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Sustainability and Bioethics

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Synonyms

Environmental bioethics; Green bioethics

Introduction

Bioethics was originally an ethical system concerned with the "problems of interference with other living beings" according to the 1978 *Encyclopedia of Bioethics* (Reich 1995). Conceptually, bioethics was broader than the patient-physician relationship. The scope was global, not local; inclusive, not exclusive. And while the development of bioethics as an academic discipline gave the appearance that ecology was separate from medicine, environmental bioethics has brought the two together. Environmental bioethics, which at once addresses the environmental impact of the medical industry and climate change health hazards, is a dynamic discipline. Simultaneously, thematic elements such as interconnectedness of planetary health and human health, dedication to living in harmony with nature, and emphasis on systems and symbiosis remain unchanged.

Scope

Climate Change

Climate change refers to the drastic acceleration of extreme weather and extreme weather events which is unprecedented at any time in recorded written history. Anthropogenic, or human-caused, climate change is the primary issue of ethical concern. Modern human activities emit greenhouse gas emissions (GHG) like carbon dioxide (CO_2) in unprecedented amounts, as a result of excavation and use of resources. Global CO_2 emissions – an indicator of human resource consumption – increased an astonishing 4.4% between 2008 and 2010 alone. Safe amounts of global carbon emissions, measured in parts per million (PPM) – which is a way of measuring the ratio of carbon dioxide molecules to all of the other molecules in the atmosphere – has been exceeded. There is "clear evidence that the composition of the atmosphere is being altered as a result of human activities and that the climate is changing" according to the Environmental Protection Agency and numerous other scientific sources.

Climate Impacts

The impact of carbon emissions includes not only climate change, but also health hazards like

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pollution, significant environmental destruction, violent conflict over scarce resources, loss of biodiversity, and diminished quality of life for humans (Costello et al. 2009). As a response to anthropogenic climate change nearly every sector of public and private life has sought to undertake positive steps to reduce carbon. Many scholars trace the budding of a conservationist consciousness in the United States to Aldo Leopold's *A Sand County Almanac and Sketches Here and There* in 1949, while Rachel Carson's seminal text, *Silent Spring* in 1962, is credited with spawning the environmental movement. Paul Ehrlich's *The Population Bomb* from 1968 had a lasting influence on ecology, as well, by linking human reproduction with resource depletion. The first United Nations Conference of the Parties (COP) in 1995 brought together international leaders to discuss, and effect, climate change solutions and numerous academic disciplines have addressed climate change as well.

Environmental Ethics

Environmental ethics has been examining the issues of resource use and carbon emissions as a result of human activities – including biological reproduction which increases pressure on the earth's ability to sustainably provide natural resources – for at least a century. At the same time, the health effects of climate change and carbon emissions have been a topic of discussion in public health and health care.

Environmental Bioethics

In the twentieth century, environmental bioethics has united the ethical commitments of health care ethics and environmental ethics. Environmental bioethics is a dynamic discipline that focuses on two areas: climate change health hazards and the environmental impact of the medical industry (Pierce and Jameton 2001). The former traces its origins to public health and public health ethics while the latter emerges from environmental ethics with emphasis on the health care industry.

The documented effects of global warming include climate change health hazards, which refer to the health effects of climate change. These include death and injury from severe weather like flooding, tornados, and hurricanes which are intensified because of climate change, as well as famine, vector-borne illness, and heat.

The environmental impact of the medical industry includes carbon emissions and resource use. The carbon emissions of global healthcare activities make up 4–5% of total world emissions, placing the healthcare industry on par with the food sector (Pichler et al. 2019). Healthcare carbon within countries varies. In a study published in 2019, the US healthcare industry expended an estimated 479 million metric tons (MMT) of carbon dioxide per year; nearly 8% of the country's total emissions.

Both climate change health hazards and the environmental impact of the medical industry can be separate ethical issues but environmental bioethics underscores the connection between the two through normative and applied ethics. Normative ethics describe actions that may be morally right or wrong. For instance, US healthcare produces 9% of total world air pollution emissions causing over 4,35,000 Disability Adjusted Life Years (DALYs) worldwide, which is ethically problematic in that these cause harm to humans. Applied ethics offers solutions for ethical problems. For instance, since carbon emissions contribute to poor health conditions related to climate change health hazards, the medical industry should have an interest in sectoral carbon reduction as a means to reduce disease burden since carbon is counterproductive to patient health.

Environmental bioethics has connections with a number of other ethical disciplines, such as business ethics and the corporate social responsibility to reduce carbon emissions; theological ethics, which underscore the God-given imperative to take care of the earth; queer ethics, which emphasizes non-reproductive and other non-consumptive ways of life over biological reproduction; and global bioethics, which addresses health care gaps and access in the developing world – among others.

Due to both its breadth and its agility, environmental bioethics often suffers from an identity problem in that, disciplinary, it does not clearly fit within any one discipline and so often gets ignored or becomes invisible. This is due, in

part, to the intellectual and topical development of environmental bioethics.

History

Bioethics

Bioethics was predicated on the work of two men – Frtiz Jahr in Germany – and Van Rensselaer Potter in the United States (2010). In 1927, Fritz Jahr described bioethics (German: *bio-ethik*) as "the assumption of moral obligations not only towards humans, but towards all forms of life." Jahr summarizes his philosophy by declaring, "Respect every living being on principle as an end in itself and treat it, if possible, as such"! Almost half a century later, the term "bioethics" appeared in English.

In 1971, Van Rensselaer Potter advanced the term bioethics as a way to describe "a global perspective with an ecological focus on how we as humans will guide our adaptations to our environment." This life (*bios*) ethic emerged from a tangible need to evaluate the actions of humans in an industrialized society struggling within a precarious ecosystem. Trained as an oncologist, Potter was particularly sensitive to the connections between health and habitat. Thus, he conceptualized a humanistic ethical system rooted in an intrinsically practical approach to a sustainable life, inclusive of the earth and other organisms.

Biomedical Ethics

Despite the foundational work of Jahr and Potter, a second way of defining "bioethics" appeared in academia and medicine. The so-called Georgetown mantra – respect for patient autonomy, beneficence, non-maleficence, and justice – which was developed by Tom Beauchamp from the Philosophy Department and James Childress of the Religious Studies department at Georgetown University became the standard ethical system for philosophy departments and medical schools (1979). Following from this formalization of biomedical ethics, numerous research centers connected to universities and hospitals arose, focused on the four principles of bioethics to the exclusion of Jahr and Potter's original concept. Thus, the environmental component to biomedical ethics was forgotten by students, teachers, and practitioners.

Environmental Bioethics

The development of bioethics as an academic discipline, which focused on patients and doctors within the hospital and health care facility gave the illusion that the environmental issues were separate from health care. Indeed, when Potter published *Global Bioethics: Building on the Leopold Legacy* in 1998, he lamented that modern bioethics went in a drastically different direction than he envisioned, writing "with the focus on medical options, the fact that bioethics had been proposed to combine human values with ecological facts was forgotten by many: the ethics of how far to exercise technological options in the exploitation of the environment was not associated with the term bioethics." Here, the identity problem is the supplantation or cooptation of bioethics by biomedical ethics and the erasure of the origins of bioethics as an ethical system tied to the environment. Thus, the term "environmental" began to stand as a modifier to "bioethics" and "environmental bioethics" developed its own scholars and literature, which led to more environmentally sustainable health care curriculum in medical schools.

Modern Movements

Scholars

Notably, the "father" of environmental bioethics was a biochemist and professor of oncology. Van Rensselaer Potter's first book *Bioethics: Bridge to the Future* (1971) detailed "a global perspective with an ecological focus on how we as humans will guide our adaptations to our environment." Potter saw the interconnectedness of humans and nature as self-evident and, given that humans are situated in a natural environment, sought to connect humans not only to health within the hospital, but to holistic life in the world of nature as well. In 1988 Potter published his second and final book, *Global Bioethics: Building on the Leopold Legacy. Global Bioethics* brought the medical

industry – made by and for humans – back to the land, and acknowledged how far we had come from "nature." Potter's work connected conservation and medicine and laid the foundation for environmental bioethics to develop.

About a decade elapsed between Potter's last book and the next wave of conservation-based medicine. In the late 1990s Jessica Pierce appeared as a major advocate for environmentally sustainable advances in medical and hospital practices. Pierce was influenced by Potter and indebted to his initial work and wrote on a number of environmental topics for a health care audience, greening health care products and the public health impacts of resource use. Connecting what happens within the walls of hospitals with the outside world of nature lead to specific avenues for change. Reducing the use of hazardous chemicals in facilities and using environmentally friendly cleaning products is now a common practice in many hospitals.

Literature

The years between 2000 and 2003 saw growing academic interest in environmental bioethics and issues related to human health and planetary sustainability. Literature that was the lifeblood of physicians and bioethicists began to explore the multifaceted approaches to environmental bioethics. Between 2000 and 2001 the *Canadian Medical Association Journal* published numerous articles on the ecosystem and health, spearheaded by Michael McCally. Around the same time, in 2002, the *Journal of Medical Humanities* dedicated an entire issue to the declining environment and health care. The efforts of these two journals expanded the discipline of environmental bioethics from a purely scientific, medical pursuit to one that embraced ecology, philosophy, religion, and ethics. With many entry points into the conversation, physicians could advocate for sustainability within their own practice from a number of angles.

Later, in 2012, David Resnik's *Environmental Health Ethics* traced many of the same paths that Potter and Pierce had created, while also expanding on issues of nutrition, natural disasters, and public health, thus two bringing environmental bioethics back to the forefront of medicine. In 2019, the first comprehensive ethical methodology developed specifically for environmental bioethics was created by Cristina Richie. "Green Bioethics" proposed a principle-based system similar to Beauchamp and Childress's principles of biomedical ethics which assesses the sustainability of medical developments, techniques, and procedures based on four principles: distributive justice, resource conservation, simplicity, and ethical economics (2019). The scholarship on environmental bioethics began to influence curriculum in higher education.

Curriculum

As of 2019, medical schools in at least 92 countries have topics related to climate change ethics and environmental sustainability in their curriculum. In 2020, 20 out of 30 reporting medical schools in the United Kingdom included "future impact of climate change on health and healthcare systems" as a learning objective, while 25 listed "environmental and occupational hazards and ways to mitigate their effects" as a learning objective (Walpole et al. 2019). New York University (NYU) offers a Masters of Arts in Environmental Bioethics and a 5-year MD/MA program, which has two tracks leading to the terminal degree – one of which focuses on environmental issues. The medical school curriculum trains doctors to be aware of the environmental consequences of carbon emissions which bolsters support for sustainable health care institutions and initiatives.

Institutions

Many health care organizations including Healthcare Without Harm, Practice Greenhealth, the Healthier Hospitals Initiatives, the Catholic Health Association, and UK's National Health Service have recognized the connections between the carbon emissions of health care and climate change. These, and other, organizations, have implemented initiatives such as recycling and clean energy purchasing. Most early sustainability programs were imported from general business frameworks which only focus on the external aspects of sustainability and did not address the internal health care carbon unique to the medical industry. That is, the carbon that is produced by

hospitals and clinics such as water sourcing, energy, and food, patient transportation to and from hospitals, and doctors communing to work and as well as shipping products to health care facilities was evaluated. Later, the carbon of health care delivery, which includes emissions from medical tests, bedside care, single-use instruments, and pharmaceuticals, as well as medical developments, techniques, and procedures were addressed in initiatives, policy, and law.

Initiatives

The UK's National Health Service is the only publicly held health care system that has legally binding carbon reduction measures. Following from the UK Climate Change Act of 2008, the *Saving Carbon, Improving Health: NHS Carbon Reduction Strategy for England* encouraged carbon-neutral transportation – like walking and biking to and from work – eliminating animal-based foods from menus, and reducing water waste in health care facilities to meet carbon reduction standards (National Health Services Sustainable Development Unit 2009). Similarly, the NHS *Climate Change Strategy for Wales*, released in 2010, outlined policies for sustainable health care based on the groundbreaking data from the Carbon Footprint of NHS Wales 2005–2009 study. Efforts in Scotland to reduce carbon emissions include NHS *Scotland's Climate Change Plan* from 2017 and support from the Scottish Public Health Network and Scottish Managed Sustainable Health Network, which also addresses climate change health hazards.

Despite many developments in environmental bioethics, it still suffered exclusion from the traditional scope of biomedical ethics. Since it is interdisciplinary, environmental bioethics tends to be placed in the scope of environmental ethics, thus isolating academic environmental bioethicists from biomedical ethics, and simultaneously, downplaying the ethics of carbon reduction in health care organizations.

Future Directions

Carbon Calculations

Environmental bioethics is agile. It continues to expand its scope of concern, rightfully advocating for carbon reduction in the medical industry. Given the move towards carbon reduction as the primary metric of sustainability, a number of studies on the carbon footprint on specific procedures in specialty areas such as gynecology and obstetrics, ophthalmology, anesthesia, urology, dentistry, internal medicine, and pathology have been published. This qualitative data will reinforce justification for effective carbon reduction policies and practices in health care organizations.

Coronavirus Pandemic

The Coronavirus pandemic reiterated the importance of environmental bioethics for health in a variety of ways. First, the precautionary measures of social isolation remind the human collective that we are all interconnected. One person's actions affect another and may set off a chain reaction with international implications. Humans have adapted to thinking in terms of long-range cause and effect by understanding the spread of Coronavirus via human contact. The carbon impact of medical consumerism is similar in that medical choices emit carbon which continues to climate change health hazards and that affects others.

Second, many people have lived through restrictions where movements were considerably limited, through shielding for those of advanced age and with weakened immune systems and mandated home quarantines for people who tested positive for the virus. Road closures, domestic bans, and closed borders prevented travel. These, and similar measures will become more a commonplace unless carbon emissions are reduced and climate change health hazards are minimized. All adults will need to stay indoors when air quality compromises respiratory health. Severe weather will close access points, leaving thousands of people stranded. As with the Coronavirus, the elderly and vulnerable will be most affected.

Third, the devastating economic effects of the Coronavirus have illuminated the need to rethink commerce. Certain businesses that provide "fast fashion," lifestyle trends, other "non-essential" services were forced to close physical shops, while sanitation, health care, and education continued. The parallels between COVID-19 and climate change has offered environmental bioethics a platform to address carbon reduction in health care by making these tangible connections.

As environmental bioethics attempts to maintain relevance, the identified problem of "greenwashing" may hinder authentic change. "Green" may be the buzzword of the twenty-first century, but sustainable health care and a clean living environment will be perennial ethical demands of both biomedical and environmental ethics in the future.

Cross-References

- Bioethics
- Ethics and Economic in Healthcare Decision-Making
- Indigenous Environmental Justice
- Medical Ethics and the Land Ethics
- Professional Ethics in Healthcare
- Vaping and Bioethics

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