Chapter 1
Public Health Disasters

Abstract Public health disasters reflect the uncharted conceptual, ethical, and pragmatic intersections between public health ethics and the emerging discourse on disaster bioethics. This novel concept reflects public health issues with calamitous social consequences such as infectious disease outbreaks, the attendant public health impacts of natural or man-made disasters, and currently latent or low prevalence public health issues with the potential to rapidly acquire pandemic capacities. The attendant moral dilemmas that PHDs generate have local and global dimensions. For this reason, they demand a multifaceted ethically grounded and pragmatically oriented approach. This chapter presents the conceptual foreground to the ethical and pragmatic dimensions of these issues.

1.1 Introduction

There is an increasing conceptual, ethical, and pragmatic intersection between the concerns of traditional public health ethics and the emerging academic discourse on disaster bioethics, an intersection that has not received any scholarly attention in the bioethics literature. This book describes this epistemic gap as "public health disasters" (PHDs). It seeks to untangle the attendant moral dilemmas as well as frame a global ethical framework (GEF) *vis-à-vis* engaging them and the associated pragmatic issues. Such a task is necessary for at least two reasons.

First, the need for conceptual clarity on what constitutes PHDs, which also has the potential to serve as a rallying ground to draw attention to these distinct types of disasters in bioethical discourses. Whereas the term "Public health disaster(s)" may show up via scholarly search engines, yielding articles such as "Allocation of ventilators in a public health disaster",[1] "The lingering consequences of sepsis: a hidden public health disaster?",[2] "The ticking time bomb: escalating antibiotic resistance in

[1] Tia Powell, Kelly C Christ, and Guthrie S Birkhead, "Allocation of Ventilators in a Public Health Disaster," *Disaster Medicine and Public Health Preparedness* 2, no. 1 (2008). Pp. 20–24.

[2] Derek C Angus, "The Lingering Consequences of Sepsis: A Hidden Public Health Disaster?," *Jama* 304, no. 16 (2010). P. 1833.

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Advancing Global Bioethics 12, https://doi.org/10.1007/978-3-319-92765-7_1

Neisseria gonorrhoeae is a public health disaster in waiting",[3] "Australia's new coal mine plan: a "public health disaster"",[4] and "Public Health Disasters: Be Prepared"[5]; none of such articles offers conceptual clarity as to the term's clear meaning(s) and nuances. There is, therefore, the need to address this lack of conceptual homogeneity.

Secondly, while a GEF may help address public health disasters in particular, its global nature has the potential to contribute to the critical reexamination of some of the precepts of extant frameworks such as the *UNESCO Declaration on Bioethics and Human Rights* (UDBHR) in relation to some of the moral quandaries generated by PHDs. Also, a global ethical framework will contribute to the ongoing scholarly debate about the normative value and approach to global bioethics.

To engage the theme of this chapter, the current state of knowledge in the disaster bioethics and public health ethics literature needs to be examined in order to tease out extant the epistemic gap(s). This will be followed by an elaboration of the conceptual dynamics of PHDs and how these relate to the six Ds (destruction, death, disease/disorders, displacement, disappearance, and disarray), an elucidation of some of the attendant ethical issues, the global dimensions of these issues, and the methodological angle that this book adopts.

1.2 The Current State of Knowledge *vis-à-vis* Public Health Disasters

Disaster bioethics makes up an emerging area in bioethical thought. The concept of disaster and the extent of the attendant humanitarian obligations, for scholars like Gordijn and ten Have, is still under philosophical rumination.[6] Hence, Hearn describes disaster bioethics as an emerging area of academic inquiry.[7] Consequently, there is only a sparse amount of published literature focused on elaborating the ethical issues that disasters bring about. Some of the major works on this theme include Zack who emphasizes issues such as uncertainty as one of the core moral quanda-

[3] David M Whiley et al., "The Ticking Time Bomb: Escalating Antibiotic Resistance in Neisseria Gonorrhoeae Is a Public Health Disaster in Waiting," *Journal of Antimicrobial Chemotherapy* 67, no. 9 (2012). Pp. 2059–2060.

[4] Chris McCall, "Australia's New Coal Mine Plan: A "Public Health Disaster"," *The Lancet* 389, no. 10069 (2017). P. 588.

[5] RJ Kim-Farley, "Public Health Disasters: Be Prepared," *American journal of public health* 107, no. S2 (2017). P. S120.

[6] Bert Gordijn and Henk Ten Have, "Disaster Ethics," *Medicine, Health Care and Philosophy* 18, no. 1 (2015). Pp. 1–2.

[7] James D Hearn, "Disaster Bioethics: Normative Issues When Nothing Is Normal," *Journal of Bioethical Inquiry* 12, no. 1 (2015). Pp. 151–152.

ries that arise in disaster situations.[8] George Annas' worst-case scenarios perspective underscores how useful policies and practices may need to override individual interests.[9] Scholars like da Costa recognize the importance of human rights in disaster contexts and argue that human rights can enhance individuals' resilience to face disasters.[10] However, such an approach fails to deal with the morally thorny issue of balancing conflicting rights based on competing needs and interests, especially those due to the presence of overwhelming needs and insufficient human and material resources.[11]

If human beings die very easily,[12] then disasters, by definition, accelerate the process of human death and other possible associated types of destruction (e.g. emotional trauma, loss of limb, loss of businesses etc.). The unexpected nature of natural disasters often shapes the damage and human suffering that ensue as well as the disparity between human needs and resources available to immediately confront the utilitarian goal of doing the most good or benefit(s) for as many people as possible with a minimal level of harm.[13] In disaster scenarios, the ethical goal generally entails finding some means to minimize the damaging social consequences. As such, actions that will lead positive social consequences are preferred[14] and usually pursued. This is important considering the significant physical, psychological, social, and environmental kinds of harm that are associated with disasters[15] and which must be engaged from a broad perspective.

Different levels of efforts—at the micro, meso and macro level of concept and praxis—which seek to address the disruption associated with disasters are integral to recognizing the risks and responsibilities[16] associated with disaster scenarios. Engaging these tasks demands some training and re-training of actors within and outside the healthcare sector.[17] This is because on the one hand, professionals work-

[8] Naomi Zack, *Ethics for Disaster* (Rowman & Littlefield Publishers, 2010).

[9] George J Annas, *Worst Case Bioethics: Death, Disaster, and Public Health* (Oxford University Press, 2010).

[10] Karen da Costa, "Can the Observance of Human Rights of Individuals Enhance Their Resilience to Cope with Natural Disasters?," *Procedia Economics and Finance* 18 (2014). Pp. 62–68.

[11] Dónal P O'Mathúna, Bert Gordijn, and Mike Clarke, "Disaster Bioethics: An Introduction," in *Disaster Bioethics: Normative Issues When Nothing Is Normal* (Springer, 2014). Pp. 3–4.

[12] Atsushi Asai, "Tsunami-Tendenko and Morality in Disasters," *Journal of Medical Ethics* 41, no. 5 (2015). P. 365.

[13] Aasim Ahmad, Mahmud Syed Mamun, and Dónal P O'Mathúna, "Evidence and Healthcare Needs During Disasters," in *Disaster Bioethics: Normative Issues When Nothing Is Normal*, ed. Dónal P O'Mathúna, Bert Gordijn, and Mike Clarke (Netherlands: Springer, 2014). PP. 95, 100–101.

[14] Vasil Gluchman, "Disaster Issues in Non-Utilitarian Consequentialism (Ethics of Social Consequences)," *Human Affairs* 26, no. 1 (2016). P. 52.

[15] Keymanthri Moodley, "Ethical Concerns in Disaster Research—a South African Perspective," in *Disaster Bioethics: Normative Issues When Nothing Is Normal* (Springer, 2014). P. 192.

[16] Bruce Clements, *Disasters and Public Health: Planning and Response* (Butterworth-Heinemann, 2009). P. 14.

[17] Lisa Schwartz et al., "Ethics and Emergency Disaster Response. Normative Approaches and Training Needs for Humanitarian Health Care Providers," in *Disaster Bioethics: Normative Issues When Nothing Is Normal* (Springer, 2014). Pp. 33–40.

ing in disaster situations face urgent choices which usually diverge from their normal and accustomed duty-related or deontological ethos.[18] On the other hand, nonhealthcare-based actors will have varying desires to render help to victims of disasters, desires which they will hardly be able to adequately translate into positive "clinical outcomes" in the absence of prior and proper training. Although disasters are by nature sudden, they are not completely void of the influence of human agency, hence, human culpability. Scholars like Dranseika share this view and argue that humans causally contribute to the negative outcomes of even such paradigmatic natural disasters as earthquakes, typhoons, and volcano eruptions.[19] This remark underscores the notion that some disasters may be either preventable or their overall impacts limited when relevant and carefully orchestrated human actions are taken before they occur or during ongoing disaster episodes. Whereas scholars like Bhan[20] usually emphasize this preventive approach, there has been little articulation of specifics in relation to accomplishing such a task. A possible reason for the difficulty in articulating a preventing approach, at least on a broad scale, to public health disasters involves the complex interplay between pre-disaster factors, the causal linkages between human and non-human parameters, and the biologically nuanced roles that microbial organisms play in their onset.

However, if disasters generally and public health disasters, in particular, reflect a dissonance in the relational nexus that people have with others (locally and globally), the relationship nexus between humankind and microbes and the relationship between human beings and the divine (gods, God, spirits et cetera); then, failure to engage ways of repairing these multifaceted relationships support the culpability claim advanced by Dranseika.

Some ethical issues have been identified in the arena of disaster ethical inquiry. These include issues of human rights,[21,22] varying degrees of vulnerabilities[23,24]

[18] Pierre Mallia, "Towards an Ethical Theory in Disaster Situations," *Medicine, Health Care, and Philosophy* 18, no. 1 (2015). P. 3.

[19] Vilius Dranseika, "Moral Responsibility for Natural Disasters," *Human Affairs* 26, no. 1 (2016). Pp. 73–74.

[20] Anant Bhan, "Ethical Issues Arising in Responding to Disasters: Need for a Focus on Preparation, Prioritisation and Protection," *Asian Bioethics Review* 2, no. 2 (2010). Pp. 143–145.

[21] Annas. Pp. 5–25.

[22] da Costa. Pp. 62–65.

[23] Ruth Macklin, "Studying Vulnerable Populations in the Context of Enhanced Vulnerability," in *Disaster Bioethics: Normative Issues When Nothing Is Normal*, ed. Aasim Ahmad, Mahmud Syed Mamun, and Dónal P O'Mathúna (Springer, 2014). Pp. 159–163.

[24] Sneha Krishnan and John Twigg, "Menstrual Hygiene: A 'Silent' need During Disaster Recovery," *Waterlines* 35, no. 3 (2016). Pp. 265–268.

conflicting ethical options,[25,26] limited human and material resources,[27,28,29] justice[30] and the design as well as the implementation of triage.[31,32,33] Another significant moral feature of disasters is the high degree of uncertainty.[34,35,36] The unpredictable nature of uncertainty in disaster situations clearly limit responses and available options, practically and ethically. As such, scholars like Lepora and Goodin note that an approach involving ethical compromise[37] will be inevitable when dealing with the quandaries and challenges posed by disasters.

Due to the nascent nature of the moral reflections on the ethical dynamics of disasters, the ethical approaches have generally been speculative, tentative or lacking. Perhaps, a striking approach is that of Kalokairinou who contends that a virtue ethics approach which creates a virtuous disposition in persons responding to disaster situations constitutes a richer and more efficient way of dealing with the associated moral dilemmas.[38] Put another way, Kalokairinou seems to be saying that if all the potential relevant actors for particular kinds of disasters may be identified before

[25] Mallia. Pp. 4–8.

[26] Andrew Shortridge, "Moral Reasoning in Disaster Scenarios," *Journal of medical ethics* 41, no. 9 (2015). P. 780.

[27] O'Mathúna, Gordijn, and Clarke. Pp. 3–4.

[28] Sara Kathleen Geale, "The Ethics of Disaster Management," *Disaster Prevention and Management* 21, no. 4 (2012). Pp. 445–447.

[29] Claritza L Rios et al., "Addressing the Need, Ethical Decision Making in Disasters, Who Comes First?," *Journal of US-China Medical Science* 12 (2015). Pp. 20–23.

[30] Anushree Dave et al., "Engaging Ethical Issues Associated with Research and Public Health Interventions During Humanitarian Crises: Review of a Dialogic Workshop," *Bioéthique Online* 5, no. 2 (2016).

[31] Henk ten Have, "Macro-Triage in Disaster Planning," in *Disaster Bioethics: Normative Issues When Nothing Is Normal*, ed. Dónal P O'Mathúna, Bert Gordijn, and Mike Clarke (Springer 2014). Pp. 13–16.

[32] Hu Nie et al., "Triage During the Week of the Sichuan Earthquake: A Review of Utilized Patient Triage, Care, and Disposition Procedures," *Injury* 42, no. 5 (2011). Pp. 515–519.

[33] Michael Y Barilan, Margherita Brusa, and Pinchas Halperin, "Triage in Disaster Medicine: Ethical Strategies in Various Scenarios," in *Disaster Bioethics: Normative Issues When Nothing Is Normal*, ed. Aasim Ahmad, Mahmud Syed Mamun, and Dónal P O'Mathúna (Springer, 2014). Pp. 49–52.

[34] Fatimah Lateef, "Ethical Issues in Disasters," *Prehospital and Disaster Medicine* 26, no. 4 (2011). Pp. 289–291.

[35] Sven Ove Hansson, *The Ethics of Risk: Ethical Analyses in an Uncertain World* (Palgrave Macmilan, 2013). Pp. 1–112.

[36] Gordijn and Ten Have. Pp. 1–2.

[37] Chiara Lepora and Robert E Goodin, *On Complicity and Compromise* (OUP Oxford, 2013). Pp. 15–28

[38] Eleni M Kalokairinou, "Why Helping the Victims of Disasters Makes Me a Better Person: Towards an Anthropological Theory of Humanitarian Action," *Human Affairs* 26, no. 1 (2016). Pp. 26–29.

a given disaster so that certain virtues are infused into them, then they will more likely than not act virtuously during disasters. If this interpretation is true, then responding ethically to disasters will entail a long-term moral endeavor that will need to involve every segment of the society. How such a task may be counted worthy of pursuit in an increasingly pluralistic, secularized, and post-modern world remains the major setback to this approach but it does not render it void of logical credence. Perhaps, partly because the scholarly discussion on disaster bioethics has only recently begun,[39] some scholars believe that the best that can be attained in handling disasters is a non-ideal ethical approach.[40]

Unlike the field of disaster bioethics, reflection on public health ethics goes a few years back, and are greater in volume. Some of the seminal writings in this line of ethical reflection include Harris and Holm who emphasize the moral duty of not infecting others. For them, failure to act on this obligation translates into deliberately harming others. Yet, a system of compensation may be necessary to motivate people to comply.[41] Kass argues that a public health ethics approach needs to reduce morbidity or mortality and minimize any existing social injustices while adopting fair procedures.[42] Callahan and Jennings contend that ethics and public health cannot be advanced without taking into consideration the values of the general society as well as that of the particular communities where the public ethical course of action is needed.[43] This echoes Rhodes age-long remark that the practice of medicine is inseparable from the values of the society in which its practice occurs.[44] If contemporary public health is bereft of national boundaries and is inherently global,[45] then engaging the ethical issues generated by public health inevitably needs an approach that is local and context specific, globally sensitive, and nuanced. The absence of a global health policy response further highlights the necessity of such an approach.[46]

Roberts and Reich posit that an elaboration of consequences, fostering the flourishing of communities, balancing of conflicting rights and a quest for justification are cardinal features of public ethical analyses, as well as the need to understand moral alternatives.[47] Whereas moral values are integral to decision making in the

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[39] Gordijn and Ten Have. Pp. 1–2.

[40] Dónal O'Mathúna, "Ideal and Nonideal Moral Theory for Disaster Bioethics," *Human Affairs* 26, no. 1 (2016). Pp. 8–9.

[41] John Harris and Soren Holm, "Is There a Moral Obligation Not to Infect Others?," *British Medical Journal* 311, no. 7014 (1995). Pp. 1215–1216.

[42] N. E. Kass, "An Ethics Framework for Public Health," *American Journal of Public Health* 91, no. 11 (2001). Pp. 1776–1777.

[43] Daniel Callahan and Bruce Jennings, "Ethics and Public Health: Forging a Strong Relationship," ibid.92, no. 2 (2002). P. 172.

[44] Philip Rhodes, *The Value of Medicine* (Allen and Unwin, 1976). Pp. 86,117.

[45] Annas. P. xxiii.

[46] Annamarie Bindenagel Šehović, *Coordinating Global Health Policy Responses: From Hiv/Aids to Ebola and Beyond* (Springer, 2017). P. 1.

[47] Marc J Roberts and Michael R Reich, "Ethical Analysis in Public Health," *The Lancet* 359, no. 9311 (2002). Pp. 1055–1059.

context of public health, pursuing the welfare or interests of the larger society will often engender tensions in individualistic societies.[48] Yet, there is no evidence to show that moral tensions that are tied to the balancing of conflicting interests and priorities are exclusively felt in non-communally structured societies. This partly explains why justice and the need to pursue justice in multiple ways remains a recurring decimal in public health.[49]

Hence, it is not surprising that the dilemmas central to public health ethics revolve around how to ethically weigh and balance individual against population health needs[50,51] how to balance health-related harms amidst members of society at the individual and collective planes of differing interests[52,53] as well as how to ethically justify any one course of action that is chosen or suggested for public health policy and implementation.[54] A recent and interesting issue relates to the obligations of healthcare workers to infectious disease patients as well as to patients during infectious disease outbreaks.[55]

An examination of the disaster bioethics and public health ethics literature clearly brings to the fore the observation that the idea of public health disasters has not received academic attention. As such, this novel area of bioethical inquiry—which reflects the intersection of disaster bioethics and public health ethics—demands critical scrutiny and exploration. This conceptual lacuna invariably explains the absence of a moral framework for addressing the moral perplexities of PHDs. It is against this backdrop that this book seeks to elaborate the concept of public health disasters, fashion a GEF for addressing the attendant moral quandaries, and, ultimately, contribute to the scholarly conversation on global bioethics.

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[48] Ronald Bayer and Amy L Fairchild, "The Genesis of Public Health Ethics," *Bioethics* 18, no. 6 (2004). Pp. 473, 492.

[49] Nancy E Kass, "Public Health Ethics from Foundations and Frameworks to Justice and Global Public Health," *The Journal of Law, Medicine & Ethics* 32, no. 2 (2004). Pp. 232–234.

[50] Stephen Holland, *Public Health Ethics* (Polity Press, 2007). Pp. 1–15; *Public Health Ethics*, 2nd ed. (Polity Press, 2015). Pp. 1–10.

[51] Marcel F Verweij and Angus Dawson, "The Meaning of 'Public' in Public Health'," in *Ethics, Prevention and Public Health* ed. Marcel F Verweij and Angus Dawson (Oxford: Clarendon Press, 2009). Pp. 13–16.

[52] Harris and Holm. Pp. 1215–1216; Charles B Smith et al., "Are There Characteristics of Infectious Diseases That Raise Special Ethical Issues?," *Developing World Bioethics* 4, no. 1 (2004). Pp. 1–3.

[53] Leslie P Francis et al., "How Infectious Diseases Got Left out–and What This Omission Might Have Meant for Bioethics," *Bioethics* 19, no. 4 (2005). Pp. 307–311; Michael J Selgelid, PM Kelly, and Adrian Sleigh, "Ethical Challenges in Tb Control in the Era of Xdr-Tb [Unresolved Issues]," *The International Journal of Tuberculosis and Lung Disease* 12, no. 3 (2008). Pp. 231–234.

[54] Callahan and Jennings. Pp. 169–170; Stephen Peckham and Alison Hann, "Introduction," in *Public Health Ethics and Practice*, ed. Stephen Peckham and Alison Hann (Bristol: Policy Press, 2010). Pp. 1–5.

[55] Michael Millar and Desmond TS Hsu, "Can Healthcare Workers Reasonably Question the Duty to Care Whilst Healthcare Institutions Take a Reactive (Rather Than Proactive) Approach to Infectious Disease Risks?," *Public Health Ethics* (2016).; Aminu Yakubu et al., "The Ebola Outbreak in Western Africa: Ethical Obligations for Care," *Journal of Medical Ethics* 42, no. 4 (2016). Pp. 209–210.

1.3 Conceptual Dynamics of Public Health Disasters

At a glance, the concept of public health disasters suggests the idea of disasters linked to public health. Transposed to the realm of ethics, four distinct conceptual building blocks may be untangled from PHDs. These are "public health", "disaster(s)", "public health ethics", and "disaster ethics/bioethics". Defining each of these and combining the resultant ideas offer important insights into what PHDs may be and present a prism through which the attendant practical and ethical challenges may be seen.

Public health is often described as the science and art of promoting health and preventing diseases for the whole society[56] or a specific segment of society.[57] Disasters are sudden, large-scale, chaotic events of acute onset, the end result of which are significant physical, social, psychological, and environmental harm.[58] Public health ethics refers to ethical issues that come to the fore in relation to implementing public health schemes. Specifically, it constitutes the myriads of moral quandaries that may arise when weighing individual health needs against that of the collective society[59] while pursuing social health goals and agendas. Lastly, disaster bioethics is an emerging area of academic inquiry[60] engaged in raising and engaging bioethical perplexities that arise during disasters.

Against this conceptual background, public health disasters may refer to one of three distinct phenomena. Firstly, public health issues with calamitous or devastating social consequences such as infectious disease outbreaks. Secondly, it may refer to the attendant public health impacts of natural or man-made disasters. Thirdly, PHDs may refer to currently latent, "silent", or low prevalence public health issues with the potential to rapidly acquire pandemic capacities. Infectious diseases of current low-prevalence whose untreatable nature spell future calamity fit this category.

A central and common denominator amongst all these three possible categories is the presence of all or some of the six cardinal features of disasters; that is, the so-called six Ds. These are destruction, death, disease/disorders, displacement, disappearance, and disarray.[61] In the context of public health, each of these Ds or a part/whole combination has unsettling implications. Effective public health is a participatory and often coordinated course of activities which require cooperation amongst the different professional and non-professional actors in terms of a clear delineation of who does what and to what end. This affirms the idea that public health involves cooperative behavior and relationships that are forged on overlapping values and

[56] Adetokunbo O Lucas and Herbert Michael Gilles, *Short Textbook of Public Health Medicine for the Tropics* (Arnold Publishers, 2003). Pp. 1–10.

[57] Verweij and Dawson.

[58] Moodley. P. 192.

[59] Holland, *Public Health Ethics*. Pp. iv–ix.

[60] Hearn. Pp.151–152.

[61] Ahmad, Mamun, and O'Mathúna. P. 96.

elements of trust.[62] As such. stakeholders including professionals, policymakers, and patients (or potential patients) as well as the social context ultimately influence public health goals.[63] However, the destruction, death, disease/disorders, displacement, disappearance, and disarray that characterize disasters and which can affect all public health actors will inevitably disrupt the participatory activities during public health disasters. It is important to specifically show how each of the six Ds plays out during PHDs.

In relation to destruction, it is known that public health disasters often destroy social infrastructures including healthcare and other activities in the public sector. In developing economies where resources are usually limited and/or poorly managed, this will lead to the disintegration of healthcare systems. This may be exemplified by the closure of hospitals and clinics which invariably increases social suffering as well as the burdens of infectious diseases including tuberculosis, HIV/AIDS, enteric and respiratory illnesses, cancer, cardiovascular disease, and mental health.[64]

The death-related disaster feature of Ebola virus outbreak has always been played out since the first outbreak in 1976. For example, the 2013–2015 episode recorded a 39.5% case-fatality rate and produced more than 11,000 deaths.[65] Since some of the deceased were children, mothers, fathers, and other subsets of dear ones, it can be said that some type of emotional, financial or social disarray also accompany Ebola outbreaks as an exemplar of PHDs. During the Congo Ebola outbreak of 1995, healthcare workers and many people living in the community of the index case fled their homes amidst the confusion and rising death toll.[66] This clearly illustrates the displacement-related disaster dimension of Ebola diseases, and it adds another conceptual justification for placing EVD under the category of PHDs. Scholars like Nancy Kass note that EVD ignites some of the worst fears in a globalized world, especially in terms of the ease with which it transcends borders.[67] This implies that public health disasters are global or at least have some intrinsic tendency to become global.

It is generally accepted that availability of effective and affordable drugs helps to ameliorate diseases.[68] However, biological phenomena such as antimicrobial drug

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[62] James F Childress et al., "Public Health Ethics: Mapping the Terrain," *The Journal of Law, Medicine & Ethics* 30, no. 2 (2002). Pp 170–171.

[63] Peckham and Hann. Pp. 2–5.

[64] Jeremy J Farrar and Peter Piot, "The Ebola Emergency—Immediate Action, Ongoing Strategy," *New England Journal of Medicine* 371, no. 16 (2014). P. 1545.

[65] James M Shultz et al., "The Role of Fear-Related Behaviors in the 2013–2016 West Africa Ebola Virus Disease Outbreak," *Current Psychiatry Reports* 18, no. 11 (2016). P. 101.

[66] Yves Guimard et al., "Organization of Patient Care During the Ebola Hemorrhagic Fever Epidemic in Kikwit, Democratic Republic of the Congo, 1995," *Journal of Infectious Diseases* 179, no. Supplement 1 (1999). Pp. 269–270.

[67] Nancy Kass, "Ebola, Ethics, and Public Health: What Next?," *Annals of Internal Medicine* 161, no. 10 (2014). P. 744.

[68] Michael O.S. Afolabi, "A Disruptive Innovation Model for Indigenous Medicine Research: A Nigerian Perspective," *African Journal of Science, Technology, Innovation and Development* 5, no. 6 (2013). P. 446.

resistance negate the *telos* of public health—fostering positive health outcomes[69]—and engenders increased morbidly and mortality. Beyond limiting the effectiveness of combination drug regimens,[70] drug resistance influences the further dispersal of resistance within and amongst communities and between economic and geographic divides,[71] exhibiting an unsettling ripple effect. This feature clearly entails the disease/disorder and death parameters of disasters, and the physical as well as psychological suffering that comes with it (as in most disease states)[72] comes with different kinds of social, personal, and economic disarray. If drug resistance has the conceptual dimensions to be classed as a type of disaster, then non-apparent or silent forms of drug resistance will be more "disastrous". Atypical drug-resistant tuberculosis (ADR-TB) belongs to such a class. Indeed, scholars like Viens and Littmann recently mused that antimicrobial drug resistance constitutes a slowly emerging disaster.[73]

Pandemic influenza can also be described as a public health disaster. One-third of the world's population was estimated to be infected and had clinically apparent illnesses during the 1918–1919 influenza pandemic.[74] 201,200 respiratory deaths (ranging from 105,700–395,600) with an additional 83,300 cardiovascular deaths were estimated to have occurred.[75] The global mortality rate for the 1957–1959 influenza pandemic was moderate relative to that of the 1918 pandemic but was approximately 10-fold greater than that of the 2009 pandemic.[76] Deaths resulting from pandemic influenza, the attendant disruption of personal and social flourishing due to control measures such as quarantine, as well as disarray due to the oft-associated panic[77] put influenza outbreaks in the category of PHDs. The preceding analysis shows that Ebola virus and pandemic influenza outbreaks are diseases of significant public health concern that may bring about devastating social

[69] Lucas and Gilles. Pp. 1–3.

[70] Giovanni Battista Migliori et al., "Drug Resistance Beyond Extensively Drug-Resistant Tuberculosis: Individual Patient Data Meta-Analysis," *European Respiratory Journal* 42, no. 1 (2013). P. 170.

[71] Richard Wise et al., "Antimicrobial Resistance: Is a Major Threat to Public Health," *British Medical Journal* 317, no. 7159 (1998). P. 810.

[72] H Tristram Engelhardt, "Ideology and Etiology," *Journal of Medicine and Philosophy* 1, no. 3 (1976). Pp. 256–259.

[73] AM Viens and Jasper Littmann, "Is Antimicrobial Resistance a Slowly Emerging Disaster?," *Public Health Ethics* 8, no. 3 (2015). Pp. 255–262.

[74] Jeffery K Taubenberger and David M Morens, "1918 Influenza: The Mother of All Pandemics," *Review of Biomedicine* 17, no. 1 (2006). P. 70.

[75] Fatimah S Dawood et al., "Estimated Global Mortality Associated with the First 12 Months of 2009 Pandemic Influenza a H1n1 Virus Circulation: A Modelling Study," *The Lancet: Infectious Diseases* 12, no. 9 (2012). Pp. 687–688.

[76] Cécile Viboud et al., "Global Mortality Impact of the 1957–1959 Influenza Pandemic," *Journal of Infectious Diseases* 213, no. 5 (2016). P. 738.

[77] Mark Davis et al., ""We Became Sceptics": Fear and Media Hype in General Public Narrative on the Advent of Pandemic Influenza," *Sociological Inquiry* 84, no. 4 (2014). Pp. 499–503.

consequences. Their disaster dynamics are tied to the destruction, death, displacement, disappearance, and disarray that they cause.

The public health consequences of man-made or natural disasters which exhibit all or some of the six Ds may also fit into the class of PHDs. For instance, cholera constitutes a common post-earthquake event, which was observed in the 2010 Haiti earthquake.[78] Rapidly occurring or accelerated levels of physical and psychological trauma, and other mass causality events are other characteristics of earthquakes. Destruction of homes and water supply systems, the disintegration of families and disappearance of people,[79] as well as human displacements are also features of earthquakes.[80] Hence, while earthquakes are not diseases or disorders, their capacity to cause destruction, deaths, displacement, disappearance, and disarray (the disaster dynamics) and pose significant public health issues justify their categorization as PHDs.

The high index of untreatability associated with a typical drug-resistant tuberculosis not only leads to unavoidable deaths but also causes some degree of social disarray as exemplified by the escape of infected persons from hospitals (as occurred in South Africa and Kenya) with an attendant spread of infections[81]. While the extent to which silent public health disasters such as ADR-TB exhibit elements of the six Ds may be low in comparison to that of other PHDs, it is not certain that the interaction of the social dynamics and the causal factors will remain unchanged. As such, any change (social, behavioral, and biological) that favors a slight exponential increase in the number of infected patients will foster the transition of the "silent status" of this type of PHD into an "overt status".

Besides the disaster dynamics associated with PHDs, they create scenarios where the multifaceted individual and social interests or good run against one another and will require some measure of balancing. On this note, the general ethical quandaries elicited by PHDs may be elaborated.

1.4 Ethical Dynamics of Public Health Disasters

Since public health disasters incorporate elements of disaster bioethics and public health ethics, some of the moral concerns that are at the intersection of these two axes of moral investigation are also elicited by PHDs. Yet, the nature of PHDs (based on any or all of the three possible conceptual interpretations outlined in the

[78] Ezra J Barzilay et al., "Cholera Surveillance During the Haiti Epidemic—the First 2 Years," *New England Journal of Medicine* 368, no. 7 (2013). Pp. 599–602.

[79] Mei-Ling Xiao et al., "Simulation of Household Evacuation in the 2014 Ludian Earthquake," *Bulletin of Earthquake Engineering* 14, no. 6 (2016).

[80] Xin Lu, Linus Bengtsson, and Petter Holme, "Predictability of Population Displacement after the 2010 Haiti Earthquake," *Proceedings of the National Academy of Sciences* 109, no. 29 (2012).

[81] Ross E.G Upshur, "What Does It Mean to 'Know' a Disease? The Tragedy of Xdr-Tb," in *Public Health Ethics and Practice*, ed. Stephen Peckham and Alison Hann (Policy Press, 2010). P. 55.

previous section) as a distinct type of disaster also generate unique moral dilemmas.

The vulnerable nature of human beings, for instance, implies that they are prone to certain negativities just because they belong to the *Homo sapiens* species. Public health disasters accelerate and accentuate the vulnerability dimensions of human life. They underscore the multifaceted aspects of how humans are susceptible to being hurt and taken advantage of by physical, psychological, social, economic, human and environmental factors.[82] In this regard, cultural practices connected to burial rites increase the risk of Ebola viral infection, poor living conditions in overcrowded housing enhance influenza virus transmission, and being born in and living in an earthquake-prone region of the world increases the likelihood of one dying or suffering harm directly from an earthquake, or indirectly from one of its attendant effects such as psychological trauma and cholera infection. Understanding the nature and dimensions of these different kinds of vulnerabilities (social, biological, epistemic, and geographic) will thus enable a better way of engaging the quandaries of PHDs and the attendant pragmatic challenges.

The limited human and material resources characteristic of disaster situations creates the need to make difficult moral choices in terms of allocation of these resources including triage decisions. These factors inevitably generate questions of justice, which involves increasing utility in a mutually fair and harmonious atmosphere that is open to contextual values and needs.[83] Local justice in the context of PHDs will incorporate the need to prioritize needs and resources amongst local actors and victims of any given disaster. On the other hand, issues of global justice will arise when other nations or international relief agencies become part of the players in disaster situations, or when neoliberal forces constitute some of the background factors that shape the severity of specific disasters. Justice in any of these contexts requires developing and following the fairest and balanced course of action. But the multiple local and global actors involved in disaster situations may complicate the process of achieving justice or agreeing to what constitutes justice in any one given scenario. This is largely because what is fair may vary by context, culture, and experience.

Human rights issues also arise within the context of public health disasters. These are context-specific but generally come to the fore as a result of what one individual may do or fail to do to other individuals during disaster situations. For instance, triage decisions by healthcare workers which often come with the exclusion of some disaster victims from receiving medical care may be shown to violate the rights of vulnerable victims of disasters. Such instances cannot be ignored and deserve attention and critical reflection considering the interconnection between health or the right to health and human rights.[84] In other words, denial of health

[82] Henk ten Have, *Vulnerability: Challenging Bioethics* (Routledge, 2016). Pp. 10–11.

[83] Tom L Beauchamp and James F Childress, *Principles of Biomedical Ethics* (Oxford university press, 2013). Pp. 249–253.

[84] Lisa Forman and Stephanix Nixon, "Human Rights Discourse within Global Health Ethics," in *An Introduction to Global Health Ethics*, ed. Andrew D Pinto and Ross E.G Upshur (London: Routledge, 2013). Pp. 54–55.

needs during public health disaster situations—for whatever potentially justifiable reasons—constitutes a denial of rights. This clearly echoes the thrust of the moral tension that is at the heart of public health ethics. However, even if societies have to painfully sacrifice the rights and needs of a few for the overall interest of her self-survival, human rights issues often become nuanced during public health disasters and may be tainted by political and other non-rights considerations.

During the 2014 Ebola outbreak, there was a slow pace with which human resources were committed to Ebola-hit regions, especially at the early phase. This contributed to the suspicion that a large-scale situation was being diplomatically incubated to create markets for vaccines so that BigPharma companies may profit off the outbreak. At the same time, there were so-called cases of preferential or "privileged" care and attention/treatment by elite local and international victims of the Ebola outbreak. In some way, this particular observation seems to reflect George Orwell's idea of "all animals are equal, but some are more equal than others".[85] If this is true, then the traditional moral quandary of human rights elicited during disaster scenarios as well as the selective interpretation or implementation of rights during PHDs deserve critical appraisal.

Uncertainty is another significant moral issue that resonates across public health disasters. Specifically, it arises as a result of the absence of certitude or exact knowledge[86] to guide the required and necessary courses of public health actions and policies during disaster scenarios. Traditionally, whereas acquiring knowledge is an important means of diminishing uncertainty,[87] this hardly applies to contexts of PHDs such as Ebola viral outbreaks, pandemic influenza, atypical drug-resistant tuberculosis, and earthquakes. For instance, the risk factors for Ebola and influenza viral outbreaks are generally well-known. However, the particular way in which the nature-nurture nexus will produce particular disease situations and at what time and place often remain unknown and unpredictable.

Similarly, while natural forces beyond the control of humankind contribute to the occurrence of earthquakes[88] as well as human activities including the underground detonation of explosives and deep-well injections[89]; the role of non-anthropological factors (e.g. gods, God, spirits etc.) have been acknowledged but their influences writ large are hard to demonstrate. This is so especially in an increasingly pluralistic and secularized world. These shades of uncertainties sometimes paralyze action, foster complacency but may suggest alternative courses of actions which are barely favored and explored at the public policy level.

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[85] George Orwell, *Animal Farm: A Fairy Tale* (New American Library, 1946). P. 192.

[86] Hansson. Pp. 1–3.

[87] Christof Tannert, Horst-Dietrich Elvers, and Burkhard Jandrig, "The Ethics of Uncertainty," *EMBO Reports* 8, no. 10 (2007). Pp. 892–893.

[88] Canan Lacin Simsek, "Turkish Children's Ideas About Earthquakes," *Online Submission* 2, no. 1 (2007). Pp. 14–15.

[89] Eric K Noji, *The Public Health Consequences of Disasters* (Oxford University Press, USA, 1997). Pp. 3–8.

Vulnerability, local and global justice, human rights and the associated nuances, as well as uncertainty, therefore, constitute some of the major ethical issues that arise during public health disasters. Each of these ethical quandaries may, however, be shown to arise as a result of context-laden relational dissonances. Such relational dissonances or disharmony occur amidst a complex interplay of human, microbial life and non-anthropological parameters. If this is true, then it would require an ethical framework forged on the foundations of relational principles and values to engage the moral quandaries of public health disasters. Scholars like ten Have, for instance, describe vulnerability as a gradual and relational experience that negatively impact people's wellbeing.[90] Applied to the context of disasters, this suggests the notion that dealing with the different shades of vulnerabilities that PHDs elicit will warrant an approach that takes into consideration the different relational tensions and dimensions that contribute to engendering PHDs *ab initio.* To be sure, public health disasters bring about several kinds of disruptions in relationships at the personal and social experiential axes. For instance, earthquakes negatively shape personal confidence in nature's benign nature and engender a sense of fear and helplessness.

Earthquakes as a distinct category of PHDs also raise existential and theological questions about how personal or social moral comportment may elicit catastrophic destructions through the forces of nature acting in tandem with a divine hand. Other types of public health disasters including Ebola viral and pandemic influenza outbreaks disrupt individual, familial, and business relationships through the agency of requisite travel restrictions, quarantine, and sometimes a halt in commercial activities. Therefore, engaging these issues will demand an approach that seeks ethically creative ways to prepare moral actors, survivors, and victims of disasters ahead as well as help them to deal with the relational dissonances that public health disasters engender. It is such a task that this book will ultimately address through the global ethical framework it seeks to develop.

1.5 Global Dynamics of Public Health Disasters

The increasing realization that contemporary public health has no national boundaries and is inherently global[91] underscores the notion that the pragmatic and moral perplexities raised by public health disasters will not be localized but would and should garner a more global kind of reflection, policy response, and pragmatic interventions. The practical import of this is historically illustrated by the case of smallpox which seemed to have begun in Northeastern Africa around 10,000 BC but spread to other regions of the world to wreak untold morbidity.[92] Therefore,

[90] ten Have, *Vulnerability: Challenging Bioethics*. P. 6.

[91] Annas. P. xxiii.

[92] Laura H Kahn, *Who's in Charge?: Leadership During Epidemics, Bioterror, Attacks, and Other Public Health Crises* (ABC-CLIO, 2009). P. 13.

developing a global framework for PHDs offers a lens for focusing attention on this global but under-studied issue. The transcontinental nature of the SARS epidemic, for instance, has made some commentators hold the position that there is an urgent need to strengthen the ways the global community deals with emerging infectious diseases, and how novel visions of global solidarity and cooperation will be key in such an endeavor.[93]

For scholars like Radest, the paucity of an ethical framework that can help deal with the different dimensions of health disasters involving a large number of casualties, deaths, and dislocated societies endanger the global community.[94] Other commentators like Schuklenk and Hare emphasize the need for a concerted global response to combat infectious diseases that approach disaster proportions.[95] To get better insights into the global dimensions of PHDs, an examination of the social consequences locally, and how these generate global dimensions will be useful. This can be done by pursuing the six-D characteristics of disasters.

All public health disasters cause death to different degrees. For example, the 1976 Ebola Sudan outbreak had a mortality rate of 53%, the second outbreak in Zaire also in 1976 had a rate of 89% and the third outbreak in Sudan in 1979 had a mortality rate of 65%.[96] These figures translate not only into the deaths of individual human beings including mothers, fathers, children, uncles, and aunties but also engender the social, personal and economic disruption of the lives of the dependents (children and spouses), parents, and associates of the victims. The morbidity wrought by the 2014 Ebola outbreak which killed more than half of infected persons further highlights the mortality of this public health issue and its disastrous consequences. It likewise underscores the importance of a proper pragmatic and ethical approach, especially in terms of the ease with which the disease transcended borders[97] and rapidly acquired a global status. With the rise in rapid air-transportation capabilities today which readily moves people including the infected from one region to another (potentially exporting diseases), it is no surprise that there have been suggestions that quantitative analysis of worldwide air-traffic patterns may enable cities and countries around the world to better anticipate the risks of importing global infectious diseases.[98] The air transportation restrictions that were instituted during the 2014 Ebola outbreak illustrates this public health preventive approach.

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[93] Peter A Singer et al., "Ethics and Sars: Lessons from Toronto," *British Medical Journal* 327, no. 7427 (2003). Pp. 1342–1343.

[94] Howard B Radest, *Bioethics: Catastrophic Events in a Time of Terror* (Lexington Books, 2009). Pp. 7–18.

[95] Udo Schuklenk and Darragh Hare, "Issues in Global Health," in *Global Bioethics and Human Rights: Contemporary Issues*, ed. Wanda Teas, John-Stewart Gordon, and Alison D Renteln (London: Rowman & Littlefield, 2014). Pp. 300–301.

[96] Xavier Pourrut et al., "The Natural History of Ebola Virus in Africa," *Microbes and Infection* 7, no. 7 (2005). Pp. 1006–1007.

[97] Kass. P. 744.

[98] K Khan et al., "Spread of a Novel Influenza a (H1n1) Virus Via Global Airline Transportation," *The New England Journal of Medicine* 361, no. 2 (2009). Pp. 212–213.

Commercial airlines are a suitable environment for the spread of pathogens carried by passengers or crew; as such, transmission of infectious diseases during commercial air travel is an important public health issue[99] locally and globally. In the context of public health disasters, however, the required restriction in the transportation of goods and human cartel will bring about some disruption in social life. Consider, for instance, Mr. G who is a business man living in an area where an outbreak of Ebola has recently taken place. If his primary business involves air-travel to buy stock, a travel restriction will negatively affect him. In addition, the local hysteria and fear may keep people away from patronizing his business. Consequently, those directly and indirectly dependent on his economic input will bear some significant pecuniary loss.

This is only hypothetical; yet, it illustrates the notion that preparedness efforts need to take into serious consideration the associated complex social dynamics that often surround disaster scenarios. In the hypothetical case, it will be hard to imagine that Mr. G may not seek for alternative travel channels to keep his business alive. It is equally plausible that acts of corruption may create loopholes that will enable Ebola-positive undiagnosed people to circumvent any travel barriers meant to curtail the spread of infection. These pragmatic possibilities again echo the importance of an all-inclusive approach that pays serious attention to all underlying social factors that may shape the actions and inactions of moral agents during PHDs. It also echoes the importance of local solidarity and cooperation as well as well-coordinated international solidarity during public health disasters. If solidarity, as Featherstone opines, involves creating new ways of relating and interaction,[100] then any moral framework developed towards engaging the ethical quandaries that PHDs generate must incorporate creative relational approaches.

Although the death, destruction, and social disarray that accompany disease outbreaks such as Ebola viral diseases and pandemic influenza demonstrate the social impacts of public health disasters locally and their global dimensions, the public health consequences of natural disasters such as earthquakes can offer some additional perspectives. To be sure, by 1997 it was estimated that natural disasters such as earthquakes had claimed more than 3 million lives while negatively affecting the lives of other 800 million people as well as causing more than 50 billion USD loss at a global level.[101] These figures approach disaster proportions and reflect the death, destruction, and destruction aspects of the six Ds. On the other hand, communicable diseases are also brought to the fore during earthquakes, locally and globally. For instance, dengue fever was imported into the United States during the 2010 Haiti

[99] Alexandra Mangili and Mark A Gendreau, "Transmission of Infectious Diseases During Commercial Air Travel," *The Lancet* 365, no. 9463 (2005). Pp. 989, 994.

[100] David Featherstone, *Solidarity: Hidden Histories and Geographies of Internationalism* (Zed Books, 2012). P. 5.

[101] Eric K. Noji, "The Nature of Disasters: General Characteristics and Public Health Effects," in *The Public Health Consequences of Disasters*, ed. Eric K. Noji (New York: Oxford University Press, 1997). Pp. 3–4.

Earthquake.[102] Health infrastructures are likewise targets of natural disasters such as earthquakes,[103] further hindering and complicating the speed and type of available health responses. In addition, the destruction of houses that accompanies earthquakes expose victims to environmental disease vectors including mosquitoes, lice, and fleas.[104]

However, it is not only the disease dynamics of earthquakes on a global transmission scale that cause concerns. The enhanced interconnectivity in traditional media and the new social media platforms can rapidly distribute real but disturbing images of the carnage of earthquakes and the associated public health sequelae. These platforms effectively transmit the horrors and realities of earthquakes, the distress of the victims, as well as the overwhelming burdens of the local healthcare system to other parts of the world. But disturbing as this may be, it equally provides an avenue through its capacity to stimulate external acts of solidarity to help lessen the burdens of such public health disasters. As Keim and Noji reported, during the immediate aftermath of the 2010 Haiti earthquake, social media platforms were the source of what people around the world knew. It also served as a new forum for collective intelligence, social convergence, and community activism, and within the first two days of the earthquake led to donations of more than $5 million to the American Red Cross.[105]

The visceral-type of identification with disaster victims as vulnerable people needing urgent rescue and care which can thereafter elicit acts of solidarity underscores the significance of how burdens of a locality can rapidly become a global burden that demands attention and solutions. At the same time, however, not any kind of international assistance is needed during public health disasters. For instance, Noji argues that a hasty response that is devoid of prior impartial assessment will only complicate the chaos of disasters such as earthquakes. As such, it is better to wait until real needs have been identified.[106]

Silent public health disasters such as atypical drug-resistant tuberculosis also exert a number of global dimensions. In traditional western societies and in westernized climes, most people value individual freedom and construe it an inviolable "right". In the American context where the ethos of moralism, meliorism, and individualism hold sway,[107] the fate of those carrying an infectious disease is generally not tied to that of the collective society. This is indeed the genesis of the moral tension in public health ethics where the atomization of persons' interests run contrary to collective interests. Applied to the context of ADR-TB, an autonomy-driven

[102] Tyler M Sharp et al., "A Cluster of Dengue Cases in American Missionaries Returning from Haiti, 2010," *The American Journal of Tropical Medicine and Hygiene* 86, no. 1 (2012). P. 16.

[103] Noji. Pp. 14–15.

[104] Michael J. Toole, "Communicable Diseases and Disease Control," in *The Public Health Consequences of Disasters*, ed. Eric K. Noji (New York: Oxford University Press, 1997). P. 81.

[105] Mark E Keim and Eric Noji, "Emergent Use of Social Media: A New Age of Opportunity for Disaster Resilience," *American Journal of Disaster Medicine* 6, no. 1 (2010). Pp. 47–50.

[106] Noji. P. 17.

[107] Albert R Jonsen, *The Birth of Bioethics* (Oxford University Press, 2000). P. 390.

ideology naturally runs against compliance to public health directives, especially when they involve bearing burdens that are directly removed from the personal risks and interests of individuals.

In the United States, there have been empirical proofs of this tension in relation to tuberculosis. Specifically, this was exemplified by the cases of Robert-Daniels (who refused to comply with directives to wear a mask to prevent disease dissemination in public) and Andrew Speaker (who ignored public health orders and traversed national and international borders).[108] The actions of these Americans echo the idea that health policies and programs may be discriminatory and burdensome on human rights; hence, are to be challenged.[109] It likewise reflects the Western "me, myself, and I" mantra which prioritizes freedom and self-determination above all other considerations.[110]

The global risk of spreading infections demands that a global public health engagement of PHDs in general and atypical drug-resistant tuberculosis, in particular, will require an approach that has some departure from a morality forged on individualism. In this regard, a relational-based moral system that reckons with the relationship of people to other people, the infected versus the non-infected and the relationship between microbial life and people offers a useful and remarkable means of addressing this moral quandary and the attendant pragmatic issues.

1.6 Methodology

This book draws insights from extant literature from a range of academic arenas including sociology and medical sociology, biomedical sciences, public health, as well as the bioethics literature. This approach reflects what bioethicists like ten Have recently argued for, noting that bioethical discourses increasingly demand multiple voices. If this is true, the voice of reasoned insights from non-bioethics academic disciplines is relevant, especially in areas of shared themes. Four representative types of global problems *à la* public health disasters across geographic and cultural divides are first selected. This is followed by using an ethical lens that closely mirrors the particular disaster to engage and formulate context-suitable ethical resolutions. For instance, the African moral lens of *Ubuntu* is applied to Ebola virus outbreaks due to the general origin of such outbreaks from that part of the world. In the case of atypical drug-resistant tuberculosis, a completely new ethical lens is developed based on the specific parameters associated with its dynamics. The relevant transnational nuances and limitations associated with each context-specific ethical lens, the common linkages around each of the PHDs, as well as the

[108] Upshur. Pp. 53–54.

[109] Jonathan M Mann et al., "Health and Human Rights," *Health and Human Rights* 1, no. 1 (1994). P. 16.

[110] Eric J Cassell, *The Nature of Suffering and the Goals of Medicine* (Oxford University Press, 2004). Pp. 23, 25–26.

overlapping quandaries are then systematically identified and clarified. These are ultimately used to frame a global normative framework for engaging public health disasters as a class of global health problems.

Procedurally, the thematic objectives of this book will be realized as follows. From Chaps. 2, 3, 4 and 5, a context-specific ethical framework will be developed for each of the four representative public health disasters. For Ebola viral disease, a *Ubuntuan* ethical framework will be developed. This will be based on the African notion of *Ubuntu* which conceives morality as a function of the mutual recognition of personhood in all parties in a relationship,[111] affirmed through the maxim: I am because we are. This ethical lens will show that an other-centric cognitive frame of mind is exigent to dealing with the moral quandaries raised by EVDs. Chapter 3 will use two people-centric moral lenses to engage the moral issues embedded in pandemic influenza outbreaks. Specifically, it will employ the communitarian as well as the ethics of care moral framework to point out the strengths of these two and what insights they may offer public health disasters in general.

Chapter 4 will develop an anthropo-ecological moral lens for engaging the moral perplexities that arise from atypical drug-resistant tuberculosis. This approach will be framed on the vectorhood and victimhood of humans, the teleological elusiveness of microbes and the evolving nature and capacities of the ecosystem. Chapter 5 will engage the public health consequences elicited by earthquakes as well as the attendant ethical issues. In this regard, it will develop a solidaristic framework that can help address the anthropogenic and non-anthropogenic dimensions of the moral issues.

Chapter 6 will systematically examine how the ethical issues elaborated in Chaps. 2, 3, 4 and 5 overlap and the limitations of the moral frameworks that were used to engage the attendant ethical issues which the four respective PHDs bring about. It will then attempt to weave a common logical thread around the range of human and non-human interconnectedness that resonate across Ebola outbreaks, ADR-TB, pandemic influenza, and earthquakes. Using this as a conceptual fulcrum, the chapter will develop a relational-based GEF to address the moral quandaries of public health disasters. It will also offer justificatory polemics as to why such an approach is what best suits the moral quandaries engendered by public health disasters. Finally, Chap. 7 will explore how to translate the relational-based global ethical framework into action guides via relevant local and transnational stakeholders in order to influence on-the-ground realities. The chapter will also examine the GEF *vis-a-vis* the UDBHR.

[111] Leonard Tumaini Chuwa, *African Indigenous Ethics in Global Bioethics* (Springer, 2014). Pp. 36–37.

1.7 Conclusion

This introductory chapter has pointed out the conceptual, ethical, trans-national, and global dimensions of public health disasters. It has shown the gaps in the extant bioethics literature. Specifically, it has shown how public health disasters as a notion and an ethical category has not received the needed scholarly attention.

It has likewise shown that analyzing the notions of "public health", "disasters", "public health ethics", and "disaster ethics/bioethics" hold the key to untangling what a public health disaster may possibly be. In this vein, PHDs constitute public health ethics-related issues that arise due to disasters such as infectious disease outbreaks of pandemic proportions; public health issues that have disaster dynamics, for instance, the attendant public health impacts of natural or man-made disasters; and "silent" or non-apparent disasters (natural or man-made) that are yet to garner ample public health attention but which may (given the right combination of biological and social conditions) rapidly approach pandemic proportions.

This chapter also presented the general ethical quandaries of public health disasters encapsulated by social, existential, biological and geographic vulnerabilities, human dignity and rights-related issues, balancing local and global justice issues, and uncertainty. The local and global dimensions of these quandaries were highlighted as well as the compelling ethical and pragmatic need—illustrated by several shades of the six Ds—to engage them. Finally, the chapter briefly set out the methodological approach that will be used to frame and develop the relational-based GEF for engaging the moral dilemmas generated by PHDs.

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