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The Future of Public Health through Science Fiction

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Abstract: This study investigates the ability of science fiction to address issues that emerge in public health. The issues that form the focus of this paper include the spread of misinformation and disinformation, dependence on technology, and competent public-private partnerships that serve the interests of society. Each of these issues is brought under the spotlight by Barbadian sociologist Karen Lord in 'The Plague Doctors' and American psychiatrist Justin C. Key in 'The Algorithm Will See You Know'. The stories, although set in unrealized futures and describe as yet inconceivable advancements in technology, contain real-world problems involved in accessing healthcare. In doing so, both writers attend to the viability of literature, and the humanities in general, as a vehicle for encouraging reform to public health policies that face challenges such as inequities in healthcare and raising greater awareness of health concerns. My study bridges public health and literature, specifically science fiction, to get certain messages across. These messages include effectively communicating risks to people's health, increasing understanding of social responsibility, and addressing uncertainty with transparency. The stories in question reveal futures where public health management has, for the most part, either got it right, in the case of 'The Plague Doctors', or not quite, in the case of 'The Algorithm Will See You Now'. Because I consider the COVID-19 pandemic to be less of a disruptor to public health and more of a revealer of what public health needs to focus on, I foresee interdisciplinary projects such as mine as crucial to bridging the disconnect between people and public health policies.

Keywords: science fiction; medical science; public health; psychiatry; communication; humanities

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1. Introduction

As a term, 'Medical Humanities' was first used in 1948 by the medical historian Sarton (1948, p. 127) and gradually gained popularity during the 1990s.[1] This subdiscipline attempted to re-establish the relationship between medicine and the arts, a relationship which has existed from as early as the sixteenth century and "most prominently in the figure of Andreas Vesalius, who integrated science, religion, and the study of the human body" (Kutac et al. 2015, p. 377). The new way of thinking, inspired by Vesalius and his Renaissance contemporaries such as Petrarch, is similar to the more modern approach of translational medical humanities and much broader, health humanities. Recently, Engebretsen et al. (2020) have applied "Derrida's understanding of translation as a *supplement*, that is as a textual process that always involves additions and adaptation to and of the original message" to the medical humanities. In this paper, I use the term 'translational' to characterize my reading of science fiction as providing supplemental information to medical and non-medical specialists alike on the future of public health through futuristic stories. At times I go beyond the definition offered by Engebretsen et al. in my use of translational as a form of instruction for improving public health practice through a critique of present-day health protocols.[2] I utilize a translational medical humanities approach to my study of two science fiction short stories, 'The Plague Doctors' by Barbadian Karen Lord, and 'The Algorithm Will See You Now' by American Justin Key.

Both stories employ narratives of illness to expose issues in public health. Issues that emerge in each story, to varying degrees, include access to and the ethics of healthcare, socio-political critique of governmental inaction, and changes to practitioner-patient relationships brought on by technological advancements in medicine. My consideration of literature as a viable medium for translating medical science is in line with a study by Blanton et al. (2020) who investigated the impact of reading Tolstoy on physical therapy practice.[3] Following the brief analysis of Tolstoy's work, Blanton et al. go on to explain that the *Journal of Humanities in Rehabilitation* was inaugurated with to use narrative writing, poetry, arts, and film as "full partners in the restoration of health" (Charon 2015, p. 886). As identified by the likes of Charon and Blanton et. al, my paper focuses on literary framings of public health that are developed alongside broader understandings of socio-cultural, historical, emotional, and ethical experiences of technological changes in medical and scientific practice.

As examples of medical humanities, each story's fictional world necessarily "describes a model for understanding CS [cultural sensitivity] from a public health perspective" and "a process for applying this model in the development of health promotion" (Resnicow and Baranowski 1999, p. 10). Additionally, I show how the production of literature that takes up questions of health reflects current and past experiences of access to healthcare. Finally, to what extent can science fiction and associated sf literature (De Matas 2022) enable cultural understandings of public health procedures? The illustration of public health in each story focuses on qualities such as emotional competency, cooperation, and empathy to varying degrees. The extent to which each story emphasizes these qualities on its way to translating medical science is a central point of inquiry for my paper. For example, 'The Plague Doctors' allows us to view effective public health measures as involving both competency by the community as well as the safeguarding of equitable and ethical access to healthcare by the state. In 'The Algorithm Will See You Now', Key draws similar attention to issues of equitable access to mental care with a specific focus on Black communities that are disproportionally unable to access psychiatric services.

Although set in the future, each story is grounded in present-day issues. As a result of this, the fiction allows us to question our reality by emphasizing the long-term impacts of continual neglect of public health matters. I argue that both stories are emblematic of a medical humanities approach to translating science through cultural approaches to medicine and health. My paper elaborates this central idea through an investigation of the ways in which both stories use fictional illnesses as cultural metaphors for the socio-cultural critique of political competence in the case of 'The Plague Doctors' and racial inequity in the case of 'The Algorithm Will See You Now'.[4] The medical knowledge about viruses and mental health generated by Lord and Key, respectively, intersect with the socio-economic and cultural discussions of how an island state manages a public health crisis, seen in 'The Plague Doctors', and who is discriminated against for accessing therapy, highlighted in 'The Algorithm Will See You Now'.

In addition to the thematic and cultural exploration of medical knowledge, both stories bear the influence of Lord's and Key's professional backgrounds as a sociologist and physician, respectively. The different kinds of scientific knowledge offered by both writers reflect the claim by Viney et al. (2015, p. 3), that "a critical medical humanities will flourish wherever the procedural norms and routines of the humanities, the social sciences, *and* the biological sciences are openly, evenly and creatively interrogated and reworked." Added to the different scientific backgrounds that each writer brings to their cultural exploration of public healthcare, are different forms of cultural awareness based on each writer's geographic context. This context uniquely situates each writer to provide cultural knowledge readily available to them. For example, Lord, a Barbadian explores the impact of a plague on a fictional island. Key, on the other hand, a Black writer, draws attention to inequitable access to mental healthcare by Black patients.[5] My study, therefore, brings a different engagement with the field of medical humanities through a focus on the social implications of ineffective, inefficient, and inequitable public health practice.

In 'The Plague Doctors' an island nation attempts to manage a respiratory virus called 'the plague'. When Maisie, a child and patient zero, contracts the virus, Audra Lee, her aunt, and scientist or 'plague doctor', is tasked with managing the diagnostic lab which eventually engineers a successful vaccine with the help of Dagmar Bauer and her philanthropist friend, Alexander Esterházy-Schwarzenberg. As the virus spreads throughout the community that has become isolated from the wider world, Audra's team accepts funding to develop the vaccine from Alexander. However, when a whistleblower releases a secret cache of research into the virus, this implicates Dagmar's lab in the criminal withholding of information on the plague. During the story, it is further revealed that the information could have saved millions of lives but was instead withheld and with it "the best chances of prevention and cure for those who could afford to pay for it" (Lord 2019, p. 433). Although the vaccine is yet to undergo human trial, Audra allows her brother, Colin, who also contracts the virus, to steal two vials, one for Maisie and the other for himself. When the team leader and senior doctor for the district, Jane Pereira, discovers the missing vials, she relieves Audra of her duty. Lord explores the ability of individuals to influence public health procedures when the state is unable to intervene along with the disruptions caused by the plague which include quarantine orders affecting social life, declining profitability from the tourism industry, and ethical malpractice involved with the biomedical engineering of a vaccine.

In 'The Algorithm Will See You Now', Dr. Hairston, a psychiatrist, works alongside what is simply referred to as 'the algorithm'—an implant in her brain that relays patient information to her. The story is set in an unspecified future when cluster-based treatment is the norm, replacing even face-to-face treatment.[6] Both Dr. Hairston and the algorithm treat Alaina Harris who is diagnosed as psychotic by the algorithm while Dr. Hairston believes her to be affected by multiple personality disorder. The story's exploration of mental health issues intersects with questions of racial inequity as it concerns Alaina's identity as a Black American and her lack of access to therapy. During the appointments, Dr. Hairston and the algorithm are constantly recalibrating their understanding of Alaina which is informed by her Blackness and the underrepresentation of mental health data for Black patients which causes the algorithm to make inaccurate and inadequate diagnoses. Despite having a neural probe implanted into her brain,[7] Dr. Hairston vacillates between trusting the algorithm's assessments of Alaina based on her changing neural clusters, and her instincts of her mental condition based on her own identity as a Black healthcare provider. Through the triangulation of Blackness, algorithmic possibility, and psychiatric nomenclature, Key investigates the potential and shortcomings of technological advancements in mental healthcare. The themes contained in, as well as the production of, each story is significant for the ways in which they extend our understanding of medicine through cultural discourse.

As much as I examine each story's unique ability to translate scientific knowledge for socio-cultural critique, I also question the extent to which Lord and Key are able to not just add but also integrate our understanding of medical practice in a way that recasts how knowledge of medicine is shaped by human experiences. The distinction between the additive and integrated views of medical humanities, discussed by Evans and Greaves (1999) therefore forms the other major thread of my paper which is situated at the intersection of the medical and social sciences and science fiction. A study of the science fiction genre alongside medical humanities increases the corpus of literature treating with matters involving public health and aids in expanding the domain of both science fiction and medical humanities. Additionally, the science fiction genre, which often focuses on the future and frequently uses various sciences as integral parts of the stories, offers opportunities to envision the future of public health. Science fiction, therefore, has the potential to provide perspectives and situations not found in other literary genres. Writer and scholar, Amis (1962, p. 87), recognizes the effectiveness of science fiction as "a medium of social diagnosis and warning." The stories by Lord and Key substantiate Amis's claim by imagining futures where technology has become deeply imbricated in public healthcare to the extent where, if left unchecked, it negatively affects access to treatment. More

recently, the ongoing project led by Miller and McFarlane (2016) has resulted in a special journal issue on science and fiction and the medical humanities. McFarlane notes issues of inequality, privatization, and medical ethics that have come under the scrutiny of science fiction writers (McFarlane 2016, p. 3). Through an emphasis on how to effectively provide healthcare as well as the areas where healthcare needs to improve, both stories by Lord and Key add to the field of medical humanities by translating public health policy through narrative.

Both stories, by their very publishing in anthologies that purposely set out to explore healthcare, further contribute significantly to my paper's exploration of science fiction literature and the medical humanities. Each writer emphasizes the changes in scientific discovery and technological advancement that help as well as hinder access to healthcare. 'The Plague Doctors' is originally published in the 2019 anthology *Take Us To A Better Place: Stories*. The anthology was commissioned by The Robert Wood Johnson Foundation (RWJF) which "has worked to improve health and healthcare in the United States" through a "national Culture of Health rooted in equity."[8] The RWJF's intention for the anthology, to "help ignite a lively discussion and health debate about what it will take to build a better future,"[9] reflects a central idea of translational medical humanities. This idea of communicating a culture of health to help change the future occurs in 'The Plague Doctors' through a focus on government, professional, and individual responses to 'the plague'. Justin Key's 'The Algorithm Will See You Now' is published in the 2020 anthology *Vital: The Future of Healthcare.* As described on its website, the anthology was intended to contribute charitably toward the United Nations Foundation's COVID-19 Solidarity Response Fund.[10] For this reason, Ambrose argues that science fiction, because of its ability to build empathy, is important for building social connections—especially during a health crisis. Each story's reflection of the most pressing issues in public health policy, together with their illustration of fictional worlds set in the future, enable a combined humanistic approach to understanding the delivery of effective and culturally sensitive healthcare. Given the lack of empirical evidence for "the causal link between fiction reading and the development of empathy" (Keen 2007, p. 124), my study balances the empathy that is encouraged through the anthologies with a social justice approach to public health and health policy provided by Powers and Faden (2006).[11] As such, my study looks outside of medical care, to stories that explore issues of corporate profiteering and racial inequity, in order to draw attention to such issues that affect medical care.

Stories such as 'The Plague Doctors' and 'The Algorithm Will See You Now' in particular and the respective anthologies in which they were published in general add to the increasing turn in the medical and health humanities which is grounded in the belief that "arts and humanities approaches can foster significant interpretive enquiry into illness, disability, suffering, and care" (Bolton 2008, p. 131). If, as Bolton goes on to say, the ultimate aim of the medical humanities "is about developing the model of medicine to become interdisciplinary, to include the aesthetic, and the whole person of both patient and clinician" (p. 146), the stories by Lord and Key transform public healthcare procedures by identifying and critiquing what is dysfunctional and providing alternative practices through an emphasis on various types of competency.[12] My analysis of both stories takes up "[t]he task for science fiction within the medical humanities [which] is to articulate interpretative frameworks that do justice to medical thematics within the genre" (Miller and McFarlane 2016, p. 213). I argue throughout my paper that the stories by Lord and Key offer interpretative frameworks for the future of healthcare. This is particularly brought under the spotlight by the science fiction tropes which question what is public health from an individual perspective, where are there inequities and disparities in access to healthcare, who is included in public health decisions, and how gaps in accessing public health can be addressed.

2. Public Competency and Private Corporatization in 'The Plague Doctors'

In addition to the tangible, technical expertise involved with managing a health crisis, the stories also emphasize the intangible, emotional intuitiveness required in effective public health procedures. Audra Lee, because of her position as manager of the diagnostic lab, is aware of the need to keep her emotions under control, especially when around her brother. The narrator explains that "She [Audra] should have been kind and understanding, but she was tired, too, and her fears were larger than his, and heavy with the secrecy of professional confidentiality. *Ensure there will be no panic*" (Lord 2019, p. 402). This echoes the instruction by the team leader and senior doctor for the district, Jane Pereira, who understands that a large responsibility of the medical team is "to ensure there will be no panic in the community" (401). Audra's awareness of the need to maintain calm during a crisis is illustrative of a central concern in public health competency, namely the importance of emotional intelligence (EI) (Freshman and Rubino 2002). As much as Freshman and Rubino classify emotional intelligence as a core competency in healthcare, at the time of their writing they note that progressive healthcare facilities have recently recognized the value of EI training and have incorporated programs that emphasize its principles" (p. 5).[13] Through the medical team's acknowledgment of the need to maintain calm throughout the community, 'The Plague Doctors' becomes instructive of the emotional competency required in public health procedures.

Another significant competency in public health practice that is illustrated in 'The Plague Doctors' concerns the ability of small communities to effectively manage a pandemic. The view of community management during a public health crisis diverts from the argument by Rothstein (2002). In his search for a precise parameter of the dynamic field of public health, Rothstein advocates for government intervention in public health whereby "only public health officials can undertake public health actions because their coercive powers are firmly grounded in constitutional provisions and enabling legislation" (p. 146). The limited scope of Rothstein's argument is exposed by the events of 'The Plague Doctors'. Due to the population's dependence on the healthcare system, the narrator notes that "The island's sole hospital struggled with the reduction of key imports; the quarantine center was about to reach maximum capacity; and more and more bodies were appearing in spite of the best efforts of the Navy and Coast Guard to keep the beaches clear" (Lord 2019, p. 408). The inability of state institutions in managing a public health crisis is countered by the community-wide response, inclusive of Audra's private medical team. Lord's spotlight on a community effectively managing a health crisis illustrates what is at stake for the future of public healthcare, particularly where the relationship between state and community competencies is considered.

Faced with conspiracy theories of state cover-ups, censorship, and global bio-warfare, the team of plague doctors turn to "the medical team of a small community clinic" (Lord 2019, p. 401) to ease the burden caused by the pandemic. The turn to "a project that collated similar information from community clinics, herbalists, and healers in the Rural and Emergency Medicine Network" (Lord 2019, p. 413), is a marked departure from Rothstein's argument that "the key element of public health is the role of the government—its power and obligation to invoke mandatory or coercive measures to eliminate a threat to the public's health" (Rothstein 2002, p. 146). The 'The Plague Doctors' illustrates the extent to which a pandemic can be managed through balancing public, that is government intervention, and private competency, by individuals or communities. As a result, the story gives agency to individuals and communities in managing a public health crisis. The representation of collaborative efforts between native and modern medicine as part of the overarching public health network opens critical interventions into public health procedures that are determined by local and global politics. By placing healthcare competency in the hands of individuals, Lord's fiction speculates on how public health can be depoliticized through community effort.

Lord's community-centered approach to solving a public health crisis, although avoiding politicized intervention, neglects to challenge the ethics of biomedical engineering of a

vaccine as well as the distribution of vaccines that have not gone through the required trial phases. When Audra's team successfully develops the vaccine, her professional responsibility and personal life clash because she faces a dilemma between allowing her brother to take vaccines to save his and Maisie's life and her ethical responsibility as a scientist to ensure the vaccines go through human trials. Notwithstanding the personal choice Audra makes despite the ethics demanded of her position as a scientist, it is the profiteering by the Guerilla Network Unit that forms a major strand of Lord's critique of unethical management during a public health crisis. What passes off as triage under the GNU's leadership is, in Audra's eyes, "pure, arbitrary selfishness that would see millions of innocents die so that rich old men could live a few months longer in an emptier world" (Lord 2019, p. 433). The GNU stands in for what Sharp and Yarborough (2006) have identified as a concern in the pharmaceutical industry, that "biomedical research is more about increasing profit than promoting public health" (Sharp and Yarborough 2006, p. 460). This concern is made a reality in 'The Plague Doctors' when GNU's surreptitious research into phage therapy, immunotherapy, and potential antimicrobial drugs is uncovered. Unlike Sharp and Yarborough who offer suggestions for medical institutions to be more transparent regarding the financing of biomedical research, particularly through a partnership-centered approach,[14] Lord does not resolve the issue of unethical biomedical research. Instead, as Alexander explains, Dagmar is guaranteed some level of immunity from prosecution and Audra's license is revoked. That both Dagmar and Audra, scientists with good intentions, have their reputations negatively impacted, points to the ongoing system of unethical profiteering in the pharmaceutical industry and the unjust system that perpetuates it.

The political injustice of the uneven distribution of medical knowledge and resources illustrated in 'The Plague Doctors' reflects the real-world inequity in global pharmaceutical operations.[15] In the absence of a competent government, the privately-run GNU dictates access to medicine leading those in the community such as Audra to make individual choices regarding the distribution of vaccines. To combat the real-world inequity in access to healthcare, initiatives such as 'The Access Campaign by Médecins Sans Frontières (MSF), an international, independent, medical humanitarian organization, have attempted to make medical tools more accessible worldwide.[16] What Lord hints at in 'The Plague Doctors' is an even greater public health crisis brought on by inequity in technoscientific knowledge and resources. At the end of the story, Audra despite having her license revoked is offered and accepts a medical administrative position by the very Network whose data was leaked. The implication is that the cycle of unethical industry practice will continue, proving to some degree the claim by Gabriel and Goldberg (2014) that "the goals of medical science and industry profit are now tightly wed to one another" (Gabriel and Goldberg 2014, p. 307). As both medical literature and literature on medical research reveal, stricter state intervention is required to regulate the power and influence medical corporations have in determining prices and ensure the ethical conduct of testing, treatments, and vaccine development.

In 'The Plague Doctors' Lord counterbalances medical and scientific competency at the community and individual levels with unethical privatization of healthcare by corporations and a lack of state intervention in private industry. The story's ending indicates what the future of health needs to involve: community-wide competency along with equitable and ethical access to healthcare. My focus on Lord's description of the impacts of public health procedures on a community during a pandemic changes in scope to a focus on one Black individual and her lack of access to psychotherapy in Justin Key's 'The Algorithm Will See You Now'.

3. Access and Inequity in Psychiatry in 'The Algorithm Will See You Now'

While both stories share themes related to access and equity through a public health perspective, 'The Algorithm' is especially focused on a lack of empathy and racial disparity affecting Black individuals who suffer from mental illness. By centering mental wellbeing as a public health issue, Key's story attempts to integrate the practice of psychiatry with

fiction as part of a medical humanities approach that "may improve the understanding of mental illness and support more effective interventions" (Bhugra and Ventriglio 2015, p. 79). As such, 'The Algorithm' allows us to consider the possibilities and pitfalls of technological advancements in providing mental healthcare including the debated topic of technology that may improve psychiatric practice and the extent to which technology can provide therapy for practitioners and patients. Key channels his positionality as a Black, practicing psychiatrist into his exploration of racial disparities of inequity in accessing mental healthcare.

Of the findings revealed in a survey on artificial intelligence and the future of psychiatry, "the perceived *"loss of empathy"*, and absence of a therapeutic interpersonal relationship in the treatment of mental health patients" (Blease et al. 2020, p. 5) was a primary concern. Set in the future, 'The Algorithm' magnifies a perceived loss of empathy through attention to racial injustice and inequity in psychiatry by highlighting the role of the algorithm which "honed in on abnormalities in the brain's language and emotional centers and interpreted this as a psychotic process, which was clearly wrong" (Key 2021, p. 185). Later, the extra work Dr. Hairston takes up at the community hospital to distract herself is entirely digital:

> Each [patient] had a computer read-out that aggregated data from all their medical care across the country and analyzed them against a global database of various clinical presentations, treatments, and outcomes. This produced a nice little table of risks, scores, and suggested interventions. (Key 2021, p. 210)

Dr. Hairston's turn to digital psychiatry imagines a loss of the therapeutic relationship including a lack of rapport and contact identified in the survey of psychiatrists (Blease et al. 2020, p. 6). What psychiatric practice in the story gains in efficiency through the algorithm, it loses in empathy and personal connection. The swift turnover of patients that is enabled by the algorithm removes the practitioner from the therapeutic relationship thereby changing the fundamental principle of psychiatry from the interaction of first-hand experience to algorithmic, third-party assessments of predefined mental conditions. Other forms of techno-scientifically advanced treatment include the cluster ablation procedure which Dr. Hairston frequently uses and the NAR protocol which she uses on Alaina.[17] The story ends with Dr. Hairston undergoing another ablation treatment, in effect substituting a human connection for computerized treatment. She prefers to live in ignorance, afforded by the ablation treatment, rather than confront her mental distress (Key 2021, p. 230). Through her actions the story comments on the future of psychiatric care not just for patients but also for physicians. Although face-to-face therapy has not been completely eclipsed by technology, it is waning in popularity and efficiency compared to algorithmic models.

Connected to the increasingly popular form of digital psychiatry in 'The Algorithm' is the tenuous relationship between psychiatric practice and assistive technology. Dr. Hairston's practice began during the "cluster-based treatment revolution [that] swept through psychiatry" (Key 2021, p. 186). As such, she uses technology to augment her psychiatric healthcare. Key allows readers and physicians to question the extent to which technology helps and hinders the provision of psychiatric care. Immediately upon Alaina's entering the psychiatrist's office, Dr, Hairston notes that the algorithm's triage of Alaina was inadequate because "[h]er referral note simply read: "odd presentation, in need of therapy, no medical issues" (Key 2021, p. 182). The vague assessment, notable because "'[o]dd' wasn't a treatable disorder" (Key 2021, p. 182), draws attention to the shortcomings of digital technology in accurately diagnosing mental health patients. 'The Algorithm' therefore offers speculation on the future of digital psychiatry, one of the priority areas identified by the Lancet Psychiatry Commission (Bhugra et al. 2017). Key's algorithm is in many ways a futuristic extension of real-world digital tools such as machine learning models (Bzdok and Meyer-Lindenberg 2018), mobile applications, chatbots, and virtual reality (Torous et al. 2021) that are currently used in psychiatric healthcare. A common concern by researchers of such digital health technologies involves the ability to augment healthcare. This is highlighted frequently throughout 'The Algorithm' but especially when the algorithm's diagnostic tool fails to provide Dr. Hairston with substantial information

about Alaina's mental condition. Because the algorithm relies on data to make psychiatric assessments, and because Black patients are underrepresented in data, the algorithm makes incorrect diagnoses. Key, therefore, echoes the claim that "misdiagnosis is more common in black patients, the consequences are serious for them and have implications for others" (Adebimpe 1981, p. 279). addresses the consequences of the underrepresentation of Black patients by imagining a future where the technology meant to improve the quality of healthcare further disadvantages the already disproportionately affected racial groups. During the first session, Dr. Hairston disregards a clinical warning by the algorithm based on neuroimaging signals. When she skims the automated assessment of the session, she notices that "[t]he algorithm honed in on abnormalities in the brain's language and emotional centers and interpreted this as a psychotic process, which was clearly wrong" (Key 2021, p. 185). The incorrect diagnosis by the algorithm reflects one of the challenges in digital health, that is technologies should enhance, not replace, the psychiatrist-patient relationship.

Although Dr. Hairston second-guesses information provided by the algorithm, she is more reluctant to part ways with her neural probe out of the fear that without the probe her thoughts will affect her practice. This highlights an overdependence on technology to ensure professionalism, something which 'The Algorithm' implicitly criticizes. As much as Dr Hairston tries to suppress the algorithm's "visual representation of an [her] ablated past" (Key 2021, p. 190), each new session with Alaina unravels her "emotional dysregulation" (Key 2021, p. 189) to the extent where, by the end of the story, Alaina stops attending therapy and Dr. Hairston undergoes another ablation treatment. The irony of Dr. Hairston overriding the algorithm's diagnosis of Alaina yet accepting its ablation treatment for herself spotlights the widely encouraged belief that mental health professionals should access therapy because "[i]n the absence of therapy for therapists, a debt or void may be created" (Botaitis and Southern 2020, p. 205). In the future world of 'The Algorithm', Dr. Hairston substitutes human therapy for technological treatments. As a result, she experiences conditions, vicarious trauma, compassion fatigue, and countertransference,[18] that threaten her competent practice and clinical judgment. Vicarious trauma is seen through Dr. Hairston's repeated exposure to Alaina's experience (Key 2021, p. 190); compassion fatigue, evidenced by Dr. Hairston's increasingly strained relationship with her husband (Key 2021, p. 197); and countertransference, observed when Dr. Hairston's experience in college encroaches on Alaina's session (Key 2021, p. 225). Key's exploration of mental health issues faced by both practitioner and patient recall the health humanities approach which can be "beneficial for both service providers and service users" (Hankir and Zaman 2013, p. 4). Fictional works such as 'The Algorithm', like autobiographical narratives, also carry the potential of "strengthening and redefining the therapeutic relationship" (Hankir and Zaman 2013, p. 4) through empathetic storytelling.

Another area in psychiatric practice that 'The Algorithm' illuminates as constituting a public health problem is the racial disparity in access to mental healthcare. During the story, Dr. Hairston explains that the algorithm "conflated race with shared experiences. The last iterations supposedly addressed this, but old glitches died hard, and Black patients were still underrepresented in data pools" (Key 2021, p. 187). Through the emphasis on a Black psychiatrist serving a Black patient, Key draws attention to the need for greater representation, both in fiction (Edge 2013; Riles et al. 2021) as well as in mental health data for Black persons (Ashley 2013; Miu and Moore 2021). The "[c]ontinued access disparities are of high clinical and public health significance" which allows us to consider "inequality not only as a social justice issue but also as a public health problem, with tangible population and individual health consequences" (Lê Cook et al. 2016, p. 13). Such consequences, alluded to by Key, manifest in Dr. Hairston's own mental illness which is suppressed by the ablation treatment but reignites during the sessions with Alaina, through vicarious trauma and countertransference.

4. Conclusions

Stories such as Lord's 'The Plague Doctors' and Key's 'The Algorithm Will See You Now' add to the narrative impetus behind the translational medical humanities. Furthermore, each writer, through the intersection of healthcare and fiction, expands the purview of medical humanities by emphasizing the future of public healthcare through stories set in the future. While 'The Algorithm Will See You Now' uses futuristic technology that may never exist, 'The Plague Doctors' is grounded in already-utilized technology such as 3D printing. Despite the varying extent of technological advancements used by both writers, the message of their stories is the same: certain areas of public health need to be improved. In their respective roles as social scientist and psychiatrist, Lord and Key translate ongoing concerns in their field through as-yet unrealizable techno-scientific advancements. The science fiction genre, therefore, offers a lens to question such issues that evolve from present-day experiences of managing a pandemic, in the case of 'The Plague Doctors' or disparate access to mental healthcare, in the case of 'The Algorithm Will See You Now'.

As I have shown, the underlying medical, scientific, ethical, and cultural concerns in each story direct attention toward how and where public healthcare needs to improve. Through a focus on evoking empathy as well as compelling concerns of social justice through narrative, Lord and Key add to scientific and medical discourse on pandemic management and psychiatric access. In 'The Plague Doctors' Lord focuses on competency at the community level during a pandemic when state intervention is lacking. Notwithstanding the best efforts of the community which for the most part manages the crisis effectively, questions are raised about unethical scientific conduct by medical corporations which threaten to affect the most vulnerable populations. Through the exploitive actions of medical corporations in the story, Lord draws attention to the changes necessary for improving equitable healthcare, particularly during a global health crisis. Key's 'The Algorithm Will See You Now' shares Lord's concern for equitable healthcare by attending to inequity in psychiatric access for Black patients. Both narrative imaginings of the future invite us to read the state of public healthcare differently from the medical and scientific data. Lord and Key intersect the medical and scientific domain with socio-cultural and political ideologies of equity and access. By foregrounding the emotional and political impact of inequitable public health procedures on individual lives, the stories expand the value of science fiction narratives in exposing issues of social justice, particularly in this case corporate profiteering and racial inequity.

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Notes

[1] Sarton used the phrase 'medical humanities' to refer to the text *A History of Scientific English: The Story of its Evolution Based on a Study of Biomedical Terminology* by physician Edmund Andrews which, Sarton explained, "combines medical experience with philological insight" (Sarton 1948, p. 127). Sarton believed that "doctors reading this book will obtain some important guiding ideas" (p. 127). This belief remains a foundational principle of the medical humanities, and my paper.

[2] My use of translational as providing instruction that improves the future of public health through a critique of present-day protocols is an extension of Campbell's (2018) examination of the rhetoric of health and medicine as a 'teaching subject' through its inclusion in clinical curricula.

[3] The nineteenth-century novella is centered around an elderly high-court judge who progressively deteriorates in health and eventually dies. Blanton et. al's study examines the way Tolstoy's *The Death of Ivan Illyich* "illustrates how suffering is worsened when family members and doctors deceive and conceal the inevitability of death" (2020, p. 885).

[4] My consideration of these stories as constituents of translational medical humanities is in line with Charon's (2006) discussion of narrative medicine as that which "not only describes an ideal of healthcare but also provides practical methods to develop

the skills needed to reach that ideal" (p. 10). Of the "urgent charges against medical practice and training" outlined by Charon (2006, p. 10), I focus on three specifically that are illuminated and overturned by both stories; impersonality, coldness, and the lack of social conscience. The other "urgent charges" referred to by Charon are fragmentation and self-interestedness.

[5] Each writer's scientific training and identity, to return to the three focal points taken from Charon (2006), personalize the themes, evoke empathy and understanding, and imbue the stories with socio-cultural awareness.

[6] Cluster-based treatment is described during the story as a procedure that "magnetically target[s] select neural clusters correlated with distress and remove them permanently" (Key 2021, p. 190).

[7] Dr Hairston explains that the neural probe was "a device now ubiquitous for neural self-regulation, especially amongst mental health workers" (Key 2021, p. 190).

[8] See https://www.rwjf.org/en/about-rwjf.html (accessed on 1 January 2020) for more on the RWJF's mission statement.

[9] The anthology's blurb, accessible here https://www.rwjf.org/en/library/research/2019/11/take-us-to-a-better-place-stories-coming-january-2020.html (accessed on 1 January 2020), goes on to describe the stories as contributing to conversations about a Culture of Health.

[10] See https://www.vitalanthology.com/about/ (accessed on 1 January 2020) for more information about the anthology's origins. As one of the editors of the anthology goes on to explain in the Introduction to the collection, the writing of stories may predate the COVID-19 pandemic but the theme of building empathy in healthcare remains and always will remain relevant.

[11] Such an approach takes up the challenge that "it is impossible to make progress in our understanding of the demands of justice *within* medical care without looking *outside* of medical care to public health and indeed without situating an analysis of justice and health policy in the wider social and political context" (x).

[12] Both stories follow the tradition of various forms of literature being used for medical education, such as different genres of literature to foster personal reflection and professionalism (Ytterberg et al. 1998), poetry to deepen understanding, compassion, and experience of mindful practice (Shapiro 2001), and creative writing to develop an ethics of care in mental health nursing (Kidd and Tusaie 2009). The stories by Lord and Key differ from the genres of literature referenced here through their emphasis on science fiction.

[13] The earlier findings of a lack of EI in healthcare have been improved through a 2014 study by Czabanowska et al. (2014) which investigated the relationship between public health (PH) procedures and emotional intelligence (EI) in reveals a "positive relation between PH and EI competencies" among Master of European Public Health (MEPH) students and graduate at Maastricht University (p. 6).

[14] According to Sharp and Yarborough, the partnership-centered approach to managing financial conflicts of interest in clinical research is based on transparent practices between sponsors, clinical investigators, and research volunteers involving a disclosure of industry ties to community partners discussion of research financing with potential volunteers, and description of financial relationships to institutional review boards (Sharp and Yarborough 2006, p. 461).

[15] With specific reference to the COVID-19 virus, Hassan et al. (2021) attribute what they discuss as 'pandemic profiteering' to "a free market, profit-driven enterprise based on patent and intellectual property protection, combined with a lack of political will" (p. 1).

[16] MSF has implemented such things as the TRIPS (Trade-Related Aspects of Intellectual Property Rights) Waiver which resists monopolies by 'Big Pharma' companies such as BioNTech, Pfizer, and Moderna through the sharing of vaccines, treatments, and tests between over 100 countries (Médecins Sans Frontières 2021).

[17] The NAR protocol "took one's memories and thoughts and brought them out into the open" (Key 2021, p. 199).

[18] These three conditions are outlined and explained by Botaitis and Southern (2020) as "professional presenting problems" (p. 204) which, if managed through therapy, can help therapists "maintain adequate boundaries and competent practice standards" (p. 212).

References

Adebimpe, Victor R. 1981. Overview: White Norms and Psychiatric Diagnosis of Black Patients. *American Journal of Psychiatry* 138: 279–85.

Amis, Kingsley. 1962. *New Maps of Hell: A Survey of Science Fiction*. New York: Arno Press.

Ashley, Wendy. 2013. The Angry Black Woman: The impact of Pejorative Stereotypes on Psychotherapy with Black Women. *Social Work in Public Health* 29: 27–34. [CrossRef]

Bhugra, Dinesh, and Antonio Ventriglio. 2015. Social sciences and medical humanities: The new focus of psychiatry. *BJPsych International* 12: 79–80. [CrossRef]

Bhugra, Dinesh, Allan Tasman, Soumitra Pathare, Stefan Priebe, Shubulade Smith, John Torous, Melissa R. Arbuckle, Alex Langford, Renato D. Alarcón, Helen Fung Kum Chiu, and et al. 2017. The WPA-Lancet Psychiatry Commission on the Future of Psychiatry. *Lancet Psychiatry* 4: 775–818. [CrossRef]

Blanton, Sarah, Bruce H. Greenfield, Gail M. Jensen, Laura Lee Swisher, Nancy R. Kirsch, Carol Davis, and Ruth Purtilo. 2020. Can reading Tolstoy make us better physical therapists? The role of the health humanities in physical therapy. *Physical Therapy* 100: 885–89. [CrossRef]

Blease, Charlotte, Cosima Locher, Marisa Leon-Carlyle, and Murami Doraiswamy. 2020. Artificial Intelligence and the Future of Psychiatry: Qualitative Findings from a Global Physician Survey. *Digital Health* 6: 1–18. [CrossRef]
Bolton, Gillie. 2008. Boundaries of Humanities: Writing Medical Humanities. *Arts & Humanities in Higher Education* 7: 131–48.
Botaitis, Nicole, and Stephen Southern. 2020. Telehealth Therapy and Therapists: Barriers and Benefits. *The Family Journal: Counseling and Therapy for Couples and Families* 28: 204–14. [CrossRef]
Bzdok, Danilo, and Andreas Meyer-Lindenberg. 2018. Machine Learning for Precision Psychiatry: Opportunities and Challenges. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* 3: 223–30. [CrossRef]
Campbell, Lillian. 2018. The Rhetoric of Health and Medicine as a "Teaching Subject": Lessons from the Medical Humanities and Simulation Pedagogy. *Technical Communication Quarterly* 27: 7–20. [CrossRef]
Charon, Rita. 2006. *Narrative Medicine: Honoring the Stories of Illness*. Oxford: Oxford University Press.
Charon, Rita. 2015. Embodied Narrative: Living Out Our Lives. *Journal of Humanities in Rehabilitation* 14: 1–5.
Czabanowska, Katarzyna, André Malho, Peter Schröder-Bäck, Daniela Popa, and Genc Burazeri. 2014. Do we develop public health leaders?—Association between public health competencies and emotional intelligence: A cross-sectional study. *BMC Medical Education* 14: 83. [CrossRef]
De Matas, Jarrel. 2022. Configuring the Caribbean through sf. *SFRA Review* 52: 187–93.
Edge, Dawn. 2013. Why are you cast down, o my soul? Exploring intersections of ethnicity, gender, depression, spirituality and implications for Black British Caribbean women's mental health. *Critical Public Health* 23: 39–48. [CrossRef]
Engebretsen, Eivind, Gina Fraas Henrichsen, and John Ødemark. 2020. Towards a translational medical humanities: Introducing the cultural crossings of care. *Medical Humanities* 46: e2. [CrossRef]
Evans, Martyn, and David Greaves. 1999. Exploring the Medical Humanities. *BMJ* 319: 1216. [CrossRef]
Freshman, Brenda, and Louis Rubino. 2002. Emotional Intelligence: A Core Competency for Health Care Administrators. *Health Care Manager* 20: 1–9. [CrossRef]
Gabriel, Joseph M., and Daniel S. Goldberg. 2014. Big Pharma and the Problem of Inflation. *International Journal of Health Services* 44: 307–22. [CrossRef]
Hankir, Ahmed, and Rashid Zaman. 2013. Jung's archetype, 'The Wounded Healer', mental illness in the medical profession and the role of the health humanities in psychiatry. *BMJ Case Reports* 2013: bcr2013009990. [CrossRef]
Hassan, Fatima, Gavin Yamey, and Kamran Abbasi. 2021. Profiteering from vaccine inequity: A crime against humanity? *BMJ* 374: n2027. [CrossRef]
Keen, Suzanne. 2007. *Empathy and the Novel*. Oxford: Oxford University Press.
Key, Justin. 2021. The Algorithm Will See You Now. In *Vital: The Future of Healthcare*. Edited by R. M. Ambrose. Riverside: Inlandia.
Kidd, Lori I., and Kathleen R. Tusaie. 2009. Disconfirming Beliefs: The Use of Poetry to Know the Lived Experience of Student Nurses in Mental Health Clinicals. *Issues in Mental Health Nursing* 25: 403–14. [CrossRef]
Kutac, Julie, Rimma Osipov, and Andrew Childress. 2015. Innovation Through Tradition: Rediscovering the "Humanist" in the Medical Humanities. *The Journal of Medical Humanities* 37: 371–87. [CrossRef]
Lê Cook, Benjamin, Zhihui Li, Sherry Shu-Yeu, and Ana M. Progovac. 2016. Trends in Racial-Ethnic Disparities in Access to Mental Health Care, 2004–2012. *Psychiatric Services* 68: 9–16. [CrossRef]
Lord, Karen. 2019. The Plague Doctors. In *Take Us to a Better Place: Stories*. Edited by Roxane Gray and Pam Belluck. New York: Robert Wood Johnson Foundation, pp. 393–442.
McFarlane, Anna. 2016. Science Fiction and the Medical Humanities. *SFRA Review* 315: 1–46.
Médecins Sans Frontières. 2021. Compulsory Licenses, the TRIPS Waiver, and Access to COVID-19 Medical Technologies. Technical Brief. Available online: https://msfaccess.org/compulsory-licenses-trips-waiver-and-access-covid-19-medical-technologies (accessed on 10 July 2022).
Miller, Gavin, and Anna McFarlane. 2016. Science Fiction and the medical humanities. *Medical Humanities* 42: 213–18. [CrossRef]
Miu, Adriana S., and Jessica R. Moore. 2021. Behind the Masks: Experiences of Mental Health Practitioners of Color during the COVID-19 Pandemic. *Academic Psychiatry* 45: 539–44. [CrossRef]
Powers, Madison, and Ruth Faden. 2006. *Social Justice: The Moral Foundations of Public Health and Healthy Policy*. Oxford: Oxford University Press.
Resnicow, Ken, and Tom Baranowski. 1999. Cultural Sensitivity in Public Health: Defined and Demystified. *Ethnicity & Disease* 9: 10–21.
Riles, Julius Matthew, Brandon Miller, Michelle Funk, and Ethan Morrow. 2021. The Modern Character of Mental Health Stigma: A 30-year Examination of Popular Film. *Communication Studies* 72: 668–83. [CrossRef]
Rothstein, Mark A. 2002. Rethinking the Meaning of Public Health. *Journal of Law, Medicine & Ethics* 30: 144–49. [CrossRef]
Sarton, George. 1948. Seventy-First Critical Bibliography of the History and Philosophy of Science and of the History of Civilization (To October 1947). *Isis* 39: 70–139. [CrossRef]
Shapiro, Shauna L. 2001. Poetry, Mindfulness, and Medicine. *Literature and the Arts in Medical Education* 33: 505–7.
Sharp, Richard R., and Mark Yarborough. 2006. Currents in Contemporary Ethics: Informed Trust and the Financing of Biomedical Research. *Journal of Law, Medicine & Ethics* 34: 460–64.
Torous, John, Sandra Bucci, Imogen H. Bell, Lars V. Kessing, Maria Fauholt-Jepsen, Pauline Whelan, Andre F. Carvalho, Matcheri Keshavan, Jake Linardon, and Joseph Firth. 2021. The growing field of digital psychiatry: Current evidence and the future of apps, social media, chatbots, and virtual reality. *World Psychiatry* 20: 318–35. [CrossRef]

Viney, William, Felicity Callard, and Angela Woods. 2015. Critical medical humanities: Embracing entanglement, taking risks. *Critical Medical Humanities* 41: 2–7. [CrossRef]

Ytterberg, Steven R., Gregory A. Plotnikoff, and Ilene B. Harris. 1998. Teaching Professionalism through Tutorial Discussions of Literature—Stories, Poems, and Essays. *Academic Medicine* 73: 575–76. [CrossRef]