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The Great American (Vaccine) Novel: An Analysis of Vaccines as Described in Modern Literature

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B.A.
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2017

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Abstract

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The topic of vaccination is one that sparks plenty of debate, attention from public health institutions, and formal study. While scientific vaccine information and official recommendations are carefully crafted for optimum reception, depictions of vaccination in narrative fiction and the influence of vaccine information found in popular literature are largely ignored. This study sought to begin assessing the impact of these understudied sources of public opinion by analyzing novels published in English since 2010, identified with "vaccine" or "vaccination" as a keyword. These texts were analyzed independently through close reading, mixed methods, and literary analysis techniques. Metaphors used to describe vaccines were identified in each. The majority of novels in this study presented vaccines that were effective in protecting recipients against their pathogen of interest, but many were accompanied by unintended consequences, even those distributed or subsidized by the government. The texts also addressed themes such as personal autonomy, national security, and profitability in connection with vaccines. The data from this study may be applied for public health professionals seeking to confront negative stereotypes about vaccines by equipping them with a more comprehensive understanding of the manner in which vaccines are discussed in popular fiction, and subsequently how those views may be adopted by readers.

Length: 205 words

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Background

Humans have always conveyed important information, collected history, and negotiated harsh realities through storytelling. While scholarly and scientific writing employs objective rhetorical style that intentionally avoids personal narrative, fictional prose reveals truths about the human condition that merit scholarly study. Narrative is distinct from impersonal, informative, or declarative articulation, and as such offers particular strengths. As identified in public health scholarship: "Narrative is closer than non-narrative communication to lived experience in its simultaneous appeal to multiple senses, to reason and emotion, to intellect and imagination, and to fact and value; it is also easier to understand and therefore more accessible or 'democratic'" (Winskell & Enger, 2013, p. 191). While narrative stories may be more fiction than fact, their structure and linearity are inherently accessible by diverse audiences who recognize their own lives in that format more readily than in philosophical treatise or structured scientific discourse.

Uniquely, narratives are "co-constructed by teller and audience," providing for benefits to both writer and reader (Winskell & Enger, 2013, p. 193). As sociologist Arthur Frank (2014) argues, the act of therapeutic storytelling offers healing power through the ability of a patient to reclaim identity and craft their own story. In one psychological study, writers were asked to craft either emotional (personal) or unemotional pieces, and researchers found that the personal stories were both more eloquent and seemingly more beneficial to the writer, even boosting immune function (Pennebaker, 2000). These narratives offer clear mental and even physical benefits to their creators, as means of negotiating the otherwise identity-stealing nature of illness. Public health scholarship again

confirms: "Inherently dialogical, narrative is a primary tool in the continuing social renegotiation of meaning" (Winskell & Enger, 2013, p. 193). Frank asserts the value of storytelling and medical humanities not just as a means of recasting disease in a brighter, more optimistic light, but a way of confronting all manner of emotions evoked by disease, including the devastating. He maintains, "If the humanities offered only sunlight and flowers, these would be thin offerings. The humanities also offer tragedy and all manner of sufferings made more intense in their aesthetic depiction" (Frank, 2014, p. 18).

The impact of narratives is magnified further when assessing their audiences, for whom stories deliver models and metaphors that are subsequently used to define worldviews. Because narratives are so recognizable and easily consumable as human stories, they frequently become models, adopted by their audiences as ways of framing their own unique stories. In particular, the metaphoric language that operates as a defining feature of narrative communication frequently migrates from the pages of fiction to real life.

A metaphor can be defined as "A figure of speech in which a name or descriptive word or phrase is transferred to an object or action different from, but analogous to, that to which it is literally applicable," or "Something regarded as representative or suggestive of something else" (OED, 2019). As linguists and philosophers Lakoff & Johnson argued in their treatise, *Metaphors We Live By* (1980), "…metaphor is pervasive in everyday life, not just in language but in thought and action. Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature" (p. 3). By using terms like "fight," "win," "attack," and "defend," to describe argumentation, we co-opt the original application of these terms for waging literal battle, and our arguments become conceptualized as battles. An argument in which there is no "winner" is no longer thought of as an argument, but as another form of discourse altogether, one that does not demand

battle metaphors (Lakoff & Johnson, 1980, p. 5-6). It is not only the creation of new definitions through metaphor that concerns Lakoff & Johnson (1980), but also the ways in which application of metaphor necessarily obscures certain facets of a topic. They claim, "The very systematicity that allows us to comprehend one aspect of a concept in terms of another…will necessarily hide other aspects of the concept. In allowing us to focus on one aspect of a concept…a metaphorical concept can keep us from focusing on other aspects of the concept that are inconsistent with that metaphor" (Lakoff & Johnson, 1980, p. 10). The employment of battle language to describe argumentation means that the possibility of an argument being concluded without a win/loss resolution is eliminated. Such a conclusion does not exist. This process of social redefinition through narrative is often ignored by scholarship that dismisses the relevance of storytelling to reality.

One can, however, readily imagine the real-world implications of this kind of narrative power on health and medicine. Battle metaphors are employed not just when discussing argumentation, but also when articulating cancer. This naturally elevates the power of the patient to "wage war" against the "invader" of their body but ignores the possibility that cancer may "win" despite the most valiant, strategic efforts of medicine.

Critic Susan Sontag famously demanded the elimination of metaphor from medical narratives, condemning them for causing real, dire consequences for patients exposed to them, including internalization of stigma and hesitancy in seeking treatment (Sontag, 1989, p. 102). Sontag contends, "The metaphors and myths, I was convinced, kill" (Sontag, 1989, p. 102). Even she, holding such a strong stance and having experienced the negative effects of metaphorization as a cancer patient herself, admits, "Of course, one cannot think without metaphors. But that does not mean there aren't some metaphors we might well abstain from or try to retire. As, of course, all thinking is interpretation" (Sontag, 1989, p. 93).

Despite Sontag's warnings, metaphors (and their narrative vehicles) continue to be pervasive in pop culture, and are even promoted as a means of effective health communication through social marketing. The empathy encouraged by narrative style makes this format not only accessible, but also highly persuasive for many. Winksell & Enger (2013) argue, "Narratives are more difficult to resist, counter-argue, or refute" (p. 191). They are also "… easier to remember than non-narrative communication…." making them ideal for product or social marketing (Winskell & Enger, 2013, p. 191). Personal stories are employed for any number of purposes in support of public health, and given their memorability and persuasiveness, are frequently used to spur cognitive rehearsal. One need only look to the nearest ubiquitous medication advertisement to see the drugs embedded in personal stories, encouraging viewers to see themselves in the protagonist of the ad and equipping them with questions to ask their physician.

Even when medical narratives are promoted unintentionally (i.e. not meant to present a particular public health agenda, rather as accidental to some other story or purpose), they still have serious implications for how audiences conceptualize medical reality and prepare themselves to face it. Several studies have shown that popular understanding of forensic science and medical realities (such as survival rates following CPR) are directly influenced by depictions in media, including scripted television series (Portanova et al, 2015; Schweitzer & Saks, 2007).

As such, narratives have enormous power to influence public imagination in the realm of health, including as it relates to vaccination. This power can be harnessed, such as through social marketing campaigns, or can be unintentionally invoked in media. In either case, the manner in which metaphor and narrative operate deserves scholarly investigation.

In the digital age and with an increasingly concerning phase of the long-standing anti-vaccination movement, much attention is now being paid to the implications of social media on public health. In many respects, social media is the most modern form of storytelling and narrative dissemination, allowing personal anecdotes to be shared widely and influence broad, often unexpected audiences. Kata (2012) addresses the concerns of online misinformation related to vaccines, particularly in the Web 2.0 era, in which consumers are also content-creators. She argues that while there are benefits to the collaborative, community aspects of internet sharing between patients, the trend as a whole represents a distinctly "postmodern" rejection of traditional authority structures and preoccupation with risk. Guidry et al (2015) investigate the nature of anti-vaccination sentiments online even more specifically than Kata, by honing in on one particular social media website. These investigators importantly emphasize the utility of employing narrative as a compelling argument either for *or* against vaccination. In both of these analyses, the researchers assessed tropes, categorizations, or content variables associated with the vaccinations.

While social media narratives are given attention as a novel means of storytelling, more traditional methods such as literature are all but ignored. Reading fiction continues to be popular, especially among women and teens (key demographics for decision-making regarding vaccines) and is only strengthened by promotion via social media in the modern era. This form of narrative and applied metaphors demands academic study, such that the power of this format can be understood by public health professionals.

Literary fiction has historically revealed social truths in ways that are imaginative, emotional, accessible, and memorable. These are not simply fantastical stories with no association to reality – they are the creations of authors defined by their social context, and therefore representative of broader social realities. Charles Dickens famously articulated and

promoted narratives that bore witness to the poor working and living conditions of children and impoverished Londoners. Even those novels that are not classified as realistic fiction – those in fantasy and science fiction genres – find their origins in the reality faced by their authors. J.R.R. Tolkien's *Lord of the Rings* trilogy is often seen as an allegorical depiction of several modern nations, represented by communities of mystical beings. George Orwell's *1984* may read as futuristic paranoia, but was founded in contemporary preoccupations with the rise of authoritarianism, surveillance, and censorship.

Narrative accounts from literature have provided not only social commentary in general, but offer targeted insight into historic visions of health and medicine as well. Physician characters – such as Nathaniel Hawthorne's Roger Chillingworth, Charles Dickens' Alan Woodcourt, Bram Stoker's John Seward, and Robert Louis Stevenson's Henry Jekyll – negotiate boundaries of personal autonomy as they bridge the gap between authorities and citizens. These characters help their readers navigate social mobility, as they present exemplars of an emerging middle class defined by respectability and financial security, but characterized by hard work, deference to hierarchy, and professional obligations. Bram Stoker's *Dracula* introduces a mysterious, fatal affliction that is associated with an immigrant to the United Kingdom, metaphorically suggesting a link between disease and foreignness. In *Bleak House*, by Charles Dickens, infectious disease is scarring, and reveals otherwise concealed familial associations. These stories reflect tropes about disease and physicians that existed in the social environment in which the authors penned their works, and have the potential to influence any readers of the text (even in more contemporary social environments) by suggesting connections the audience may not have previously considered or which they may find most persuasive when embedded in a narrative.

Introduction

Public perception of vaccination practices is strongly influenced by sources that are read by patients, yet while experts analyze and critique official public health communications, little attention is paid to popular media that seriously influences patient opinion regarding vaccination.

Growing skepticism and misinformation present ongoing problems that demand better solutions for communicating vaccine information, which in turn requires evidence-based methods of doing so founded upon strong data, rather than provider intuition (Saint Louis, 2015). Much progress is actively being made in this area (Kennedy et al, 2011), but the prevalence of evident misinformation points to another area that requires further study – the state of information the public receives, or what is referred to by the National Vaccine Advisory Committee (2015) as the "information environment," a determinant of confidence. The National Vaccine Advisory Committee warns, "…[P]ersonal stories and anecdotes are often juxtaposed against factual opinions based on a larger body of sustained scientific work. Inaccurate stories and misstatement of facts on vaccines, even when contradicted, remain in people's minds" (2015, p.581).

The information environment includes messages that are not provided through public health authorities or "official," scientific forums. There is a need for broad understanding of how vaccines are presented, particularly in literary and media sources that are not necessarily intended to communicate the scientific and social realities of vaccination, but nonetheless dramatically impact patient awareness of and opinions concerning immunizations (NVAC, 2015, p.581). Understanding the messages and impact of non-scientific literature on the field of vaccination may help align public health campaigns with existing metaphoric language related to vaccination. It might conversely be used to help

public health campaigns effectively counter existing narratives that are deemed deleterious to achieving increased vaccine acceptance.

This study sought to begin that investigation of vaccine information embedded in written, fictional sources, that are not public health communications, but which nonetheless inform worldviews about vaccines. To do so, this study identified novels, published in English post-2010, which had been defined with the keyword "vaccine" or "vaccination." The most popular of these were subjected to close reading and literary analysis by a single reviewer, who identified metaphors used in these texts to describe vaccination and provided summary analysis for each novel. The novels were then analyzed as a group, to assess broader trends in fictional narratives involving vaccines.

Methods

This study was conducted by relying heavily upon principles of literary analysis, which were employed along with mixed methods to assess fifteen (15) works of prose fiction published since 2010.

The novels were identified using the WorldCat Fiction Finder search engine made publicly available by the global library cooperative OCLC. This website allows users to search by text "keyword" and to limit the search parameter by genre of fiction, year of publication, and language.

In order to capture the novels that had the largest impact on the public consciousness surrounding vaccination, we ranked the resulting texts by sales. Because the specific sales data of books are proprietary information of publishing companies, Amazon sales rankings were substituted as approximate values. Those with the highest Amazon sales rankings make up the set of texts included in this study. These values are not equivalent to

actual global sales, but as the metrics of the largest bookseller in the world, represent reasonable surrogates for values that seek to approximate popularity and implied impact on consumers. Even true sales would not be a perfect metric by which to measure impact, as the sale of one physical book might result in its being read by three different individuals, or might equally result in it being abandoned, unread, on shelves for years.

Each novel was read by the same single reviewer, one at a time. They were read in print or ebook form, acquired through purchase or loan from a public or university-affiliated library. The reviewer performed a close reading of each text, focusing particularly on references to vaccination.

After reading was completed, the reviewer wrote a summary analysis of each book, addressing how vaccination is presented as a plot point and how the characters in the novel respond to vaccines. Direct quotations are included in these summary analyses, situating each observation of the reviewer in textual basis. These summaries are available for review as the Appendix, in order of the novels' ranking. The summaries did not replace the novels themselves during overall trend analysis of the cohort, but served as helpful memory aids and means of synthesizing information throughout the process.

In addition to general analysis of each book, the reviewer identified metaphors of vaccination for each text. Finding no previous studies identifying ways of discussing vaccines in fiction, these metaphors were independently identified. The total list of metaphors included is as follows: vaccines as augmenting natural processes, child-specific, community building, conferring an advantage over one's peers, controversial, curative, dangerous, deadly, differentially distributed, distributed/subsidized by the government, essential, a form of exclusivity, given to the vulnerable, indistinguishable from one another, monitored/regulated, mysterious, potentially contaminated/tainted, prestige-granting [to

creator], profitable, protective, scarring/conferring visible immunity, socially expected/approved, special, time-sensitive, and valuable

Following summary analyses and metaphor identification, the collective set of fifteen novels were analyzed as a group, to assess the most frequently employed metaphors identified, trends in plot points, and general commonalities between them that indicate prevailing popular consensus about vaccines and possible public opinion regarding them.

Results

A preliminary search of Fiction Finder using the keyword parameters "vaccine OR vaccination" yielded 465 results. Of those, 224 relevant items were published post-2010. From this initial search, we narrowed the parameters of our search to include the following selection criteria: written sources only (prose fiction), published in English, published post-2010, and including the keyword "vaccine" OR "vaccination" as identified by World Cat Fiction Finder. The exclusion criteria eliminated texts that were identified as nonfiction, informational, or marketing material. Graphic novels and picture books were also later excluded, given that their narrative value was conveyed in both words and image, and the expertise of the reviewer did not extend to visual analysis to the degree required for this study.

Ultimately, fifteen novels were reviewed. The included texts are summarized in Table 1. This total number of texts is arbitrary, and corresponds only with the capacity of one reviewer to read and analyze the narratives sufficiently in the time period available. This small sample size necessarily limits the generalizability of the findings in this study, but given the paucity of data and analysis of fictional narrative prior to this, nonetheless advances study in this area. These books were not limited to a single genre, age range, or country

(provided they were published in English translation). The findings of this study, therefore, are not limited to an adult, American population, but equally address teenagers and younger children. Readers of romance are accounted for alongside readers of adventure novels.

Title	Author	Year	Publisher	Author Gender	Person	Main Character (gender, age)	Presumptive Target Audience	Number of Pages	Vaccine Effective? (+/-) **	Unintended Consequences (+/-)
Stung	Wiggins, Bethany	2013	Bloomsbury	F	first	teenage female	teens	320	+	+
Don't Even Think About It	Mylnowski, Sarah	2015	Ember	F	third	teenage male and female	teens (grade 7-9)	336	+	+
This Cruel Design	Suvada, Emily	2018	Simon Pulse	F	first	teenage female	teens	392	-	+
Illusive	Lloyd-Jones, Emily	2014	Little, Brown	F	third	teenage female	teens	422	+	+
Foamers	Kassab, Justin	2014	Kaylie Jones Books	M	third	adult male	adult	244	+	+
Starters	Price, Lissa	2013	Ember	F	first	teenage female	teens (grade 7-9)	384	+	-
Healers	Munson, Brad	2016	Permuted Press	M	third	adult male and female	adult	248	+	-
Spur of the Moment	Linzee, David	2016	Coffeetown Press	M	third	adult female	adult	323	+	-
Nefarious	Freeman, Steven F.	2013	Amazon Digital Services	M	third	adult male	adult	327	+	+
The Blizzard	Sorokin, Vladimir	2010	Farrar, Straus and Giroux	M	third	adult male	adult	181	+	-
White Bone	Pearson, Ridley	2016	Putnam	M	third	adult male	adult	395	+	-
Deceptive	Lloyd-Jones, Emily	2015	Little, Brown	F	third	teenage female	teens	419	+	+
This Mortal Coil	Suvada, Emily	2017	Simon Pulse	F	first	teenage female	teens	415	+	+
Claimed	Fine, Sarah	2015	47 North	F	third	adult female	adult	341	/	-
A Matter of Days	Kizer, Amber	2013	Ember	F	first	teenage female	teens	290	+	-

Table 1: *Above, a summary of novels included in the study and their defining characteristics such as length, author, publication date, and person. ** The "/" symbol represents neutral effectiveness, and refers to a vaccine in development that has not completed testing or trials.*

Quantitative Results

For each novel, the vaccine in question was classified on the basis of its effectiveness against its specified target and its association with unintended consequences. Of 15 novels analyzed, 13 of the vaccines in question (86.7%) were effective against the disease that they sought to prevent. Eight of the 15 vaccines (53.3%) produced unintended consequences.

Twenty-five metaphors were identified in the course of analysis for the fifteen total novels. These metaphors were then grouped into categories as referencing either biological or social factors. Within these categories, the metaphors were further classified into those with positive, negative, or neutral implications within that application category, such that each metaphor was discretely defined as: biologically positive, biologically negative, biologically neutral, socially positive, socially negative, or socially neutral.

Detailed lists of metaphors identified for each novel can be found in the summary analysis documents in the Appendix.

No single association was identified in the texts more frequently than the protective nature of vaccines, which was apparent in 10 out of the 15 books reviewed (66.7%). For the purposes of this analysis, "protective" is used to differentiate the vaccine in question from curative therapeutics or vaccines, and to indicate that it is accepted by characters as conferring protection against a pathogen. Five metaphors were identified in 7 of 15 texts (46.6%), making them the next most frequently identified. These included vaccines as: a form of exclusivity, special, valuable, mysterious, and distributed/subsidized by the government.

Only two texts – *Don't Even Think About It* and *This Cruel Design* – employed metaphors that presented the vaccines in question as both biologically positive *and* biologically negative. In terms of socially-oriented metaphors, all 15 of the books analyzed identified at least one metaphor that painted vaccines in a socially positive light. Both positive and negative social metaphors were found in eleven out of 15 novels (73.3%), with only 4 out of 15 books (26.6%) employing purely positive social metaphoric language to describe vaccines.

Six of the 15 books (40.0%) presented vaccines that were potentially contaminated or tainted. Seventy-five percent of the books in which the vaccines were linked to unintended consequences also identified them as potentially contaminated or tainted. By comparison, only 38.5% of the books in which the vaccines were deemed effective against their pathogen of interest were associated with potential contamination.

Of vaccines that were classified as the bearers of unintended consequences, 50% were still identified as protective vaccines. In the same category, 62.5% of vaccines were distributed or subsidized by the government.

Full counts and percentages of the identified metaphors, broken down by category and association with effective vaccines or unintended consequences can be reviewed in Table 2.

		Vaccine Effective (+)	**Unintended Consequences (+)**	**Total**
Biological (+)	augmenting natural processes	1/13 (7.7%)	1/8 (12.5%)	2/15 (13.3%)
	curative	0/13 (0.0%)	1/8 (12.5%)	2/15 (13.3%)
	protective	9/13 (69.2%	4/8 (50.0%)	10/15 (66.6%)
Biological (-)	dangerous	3/13 (23.1%)	3/8 (37.5%)	3/15 (20.0%)
	deadly	4/13 (30.1%)	4/8 (50.0%)	4/15 (26.6%)
	potentially contaminated/tainted	5/13 (38.5%)	6/8 (75.0%)	6/15 (40.0%)
Biological (/)	indistinguishable from one another	2/13 (15.4%)	1/8 (12.5%)	2/15 (13.3%)
	scarring/conferring visible immunity	2/13 (15.4%)	0/8 (0.0%)	2/15 (13.3%)
Social (+)	community building	3/13 (23.1%)	3/8 (37.5%)	3/15 (20.0%)
	conferring an advantage over one's peers	5/13 (38.5%)	4/8 (50.0%)	5/15 (33.3%)
	essential	2/13 (15.4%)	0/8 (0.0%)	3/15 (20.0%)

	a form of exclusivity	7/13 (53.8%)	6/8 (75.0%)	7/15 (46.6%)
	given to the vulnerable	4/13 (30.1%)	0/8 (0.0%)	5/15 (33.3%)
	monitored/regulated	5/13 (38.5%)	5/8 (62.5%)	5/15 (33.3%)
	prestige-granting [to the creator]	3/13 (23.1%)	1/8 (12.5%)	4/15 (26.6%)
	profitable	2/13 (15.4%)	1/8 (12.5%)	2/15 (13.3%)
	socially expected/approved	3/13 (23.1%)	4/8 (50.0%)	4/15 (26.6%)
	special	5/13 (38.5%)	6/8 (75.0%)	7/15 (46.6%)
	valuable	7/13 (53.8%)	4/8 (50.0%)	7/15 (46.6%)
Social (-)	controversial	4/13 (30.1%)	4/8 (50.0%)	6/15 (40.0%)
	mysterious	6/13 (46.2%)	5/8 (62.5%)	7/15 (46.6%)
Social (/)	child-specific	2/13 (15.4%)	1/8 (12.5%)	2/15 (13.3%)
	differentially distributed	3/13 (23.1%)	1/8 (12.5%)	3/15 (20.0%)
	distributed/subsidized by the government	6/13 (46.2%)	5/8 (62.5%)	7/15 (46.6%)
	time-sensitive	2/13 (15.4%)	1/8 (12.5%)	2/15 (13.3%)

Table 2: Above, the analyzed metaphors are presented, in their classifications as biologically and socially positive, negative, or neutral, by the counts and percentages in which they were found in novels that depicted effective vaccines, those with unintended consequences, and in the total set of novels.

Literary Analysis Results

The results of this study highlight dynamic social commentaries about vaccination that occur in and are propagated by contemporary novels. The books included in this analysis employ vaccinations as plot points in diverse ways, but generally produce two primary plots: the drama of vaccine development (for example, *Claimed* and *Spur of the Moment*), or an alternative world paradigm set up by the vaccine and its effects (ex. *Starters, Foamers, Illusive*). There are, however, exceptions to these two plot types, evidenced by novels such as *The Blizzard* or *White Bone*. Although these two texts do not fit stereotypes of the other novels in this study, both nonetheless depict vaccines as inherently valuable, as products that need to be delivered to the right people at the right time, thereby making vaccines drivers of stories worth telling and worth commanding the attention of readers.

Vaccines in all of the analyzed books prove to be of significant value, as they cause wars, demand journeys through blizzards, and even justify murder.

It is important to note that most vaccines depicted in the study's novels were effective against their intended target (86.7%), but the majority also had unintended consequences (53.3%). This does not necessarily undermine the power of vaccinations to achieve their intended goals as public health prevention devices, but raises questions about the public's ability to place their faith in the safety of vaccines, and the vaccines' capacity to not only achieve their goals but to *only* impact physiology in the manner intended, without causing some additional harm. In some cases the unintended results of otherwise effective vaccines were arguably worse than the disease they sought to prevent. In *Stung*, the bee flu decimated crop yield, but the bee antivenin vaccine turned humans into "beasts." Feline Flu, in Justin Kassab's *Foamers*, is of minimal concern compared to the devastating impact of the vaccine meant to prevent it, which offers a 20% fatality rate and robs 60% of recipients of their higher mental functions. In certain stories, individuals who are infected by a pathogen are seen as hopeless cases, those who "will never be people again anyway" (Sorokin, 2010, p. 137). On the other hand, *vaccinated* individuals, those who supposedly have been "saved" from this irreversible loss of humanity through disease, are known as beasts in novels such as *Stung* and *Foamers*. In *Illusive* and *Deceptive*, vaccinated individuals are seen as second-class citizens whose actions are deemed "illegal."

Most of the unintended effects causing these identity-redefining outcomes are blamed on poor vaccine development, including hasty licensing processes. In *Foamers*, the vaccine's inventor claims that he was unable to get anyone to halt the production process for his vaccine even once he noticed the potential for serious adverse outcomes. The vaccine against the so-called MK plague takes on such an outsized role in public consciousness that a

detailed history of its creator, and the vaccine's rush through FDA by Fiacre Pharmaceuticals, is common knowledge among the general public in *Illusive*. The reader actually witnesses greed undermine the regulatory process of vaccine development in *Nefarious*, in which trials are rushed despite clear evidence that the formula is harmful to humans. Several of these texts (including *Illusive* and *Nefarious*) make reference to existing U.S. regulatory and research agencies, such as FDA and CDC.

The shadow of unreliability cast by the potential for unintended effects even amidst regulation looms large, but the texts included in this study actually offer a spectrum of characterizations concerning public confidence in the comprehensiveness of immunity offered by vaccination – some positive depictions and some negative, although unrelated to unintended consequences. In *Starters*, Lissa Price conjures a world in which vaccinated youth and older adults survived bio-warfare, while the unvaccinated middle-aged adults were completely wiped out. Despite the clear effectiveness of the vaccine apparent from the new population demographics, remaining citizens still avoid outdoor recreation, "paranoid about residual spores in the air, vaccinations or no" (Price, 2013, p. 197). On the other hand, Americans in *This Cruel Design* are so confident after having received their vaccine that they abandon the airlocks they had previously employed for protection against an airborne virus and go so far as to confront "blowers," contagious individuals. Ridley Pearson, in his novel, *White Bone*, introduces doubt and mistrust that goes beyond confidence in the vaccine's biological capacity to induce immunity. In Kenya, his characters encounter locals who say, "So many times these injections make our children sick. Some have died. Others, adult and child alike, never improve. For decades, Africa has been used for clinical human trials [….] We have come to associate free medicine with disease" (Pearson, 2016, p. 296). Their mistrust is not derived from doubt about the vaccine's efficacy or even negligence in the

regulatory process, but is founded in fear of intentional deception or misrepresentation of the vaccine.

The concerns expressed in *White Bone* are based on historical precedent, but are exacerbated by a lack of transparency in communication surrounding vaccines that is evident in many of the texts in this study. In *The Blizzard,* the physician's driver Kozma expresses confusion about the concept of a vaccine, questioning "A vax-seen?" to which he receives no elucidation from Dr. Garin, who simply repeats the word "vaccine" as if it is an issue of hearing, rather than one of comprehension. Garin assumes everyone understands vaccines, and does not even consider the possibility that explanation might be valuable to someone like Kozma. Amber Kizer introduces vaccination to her characters in *A Matter of Days* in such a way that the children do not know what the shot they receive is meant to prevent, are not supported with consent from a parent, and do not even know that what they receive is a vaccination as such. Catarina Agatta, in *This Mortal Coil*, is faced with a seemingly insurmountable problem when told, "Your father was the only person who could even explain how the vaccine worked, but now he's gone" (Suvada, 2017, p. 287). To get around this problem, which will hinder the distribution of the vaccine she hopes to release, Agatta and her team decide to deliver the vaccine to every person on Earth, without their consent, and with absolutely minimal provision of information. Catarina chooses to ignore patient autonomy for the sake of advancing public health.

This conundrum – striking a balance between public health and personal liberty – lies at the heart of many arguments about vaccines (both in the fictional and real worlds) and is a fundamental consideration of the field of public health at large. Several of the novels, including Suvada's series, investigate violation of personal freedom for the sake of securing public health. As mentioned above, the leaders in the *Mortal Coil* series choose to release the

vaccination against the Hydra virus without waiting for the consent of the recipients. Emily Lloyd-Jones' series (*Illusive* and *Deceptive*), presents another form of privacy violation. Rather than forceful vaccination, those who are already vaccinated are heavily monitored and even treated as criminals – regardless of their behavior, simply on the basis of their immunity. In *Deceptive*, an activist claims that she is "currently working to dismantle the laws that have inhibited the Fourth Amendment," that is, the amendment of the U.S. Constitution which prohibits the federal government from conducting unreasonable search and seizure (Lloyd-Jones, 2015, p. 83). This statement situates the battles between health and personal autonomy in the context of real, contemporary American politics, and implies that the government's justification for prioritization of health over liberty is a matter of national interest or security.

Several of the novels contextualize vaccination in relation to nationalism and national security. In *Starters*, neighboring nations close their borders to the U.S., out of fear of residual spores from their bio-warfare. The adverse events introduced by the MK plague vaccine in *Illusive* and *Deceptive* create a pseudo-arms race of immune individuals, with every nation on Earth trying to recruit as many people with immunity as possible as "weapons" and even revive a vaccine that is no longer useful (given that the virus of concern has been eradicated) in order to create more immune citizens. In *This Cruel Design*, Catarina worries that losing the vaccine (due to viral evolution rendering it obsolete) would lead to riots or even war. Each of these articulations of vaccines presents them as essential to the establishment of peace and prosperity on a national level, not just a matter of personal well-being and immune strength. This is a vital observation, given that almost half of the vaccines in novels that were analyzed (46.6%) are distributed or subsidized by the government in some way. This does not, however, correlate to reliability or safety of the

vaccines, with the majority of vaccines with unintended consequences (62.5%) also identified as sponsored by the government.

In *Healers,* Brad Munson introduces a nationalist struggle between revival of the legitimate U.S. Government and a faction group seeking to gain control of the nation. Known as the Recovered States of America (R.S.A.), this group claims that the U.S. government is lying about the fact that they have a vaccine, and are instead in possession of a cure. This sets off a volley of reprisals and arguments over which authority can be trusted. One character comments, "Vaccine or cure, the reasoning was sound: He who controlled that medication, regardless of its real effects, controlled America and quite possibly the world" (p. 83-84). With this statement, vaccines are positioned as not unique, but as one of many forms of biopower that govern society and establish social capital for whoever controls them. As Michel Foucault illuminates in his seminal volume *The Birth of the Clinic*, healthcare is governed by power structures that can legitimize or erase individualism, autonomy, and privacy. Vaccinations, in the pages of these novels, infringe upon individual choice and privacy when they are forced upon individuals (*This Mortal Coil*), when they imbue individuals with traits which deem them lesser and therefore subject to exploitation (*Illusive, Stung*), or when they are withheld, condemning people to death even in the presence of immunological salvation (*Starters*, *The Blizzard*). The powers that control and distribute this type of commodity necessarily determine the fate of their society, particularly in the face of a pandemic or catastrophe that may *only* be averted through vaccination.

While the above scenario from *Healers* couches vaccines and curative medications as equally powerful, the analyzed texts more frequently presented vaccination as something superior to treatment. In many cases, treatment was simply unfeasible or impossible given the scope and severity of the disease in question. The only reasonable course of action that

characters identified was eradication, sometimes at any cost. In *This Mortal Coil, Illusive,* and *Claimed,* vaccinations are introduced into the public with goals that include not only management of cases, but total control of the threat. The ideal is for the vaccine to render the virus obsolete – to do less than this would be considered a failure, as Cat considers the vaccine to be in *This Cruel Design* when an evolving virus no longer responds to the immunization strain intended to eradicate it. In *Spur of the Moment*, the goal of Dr. Stromberg-Brand's vaccine is not necessarily eradication, but is nonetheless presented as far superior to existing treatment medications for UTI's, which are described as ineffective, costly, temporary remedies. The novels that comprise this study, in general, seek long-term solutions. In *Claimed*, Sarah Fine's leading lady (and lead researcher) Galena hopes to create a vaccine that would harness native immune processes to adapt in tangent with the diseases it fights. This would eliminate not only one single virus, but a whole category of human diseases.

Due to its far-reaching implications, Galena's proposed vaccine receives some pushback from the Ker, mythological superhumans who are tasked with marking people for death, and who therefore stand to lose significant revenue if Galena eliminates numerous causes of death and prolongs the human lifespan. Vaccines are, in this manner, presented as drivers of economic power, as well as social capital. In Galena's case, the vaccine would derail a revenue source and upset the status quo. The same can be said of Dr. Stromberg-Brand's UTI vaccination, which would disrupt the steady income of pharmaceutical companies profiting from short-term treatments.

These examples show how the cost-effectiveness of vaccination as a long-term preventive intervention undermines healthcare and pharmaceutical economies that rely on reactive treatment. However, vaccines themselves are often depicted as profitable and

valuable, regardless of their effect on competing markets. For the sake of this analysis, "valuable" is differentiated from profitable by referring to inherent worth as a commodity, rather than monetary gain implied from its sale. Thus only two out of 15 novels were identified to contain profitable vaccines, while 7 of the 15 had valuable vaccines. Whether profit or value, these characteristics of vaccines made them susceptible to corruption. Readers can find this in *White Bone* (when human vaccines are replaced with animal alternatives and exchanged on the black market), in *Nefarious* (in which determined researchers try to push their prototype through Phase IV trials although they know there is serious risk to humans), and in the *Illusive* series (in which the human keeper of the vaccine formula is treated as a tradable commodity). These depictions of vaccines prove that their development can be a prestigious and lucrative business. While these are classified as social positives for the analysis in this study, the characters in the novel often associate the nature of vaccines as commercially successful with eventual negative outcomes – tainted vaccinations, insufficient regulation, and general lack of transparency from creators and distributors of immunizations.

Despite the controversy presented as a necessary partner to vaccination, vaccines in the novels reviewed are presented as the social norm, to which all are expected to adhere. In the Bloomberg High School of Sarah Mylnowski's teen novel, *Don't Even Think About It*, plenty of students gripe about getting their yearly flu shot. Some students are afraid of needles. Another decries vaccines as commercial gimmicks but is quickly shut down by her peers as a "conspiracy theorist" (Mylnowski, 2015, p. 22). Although students complain about the shot or hesitate to receive it, getting an immunization against influenza is depicted as the social norm, which is only ignored by a select few, whose concerns are outright dismissed by the majority. In *Foamers*, all of the characters are alive to partake in the novel's

plot *because* they refused vaccination. Nonetheless, each character's refusal is accompanied by explanation – one is afraid of needles, another had to work, one had a bad reaction and now avoids vaccines altogether. The very fact that justifications for their refusals to be vaccinated are provided in the text confirms that these characters are going against the societal convention and must explain their reasoning for such a radical departure.

Discussion

Surprisingly, it was noted that every single novel analyzed included some form of love story. The inclusion of a romantic plot is not uncommon in fiction, but it is far from so ubiquitous as to be expected in all 15 of the novels, particularly in a sample set that included diverse genres from mystery to science fiction. Not only did love interests feature prominently in the plots, but many of the couples were thrown together or encouraged to confess their feelings as a direct result of the role vaccines played in the texts. The vaccine in question often threatened the characters' way of life such that characters appeared more willing to express their feelings (long suppressed or newly revealed in light of the person's behavior under pressure). This was true of romantic plots in *Nefarious, Foamers,* and *Don't Even Think About It*, in which characters who had long-held secret crushes on one another were forced into more intimate acquaintance with each other after vaccine mishaps. In the case of *Foamers*, as well as novels such as *This Mortal Coil*, the romantic possibilities are further compounded by the possibility that civilization (as the characters have known it) is at its end, and they may not have any future chance to pursue love. Additionally, love operated in these novels as a foil for science in general, as something messy and unexplainable that offered a humanistic counterbalance to technical language like "adverse events," "thresholds," "herd immunity," or even "risk." In *Claimed*, Galena throws herself into her

laboratory research as a way of escaping memories of her sexual assault, using her work as a validating, productive alternative for intimacy. Her budding relationship with Declan Ferry is directly related to her work, as mechanism for keeping her safe from threats so she can produce her long-awaited vaccine, but the liaison occurs at a time when her lab is literally destroyed and science is not an option. Declan's love allows her to work on overcoming her trauma and, although ultimately intending to advance her scientific future, it offers a respite from the hard logic she encounters in the lab. In *This Mortal Coil,* the protagonist falls in love with Cole as a young girl named Jun Bei and again as Catarina Agatta, a teenager with fresh DNA and wiped memories. In the midst of a society ruled by pervasive gene-hacking that reduces all human characteristics (even impulsive anger) to traits that can be designed and coded, this illogically persistent love bucks the system and suggests an unmanageable human essence that even science cannot anticipate or anesthetize. Love may not be perfectly "effective" – that is, reciprocated, long-lasting, or successful – and it may have "unintended consequences" but it is decidedly not something we can study and solve, as opposed to the immunology presented in these books.

This study had a few limitations. While covering in depth fifteen novels identified based on impact via sales, and therefore representing a reasonable sample of vaccine narratives fiction readers might be exposed to, it does not account for articulations found in more niche or less popular stories.

The investigation seeks merely to identify trends in articulations of vaccines in popular fiction. The conviction that this information is valuable is based on the assumption that narratives and metaphors influence reader opinion, as implied by the National Vaccine Advisory Committee (2015, p.581) and others. Vaccine articulations, however, might equally be considered as evidence of the opinions of their writers. As such, these articulations might

not be a truly representative sample of social norms at large, but only of one particular cohort – dedicated, educated, published authors.

Conclusion

This study analyzed fiction published since 2010, identified with keywords "vaccine" or "vaccination," in order to assess the prevailing means of articulating vaccines in contemporary literature. Through literary analysis and mixed methods, the analysis identified metaphors used to describe vaccines and investigated common themes in the fifteen novels studied, including the profitability of vaccines, the potential for unintended consequences even in the presence of regulation and legitimization through government distribution, and the balance between personal autonomy and public health. Characters in these novels held many opinions and concerns about vaccines, but vaccination was the social norm in most texts. Every novel included some form of love story, which offered a counterbalance to the technical language of science. While fiction is frequently dismissed as a world of make-believe, novels - even science fiction novels – are grounded in reality. They draw from real stories and social dynamics and they reflect true hopes and anxieties of individuals. Analysis, thereof, has a place in public health as a means of informing health communications and programs to effectively address social realities and advance social change.

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Appendix

Vaccine Narratives Summary Document

Stung – Bethany Wiggins

When the reader of Wiggins' novel first meets protagonist Fiona Tarsis, she is waking up outside the wall, the protective fortress around Denver. The city still exists, but the surrounding territory has been wiped out by agricultural and societal collapse, and is controlled by rogue gangs and a barter system in which honey is the most prized commodity.

The cause of this new paradigm is the devastating "bee flu" which decimated the bee population, leading to crop shortage and a scarcity of honey. In an attempt to get the bees off of the endangered list, genetically modified honeybees were produced. Unfortunately a sting from one of these bees led to a flu-like symptoms in humans, producing aggressive behavior, and which was ultimately fatal (p. 100). A "bee-antivenin" vaccine was produced to stop the person-to-person spread of bee flu through bodily fluids, but it was quickly found to cause violent behavior in those immunized, according to a dose-response relationship (p. 112).

When Fiona wakes up, she doesn't remember anything about the epidemic or the world in this post-vaccine state, but she discovers that she has the "mark of the beast," a spidery tattoo on her hand that indicates she received the highest possible dose of the vaccine (p. 11). It is later revealed that Fiona likely got this special early access to, and therefore highest dose of the vaccine, due to her father's military connections (p. 57). The mark suggests that she could "turn" at any moment, into a violent beast (reminiscent of traditional descriptions of werewolves). She can't remember how or why she has the tattoo, but instinctively knows that it ought to be kept covered (p. 7).

Trusting the wrong person, she winds up imprisoned in a camp outside the wall, by people who plan to turn her in to the government at the city's gate for a reward. She is guarded by one Dreyden Bowen, a young man with whom she grew up and who recognizes

Fiona. Realizing that Fiona is not turning, and does not pose the threat her tattoo suggests, Dreyden gives her more and more freedom, and eventually the two escape together, originally to protect Fiona until she can be turned in safely, then finally to forge a new path together outside the wall.

Pursued by people clamoring for the reward offered for her capture, Fiona once again trusts the wrong person, and winds up sold across the wall into the city. While many vaccinated individuals who are exchanged end up in the city laboratory where they conduct trials to find a cure, Fiona, as a "Level Ten" is sent instead to "the pits" where beasts battle each other before an audience as a gladiatorial spectacle. Fiona is pitted against her long-lost brother Jonah, who has turned.

Bowen saves the day, creating an explosion in the pits which summons a medical team to attend to Fiona. She recognizes the doctor attending her, Grayson. In this process, Bowen is injured, and Dr. Grayson encourages Fiona to kiss him to confer healing properties of the vaccine, saying, "it has certain advantages in small doses" (p. 136). Confronted in the pit, Dr. Grayson accuses the Governor of covering up the cure that he discovered, in an effort to continue profiting off of the vaccinated beasts and drinking their blood for its healing powers (p. 168). Fiona is proof of the cure. It is soon revealed that Fiona, again by privilege of her military connections, was a test subject in the lab – the test subject upon whom the cure was successful. Finding that cured patients were being systematically murdered to hide the cure, Dr. Grayson engineered Fiona's removal to a safe location outside the wall, but she woke up before she could be retrieved and moved to safety in a new state, leading her to embark on the whole quest that led her back to the pits (p. 168).

The novel ends with Bowen broadcasting the existence of a cure to the world.

Metaphors

Vaccines as…

- mysterious
- a form of exclusivity
- monitored/regulated
- potentially contaminated/tainted
- differentially distributed
- distributed/subsidized by the government
- dangerous
- deadly

Don't Even Think About It – Sarah Mylnowski

In this teen novel, Mylnowski's characters, students of Bloomberg High School find themselves in with unexpected telepathic skills after receiving a vaccine. The students, all of a single sophomore class homeroom, receive an annual flu vaccine in their school nurse's office, and within hours notice that they (and they alone) have the ability to hear what others around them are thinking. They refer to their abilities as ESP. Naturally, interpersonal drama ensues, as the teens learn each other's secrets, bond as a class, and evaluate the ethics of maintaining such an advantage over others.

Vaccination is used as the source of the teen's personal dilemma and is invoked throughout the novel in various ways, many of which present surprisingly realistic insight into vaccine safety surveillance in the U.S. A hypochondriac named Olivia offers frequent fact-checking throughout the novel, thanks to her compulsive referencing of the CDC website for the most accurate health information. She loves vaccines, finding they "make her feel safe and protected" (p. 34). She also relates the acquired powers to minor adverse events, confounded by how the telepathy is long-lasting when reactogenicity is not (p. 100) and suggests contacting the CDC, informing her peers about the Vaccine Adverse Event Reporting System (VAERS) (p. 157).

At the start of the novel, the vaccine is presented as voluntary, but a social norm, something to which everyone in the high school is expected to submit, albeit with "groans" of annoyance and some minor fear of needles (p. 22). The few dissenters in the class are outliers in their peer group. One student proclaims that vaccines are ineffective commercial gimmicks, but her classmates dismiss her as a "conspiracy theorist" (p. 22). When another girl is afraid to get the shot, her boyfriend presents it as a "fun" couples activity, and she caves (p. 23). Ultimately the conspiracy theorist and one other student, who does not

receive the vaccine due to a medical exemption/allergy, are the only two individuals in the class who do not acquire ESP, solidifying their outlier status on another social level, as those who can hear thoughts form an unlikely community around their shared skill and the secrets they must keep for their mutual benefit. The entire school receives vaccinations, but the exclusivity of the powers (which are limited to a single homeroom class) is blamed on a single batch of the vaccine.

When the students first realize their powers, they are all feel the effects of the vaccine at different intervals, and are not in school together. Those who choose to relay their symptoms to their parents are not believed, some adults even relate the symptoms to the vaccine and fear adverse events (p. 121).

Ultimately the CDC does get involved, sending an undercover "agent" to replace the school nurse and acquire information about the students, as a suspected new cluster of vaccine-related neurological conditions noted in several other places throughout the country. Once she confirms that the Bloomberg High kids are experiencing the same condition, CDC staff call a school meeting with parents and students to explain their findings (limited) and offer a reversal vaccine, modified with additional stabilizing adjuvant (p. 361). The reversal vaccine is offered in exchange for confidentiality, and general consensus not to sue the CDC (although the mechanism for doing so is left unclear). The students and parents initially agree, but the students ultimately refuse the antidote, opting instead to maintain their superhuman powers and cultivate their new community of friends in future installments of the book series.

Metaphors

Vaccines as…

- community building
- conferring an advantage over one's peers
- socially expected/approved
- protective
- special
- mysterious
- a form of exclusivity
- monitored/regulated
- child-specific
- potentially contaminated/tainted
- distributed/subsidized by the government
- controversial

This Cruel Design - Emily Suvada

In this sequel to *This Mortal Coil*, readers follow Catarina as she comes to terms with her dual identity as both Catarina Agatta, daughter of the rogue (but genius) gene-hacking vaccine designer, and as Jun Bei, a human research subject he tortured in his quest for innovation.

At this point, following the events of the previous novel, the vaccine has been released, transmitted via Cat to the entire population. This simple fact changes the way many characters interact with the world around them, whether this means being unafraid to confront a "blower" or considering airlocks newly unnecessary (p. 51).

Despite the total vaccine coverage achieved, blowers are still observed, including those who produce viral plumes that are much larger and have a different trajectory than the original virus. This leads to the discovery that the virus has mutated, and the vaccine is no longer protective against this new strain (p. 53). Given the hope and confidence inspired by the heavily publicized global release of the vaccine, Cat imagines the "loss" of the vaccine will be accompanied by devastating social outcomes, thinking, "There could be riots. There could be a war" (p. 55). Coupled with desire for a vaccine and celebrations at its success in the first book of this series, Suvada displays a full range of social responses to the lack of a vaccine, a highly effective vaccine, and one which disappoints. Eventually, it is determined that the Hydra virus has spread through pigeons, explaining its new evolution. At this realization, Cat thinks, "Now there'll be no stopping it" (p. 227).

Cartaxus remains a militant force to be reckoned with. They demand Cat's assistance to address her father and uncover a way to modify the vaccine, but also prepare to initiate flood protocol, which would wipe out all humans on Earth, working from the understanding that, "There are *two* ways to kill a virus – you can beat it with a vaccine or you can remove

every possible host for it to infect, and it will die on its own" (p. 61). This is a radical permutation of the concept of eradication.

Along the journey Cat makes, she encounters a number of gene-hackers with radical visions of societal transformation, including one named Mato and a whole colony of artists in a community called Entropia. The citizens of Entropia subscribe to a view of gene-hacking which allows them to modify their bodies in any way they choose, not just in ways that are for health or are consistent with the general trajectory of evolution. They have bodies covered in feathers or scales, sparkling jewels embedded in their skin, and unbelieveable bodily proportions. This mindset extends to their conception of healing tech and immunity; while many (including Lachlan) focus on expanding the body's natural defense mechanisms, some advocate for removing the host, such as writing code to eliminate the lungs to avoid susceptibility to respiratory diseases (p. 184).

As Cat, accompanied by Cole and Leoben, attempt to find Lachlan Agatta, she continues to confront her identity, and realizes that Jun Bei helped Lachlan create the vaccine. This realization leaves her aghast, thinking, "His plan for the vaccine goes against everything I believe in. Personal choice. Freedom. The right to make up our own minds about our own bodies" (p. 110). Although Cat understood the threat of the virus and willingly participated in pushing the vaccine to every humans' panels, she declares that she considers this to be a violation of personal autonomy.

When Cat, her friends, and the community at Entropia become infected with the new virus, a "patched" vaccine is distributed, which is not simply protective but curative, reversing the infection they sustain (p. 244).

In the end, Cat and Jun Bei fight for real estate in one mind, working together at some points and then each taking the fore and making decisions independent of the other.

Jun Bei fights for the vaccine, but Cat declares it to be "dead technology," claiming that the way forward is to embrace alternative gene hacking to address the rapid spread, mutation, and new animal hosts. The novel ends when Jun Bei wipes the memories of the entire planet, and takes over Cat's body, leaving the reader questioning the entire fate of the universe, on which Suvada holds judgment for the next installment.

Metaphors
Vaccines as…

- socially expected/approved
- special
- potentially contaminated/tainted
- distributed/subsidized by the government
- curative
- augmenting natural processes
- controversial

Illusive – Emily Lloyd-Jones

Ciere Giba is a thief. With her crew, led by an art dealer named Kit Copperfield, she robs high-end targets and acquires art. Not only are Ciere and her crew thieves, they are immune.

All members of the team were once immunized with a vaccine meant to protect them from a pandemic caused by Meningococcas Krinotas [sic], or the MK plague (p.11). The disease – a combination of viral and bacterial meningitis – was always fatal until Fiacre pharmaceuticals produced a protective vaccine known as Praevenir, Within six months of the vaccine's release, worldwide chaos erupted, when it was discovered one side effect of the vaccine was the development of special powers, in one of seven categories: dauthus (advanced physical strength and control), eidos (perfect memory), levitas (levitation), eludere (elevated intuition), mentalist (mind reading), illusionist (ability to create optical/holographic illusions), and dominus (mind control). Ciere is an illusionist.

The problems with the vaccine were blamed on rushed FDA testing that the pharmaceutical company pushed through, and the company leader went into hiding shortly after the revelation, taking the vaccine and its formula with him. He blew up the warehouse where he and his family had hidden, presumably destroying all remnant of the vaccine or its formula. (p. 99). The vaccine is considered irreplaceable without the formula because the virus died out (p. 91).

Those with the unusual powers are called "immune," though the title refers to their unique abilities, not any biological protection they have from MK plague. The powers are also called "adverse effects," necessarily casting them in a negative light by emphasizing their unintended nature (p. 12). Having immunity undoubtedly gives one an advantage over one's peers, but "having immunity doesn't improve one's life at all – it makes one a target" (p. 84).

While "immune" individuals quickly become stigmatized and feared due to their superhuman abilities and propensity to use them for criminal activities, they are simultaneously highly sought after for the special set of skills they bring to military or intelligence operations. The recruitment of immune persons for the government is highly controversial, as it turns humans into weaponized commodities and creates a degree of global brinksmanship. China promises it will never use immune individuals as weapons unless America did so first, but America already is (p. 32). Treaties established around immunity go unheeded. All citizens are required to wear ID tags that indicate their titer status whether or not they have symptoms of adverse events. Adverse events are required to be reported. A federal agency called United American Immunities (UAI) tasked with addressing, "threats to national and foreign security" and staffed entirely by immune individuals is responsible for containing dangerous or criminal immune threats and recruiting them to join the government (p. 77).

When Ciere and her eidos friend Devon are caught stealing in the New York Guntram gang's territory, they are blackmailed under threat of revelation of their immune status to the authorities. A tracking bracelet is placed on Ciere – so her location can be turned in at any time – while she is released to get payment for the gang's silence. Without telling Kit about her run-in, she joins Kit on their next job, hoping to get the money she now owes. The job is the theft of a will (extracted from a safe, memorized by Devon, and replaced) which quickly points to the Fiacre family, and conspiracy theories of a hidden copy of the vaccine formula, which would be priceless.

When they follow the will's instructions, they find not the formula, but a young man named Alan Fiacre, sequestered in a safe house. He is an eidos, and has memorized the Praevenir formula, making him the physical manifestation of the vaccine's power – highly

desired, constantly in danger from organizations who wish to exploit it. The group, now joined by Alan, is pursued by UAI, but manages to evade both them and the FBI. Ciere and Alan ultimately break away from her crew to protect them by surrendering themselves to gang for protection (and to offer their services to pay off Ciere's remaining debt). When the UAI and FBI still manage to find them, Ciere saves them all by embracing her power and refusing to hide. Reflecting on her actions, Lloyd-Jones muses, "She's spent so long running – not from the feds but from herself….For better or worse, they are immune" (p. 178). In this way, Ciere's embrace of her power is presented as the solution to confronting the pervasive fear and secrecy associated with immunity in her world.

Metaphors

Vaccines as…

- community building
- conferring an advantage over one's peers
- protective
- special
- mysterious
- a form of exclusivity
- monitored/regulated
- valuable

Foamers – Justin Kassab

In the first book of Justin Kassab's *The Primal Age Chronicles* series, the reader is introduced to Kade Zerris, a survivalist preparing for the coming of the "Primal Age," and his band of friends who join him in survival when the time final comes to put his dooms-day skills into practice. This transition from apocalypse prepping as a hobby and actually surviving the end of civilization as they know it is triggered by the mass release of a new vaccine against the Feline Flu. When the story opens, the Feline Flu has devastated much of the Northeast and Mid-Atlantic regions of the U.S., leading to protests, rioting, and avoidance of public spaces. Within twelve hours of its release, 90% of the U.S. population receives the vaccine, thanks to the President's declaration of a national emergency which shut down schools and businesses so citizens could get immunized (loc 34/2997). Despite the demand, it is understood that the vaccine is not a cure-all. Kassab notes, "This mass vaccination wasn't a silver bullet by any stretch, but it would curtail the fatalities" (34/2997).

Kade is undoubtedly the protagonist and hero of the story. However, the vaccine is "the brain child" of Damian, Kade's twin brother, and the two individuals (and their activities – vaccine development and survivalism) are presented as foils for one another.

Damian sends a letter to his brother, warning him of a serious miscalculation which that results in the grim reality that, "twenty-percent [sic] of the people who receive the vaccine will die, twenty percent will live, and sixty-percent [sic] will lose their higher functions" (171/2997). Those who lose their higher functions come to be called "foamers" and are characterized much like traditional depictions of zombies or werewolves. Only in the final pages is it confirmed that the bite of a foamer is not contagious (2829/2997). Damian confides that the Feline Flu vaccine is designed to be constantly adaptive to with new hemagluttinin and neurminidase, and ultimately transforms itself into a wholly new

virus, attacking not the lungs like an influenza strain, but the brain (350/2997). He claims he was unable to convince anyone to halt production, and instructs Kade to prevent as many people as possible from receiving the vaccine and prepare for the disintegration of life as he knows it. Of his brother, Damian notes, "I know you won't be getting the vaccine regardless of what I'm about to tell you…." (171/2997).

The friends who make up Kade's ultimate survival cohort are all unvaccinated, for a multitude of reasons. One is afraid of needles (235/2997). Another is Damian's ex-fiancée and refuses on principle to accept *his* vaccine (249/2997). Another didn't have time since he had to work, apparently despite the national emergency (209/2997). A final member of the group had a bad reaction to a vaccine once and has since never received another (209/2997). This group considers themselves lucky to have avoided the vaccine, and mourns the loss of "all those who received the vaccine" (914/2997). No vaccinated individual in the novel is presented as immune to the adverse effects, although mathematically this is occurs.

Damian instructs his brother to gather allies and supplies and head to a pre-determined site to wait out the end of the world, a college campus where they will have access to medical and laboratory equipment to assess the terrible flaw in the vaccine. The school is abandoned, since students were encouraged to go home to receive the shot, given the limited quantities anticipated at the college (1016/2997). Along the way, the group is separated, and one group finds entire neighborhoods abandoned, leaving them free to commandeer homes as campsites.

Despite all his preparations, Kade struggles to become "primed," or fully adjusted to the Primal Age. He kills many foamers, but still manages to feel empathy, wondering over one victim, "who the child had been before the vaccine" (1790/2997). They confront other

groups, such as rogue militants, who have adjusted rapidly by forgetting all remnants of their former lives (1958/2997).

After many battles, several team member deaths, and much personal strife, the team establishes themselves as secure at the college are is joined by Damian and one of his "test subjects." Their final intentions seem to be to continue researching and updating the vaccine, but the scourge of Feline Flu, and the fact that its solution may have been far worse than the problem, is not mentioned.

Metaphors
Vaccines as…

- socially expected/approved
- potentially contaminated/tainted
- dangerous
- deadly
- controversial

Starters – Lissa Price

In this young adult science fiction novel, Lissa Price imagines a world devastated by biological warfare. Set in southern California following the devastating "Spore Wars" waged throughout the Pacific Rim, the novel follows sixteen-year- Callie Woodland as she navigates this new world. In advance of the war, vaccine was distributed to citizens as protection from expected bioweapons. Distribution began with the populations deemed the most vulnerable – those under 20 and over 60 – however, the attacks struck before the rest of the population could be given vaccine, and wiped out an entire generation (p. 34-35). The vaccines were effective, but have left young children who have lost parents squatting in abandoned office buildings as "unclaimed minors," left to their own devices on the streets of Los Angeles or shepherded into institutions that are more like prisons. Meanwhile the elderly, known as "Enders," hold all the power and wealth, blind to the suffering of the young. Those lucky children who had living grandparents at the time of the attacks have been taken under their wing, and live in luxury. The vaccine is not the only cause of the social disparities created by the loss of the middle-aged/adult populations, as Price alludes to laws prioritizing employment and political power for the elderly well before the wars began, due to increasing longevity thanks to research advancements which allow them to live up to age 200 (p. 52). The wars have left America isolated, with many countries issuing travel bans against its citizens, and Mexico even building a wall to keep them out (p. 88).

In order to secure money and safety for herself and her younger brother, Callie embarks on a strange journey by donating her body through a service called Prime Destinations, through which service Enders can "rent" a young person's body to feel young again and enjoy their favorite sports. Through a series of mishaps, Callie resumes control of her body before the rental period is over, discovers her renter is using her to carry out an

assassination, and discovers a plot to force unclaimed minors into a permanent body acquisition system.

Disparities in vaccine distribution may make this social setting possible, but the major plot points of the novel revolve around other subjects. Vaccines are mentioned throughout in tangential but interesting ways. Early in the book, Callie notes that the vaccination left noticeable scars, marking those who received them in a tangible way that corresponds to their invisible immunity (p. 34). One known, "hopefully temporary" side effect of the vaccination is infertility (p. 23). The implications of this statement are not fully explored in this book, but the side effect creates an important paradigm by which the surviving minors cannot be used to repopulate the country – at least not yet. Later Callie says that playgrounds are largely abandoned since people are "paranoid about residual spores in the air, vaccinations or no," implying that although they have proved to be completely effective, the public is still unwilling to place total trust in their acquired immunity (197). Near the end of the novel, frustrated by the continued exploitation of minors, Callie fumes, "All you Enders, it's all your fault. Why didn't you vaccinate everyone? We wouldn't be in this whole mess if you hadn't been so cheap" (p. 472). Although cost efficiency is not cited as a reason for the prioritized distribution of the vaccine, Callie considers the vaccine to be a limited resource, a commodity which was deemed too valuable and scarce to be distributed to all members of the population by those who had the power to do so. This kind of statement also raises questions about the perceived efficacy of the original vaccine. Why didn't they make enough for everyone? If not simply a matter of price, did they have doubts about the ability of the vaccine to appropriately induce immunity? Did they assume adult immune systems were strong enough to withstand the bi

Metaphors

Vaccines as…

- differentially distributed
- a form of exclusivity
- conferring an advantage over one's peers
- protective
- child-specific
- distributed/subsidized by the government
- given to the vulnerable
- scarring/conferring visible immunity
- essential
- valuable

Healers – Brad Munson

Healers is the fourth book in The Morningstar Strain series, which follows the aftermath of a viral zombie apocalypse and the subsequent recovery of America in the early 2000's. As such, a reader of only this novel misses some of the nuance of the origins of the pandemic and early survival. This book, however, focuses on the development of a vaccine for the Morningstar virus.

In this volume, Brad Munson opens in Omaha, Nebraska, where the United States is slowly rebuilding, reclaiming territory and buildings from sprinters (newly minted zombies – bitten but still living humans) and shamblers (older zombies – the truly undead) by erecting fortifications and a walled compound. The interior of this city works essential as a military base, commanded by former General Francis Sherman.

Besides defending their boarders from zombies, the citizens of Omaha and a neighboring settlement called New Abraham must also contend with challenges to the authority of the remaining United States Government. A rebel faction has arisen, intent on claiming power and controlling the narrative of the zombie apocalypse. This group is know as Recovered States of America (R.S.A.).

The first pages of Munson's novel are an address from the U.S. President, announcing a vaccine. He emphasizes, "This is *not* a cure. Those who have been infected with the virus are tragically beyond our reach," but promises that every American will shortly receive lifetime immunity through a one-time vaccination (no page #). Announcements of the vaccine's existence and its readiness for distribution are both planned to be presented by the U.S. President, signaling their importance and the value of legitimation for this news. With the announcement of the vaccine, Omaha celebrates hope for a better future, and a

turning point from simply surviving to truly rebuilding society. The Vaccine Prep facility in Omaha is called "the place that's going to save the world" (p. 45).

There is significant talk of heroism throughout the novel, and this status encompasses military heroes, Mark Stiles (the only known human with natural immunity to the virus), and those who helped make the vaccine development and production possible, including Anna Demilio, the lead researcher. Although she is praised for her contributions, she laments the ethical conundrum of infecting healthy individuals with the virus in order to test her vaccine (p. 19).

The final vaccine formulation requires eggs, for which a team from Omaha must travel to the settlement at New Abraham. There, they encounter a skeptical faction which does not believe that any vaccine exists (therefore refuses to give up the eggs as their food source) and claims that the U.S. government is hiding a cure. These sentiments echo those voiced by the Chairman, the leader of the R.S.A. These individuals give no concrete reason they believe a cure has been achieved but not a vaccine, and seem eager to stir up dissent more than anything else. One spectator muses, "Vaccine or cure, the reasoning was sound: He who controlled that medication, regardless of its real effects, controlled America and quite possibly the world" (p. 83-84).

Metaphors

Vaccines as…

- controversial
- protective
- given to the vulnerable
- distributed/subsidized by the government
- essential
- prestige-granting [to the creator]

Spur of the Moment – David Linzee

Renata Radleigh is a mezzo-soprano preparing for a run of *Carmen* with the St. Louis Opera when her brother Don, the fundraising director for the same company, is arrested for the murder of one of the program's biggest donors. Dr. Helen Stromberg-Brand, a medical researcher at Adams University who had developed a vaccine to prevent UTIs, had agreed to $330,000 dollars to the opera. At a donor party celebrating their generosity, Bert Stromberg-Brand accuses Don Radleigh of sleeping with his wife in order to secure the opera's funding. Helen storms home alone, where Don follows her, and in several hours her husband returns to their home to find her dead from blunt force trauma with a crystal bowl.

The police and media both focus on the scandalous aspects of the story, and Don is immediately arrested as the prime and only suspect. Convinced of his innocence, Renata begins to investigate alternative scenarios, pressing the police to expand their inquiries. She eventually teams up with Peter Lombardo, a employee of the Adams University medical PR department yearning to get back to his journalist roots, and together they discover that the murder has more to do with professional competition and the profitability of Stromberg-Brand's vaccine than any sordid personal life.

From the beginning of the novel, Dr. Helen Stromberg-Brand's vaccine is presented as remarkable and "may well win her the Nobel" (p. 24). The production side of the vaccine development is in partnership with a famous, billionaire venture capitalist named Keith Bryson, who considers it one of the most important of his many endeavors (p.97), particularly considering that the anticipated market is "almost a hundred million people for the vaccine" (p. 109). It is acknowledged that it will still take many years before it reaches the market, after human trials and FDA approval.

Dr. Stromberg-Brand's vaccine is described as superior to other available prescription UTI treatments. As opposed to the drugs which kills some bacteria but only temporarily relieve symptoms, the vaccine works by preventing bacteria from clinging to the bladder lining. This feature, Bryson describes as "Helen intervene[ing] on the body's side," improving upon a natural bodily process (p. 99). One vaccine dose would prevent UTIs for a lifetime.

While Helen Stromberg-Brand's achievements are touted as medical breakthrough and incredibly profitable, she is presented with a foil in the form of her colleague Dr. Ransome Chase. Dr. Chase was Helen's competitor for an endowed professorship which Stromberg-Brand ultimately claimed, enabling her to advance her vaccine research. He still holds an intense grudge. Dr. Chase's research is centered around Chaga's disease, he frequently travels to Latin America to provide clinical care, and he corresponds personally with his patients. These traits are presented as the opposite of Dr. Stromberg-Brand's emphasis on the UTI vaccine, which "won't prevent any deaths, but it will make millions of comfortable lives even more comfortable" (p. 183). The research priority (and therefore funding support for vaccines) is presented as favoring the more profitable avenue of medicine, rather than that with higher mortality. The vaccine, in turn, is presented as entirely dependent on the funding source, and the willingness of investors like Keith Bryson to support it (providing that they are not imprisoned for murder) (p.282).

Metaphors

Vaccines as…

- protective
- valuable
- profitable
- prestige-granting [to creator]
- augmenting natural processes

Nefarious – Steven F. Freeman

Steven Freeman's first installment of the Blackwell Files, introduces Captain Alton Blackwell, a U.S. Army cryptographer. After an injury in the field, he is forced to accept a desk job and ultimately resigns himself to returning stateside. During this period, he makes friends, finds a love interest, and proves himself strategically capable of outwitting the enemy. This section of the novel is unrelated to vaccines or the overall plot of the text, other than introducing the main character.

In a parallel storyline, the reader meets Jeffery Finch, director of R&D for a pharmaceutical company, who becomes obsessed with the development of a superior rabies vaccination after his son is bitten by a rabid animal while camping and nearly dies. Faced with the devastating realities of rabies, he declares "the existing vaccines suck" and is determined to create a more efficient vaccine than the current available option, "maybe even one that could be administered to wild animal populations via an aerosol" (p. 32).

His colleagues are skeptical, asking, "could we turn a profit on it?" (p. 32). This sentiment is repeated frequently, but Finch ultimately convinces the Board of his company that the vaccine would be profitable to sell to governments of developing nations where rabies is still prevalent, calling the price point these countries are willing to pay "quite satisfactory" (p. 79). Later in the book, a CDC official also justifies the drug's efficiency by reminding the reader that the new vaccine would not require bovine serum, an expensive component of existing options, and could be "cheaply mass-produced in countries that have an inexpensive supply of mercury" (p. 232). Secrey is, however, imperative to the development process, since a competitor could steal the formula and produce the vaccine before Finch, making profits while avoiding development costs (p. 237).

The vaccine he and his company ultimately create is called Rabinil. During testing, it is discovered that the aerosol has dangerous consequences for humans exposed to it, producing severe bleeding from the nose and eyes, hemophilia, hypotension, and death. Rather than fully address the concerns, Finch insists on pushing through, saying "if we don't finish by the phase-four deadline, we'll be out of the bonuses and maybe even our jobs" (p. 168). Blackwell ultimately accuses him of negligence, claiming, "you abdicated your legal duties to protect the population, truthfully report clinical trial results, and disclose experimental injuries and deaths associated with this project" (p. 298).

Ignoring the problem, however, does not make it go away. In a triumph of surveillance, the CDC notices an increase in hemophilia diagnoses, as well as heart attacks and strokes, which they trace back to the two regions in which Finch's company has research facilities.

Meanwhile, Finch is contacted by an anonymous caller, claiming to be from the government, who wants to support the development of the aerosolized rabies vaccine.

At this point, Captain Blackwell has moved back to the U.S., and is living outside of Atlanta when an old friend from the Army dies under mysterious circumstances (after being exposed to the toxic vaccine). Blackwell sets out to investigate, teaming up with his secret crush, FBI Agent Wilson. The two follow the trail, from the CDC to the Pentagon, to Finch's company in North Carolina. Their investigation ultimately leads them to one Colonel Drake, who tricked Finch with the promise of military backing in an effort to develop a bioweapon out of the lethal, experimental version of Rabinil and sell it to a tribal leader in Afghanistan.

Metaphors

Vaccines as…

- mysterious
- potentially contaminated/tainted
- distributed/subsidized by the government
- dangerous
- deadly
- indistinguishable from one another
- valuable
- prestige-granting [to creator]

The Blizzard – Vladimir Sorokin (trans. Jamey Gambrell)

In this snowy novel, translated from the Russian, a physician fights a blizzard and embarks on a surrealist romp through the countryside in an effort to reach the site of an epidemic. Dr. Platon Illich Garin is on a quest to deliver vaccine to the citizens of Dolgoye, where an epidemic has taken hold (p. 9). Throughout the book, the epidemic is described somewhat vaguely, with emphasis mainly on its severity and the fear it induces, but is implied to be black plague brought into the region from another country (Garin sometimes calls it the Bolivian plague). When he arrives at a rural station and cannot find any fresh horses to convey him further on his journey, he becomes furious. The stationmaster assists him in finding a local bread deliverer named Kozma, who offers to drive Garin in his sledmobile, "powered" by fifty miniature horses, for a payment of five rubles.

Along their journey the two cross countless snow-covered fields, Garin goes on a psychedelic trip by smoking a glass pyramid, the pair almost freeze to death several times, the sled breaks multiple times, Garin makes love to the wife of Kozma's sworn enemy, and the sled gets caught in the nose of a dead giant (they thought it was a large hill). They never reach Dolgoye. They make it within three versts of the town before Kozma freezes to death and Garin is saved from the cold (but simultaneously kdinapped) by Chinese travelers.

This book might reasonably be read as *Waiting for Godot* transported to the frozen Russian countryside and focused on vaccine delivery, rather than an anticipated arrival. In this post-modern framework, it is difficult to draw connections between the many disparate episodes of the plot, and likely unnecessary for this analysis.

The vaccine is the driving force of the novel, the only reason that the travelers continue on in unbelievable blizzard conditions. Garin is repeatedly furious at the delays he faces, and is especially incensed when he does not think that his companions understand the

importance of his work. When initially trying to find transportation, he insists, "There are sick people waiting for me there. I'm bringing the vaccine" as though this is explanation enough for the stationmaster to produce horses for him out of thin air (p. 9). Later, when more calm, he finds himself sure "that he'd make it in time to save people from that terrible illness" (p. 18). He considers the vaccine to be highly effective, even curative, and considers himself to be the savior of the infected town. He repeats again and again that his purpose is important because he is the bearer of the vaccine, but also assumes everyone understands the concept of vaccination. When Kozma questions "A vax-seen?", Garin neglects to provide any context or explanation, but simply repeats "A vaccine" (p. 9).

Garin's sense of purpose does not preclude him from contradictions. Although he is very upset that there are no horses for him at the station, and constantly encourages Kozma to make the horses go faster, he has no problem putting the time-sensitive vaccine on hold for his own personal interests. He delays the journey for a night at the home of Kozma's enemy, whose wife he is attracted to. He rationalizes to himself by calculating the time to the second dose of vaccine (the one he carries) and concludes "nothing terrible will happen" (p. 51) and "the delay won't matter" (p. 74). So befuddled by the blizzard, he at one point struggles to remember that he is the doctor "on his way to Dolgoye, that he had to bring the vaccine there, that Zilberstein, who'd given the first vaccine dose, was waiting for him, and that he, Garin, was carrying the second does of the vaccine, which was so important…." (p. 168).

He seems very focused on the preventive possibilities of the vaccine, but is flippant about those who are already infected (including those who become infected while in the course of his delays). Garin muses, "The people who've been infected and bitten will never be people again anyway. They're doomed to be shot" (p. 137) reasoning that they do not

care that he is delayed and those who are fighting to stay safe will wait from him no matter how long it takes.

Nonetheless, he expresses remorse at the prospect of not achieving his medical goal. He dreams that those who go unvaccinated turn into zombies (p. 169) and sobs when he is ultimately taken in by the Chinese travelers, realizing that he never made it to Dolgoye or delivered "vaccine-2" (p. 180).

Metaphors

Vaccines as…

- time-sensitive
- essential
- protective
- given to the vulnerable
- valuable

White Bone – Ridley Pearson

In Ridley Pearson's fourth installment of the Rutherford Risk series, readers find the agents investigating swapped vaccine, stolen ivory, elephant poaching, fraud, and corrupt government officials. Operative Grace Chu goes missing in Kenya, on assignment to track down and recover expenses from a donated batch of measles vaccine that appears to have been stolen and replaced by alternate supply that causes adverse reactions. When she sends him a text implying her cover may be blown, John Knox sets off immediately to assess the situation and save her from harm. Grace has in fact been dumped in the bush, abandoned to die (her death staged as a tourist accident), having gotten too close to the truth of the web of corruption, thievery, and poaching. As Knox attempts to follow Grace's trail through Kenya, he meets investigative journalists, gets framed for murder, and escapes death multiple times.

The stolen measles vaccine was intended for charitable purposes from the beginning, as a gift to Kenya from a wealthy donor. The original donation for the measles vaccinations (from a British philanthropist) was "over a million pounds" (p. 42). The cost of both the vaccine itself and the logistical distribution thereof are emphasized in the text, where it is noted that, "[R]efridgerated transportation of the authentic vaccine" is valued at 8,000 USD (p.210).

The vaccine's cost to the donor renders it valuable, but so does the role it plays in Pearson's plot as an exchangeable commodity. The measles vaccine that Knox is tracked with tracing was transported to Kenya, then swapped for a cattle vaccine, and sold in exchange for ivory, which is hidden as a cache of capital to insulate corrupt government officials from prosecution. This is a tangled web of deceit, one which seems impossible to unravel but which Knox manages to take down by exposing each point of deception. While

this mission is a success, corruption is depicted as inevitable, with one character going so far as to describe its ubiquity in terms of pathogens: "The government is a virus…..You can't quarantine them one at a time" (p.217).

The Oloitokitok clinic to which the vaccines is donated is privately funded and delivers free medical care for a large swath of Kenya and northern Tanzania, such that patients come from miles around , up to "hundreds a day" (p. 42, p. 418). Despite being the site of this disaster, the clinic itself is above suspicion. One character praises them by saying, "They serve people, not politics" (p. 341).

Corruption is a looming theme in this novel, and while vaccines are caught up in the corrupt flow of money and influence, Pearson is careful to show that they are not inherently fraudulent and can in fact be distributed ethically, with true charitable intent.

Nonetheless, vaccines are still articulated as untrusted. One character explains, "So many times these injections make our children sick. Some have died. Others, adult and child alike, never improve. For decades, Africa has been used for clinical human trials….We have come to associate free medicine with disease" (p. 296). A history defined by lack of transparency threatens vaccine acceptance in this community, even one that is vulnerable and for whom the potential barriers of cost and access have been eliminated. The vaccine is rendered mysterious by its status as a gift from an outside donor, and its association with similar "gifts" that have been curses in disguise.

Metaphors

Vaccines as…

- valuable
- scarring/conferring visible immunity
- protective
- mysterious
- given to the vulnerable
- indistinguishable from one another

Deceptive – Emily Lloyd-Jones

In this follow-up to *Illusive*, the reader finds Ciere Giba and Alan Fiacre working off their debt in the Gyr Syndicate.

When a member of Guntram's crew gets killed during a job, Alan is blamed for his murder. To clear his name, Ciere takes a leave and follows a lead to find the real killer in Washington, D.C. There, she gets caught up in an investigation into the serial disappearances of vaccinated people – a case that is being investigated by UAI and the FBI, with the help of Ciere's former crew members Daniel and Devon, unwitting partners with those agencies.

The principles of vaccination presented in this book are the same as those introduced in *Illusive*, but this second book in the series presents several more characters who actively challenge the status-quo of immune individuals in the U.S. Aditi Sen is an activist presented in this novel who protests the system established by the government for containing and tracking immunities, even going so far as to refuse to wear her tags and encouraging others to abandon theirs at a rally , declaring "it's high time we reminded the world that we are people – not soldiers" (Ch 23). She describes herself as "currently working to dismantle the laws that have inhibited the Fourth Amendment" (Ch 20). More specifically, she advocates for the repeal of the Allegiant Act, the law by which all vaccinated individuals must have their blood checked for titers, must constantly wear their ID tags, and immune "threats" can be detained by the military (Ch 20).

Several other characters also confront the way their identity is shaped by their immunity. Devon confronts his father, recalling that his first reaction upon realizing that Devon was immune was to quote *Frankenstein* to him, implying Devon's immunity was part of his "weak and faulty nature" (Ch 21). Alan is described as "the most valuable weapon in

the world," a boy who has experienced from childhood his worth defined solely by his ability to remember the vaccine formula (Ch. 9). Agent Gervais, Daniel's associate at the FBI's Adverse Effects Division, reveals himself to be a levitas who has disguised his talent, since it would be a "conflict of interests" (Ch 47).

Ciere and Alan ultimately find a professional hit man sent by a rival gang to be responsible for the death of their Gyr Syndicate colleague, but more importantly, discover that the "disappearances" are actually a systematic, consensual exodus of immune individuals from the U.S. These people are being shepherded across the Canadian border to the relative "safety" of a nation less obsessed with the vaccine than America, in a type of Underground Railroad coordinated by Aditi Sen. Sen describes the origin of this program as derived from her interaction with an 18-year-old girl, who was distraught by her recruitment by the government after being required to submit her titer data to apply for financial aid. Ciere and Alan divert the authorities and help Sen's cohort "escape" as designed.

Metaphors

Vaccines as…

- community building
- conferring an advantage over one's peers
- protective
- special
- mysterious
- a form of exclusivity
- monitored/regulated
- valuable

This Mortal Coil – Emily Suvada

In Suvada's teen novel, the reader meets Catarina Agatta, a teenage girl who has been fending for herself somewhere in forested America for two years since the pandemic of Hydra virus swept the planet. Catarina is also a talented gene hacker and the daughter of famous creator Lachlan Agatta.

Lachlan is in the custody of Cartaxus, an enterprise Catarina describes as "a massive international amalgam of technology and violence" (p. 20). The company is the primary puveyor of genetech, which every person uses, embedded as a panel in their forearm through which they can code personal traits and bodily responses – everything from physical appearance to healing powers. Lachlan is one of the most famous gene hackers in the world, and has been tasked with the creation of a vaccine to be coded into people and protect them from Hydra. In the absence of the vaccine, Cartaxus has opened air-locked underground bunkers to the public, where they can live in relative peace and stability, on the condition that they surrender all homemade gene edits and provide Cartaxus full control of their panels.

The Hydra virus is a terrible disease that first manifests in fever and extensive bruising, before resulting in the explosion of the victim, spewing the virus skyward and threatening everyone in the surrounding area with infection via inhalation. The virus also results the production of scent from infected individuals, which becomes stronger the closer that person is to detonation. In someone smelling this scent, it produces a phenomenon called The Wrath, a bloodlust that encourages violence. In the wild, immunity can be acquired by consuming the flesh of an infected person. The Wrath encourages the killing and consumption required, but an "immunity market" also springs up to supply those

outside the bunkers with flesh (p. 25). Some people never recover from the Wrath, and roam the country as "Lurkers," committed to hunting and eating the infected (p. 27).

The novel begins with a Caratus soldier, Lieutenant Cole Franklin, showing up at Catarina's cabin, pronouncing her father dead, and claiming he is a trial subject for an effective vaccine that her father created but which Cartaxus now needs Catarina to help reproduce.

Realizing the importance of the vaccine, Catarina quickly sets to work, combing her dad's code for clues and prioritizing the vaccine above all else. When Cole tries to get her to slow down and take care of herself, she argues, " We don't have *time* to rest. The v-virus is evolving as we speak…." (p. 71). Eventually Catarina, with the help of Cole and her old coding partner Dax, discovers that she is unique as the only person in the world who can transform her own native DNA, and that the vaccine needs to be coded *through* her in order to be functional.

At the same time, Catarina discovers that she is really Jun Bei, a savage hacker, one of Lachlan's human test subjects, and the love of Cole's life, with her DNA rewritten to become Catarina Agatta.

One primary issue with the development of the vaccine is its logistical release. Cartaxus wants the vaccine for release to its bunker community, as a perk of their loyalty and a means of attracting more members. The Skies, a hacking organization Catarina works with to undermine Cartaxus at every turn, realizes that release to only one part of the global population will ultimately be ineffective against such a powerful and contagious virus. They vaccine needs to be transferred to every single person's panel at once in order to stamp out the spread and avoid further evolution. Catarina initially doesn't see the issue in this, until the leader of the Skies questions her, "How are you going to convince billions of people to

download it? There are no clinical trials, no long-term studies. Your father was the only people who could even explain how the vaccine worked, but now he's gone" (p. 287). It is both an issue of consent and access. Cat remembers the Lurkers, thinking, "I doubt they're even lucid enough to control their download settings" (p. 288).

To solve the problem, Catarina's crew teams up with the Skies to download and broadcast the vaccine to every panel in a massive feat of hacking, not waiting for anyone's consent. In the process, Catarina's body unwittingly adds a previously undiscovered string of code, a daemon code that induces the Wrath in everyone – a power move from a supposedly dead Lachlan, to prove that he has ultimate control over the base instincts of every human on the planet, and can deploy those for good or bad.

Lachlan is ultimately discovered to be alive, controlling the whole game of the vaccine's release for his own purpose, and Catarina is left to solve that problem, as well as the dilemma of her bifurcated identity, in the next installment.

Metaphors

Vaccines as…

- socially expected/approved
- special
- potentially contaminated/tainted
- distributed/subsidized by the government
- controversial
- a form of exclusivity
- deadly
- time-sensitive

Claimed – Sarah Fine

This is the second book in Sarah Fines *Servants of Fate* series, as such, the reader of only this novel has limited insight into the characters' interactions in previous texts, but it is this book of the series that is identified as most heavily related to vaccines. In *Claimed,* the reader meets Galena Margolis, a PhD researcher at Harvard University, whose work focuses on the development of a universal vaccine.

While the details of Galena's laboratory work – her analytical machinery, lab techs, human subject trials, university hierarchy, and funding competition – may seem highly realistic, the world in which Fine places her is infused with the fantastic, based heavily on Greek mythology. Galena's world is interwined with that of the Ferrys, a powerful Boston family of immortals who serve dual roles as captains of industry and ferrymen to the afterlife, capturing recently deceased souls in "the Veil," an in-between shadow world that parallels the physical world, and shepherding them to either Heaven or Hell. Another group of supernatural beings, the Kere, coexist with them and are tasked with marking humans for death. Galena's brother Eli is a Ker (singular of Kere), under the leadership of Moros.

Galena is developing a vaccine that "would enable the human body to produce antibodies that mutated right along with the diseases they were made to fight," with the goal of rendering mutating viruses impotent (p. 5). At the point the reader meets her, she is in the process of a very preliminary human trial of the vaccine, with only a handful of human volunteer subjects, and years from mass production or distribution of the vaccine. The volunteers receive a stipend for their participation in the research (p.41). Galena takes her work very seriously, and is determined to be successful. Following a traumatic sexual assault that continues to haunt her, Galena throws herself into her research as a form of distraction from horrific memories and a path to recovery.

The vaccine itself makes her a subject of interest to the immortal beings of the afterlife, since it would potentially save many humans from death, thereby lessening the workload of the Kere and decreasing the profits of the Ferrys. Although her work is seemingly counterproductive to their purposes, the Kere and Ferrys have agreed to consider Galena valuable and protect her, on the understanding that her work is the work of Fate.

One of her lab techs begins acting erratically. Her test subjects miss their check-in appointments at the lab. Then one of her subjects says her apartment was broken into. Suddenly Galena's world comes crashing down as all of her volunteers are murdered – unsanctioned killings, not officially authorized by the Moros – and her lab is blown up. Galena narrowly escapes, and her protection becomes paramount.

The rest of the novel revolves around a scheme to protect Galena by marrying her into the Ferry family, specifically to the handsome Declan Ferry, in order to make her immortal. This bond requires consummation of the marriage, which is complicated due to the trauma Galena continues to battle.

Vaccine research does not resume after the bombing of Galena's lab (at least in this volume of the series) and in fact Harvard places her on leave pending a full investigation and re-evaluation of their financial commitment to the project. Galena repeatedly thinks of her research as incredibly important, it is implied to be fate-altering for the entire human race, and but the leader of the Ferrys only vaguely calls it "her mysterious, magical vaccine" (177).

It is eventually discovered that the responsibility for the attacks and derailment of the Galena's work falls to Eris, another immortal being, called "the personification of conflict" and Moros' sister (p 307). She fails to kill any of the primary characters, but escapes, presumably to wreck further havoc in the next installment.

Metaphors

Vaccines as…

- protective
- special
- mysterious
- given to the vulnerable
- dangerous
- essential
- curative
- prestige-granting [to creator]

A Matter of Days - Amber Kizer

In Amber Kizer's novel, sixteen-year-old Nadia and her little brother Rabbit attempt a cross-country journey through a United States ravaged by a disease which claimed the lives of 98% of the global population. Starting in Seattle after the death of their mother, the two children begin a macabre road trip across the nation in an effort to reach their uncle and grandfather who are waiting for them in a West Virginia bunker. The two are travelling alone because they lost both of their parents – first their father on a military deployment, then their mother to the pandemic, a new type of hemorrhagic fever known as BlueStar. Nadia and Rabbit are alive thanks to a vaccine secretly administered to them by their Uncle Bean, a military physician working on bioweapons programs.

Along their journey Nadia and Rabbit camp out in abandoned ski resorts and prisons. They meet grandmothers who hold them up at gunpoint and a man taking care of all the surviving pets in a town of one. They have their supplies stolen and destroyed, change cars countless times, and pick up a few friends that join them on their quest.

The vaccine itself is discussed very minimally throughout the novel, but is a crucial plot point as it enables Nadia and Rabbit to embark on their quest in the first place. Surviving the post-pandemic world proves difficult, but their existence in that world is thanks to the initial vaccination.

Uncle Bean visits the children in secret to give them the vaccine, not explaining what it is or giving them any direct information about the pandemic. He simply says "There's a new bug" (p. 20) and leaves information for Nadia to read privately when signs of the disease start to become apparent in the US. He does not involve their mother in the decision to vaccinate the children, and in fact simply leaves an extra dose for her, asking Nadia to convince her to take it (p. 20). Nadia is treated as the responsible adult in the

family – chosen to lead them out of the pandemic and choose what information to share with the rest of her family. Both Nadia and Rabbit become sick after getting the vaccine, and exhibit injection site reactions (heat, soreness), but ultimately recover. It is unclear whether this illness is BlueStar and the vaccine limits its course or if this is just a more severe response to the vaccine administration itself. Nadia does administer the shot to her mother, but not until she is very sick with BlueStar, and unconscious.

Rabbit initially doesn't even release that the shot given to him was a vaccine (p. 13). Even when they do discuss it, Nadia does not call it a vaccine. Rabbit asks, "What was in the shot Uncle Bean gave us?" to which Nadia replies, "I don't know" and thinks to herself "Something that helped us fight off the virus. Something that kept Mom alive even after she developed symptoms and was sick" (p. 64). In a letter to Nadia, Uncle Bean describes it as "an experimental injection" that would ideally stop an infected person from the attack of any virus (p. 65). He also warns them that, while most of the country is dead, they may encounter other survivors. These survivors are not recipients of the vaccine – which was highly classified – but individuals with natural immunity. There are rumors that the government is providing vaccines to citizens in organized quarantine settlements, but there is no confirmation of this from Uncle Bean (the reader's only insight into the government response), who insists that Nadia resist any relocation, hide out in their Seattle home as long as possible, and drive cross-country once the virus has burned itself out. Nadia, Rabbit, and their eventual companion Zack muse that if a "magical vaccine" exists, it would have been given to "the president, or rich people, or celebrities" (p. 152) but have no way to confirm their theories.

Despite the challenges, they make it to their grandfather's bunker in West Virginia, alive to figure out the new paradigm of life on Earth.

Metaphors

Vaccines as…

- protective
- given to the vulnerable
- a form of exclusivity
- monitored/regulated
- special
- conferring an advantage over one's peers
- differentially distributed