CHAPTER 4

WhyZombie? Zombie Pop Culture to Improve Infection Prevention and Control Practices

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Throughout history humans have been fascinated and disgusted by the idea of corpses being reanimated and becoming the walking dead, or zombies. Historically, this dates back to the eighth century, presenting as fables, part of ancient myth and lore, that explore ontological anxieties.[1] They are stories of horror that warn humanity to heed their place in the universe and their role in maintaining balance of the Earth; spiritually, culturally and biologically.[2] These tales often warn against the desire to meddle with the fabric of the universe, or to bear the potentially apocalyptic consequences of such actions. The idea of the walking dead, or zombies, has therefore remained a constant in popular culture.

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E. Kendal and B. Diug (eds.), *Teaching Medicine and Medical Ethics Using Popular Culture*, Palgrave Studies in Science and Popular Culture,
DOI 10.1007/978-3-319-65451-5_4

Popular culture and urban mythology are known methods for educating and training individuals in a number of fields. Whether supernatural or science fiction themed, the use of pop-cultural references can enhance the learning experience for individuals and groups as a whole.[3] Popular culture has, throughout history, initiated innovation that has led to science fiction becoming science fact. It was not so long ago that Aldous Huxley was describing a 'Brave New World,' Isaac Asimov was writing the first law of robotics and Gene Roddenberry and the *Star Trek* team were introducing viewers to what are now called tele-conferencing, mobile phones and tablets. Are we very far off from having 'tricorders' as a diagnostic instrument for medicine with our use of handheld thermal scanners?

Traditional Infection Prevention and Control Education

Infection prevention and control is a key aspect of all undergraduate health professions and the delivery of patient care. It contributes to both patient and healthcare worker safety and is recognised as a global priority by the World Health Organization (WHO) and its member states, including Australia, with the First Global Patient Safety Challenge, Clean Care is Safer Care, launched in 2005.[4] An important part of this initiative is the education and training of healthcare workers in infection prevention and control.

Infection prevention and control education is, however, notoriously 'vanilla,' in the sense that it mainly consists of annual staff training, in-service programmes, posters, reporting of audit results and online learning. Generally speaking, it is considered a chore and little attention is paid by healthcare workers. Allen, Currey and Considine state that 'Assessment must not be undertaken simply for the purpose of assessment. When used, assessment must contribute to the learning experience—i.e. be conducted *for* and *of* learning,' which is often not the case in practice where staff undertake annual competencies, increasingly in an online format, purely to meet an administrative requirement.[5] It is for this reason perhaps that there are approximately 200,000 healthcare associated infections reported each year from Australian health facilities, which makes them the most common complication for patients.[6] Even with these statistics well known, the situation remains that standard and

transmission-based precautions are still not well complied with by healthcare workers.[7]

The literature, and healthcare history abounds with examples of how infection prevention and control is not done, of which the most recent Ebola virus disease (EVD) outbreak in West Africa and the percolating Middle East Respiratory Syndrome (MERs) are examples.[8] Before that, Severe Acute Respiratory Syndrome (SARS), the highly pathogenic avian influenzas, followed similar patterns. All of these infectious diseases have been amplified in the healthcare setting, primarily because of poor everyday infection prevention and control practice, and poor identification of infectious diseases. The challenge for healthcare educators is to make the content accessible, palatable and memorable to facilitate knowledge translating to practice.

Pop-Culture Pedagogy

Pop culture as a pedagogical device uses content with which people are familiar, generally through film and television, in order to teach. It uses what has been described as the 'self-referential effect,' where an individual can relate to an idea or concept because they have lived it either physically or in their mind by processing a story.[9] Once the viewer makes a personal identification with an idea or concept they remember and can contextualise it. This is dependent upon the target audience and the pop-cultural references that they will respond to, as not all people have the same exposure or experience with popular culture. However, it remains that using such devices encourages active learning, corrects misconceptions, instils greater self-confidence and provides a better understanding of concepts.

Research indicates that pop-cultural references, such as storylines in film, television and literature, have a significant impact on audiences.[10] There are a number of narratives in the literature that explore the impact of popular culture on society and how that can then be best used to affect change or even rally awareness. The video game *Resident Evil 2* has been used to make parallels with the state of global health and security and the totalitarian state.[11] The commentary on 'witchcraft science' by Foreman expresses the concern that the medicine and science presented in popular media is distorted and clearly not a true representation of healthcare, though the public remember and cling to these depictions.[12] This has been demonstrated by a study that ascertained that

young adults in particular gain their knowledge about HIV, amongst other sexually transmitted infections, through what they view on television.[13] It is therefore evident that the narratives and stories to which the general public are exposed, including those who are healthcare workers, can also be used as devices to influence and potentially change behaviour.

WhyZombie?

So, why are zombies a good teaching device for improving infection prevention and control practice?

It all started with a Twitter conversation, when the question 'What is your favourite movie with an infectious disease cause?' was asked. One respondent cited *Shaun of the Dead*, which created an avalanche of zombie film suggestions. Another respondent then suggested that these films did not count as examples of 'infectious disease,' but we and others argued differently, citing the many films that did indeed have a pathogenic cause for 'zombification.' Buoyed by the idea that a number of us working in infection control were also pop-culture geeks, we thought some research was in order.

McCullough, in the seminal and very useful work, *Zombies: A Hunter's Guide*, identifies five main types of zombies:[14]

- Necromantic (raised from the grave by sorcery);
- Voodoo (black magic);
- Nazi zombies (necromancy ordered by Hitler);
- Revenants (return from the grave with revenge on their mind);
- Atomic (radiation exposure).

Even with these types identified, McCullough also identifies pathogenic sources as important in zombie activity, which is supported by Brooks, Munz et al. and Montandon.[15]

Wikipedia listed 383 feature-length 'A-list' zombie films, released between 1932 and 2014.[16] These films indicated a number of causes of 'zombification,' including microbial agents that have not been contained and spread readily from person to person. We further searched English language feature-length films, released from 2000 to 2014. Each film was checked against the publicly available databases IMDb, Rotten Tomatoes and Wikipedia to identify the cause of the zombie infestation featured in each film.

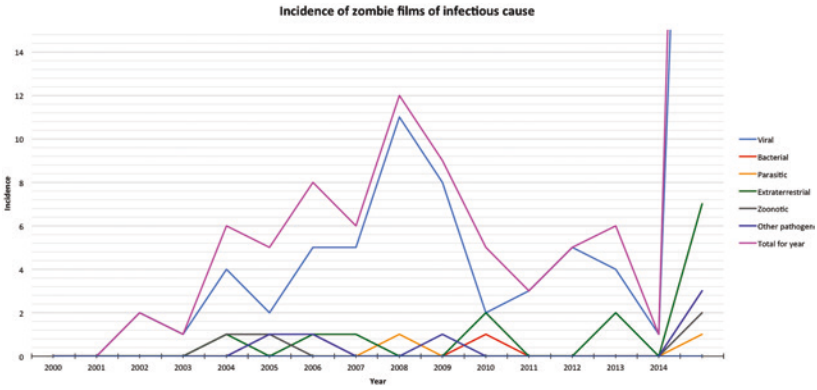

Fig. 4.1 Incidence of zombie films of infectious cause

On review of the films included on the Wikipedia list, 238 zombie films were released from 2000 to 2014.[17] Of these, 69 films had an infectious cause of some kind (viral, bacterial, parasite, extra-terrestrial, zoonotic or other biological cause). For 48 films the cause was unclear. In the remainder (n = 121), 'zombification' had no traceable infectious cause. When looking at release dates we realised there was a possible link between 'zombification' cause and global health events.

To test our hypothesis, we mapped the year of release of pathogenic zombie films against the World Health Organization's list of infectious disease outbreaks as seen in Fig. 4.1.[18] This demonstrated a correlation between the two, with an increase in the release of infectious biohorror films in the years following outbreaks such as SARS and pandemic influenza. So it appeared that global health threats have an impact on pop-culture media. This is also reported in the literature, where horror films are identified as a barometer of society's fears, anxieties and cultural consciousness.[19]

To provide more insight into this, British zombie film maker, Anthony D. Lane, currently producing and directing *Invasion of the Not Quite Dead* (due for release in 2017) stated, 'It [global outbreaks] definitely has an impact on our films. Our latest film is about an infectious disease that escapes from a lab and causes an outbreak in the town.'[20]

The zombie phenomenon has also been used by the United States Centers for Disease Control and Prevention (CDC) as a promotional

device for public health preparedness and response.[21] The United States Strategic Command has used zombies to train junior officers citing: 'Using this fictitious scenario avoided concerns over the use of classified information, it resolved sensitivity to using real-world nations or scenarios, and it better engaged the students.'[22] The literature also demonstrates its use in mathematical modelling for disease outbreaks and for use in raising public health awareness, prevention and containment strategies.[23]

In the Cross-Hairs: Targeting Your Audience

So, how might educators best make use of these relationships to teach healthcare workers about safe infection prevention and control practice?

First, it is important to pick your audience and match the images to their sensibilities. While the Traffic Accident Commission of Victoria has proven since the late 1980s that there is a role in confronting an audience, zombies are not for everyone and we need to be mindful that we do not turn people away from the message through the images we choose to use.[24] When choosing clips or images, teachers may find that groups of extroverts (such as nurses from the Emergency Department) are more likely to engage with zombie references than others. However, this is a generalisation and the individual teacher will need to ascertain the level of acceptance within their intended audience. Providing a warning about graphic content before starting your session is advisable.

If the teacher identifies that the group may be put off by a zombie-themed learning experience, the opportunity to use pop-culture pedagogy should not be abandoned. Amul Mattu presented an overview of how a successful career in emergency medicine can be achieved by exploring the principles espoused in the film *The Princess Bride* at the popular Social Media And Critical Care (SMACC) conference, which regularly employs innovative pedagogy in critical care education.[25] This type of presentation can be used as a gateway to presenting more confrontational material and as a gauge to audience acceptance of this mode of learning.

Cricket Bats or Crossbows: The Delivery

Once the audience is identified the teacher may select images/clips that illustrate the salient points. Zombie films, *World War Z* being an exception, tend not to be box office smashes so they are also unlikely to be well known outside those with an interest in the genre. Because of this, teachers cannot count on subtext within the film to be known and therefore need to choose images/clips that are unambiguous and clearly linked to the message conveyed in the class. Another issue to consider is that many of these films will be low budget and possibly low in quality, which may reflect on the presentation. Films such as *Shaun of the Dead* and *28 Days Later* offer high-quality production values and a range of scenes, and can therefore be used to advocate for more rigorous infection prevention and control practice.[26] Examples that we have used previously include a scene from *Shaun of the Dead* to highlight the use of personal protective equipment (PPE) in trauma settings and a scene from the Australian movie *Undead* that champions the role of the infection prevention and control professional.[27]

Capturing the images/clips is not particularly difficult, but educators should be aware of copyright laws relevant to their jurisdiction. Many of the more popular scenes/films are available on YouTube, which has a facility to embed the selected clip within a PowerPoint presentation. This also includes an option to embed a trimmed clip so that you are only including the parts of the movie you want to show. If you are feeling a little more adventurous it is possible, and a lot of fun, to make your own clip. This is particularly engaging if you get staff involved and adds to the reinforcement of the message. Making a short clip can be done cheaply through the use of a smartphone or digital camera and editing software such as Windows Movie Maker. Again, YouTube is a great resource here, with many videos being available to help you through the technical aspects of doing this.

Team Z in Action

What is the experience of actually using zombie pop culture as a pedagogical tool?

There are many examples of zombie scenarios being used to improve practice in healthcare. The following two show how the authors used a fictional situation to bring forth a discussion regarding contemporary

nursing practice. Stanley provides nurses with an overview of how to prepare for an impending zombie apocalypse.[28] The focus of this is on developing the ability of nurses to recognise and respond to Solanum infection, in particular the required initial (recognition and isolation) and secondary nursing interventions (dealing with reanimation, palliative care and psychological support). The author's suggestion that a zombie epidemic is theoretically possible may seem far fetched, yet the fact remains that nurses in particular are responsible for implementing many initial and secondary interventions in any outbreak of disease.[29] These would include isolation/quarantine and infection prevention, observations, medication administration and other interventions, all of which put the nurse/healthcare worker at some risk.

Reinforcing this message is an article by Lowe and Hummel that uses the CDC resources to educate nurses on the role they play in disaster preparedness.[30] This article not only includes references to workplace health and safety, but also to personal preparedness at home. Personal preparedness is often overlooked, with health services expecting full attendance by staff when in fact this can be severely limited as staff may be injured/dead, unable to access the health service or are required to provide care for their family.[31]

Brooks highlights the need to be prepared in the event of a zombie outbreak and suggests that avoiding places of high zombie populations (hospitals for instance) is safer.[32] Interestingly, Brooks also points out that hospitals are potentially the worst place to head to in the event of a zombie apocalypse, as up to 90% of first-wave zombies tend to be healthcare workers exposed because of poor disease identification and infection prevention practices, such as not recognising potentially infected individuals at triage.[33] For those planning for disasters in healthcare this is an important point to note, and while in more common disasters hospitals do tend to be safer they are not without risk. Cassir et al. and Tomas et al. show the role of contaminated PPE in potentially spreading disease owing to poor doffing procedures.[34] This is an area highly suited to using zombie scenarios in training. The outbreaks of SARS, MERs and Ebola showed that health services can be a centre of amplification of outbreaks. Knowing this can temper the enthusiasm of staff to attend work during outbreaks, particularly if training and planning have not specifically addressed these concerns.

Our own experience as educators and infection prevention and control specialists has been to recently challenge our own colleagues to

reinvigorate their education programmes and think outside the box. At the 2014 Australasian College for Infection Prevention Control (ACIPC) Conference, we presented our theory of using pop culture as a method to teach the basics of infection prevention and control. The scenes described above demonstrated the applicability of the genre to both standard and transmission-based precautions. What else can better demonstrate the need for personal protective equipment than the use of a cricket bat to incapacitate a zombie and the resulting blood splatter that ensues? Our colleagues agreed, and considered it to be a novel way to get their point across—particularly in the Emergency Department.

We currently employ pop culture in our own teaching, not only zombies, but also superheroes (*Spiderman* is arguably the result of zoonotic transmission), television shows (if you want to learn about Creutzfeldt Jakob disease watch the *X-Files*), popular games (*Resident Evil 2*) or contemporary literature (real vampires do not sparkle, but are a good example of poor standard precautions). As trained Global Outbreak Alert and Response Network (GOARN) members, we employ it to train others, with a video currently in production to support training of healthcare workers in the rapid identification and implementation of appropriate infection prevention and control precautions for a previously unknown infectious disease. The protagonist may have recently provided first aid to a person who collapsed in the street, who had profuse bleeding from their mouth and was coughing. This person scratched our hero. The collapsed person … may have been living near a lab … that may have exploded … which caused an odd dust cloud … which everyone in a one kilometre radius may have inhaled. You can make up the rest.

Conclusion

The ease with which pop-culture references can be incorporated into educational and/or awareness campaigns is evident, as is the success factor for participants remembering what they have actually learned. When it comes to our specialty, zombies are a natural conduit for educating about emerging infectious diseases and the importance of infection prevention and control practices. Recurring themes in films that can be adapted to provide case studies include unknown transmission routes; appropriate use of PPE; quarantine and isolation and identifying and managing personal exposure. This method is not just limited to traditional methods of educational delivery: smartphones, applications,

games, online learning packages and team-building exercises all offer the opportunity for immersive learning.

The sky really is the limit, but just be careful: that sky could contain highly pathogenic extra-terrestrial zombie-causing disease.

Notes

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