



# Zombies And Weapons: Examining Blog Responses To The Center For Disease Control & Prevention's (CDC) 'Preparedness 101: Zombie Pandemic' Entertainment-Education Initiative

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In an innovative attempt to engage adolescents and young adults in emergency preparedness, the Centers for Disease Control & Prevention (CDC) introduced its Preparedness 101: Zombie Pandemic entertainment-education initiative in 2011. This development received widespread attention and such popularity that the CDC's website crashed as a result of the number of users attempting to access it. However, despite this atypical publicity, concerns have been raised about using this approach. Some of the concerns focus on the efficacy of the zombie scenario to promote emergency preparedness. Others have raised the issue of this theme promoting an unhealthy focus on weapons. To date the majority of this research noting the link between using such a theme and supporting a weapons culture has examined primary school children. This research uses content and reflexive thematic analysis to explore this potential unanticipated side-effect among a public audience. Five years of data from the CDC online blog was examined. Results indicate that over 10% of blog posts mentioned weapons. A number of themes of concern were identified from the blog posts relating to firearms, weapons, and killing. Although the CDC's innovation is to be commended for its popular appeal, the use of a zombie theme links the campaign to wider media narratives that foreground weapons. As such it is recommended that such a theme should not be used in future public health interventions.



## ENTERTAINMENT-EDUCATION

Entertainment-education (EE) is the 'process of purposely designing and implementing a media message to both entertain and educate in order to increase audience members' knowledge about an educational issue, create favorable attitudes, shift social norms, and change the overt behavior' [1]. EE has frequently been used to explore health issues in

industrializing countries [1-5], often via a television or radio soap opera or [4,6-8]. EE has the advantage of being relatively low cost [3,9], engaging [10], and theoretically robust [11-13].

## ZOMBIES IN POPULAR CULTURE

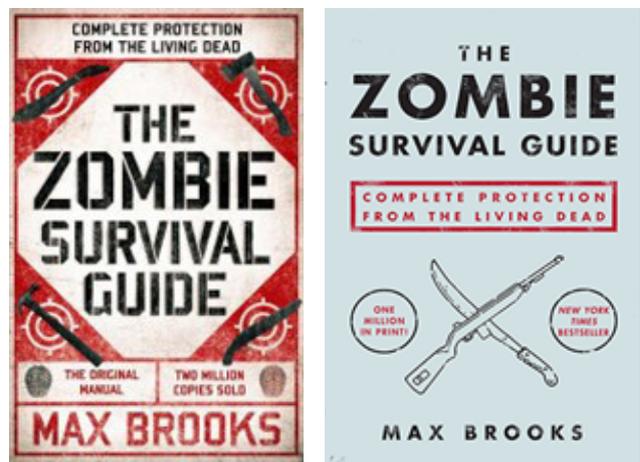
Haitian zombie folklore was introduced into Western consciousness via Victor Halperin's 1932 black



**FIGURE 1.** Images of Armed Leading Characters from The Walking Dead Series

& white movie *White Zombie*, starring Bela Lugosi. This film was followed approximately a decade later (1943) by *I Walked with a Zombie*. However, attention on this topic was not substantively rekindled until George A. Romero’s *Night of the Living Dead* was released in 1968. This franchise was developed through a series of six subsequent movies over the following four decades: *Dawn of the Dead* (1978), *Day of the Dead* (1985), *Night of the Living Dead* (1990), *Land of the Dead* (2005), *Diary of the Dead* (2007), and *Survival of the Dead* (2009). The cause of the zombification in movies has varied over time from sorcery-induced reanimation to pandemic infection. It must be acknowledged that these films largely remained niche ‘video nasties’ outside of the mainstream [14-16]. However, the zombie genre was propelled into the mainstream through the hit series adaptation by AMC of the graphic novel *The Walking Dead* (author). Starting in 2010 this series was so popular that by its conclusion it had run for 11 seasons, comprising a total of 177 episodes. The classic gory horror approach which epitomised the video nasty era of zombie film making in turn

inspired sub-genres including zombie comedies and even romantic zombie comedies (respectively referred to as Zom-Coms and Rom-Zom-Coms). However, as can be seen from Figures One and Two the mainstream zombie genre focused heavily on weapons and firearms in any zombie outbreak or apocalypse.



**FIGURE 2.** Two versions of cover art from a best selling book about surviving a zombie outbreak

Evidence of the popularity of the zombie genre can be seen in its incorporation into a wide variety of modes of entertainment (see Table One),.

**TABLE 1. Zombies in popular culture**

Films	World War Z; 28 Days Later; 28 Weeks Later; Shaun of the Dead; Zombieland; Zombieland 2: Double Tap; Train to Busan; Peninsula; Pride, Prejudice & Zombies; Army of the Dead; Cargo; The Night Eats the World; Dead Snow; The Girl with all the Gifts; Resident Evil (I-VI); The Evil Dead
Series	The Walking Dead; iZombie; Z Nation; Kingdom; Santa Clarina Diet; Black Summer; In the Flesh; Daybreak; All of Us are Dead; Fear the Walking Dead; TWD: World Beyond; Game of Thrones.
Books	Pride, Prejudice & Zombies; The Zombie Survival Guide; World War Z
Video Games	Plants versus Zombies; Call of Duty Black Ops Zombies; Resident Evil
Live Action	Humans vs Zombies
Exercise Program Apps	Zombies, run!

## PREPAREDNESS 101: ZOMBIE PANDEMIC

Given the widespread popularity of the zombie theme in contemporary popular culture, in 2011 the Centers for Disease Control and Prevention (CDC) decided to co-opt this theme to promote emergency preparedness among young adults. Emergency preparedness is essential given the increasingly interconnected nature of modern life in many Western countries, with lives increasingly dependent on global supply chains that are vulnerable and prey to both natural and man-made disasters. Promoting emergency preparedness is a notori-

ously hard sell [17-20]. This endeavour is even more problematic with certain groups including students and young adults. This demographic often has fewer resources to enable preparedness, may be less linked in to local support networks, and may have less experience of major disruption to routine services and supplies. As such, with the benefit of hindsight, the CDC initiative to prepare a set of online resources [21] utilizing a zombie theme to promote preparedness may seem an uncontroversial application of entertainment education. However, Goodman [22] outlines the history behind what was in fact a bold departure:

*'The story begins in April at the Office of Public Health and Preparedness Response within CDC. David Daigle, associate director of communications, had gathered his team to talk about hurricane season...As Daigle's staff brainstormed ways to make the hurricane preparedness post a must-read, one team member recalled some tweets that attracted attention at CDC after the Japan earthquake. Several tweeters had asked if the increased release of radiation could spawn a new wave of zombies. Serious or otherwise, the tweets were a reminder that zombies are a hot topic, and in short order an idea was hatched linking emergency preparedness to the walking dead.*

*Daigle brought the idea to his boss, Dr. Ali Khan. Keep in mind that besides being Daigle's supervisor, Dr. Khan is also a former Rear Admiral and the Assistant Surgeon General. Now, put yourself in Daigle's shoes and pitch this idea: a blog post about preparing for a zombie invasion with advice that is also useful in preparing for hurricanes. That's right: zombies. On CDC's website. Fortunately for Daigle, Dr. Khan has a healthy sense of humor as well as a taste for movies like Resident Evil. Even better, Dr. Khan is inclined to take chances on ideas that he believes are fundamentally sound and has the authority to approve blog posts without consulting higher-ups.'* [22]

This new approach, titled *Preparedness 101: Zombie Pandemic* [23], was preceded by a comic novella which had already proven popular at New York's ComicCon [24]. Figure Three features an extract from the novella showing someone looking up preparedness information on the CDC website. The ini-

tiative quickly drew widespread attention. The first blog, titled 'If you're ready for a zombie apocalypse, then you're ready for any emergency,' received far more attention than CDC resources routinely achieved [25], resulting in the CDC's website crashing under the unexpected volume of 'hits' [26].



**FIGURE 3.** Image from the CDC's zombie comic novella [24]

Interestingly, although the Goodman Center [22] reported that the site had received two million hits in one week, recent contact with the CDC noted that the site had received 1,427,371 page views over the 5 year period after May 16th 2011. Either way, the popular interest generated in the CDC was unprecedented. Health promotion and emergency preparedness experts hoped that this early excitement might indicate the usefulness of the zombie theme in engaging younger populations in emergency preparedness.



**FIGURE 4.** Images from the CDC's zombie themed post

The Goodman Center estimated the publicity to be worth \$3.4 million, while the marginal cost to the CDC was \$87 for a stock zombie photo [22]. Two examples of how this stock photo was used to capture and generate interest in emergency preparedness may be seen in Figure 3.

## USE OF THE ZOMBIE THEME IN OTHER ACADEMIC DISCIPLINES

Many fields of academia have advantageously adopted a zombie theme to promote popular engagement. These innovations include the fields of international relations [27-30], economics [31-32], geography [33], physics [34], microbiology [35], health promotion [36], and epidemiology [37-40]. The zombie theme has also been used extensively in the field of the mathematical modeling of disease diffusion [41-46].

## THE IMPACT OF THE CDC INITIATIVE

Exploring how the CDC's Zombie theme might assist pharmacy, Baker [47] argues that it would achieve public and professional engagement with the topic, as well as even potentially supporting fundraising to support emergency preparedness initiatives.

Goodman [22] also reports that the CDC conducted a survey of people that had read the blog which reported that 'Over 90% said that they now know how to make an emergency kit or devise an emergency plan'. However, the balance of current research indicates that the zombie theme does not result in improved emergency preparedness.

Kruvand & Bryant [48] conducted an evaluation of the Center for Disease Control's zombie blog post among students and found that participants were as, or less likely, to either retain preparedness information or signal a desire to construct an emergency kit or plan compared to a control group. The authors suggest that a strategy involving zombies may have led to the 'trivialization' of the emergency preparedness message. The use of the zombie approach was also examined in another study of

students in comparison to more routine preparedness education strategies by Fraustino & Ma [49]. These authors noted that the use of such a popular cultural theme in this light-hearted fashion actually resulted in less determination to engage in preparedness. Research conducted by Houghton et al. [50] examined emergency preparedness among primary school children using the zombie outbreak scenario. Alarming, the authors concluded that although none of materials used involved firearms or weapons of any kind, the children focused in-depth on their inclusion in suggested emergency preparedness kits. Follow up randomised control trials conducted by Houghton et al. on children participating in a CDC style Zombie pandemic preparedness event clearly indicated a relationship between using a Zombie themed approach and a focus on firearms [51,52]. Although some of this work has been critiqued [53], the mortality and morbidity resulting from both firearms [54-63] and knives [64-67] is a major public health issue. Therefore, the researchers found the participants' intense focus firearms and weaponry problematic enough to warrant more investigation.

This research sought to explore public reactions to the CDC's zombie themed post through an examination of the comments posted on the site. The focus was to explore emerging themes, with a particular focus on whether the use of the zombie-oriented approach promoted discussions on weapons and firearms.



**FIGURE 5.** An early screenshot from the CDC site [68]

## EXPLORING SOCIAL MEDIA

Analysis of social media is an area of research that has developed significantly in recent years [69-72]. Such analysis has included the use of social media in health settings [73-74]. One niche element of this expanding focus has been explorations of online comments [75-77]. It should be noted that it has been suggested that the impersonal nature of the internet reduces inhibition and accountability, which leads to uncharacteristic behavior [78]. It is well known that exposure to online media content can influence both attitudes and behaviours [79,80]. There is further evidence suggests that online comments can equally impact attitudes and behavior [81].

## METHODS

The sole data source used in this examination was the Comments section on publicly available Centers for Disease Control & Prevention (CDC) blog site associated with their Preparedness 101: Zombie Apocalypse site [23]. As noted by McKee [81], the delineation between public and private in social media analysis can be blurred. However, as the CDC site and its contents are publicly available and the comments examined were explicitly put into the public domain, Eastern Washington University's Institutional Review Board (IRB) determined that ethical approval for this study was not required.

During the five-year period from May 16th 2011 until May 15th 2016, 1206 individual blog postings were made on the Preparedness 101: Zombie Apocalypse site. Seven posts made by the Site Administrator were excluded, thus leaving a sample of 1199 separate public posts. The self-selected nature of this sample must be acknowledged. Reading through the posts it is evident that the vast majority of these appear to originate in the US. However, it is worthwhile noting that blog participants self-identified as responding from a wider geographical base including Argentina, Brazil, Australia, and Switzerland. All 1199 posts were read by two researchers and subjected to both quantitative content analysis and a more exploratory reflexive thematic analysis [83-88].

The reflective thematic analysis [88] performed was influenced by phenomenological approaches wherein meaning is explored from the participant's perspective [89]. All 1199 blog postings were analysed using a novel hybrid method incorporating both deductive and inductive approaches [90]. This method acknowledges both the a priori experience and knowledge of the researcher but still draws the essence of its analysis from the blog postings. Thus, the thematic approach adopted is significantly influenced by the Heideggerian hermeneutic phenomenological tradition [91]. This orientation acknowledges the legitimacy of participant accounts and aims to interpret and prioritise the respondent's perspective, whilst acknowledging interviewer preconceptions [92].

## RESULTS

Out of the 1199 blog posts examined a total of 106 (8.8%) explicitly mentioned weaponry, firearms or ammunition of some description. In addition, a further 32 (2.7%) other blog postings also mention killing but did not directly reference a particular weapon. Defense was also addressed by those posting comments. In addition to the posts already quantified, an additional nine (0.1%) mentioned armour, while another 11 (0.1%) mentioned defense and protection.

Thematic analysis identified nine dominant themes in the blog posts. These themes are defined as 'weapons missing,' 'martial advice,' 'cool,' 'anticipation,' 'admiration,' 'thanks,' 'conspiracy theories,' 'tax dollars,' and 'idiots.' In light of the focus of this paper and the word count constraints only the first two of these themes will be examined in depth. However, a brief overview of the other themes is given in Table Two.

A significant theme to emerge in the research was the issue of the absence of weapons or firearms in the CDC's list of basic emergency kit supplies. This theme is termed Weapons Missing. This theme was usually raised as a question or as a criticism of the CDC's emergency preparedness list. Examples of these included many relatively short comments such as:

**nodnarB** says: *How could you forget a firearm from an emergency kit?*

**JC** says: *Forgot the guns*

**Dan** says: *Gosh, such a politically-correct emergency kit for a zombie apocalypse- no mention of bringing along any weapons?*

**TABLE 2. Themes Identified Through Reflexive Thematic Analysis of Comments on the CDC's Zombie Outbreak Website**

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**Cool:** This theme captures the positive comments of many who felt that the zombie themed pandemic initiative was a cool or great idea.

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**Anticipation:** This theme related to a clear sense of looking forward to and anticipation of a zombie apocalypse or outbreak.

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**Admiration:** This theme related to admiration of the CDC for producing a zombie themed emergency preparedness initiative.

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**Thanks:** This theme covers the thanks expressed by many for the CDC developing a zombie themed pandemic initiative.

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**Conspiracy theories:** This theme covers the discussions by respondents concerning various schemes and machinations that they attribute to government or other agencies.

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**Tax dollars:** This theme encapsulates attacks on the CDC for wasting/ spending money on a zombie themed pandemic theme.

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**Idiots:** This theme related to comments that the CDC were fools for having developed the zombie apocalypse initiative.

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However, a number of participants expounded on this deficit, clearly linking it to defence against looters. This was identified as a sub-theme as can be seen in the following three posts:

**CANNON** says: *'Is the CDC stupid!?! Telling people to worry about having their papers ready to present to the government, but leaving the most important thing out of post-disaster survival? Which would be having a means to defend yourself from looters, government soldiers (post martial law, as in hurricane katrina) trying to force you to concentrated locations to be under their control, and of course zombies. If there is any such disaster similar to the one described above, my first thing in the list of my survival kit is my AK . The survival kit above looks*

like something some girl-scout or gay feminist would have, not a true survivalist. Guns are good in all disasters not only for defense from looters and other enemies, but good for hunting and putting food on the table.

**Jason Charles Reichenbach, Esq.** says: 'I wish the CDC would politely & publically recognize the reasonable necessity of citizens being sufficiently armed so that they may better protect their precious & limited emergency supplies from those who would dispossess them of same & likewise increase the victim's chances of survival during serious disasters such as the zombie apocalypse the CDC posits here. For without weapons the unarmed victims are easy prey for the armed predators who will be equally, if not more so due to lack of adequate forethought & preparation, as desperate to survive as the typical American family of four.'

**Mike** says: I never understand why in all of these disaster preps no one in the government ever recommends including a basic firearm. Katrina with the loot gangs and rogue police officers is a prime example.

Related to the first theme, the second theme identified was termed Martial Advice. A large number of respondents were giving advice concerning weapon choice, with a small number seeking such advice. In fact, the very first post on the CDC blog states:

**Donovan Young** says: 'I might suggest adding a baseball bat, preferably aluminum, to your emergency kit as well. It doesn't require ammunition and can be highly effective at clearing a path through hordes of zombies whilst trying to make good your escape.'

A substantial volume of the martial advice given related to what some participants referred to as melee, i.e. non-projectile, weapons:

**Fishticon** says: Bats are good because they don't run out of ammunition but machetes are much cheaper and can remove heads.

**Ralf in homestead** says: personally id invest in a couple well made machetes and a hunting cross-

bow with plenty of bolts.

**Nate** says: I think a katana should be added to the list'

A significant element of this theme related to firearms as can be seen from the following posts:

**Beatbox** says: @mckenna You would be better off with a shotgun rather than a rifle when fighting zombies.

**Fred** says: maybe I will just buy an AK47 and rig it with a powersaw just in case.

**Mr. Clean** says: 'Zombie defense can only be accomplished through application of accurately directed objects via kinetic energy as a function of the ejection of lead from a metal tube caused by a gaseous explosion. 'live perpetrators often require 2 to the chest, one to the head, guaranteed to make them dead' Zombies however require 'one to the head just to ensure they're really dead'

The final element of this theme related to advice when killing zombies:

**Drew** says: Only thing I've got to say is, double tap, baby

**Rene** says: double tap...

**Matool (just kidding, it's Karen)** says: And don't forget – Cardio, cardio, cardio (w/the occasional double-tap!)... PS- Never forget to double-tap!!

An additional and unexpected source of information relating to the central research question in this project emerged via the online 'identities' used by those posting comments on the CDC webpage under examination. As can be seen from the following list, a martial focus in some of the names adopted by those posting comments is clearly evident: 'ZOMBIEKILLER', 'Zombie Slayer', 'CHA-VA-ZOMBIE-KILLA,' 'Zombeekillah', 'Zombieproof Tactical', 'Salzombiehunter', 'Sonya Sniper', 'Double TAP—', and 'KillMeAgain'.

## DISCUSSION

A notable finding from this research is the relatively high level of blog responses that explicitly mention

weapons, killing, or armour. To have such issues addressed by over 150 responses is significant in two ways. Firstly, it was evident that many blog posts were responses to other blog posts, which clearly demonstrates that people using the site were not merely responding to the CDC but actively reading and engaging with the comments made by others. Thus, with more than 10% of responses mentioning weapons, killing, or armour, it is likely that many more readers will have read messages blatantly promoting firearms. The second issue is an almost unbreakable link in contemporary popular culture appears to exist between use of a zombie theme and a focus on weaponry. Therefore, even to mention the word zombie may provoke an immediate response in many to imagine appropriate weapons and firearms. Given the focus on danger and violence in many of the media detailed in Table One, and exemplified in Figures One, Two and Six, this linkage is perhaps no surprise.



**FIGURE 6.** Popular zombie movies featuring a significant focus on weapons in promotional materials

The use of a zombie pandemic theme in emergency preparedness may therefore inadvertently continue to foster the current gun culture in the US and elsewhere [93,94]. This finding reinforces earlier examinations of the impact of such a theme in school children [50-52].

The CDC should be commended for their zombie themed entertainment education innovation. The adoption of a zombie theme was certainly an imaginative and innovative approach in trying to promote emergency preparedness in young adults. It was also a courageous endeavour for a state Public

Health agency to adopt. However, it is also a salutary lesson for public health and health promotion personnel on the importance of wider cultural associations, the environment, and impacts. As noted above, it appeared as though the majority of those posting comments were from the US, a country with very high rates of gun ownership [93-95]. The CDC material did not at any point portray or mention weapons or firearms. Nonetheless, the wider zombie genre that their work inevitably linked to triggered a focus on weapons and as such should be avoided in future public health initiatives.

### Conflict of Interest

The authors of this article declare that there is no conflict of interest.

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