# **Written Report**

## Hypothesis:

The hypothesis is:

Humans will only survive a zombie apocalypse if the probability of individuals winning an aggressive encounter with a zombie (i.e., avoid infection) is greater than 40%

|  |  |
| --- | --- |
| Condition Number: | 1 |
| Value of convert\_probability | 20% |
| Number of simulations run with this value | 10 |
| Mean value of humans alive (uninfected) | 5.2 |

|  |  |
| --- | --- |
| Condition Number: | 2 |
| Value of convert\_probability | 40% |
| Number of simulations run with this value | 10 |
| Mean value of humans alive (uninfected) | 8.5 |

|  |  |
| --- | --- |
| Condition Number: | 3 |
| Value of convert\_probability | 60% |
| Number of simulations run with this value | 10 |
| Mean value of humans alive (uninfected) | 12.7 |

|  |  |
| --- | --- |
| Condition Number: | 4 |
| Value of convert\_probability | 80% |
| Number of simulations run with this value | 10 |
| Mean value of humans alive (uninfected) | 14.3 |

Analysis:

In my testing, I have gathered sufficient data by testing my model 10 times at a tick time of 70,000 for all 4 condition, this has allowed me to see how the probability affects the outcome of both humans and zombies. Above you will notice that at 20% there are very few humans still alive as the zombies turn the humans into zombies. This is very similar with 40% but this time less humans are being infected. The change however is noticeable at 60% and 80%, where we are able to see, that humans are starting to win the fights as very few humans are getting infected. The tipping point I have found was at approximately 80-90k ticks and at this time there was a big change as either the zombies would infect the humans very fast, or the humans would end up killing all the zombies really fast depending on the convert probability.

Therefore, I believe my hypothesis was correct in saying that most humans will survive a zombie fight if the probability is greater than 40%, this is proven from the data collected.