-Ngwa, Daggfeldt, Titanji, & Gronvik, 2005) which could help in reducing the need for animals in research. Based on this, it could be said that researchers in Cameroon are gradually moving toward promoting the 3R principle (Replacement, Reduction, and Refinement) which features among the principles of good clinical practice (GCP).

Training in Bioethics

Currently there are no academic institutions that provide formal training in research ethics in Cameroon and the majority of researchers and members of Research Ethics Committees (RECs) have to rely on web-based courses or workshops and seminars to obtain training in research ethics (Ateudjieu et al., 2009; Nyika et al., 2009). There is, therefore, only very nominal training in bioethics in Cameroon, most of which is focused on health research ethics. Such training is predominantly in the form of workshops or symposia, usually lasting 1–5 days. The target group has predominantly been members of RECs, though a few have targeted investigators or members of drug regulatory bodies. Long-term (greater than a month) training in research ethics is atypical in Cameroon (Tangwa & Munung, 2011). An intensive 2-week course for preclinical and clinical medical students at the Faculty of Medicine and Biomedical Sciences (FMBS), University of Yaounde 1, introduced as part of a cooperation program with the University of Geneva, ran for a few years but floundered on organizational and communication problems and the lack of appropriate interest by the Faculty authorities. Recently, the University of Dschang introduced a course in research ethics to be taught to students in the biological sciences involved in research, but whether such initiative will be sustainable and how it may evolve remains to be seen, especially as it is not evident that the University disposes of qualified teachers for such a course.

Research in Bioethics

There are few empirical studies on bioethics in Cameroon and these mostly are concerned with research ethics. The primary focus has been on assessing the needs or identifying training gaps of RECs (Ateudjieu et al., 2009; Nyika et al., 2009), while a few others have focused on the failed tenofovir trials of the early 1990s in Cameroon (Mack, Robinson, Macqueen, Moffett, & Johnson, 2010). Other researchers have used a bibliometric approach to assess adherence by scientists in

Cameroon to some basic research ethics requirements (Munung, Che, Ouwe-Missi-Oukem-Boyer, & Tangwa, 2011a; Wonkam et al., 2011) and publication ethics in Cameroon journals (Nchangwi, Asahngwa, & Che, 2009). Besides the few empirical studies in bioethics, there exist few academic writings on bioethics in Cameroon. These have mostly been authored by students (theses and dissertations written as partial requirements for obtaining an academic qualification in the university) and researchers (books, book sections, journal articles) in the humanities faculties of universities. The bibliography on bioethics in Cameroon is therefore rather small at present.

Current Bioethics Infrastructure

There are very few structures in Cameroon which can be said to be wholly or partly dedicated to bioethics issues. In fact, most of the structures that exist are in the form of research ethics committees, created in response to the needs of various researchers and research institutions but most of which are not officially recognized let alone accredited by the government. Aside from RECs, there exist a few nongovernmental and not-for-profit organizations dedicated to bioethics issues. These organizations usually have very little funding for their activities as a consequence of which their actions and sphere of influence is rather limited. The activities of these organizations vary but are mostly geared toward sensitization through training workshops or seminars and publications in journals, magazines, and newspapers. Some of these organizations are briefly highlighted below.

Cameroon Bioethics Initiative (CAMBIN)

CAMBIN was created in 2005 and officially recognized in 2006. It is the Cameroon chapter of the Pan African Bioethics Initiative (PABIN). CAMBIN is a not-for-profit, non-governmental, non-political and non-discriminatory, multidisciplinary association with official seat in Yaoundé. The overall objective of CAMBIN is to enable the development of bioethics in Cameroon with the main focus on capacity building and empowerment in biomedical research, through the promotion of research ethics. CAMBIN equally shares the goals and objectives of PABIN and coordinates its activities in such a way as to foster the development of biomedical research through the promotion of bioethics in Africa (Tangwa & Munung, 2011). CAMBIN is equally involved in empirical research in bioethics, organization of training workshops and sessions in bioethics and active participation in bioethics debates in the country. CAMBIN has a research ethics review and consultancy committee, which in addition to reviewing research protocols also provides consultancy services for biomedical research and ethical review of research in Cameroon and the Central African subregion. The administrative structure of CAMBIN is made up of the General Assembly, the Executive Council and the Ethics Review and Consultancy Committee. Membership into

the organization is open to all persons and institutions interested in bioethics. The current membership of the institution which stands at about 75, is divided into three categories: ordinary members, institutional members, and honorary members. The academic background of its current membership is diverse and is mostly in the biosciences, social sciences/humanities, clinical sciences, law and engineering.

Since its creation in 2005, CAMBIN has registered a number of successes in the area of capacity building through the organization of training workshops for members of research ethics committees as well as for researchers. In recent years CAMBIN has teamed up with AMANET and CANTAM to conduct capacity-building in health research ethics in central Africa for members of ethics review committees and medical products regulatory authorities. The research arm of CAMBIN has recently also become active and is involved in empirical research in bioethics which has led to a number of articles in international peer-reviewed journals (Munung, et al., 2011a; Nchangwi et al., 2009; Tangwa & Munung, 2011) and presentations (oral and poster) in international scientific meetings (Munung, Tangwa, Che, Vidal, & Ouwe-Missi-Oukem-Boyer, 2011b; Ouwe-Missi-Oukem-Boyer, Nyika, Munung, Tangwa, & Ntoumi, 2011).

The major setbacks to the daily operation of the organization have been the lack of adequate legislation governing research and bioethics in Cameroon as a whole and the fact that there is very limited funding available for its activities.

Cameroon Bioethics Society (CBS)

Created in 1995, the Cameroon Bioethics Society (CBS) is, perhaps, the earliest nongovernmental and apolitical organization solely interested in bioethics issues. The mission of the CBS, according to its own report, is to promote information and debates on ethics and morality of life and health and also to organize meetings on scientific and cultural issues on bioethics. Its activities involve promoting specialized studies in the field of Public Health and Human Rights, continuous training of health professionals and members of Ethics Committees, the provision of scientific documentation of high quality, generating interest in bioethics within the scientific community in Africa, promoting the development of ethics and bioethics research in Africa with particular emphasis on African perceptions of bioethics, increasing scientific capacity for multidimensional ethics review and public health in Africa (Cameroon Bioethics Society and the Public Health and Bioethics Research Centre. Report of the Cameroon Bioethics Society, 1990–2008). The CBS has in the past years organized some training workshops in research ethics. It does not, however, seem to have been very active in recent years.

Reseau sur l'éthique, le Droit et le SIDA (REDS), Cameroon

REDS is the Cameroon branch of the African Network on AIDS, Ethics and Human Rights, better known by its French appellation: Réseau Africain sur l'Éthique,

le Droit et le VIH. REDS Cameroon has its headquarters in Yaoundé and is an activist group, created in 1998 and officially legalized in 2000. The main mission of this organization is to advance knowledge and improve education in the ethical and legal fields and to promote actions and measures that respect especially human rights in the fight against HIV/AIDS in Cameroon. The current areas of intervention of REDS include public policy and human rights, ethics and biomedical research, clinical ethics, resource mobilization, and direct aid, including legal and judicial assistance for persons living with HIV/AIDS (PLWHA) and their relatives.

In 2005, together with eight other organizations, REDS set up an interassociative working group on biomedical research in Cameroon (GTIA), whose objectives consist of effective and appropriate ethical review of research protocols especially on HIV-related research; ensuring that sloppy and unethical research does not go through unnoticed; participating in the protection of persons recruited as research participants in biomedical research; helping researchers and research agencies in optimizing their research protocols and acting as a watchdog for research studies carried out in Cameroon (Yomgne, 2008, 2009b).

REDS participated actively in the attempt at protecting research participants that were recruited in the controversial Tenofovir trials in the early 1990s in Cameroon. However, REDS Cameroon admits a couple of challenges and these include the fact that GTIA is yet to convince many researchers and research agencies of their ability to be neutral and to protect the ideas of researchers who submit their research proposals for review (Yomgne, 2009b).

The presence of these nongovernmental, bioethics-related organizations in Cameroon has helped to spark up some bioethics discussions, if not debates, in the country. Of particular note here are current discussions within the Ministry of Public Health to better organize health research and research regulation within the ministry, including the creation of a more credible nation-wide ethics review committee, subsequent to, if not perhaps consequent on, the critiquing of the “national ethics committee” (Tangwa & Munung, 2011).

Current Bioethics Issues, Discussions, and Debates

As already stated, research ethics is relatively more advanced in Cameroon when compared to other branches of bioethics. Accordingly, the majority of bioethics issues, discussions, and debates in Cameroon occur around research ethics. Nevertheless, very little progress has been made even in the area of research ethics. As a matter of fact, most of the discussions and debates on research ethics began after the Tenofovir trials were suspended in Cameroon and Cambodia. A couple of workshops to build the capacity of researchers and members of RECs in research ethics have been organized in Cameroon, mostly with foreign institutions taking the lead and/or footing the bill. There is very little effort in terms of funding from the government of Cameroon to build capacity in research ethics. The initiative to organize training is taken by some nongovernmental organizations with very little

funding or with funding from international organizations. Consequently, the level of research ethics in Cameroon is still rather embryonic. Very few members of research ethics committees have even basic training in research ethics (Ateudjieu et al., 2009), while many investigators, graduates, and medical students have only the most rudimentary notions about research ethics.

There are a good number of research ethics committees in Cameroon though, for the time being, only two – the National Ethics Committee (NEC) and the Ethics Committee of the Chantal Biya International Reference Centre (CIRCB) – are officially recognized by the Ministry of Public Health which is charged with the approval or recognition of RECs in Cameroon. Researchers in Cameroon have in the past years obtained or at any rate documented research ethics approval from a plethora of RECs and IRBs in Cameroon (Munung et al., 2011a). In 1987, there existed just one ethics committee in Cameroon and by 2009 the number had greatly increased. It is arguable if “unrecognized” RECs in Cameroon, some of which conform fully to international standards and regulations, should continue to exist unrecognized. In this regard, some of the RECs/IRBs have submitted files to the Ministry of Public Health requesting official recognition though, till date, a decision on their official status is yet to be obtained. In the meantime, these RECs continue to review research protocols in spite of the uncertainty and lack of clarity regarding their official status. The state of RECs in Cameroon thus remains rather controversial (Tangwa & Munung, 2011) when compared to other countries like South Africa, Kenya, Ghana, Tanzania, or Nigeria that have a clear system of accreditation of RECs.

The status of Cameroon’s National Ethics Committee (NEC) remains contentious and has been a topic of debate amongst individuals and groups/organizations involved in research and bioethics in Cameroon. Though the government of Cameroon created the first research ethics committee in 1987, the committee had no specific appellation as the text of creation referred to it simply as “an ethics committee.” Today, there exists a National Ethics Committee (NEC) in Cameroon, which is assumed to be the ethics committee that was created in 1987, though its mode of operation, membership, financing, and accommodation appear to be very different from what is stated in the 1987 ministerial decision creating the first ethics committee (Tangwa & Munung, 2011). There exists no ministerial decision creating or explicitly recognizing the National Ethics Committee (NEC) of Cameroon as it is today, whereas there does exist one creating the ethics committee of the CIRCB. There have been calls on the authorities to create a national ethics committee, which, Tangwa and Munung (2011) proposed, should have the status of an overseeing body as is the case with some other national ethics committees elsewhere. In an era of increased scientific research in the country and ongoing debates on bioethics worldwide, coupled with the high incidence of scientific misconduct globally, it is important and urgent that such a situation be rapidly regularized to meet up with the global challenges of scientific research.

Equally significant is the fact that both government-recognized ethics committees are located in Yaoundé, Cameroon’s administrative capital, whereas research is going on in universities and research institutions located in many other parts of the

country. It has been urged that the government should move quickly to recognize credible IRBs/RECs, in the interest of facilitating research review, as the current situation could easily lead researchers to consider ethics review as a bottleneck to research. None of the RECs in Cameroon receives any funding from the government despite the fact that the 1987 ministerial decision clearly stated that funding for the ethics committee that was created was to be the responsibility of the government of Cameroon. All the existing RECs in the country therefore seek external funding, charge fees for review, or rely on the generous contributions of their members. Overall, there is no national framework for the operation of RECs in Cameroon and the current situation appears rather chaotic (Tangwa & Munung, 2011).

Concerning the legal and administrative underpinnings of research ethics or bioethics, there exist, in addition to a single law governing modern biotechnology (Law No. 2003/006 of 21 April 2003), only two “ministerial decisions” pertaining to research ethics in Cameroon. The very first of these decisions was signed in 1987 creating an ethics committee and the second in 2009 stating conditions for obtaining administrative approval for research studies. Outside of these, recourse has to be made to the general criminal law or the constitution to find a legal basis for arguments in research ethics or bioethics in Cameroon.

The Tenofovir Trial in Cameroon

The controversies surrounding the tenofovir trials have been among the liveliest in the area of research ethics in recent times in sub-Saharan Africa.

The tenofovir trials were carried out not only in Cameroon but also in Cambodia and other countries. They were carried out on commercial sex workers and were prematurely suspended in February 2005, after a Paris-based organization – Act Up-Paris – criticized the trials on ethical grounds. Some studies have attributed the failure of the trial to insufficient media preparation and understanding of the study (Mack et al., 2010; Mills et al., 2005), while some hold that there were substantive ethical problems in the way the trials were conducted in Cameroon (Munday, Lubangi, Mukandu, & Leyens, 2006). The trial sought to recruit approximately 400 commercial sex workers in Cameroon as research participants. The research protocol for the trial had been reviewed and approved by the National Ethics Committee of Cameroon. Several reasons have been advanced for the failure of the trial in Cameroon, including inadequate access to care for sero-converters, participants not sufficiently informed of risks, inadequate number of staff, exploitation of study participants, and unethical study design (Mills et al., 2005). Trial documents pertaining to research participants such as informed consent forms were only in English whereas the city of Douala where the trial was taking place is predominantly French speaking. There was also no provision for future access to tenofovir for trial participants (Yomgne, 2009a) in case the trial was successful. Follow-up studies by the team of REDS (Yomgne, 2009a) indicate that, though the National Ethics Committee of Cameroon had approved the trial, it was unable to

conduct visits to the trial site, owing to lack of funds. According to the REDS team, which had interviews with some officials involved in or, in some other way, connected to the tenofovir trial:

- The president of Cameroon's National Ethics Committee did not recall if the protocol made reference to medical care for sero-converters, did not offer female condoms, or made provision for future access to tenofovir, should it be found effective. He nonetheless noted that he was informed that care was to be provided to participants who sero-converted during the course of the trial.
- The principal investigator (PI) of the study agreed there was no French version of the trial documents and that the provision of the female condom was not included in the trial protocol, but, however, he argued that potential participants were not familiar with the female condom and that incorrect use of the female condom could only help in increasing their exposure to HIV infection. He promised to ensure that trial documents were translated into French and to discuss the other issues raised with Family Health International (the sponsor of the trial).
- An official responsible for oversight of HIV/AIDS trials in the National HIV/AIDS Committee of Cameroon said he was not aware of the planned trial.

Following the controversies surrounding the trial, France 2, a Paris-based television station aired a program on "what the pharmaceutical companies don't tell us" (Yongne, 2009a). This was closely followed by demonstrations that condemned the trial (Tangwa & Munung, 2011). The trial coordinator noted that though he had been interviewed by France 2, his interview was greatly censored while the Cameroon minister of public health announced that the study was quite ethical (Yongne, 2009a). In his write up, Yongne (2009a) further noted that the investigations of the National Medical Council of Cameroon showed that there were both administrative and legal gaps in the conduct of the study.

The tenofovir trials could have provided insights about a potential microbicide for HIV prevention, an initiative with important implications for developing countries. However, owing to administrative and ethical shortcomings, in addition to poor media coverage and rumors, a potentially important study was prematurely suspended in Cameroon.

Future Outlook and Challenges for Bioethics in Cameroon

The current state of bioethics in Cameroon poses a whole lot of challenges. Its growth and development are not matched by the global growth and trends in bioethics and health research as a whole. The current lack of interest in research ethics by government and policy makers has been a serious handicap in the growth of bioethics in Cameroon. For research ethics and bioethics as a whole to develop firm roots in the country, the government needs to participate in and to encourage bioethics initiatives in the country. Such interest should go beyond taking part in opening ceremonies for bioethics workshops. Policy makers should be able to

follow up and execute recommendations reached at such workshops and to provide the necessary conditions for those who have been trained to practice bioethics in their various institutions.

Overall, there exist as already stated three regulations related to bioethics and research ethics in Cameroon and two of these are in the form of “ministerial decisions.” Only one (the law governing modern biotechnology) has passed through Cameroon’s law-making body (the national assembly or parliament). Though the presence of these regulations can be said to be proof of government’s efforts to promote bioethics, they are clearly still quite inadequate in the face of current global challenges in bioethics. For such laws to be comprehensive and effective, a wide range of different kinds of expertise drawn from several fields including bioethics, the biosciences, medicine, law, and the humanities need to be sought in the conception and drafting of such regulations. The government of Cameroon therefore has the challenge of ensuring that adequate regulations and laws on bioethics are put in place, for Cameroon to be able to meet up with some of the ethical challenges arising from the rapid progress in the bio-sciences, the health sciences, and health research.

Many authors have identified the need for African countries to draw up regulations that govern health-related research in their various countries. The recommendations are that such country-specific laws should be guided by international guidelines but should take into account the local, cultural, legal, and medical situation of each country (Chima, 2006). Chima (2006) further argues that such regulations should address issues of local research ethics committees, standard of care, informed consent, and compensation for injuries that are sustained through participation in any sponsored research. However, the current focus and emphasis on regulation in bioethics in Africa has been on the development of regulations governing biomedical research in Africa. Africa, and Cameroon in particular, needs to draw up guidelines that go beyond biomedical research. Such guidelines should address issues pertaining to all forms of research involving the use of humans as research participants as well as other bioethics-related issues like animals in research, end of life decisions, routine medical care, in vitro fertilization, the use of genetically modified organisms, reproductive health, access to essential drugs, intellectual property rights, and global health training.

Access to essential medicines which has even been described as a basic human right is at the center of bioethics discussions around the globe. The WHO defines essential medicines as medicines that satisfy the priority health-care needs of the population and are selected with due regard to public health relevance, evidence on efficacy and safety, and comparative cost-effectiveness. Thus, essential medicines are intended to be available within the context of functioning health systems at all times in adequate amounts, in the appropriate dosage forms, with assured quality and adequate information, and at a price the individual and the community can afford (http://www.who.int/topics/essential_medicines/en/).

In Cameroon, essential medicines are sold at relatively reasonable prices in the pro-pharmacies located in public hospitals and there is a National Centre for Essential Drug Supply that is charged with the responsibility of supplying these

drugs to hospital pharmacies. Provision of essential drugs in pro-pharmacies has been possible thanks to international aid such as that of Merck and Co. Inc. (which provides Ivermectin free of charge for the treatment of onchocerciasis), the Global Fund, and the Clinton Foundation that subvention antiretroviral drugs. Recently (2011), the Cameroon government has also announced that treatment for uncomplicated malaria in children below 5 years will be provided free of charge. However, all these measures are not yet adequate or sustainable. Most Cameroonians do not use public hospitals for a variety of reasons, including, but not limited to, poverty, inaccessibility owing to the horrible condition of the roads infrastructure, and studies have shown that many people in Cameroon buy drugs from sources other than the pro-pharmacies located in public hospitals (Chana & Bradley, 2011). And, in spite of international and local efforts, Cameroon is one of the African countries yet to achieve universal treatment for HIV/AIDS. The government of Cameroon is evidently still facing the task of providing accessible and affordable health care to its 20 million inhabitants.

Education in bioethics is, for the time being, the most important precondition for the promotion of bioethics in Cameroon. Training in bioethics in Cameroon has mostly been in the form of short-term training (1–5 days) and it has in most cases been focused on research ethics for members of ethics review committees. Overall, there has been a general apathy toward introducing courses in bioethics in the curriculum of universities in Cameroon. This situation needs to evolve if the growing needs for human capacity building in bioethics in Cameroon are to be met.

The tendency in training in bioethics in Africa and Cameroon in particular has been to focus on individuals in the biomedical sciences. However, with the current global situation in bioethics and the fact that bioethics is by its very nature multidisciplinary, there is a need to train students across a wider range of disciplines relevant to bioethics and to encourage them to take up research and professional careers in bioethics. It is only with such approach that adequate human capacity in bioethics can in the long run be achieved in Cameroon.

Conclusion

Cameroon is in many ways a very remarkable country with enormous potential in many domains. Given its remarkable bio and other diversities, its material and human resources, its disease profile, and even available local expertise, Cameroon is a country where all aspects of bioethics should be exciting and flourishing. But, while the main outlines of bioethics activities are indeed present and visible, they are evidently underdeveloped. The underlying fundamental reasons for this situation of underdevelopment must be linked to the overarching politico-administrative-economic system of the country, because other mainly Francophone countries operating similar systems, especially in the same central African subregion, present very similar profiles. Innovative efforts at capacity building in bioethics need to be experimented in Cameroon and other Francophone countries, especially of the central African subregion.

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