Live to Win!

Analyzing Common Causes of Death within the World of Warcraft Hardcore Challenge

Aaron Evans, Andrew Daulton, Zhentao Wang

# Abstract:

The Hardcore Challenge has emerged as a prominent phenomenon within the World of Warcraft (WoW) community, wherein players voluntarily subject themselves to a unique and demanding gameplay mode. Whereas players within this online role-playing environment typically quest within the lands of Azeroth without substantial long-lasting consequences, the Hardcore Challenge reverses this paradigm by forcing players to restart their journey from scratch upon character death.

This concept of 'one-life' or 'death=delete' has illuminated the game's more formidable aspects, bringing attention to encounters the community finds particularly challenging. This report delves into the intricate landscape of the Hardcore Challenge, exploring the many causes of death players encounter as they navigate Azeroth's perilous realms.

The core of this report comprises a detailed analysis of various WoW leveling zones. Each region undergoes meticulous examination, illuminating distinctive trials such as treacherous caverns, densely populated regions teeming with hostile entities, and encounters with formidable adversaries. The outcome is an informed evaluation of the prevalent reasons for player mortality, providing valuable guidance for those embarking on the Hardcore Challenge.

# Introduction:

## World of Warcraft

## World of Warcraft (WoW), a massively multiplayer online role-playing game (MMORPG) developed by Blizzard Entertainment, has left an indelible mark on the gaming landscape since its debut in 2004. Its immersive virtual universe, set in the fictional realm of Azeroth, captivates players with a myriad of races, classes, and quests, creating a dynamic and ever-evolving experience. WoW's enduring appeal is anchored in its rich narrative, engaging gameplay mechanics, and vibrant community, which has only grown more vibrant over its extended lifespan, spanning two decades and multiple generations of players.

## The Hardcore Challenge

Amidst this expansive world and diverse gameplay, a distinctive movement has gained momentum within the WoW community – the Hardcore Challenge. In contrast to the conventional norms of exploring Azeroth without enduring consequences, the Hardcore Challenge redefines this gameplay paradigm. Players willingly embrace a unique and demanding mode where the stakes are high, and the margin for error is minimal. Unlike the standard gaming experience, where characters can recover from defeat, the Hardcore Challenge imposes a harsh ultimatum: character death results in permanent deletion, compelling players to start anew.

## Death in Gaming

Contrastingly, in many mainstream games, character death is often utilized as a learning tool. Players are encouraged to experiment, take risks, and occasionally fail, as death is merely a temporary setback. This design philosophy aligns with a more forgiving approach, allowing players to explore gameplay mechanics, test strategies, and overcome challenges through iterative trial and error.

While this design philosophy has permeated much of the gaming industry, it has the potential to diminish the importance of death, transforming a significant experience into a near non-event. Klastrup, L. (2006) describes this phenomenon as making ‘death part of the grind’, where players associate death with normalcy, “as natural almost as breathing”.

However, there are examples of games that successfully challenge this paradigm, and in doing so, create compelling experiences for their players. Observing the standalone version of DayZ – an online survival game where players are forced to contend against both zombies and other players – Carter, M., Gibbs, M., & Wadley, G. (2013) exerts that harsher penalties in an online game can increase player investment, invoke moral dilemmas, and create social interactions that would otherwise not be possible.

This level of engagement leads players to develop a sincere attachment to their in-game personas and the communities they engage with. Examining two prominent and challenging gaming experiences currently prevailing: the Ironman Mode in RuneScape [RuneScape, 2023] and the WoW Hardcore Challenge [Classic Hardcore, 2023], both communities exhibit robust social media presence, tightly knit groups with accessible entry points, and regular content that pays tribute to characters that have been lost. With extensive hours dedicated to in-game progression and the establishment of deep social bonds, these players reach a point of commitment where character death no longer remains a mere aspect of gameplay, but instead evolves into an intensely palpable experience that they are determined to avoid at any cost.

Research Goals

Motivated by the profound emotional connection players have towards their in-game hardcore characters, the study aims to delve into the instances of character fatalities within the context of the WoW Hardcore Challenge.

The principal objective is to gain insight into the timing, locations, and circumstances surrounding character deaths throughout the challenge. This analysis will employ summary statistics to uncover overarching patterns in player fatalities, examining race, class, and mob associations. Furthermore, through a zone-specific clustering approach, the study aims to pinpoint specific causes of death within distinct regions and unearth any recurring patterns that frequently contribute to character mortality.

# Methodology:

The primary tool used in this analysis of character death records is a DBSCAN (Density-Based Spatial Clustering of Applications with Noise) clustering algorithm to categorize common causes of death by their spatial density. This section will introduce the datasets used in this analysis and explain why this technique was chosen.

## Data Source

This report utilizes compiled data on character deaths, which has been collected through the WoW Hardcore Challenge addon. When players are actively logged into a WoW server, this addon records each instance of character death on the server and maintains a comprehensive death log within the local storage of the computer utilizing the addon.

Among the creators of the WoW Hardcore Challenge addon, a contributor known as CurseForge User Yazpad, has aggregated an assortment of death records sourced from members of the Hardcore WoW community. This compilation of ~50,000 death records is made publicly accessible under the GNU General Public License through the Death Log addon project, which is hosted on the CurseForge platform [Yazpad, 2023]. Our research team initiated contact with this developer, seeking permission and guidance regarding the utilization of this dataset, which forms the basis for the subsequent analysis.

Illustrated in Figure 1 below is a representative entry from a death log, wherein each record retains essential details regarding the character, adversary (mob), and zone in which the character's demise occurred:

##### Figure 1. Death Log Record

A screenshot of a computer code

Description automatically generated

In conjunction with the dataset detailing character fatalities, this study also employs the classic NPC database available on WoWhead.com. This resource aids in extracting general details regarding the origins of each recorded death. Refer to Figure 2 below for an illustrative depiction of the primary elements encompassing a typical entry the dataset:

##### Figure 2. Mob Record (Key Fields)

A table with numbers and text

Description automatically generated

Lastly, this study employs the classic maps available on WoWhead.com to create any map visualizations seen in this report. These are scaled maps that align with the coordinate system being used in the death record dataset. Refer to Figure 3 below for an example of a map (Elwynn Forest) used this study:

##### Figure 3. World of Warcraft Classic Maps

A map of a town

Description automatically generated

## Data Description

Utilizing the datasets on character deaths from the death log dataset and the mob details from the classic npc dataset sheds light on the details surrounding who, where, and how players die within the Hardcore Challenge.

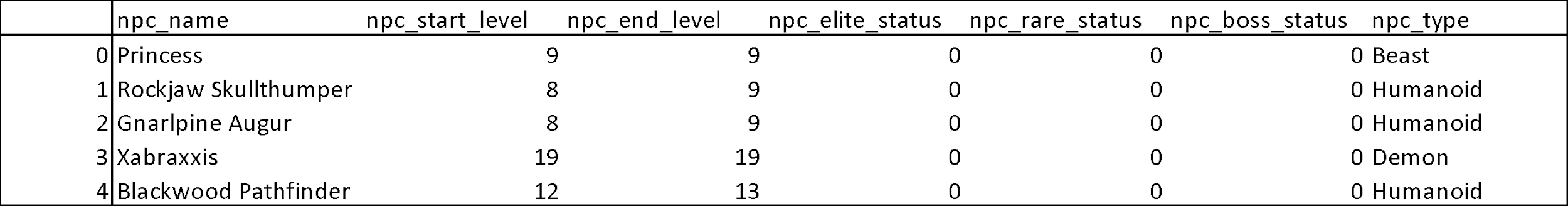
Illustrated in Figure 4 below are the key fields used from the death log dataset. Each record reveals general information about the character (level, race, class), location of death (map, coordinates), and source of death (npc):

##### Figure 4. Death Log Dataframe (Key Fields)



Illustrated in Figure 5 below are the key fields used from the classic npc dataset. Each record reveals general information about mob’s identity (name), its power level (start level, end level), its rarity (elite, rare, boss) and its type:

##### Figure 5. Mob Dataframe (Key Fields)



## Discussion on Normalization

Considering that the culmination of the Hardcore Challenge hinges upon the inevitable demise of a character, coupled with the pervasive susceptibility to mortality throughout the entire progression, an abundance of character deaths surface during the initial phases of the game, while a discernibly diminished dataset characterizes the latter stages of the leveling journey. This scenario is indicative of a natural bias favoring the accumulation of data from the early levels of play. In response to this challenge, our analytical approach centers on character fatalities within well-defined leveling zones. As each leveling zone is tailored to accommodate a specific range of levels (typically spanning 5-10 levels), the strategic partitioning of our data geographically (with an independent focus on each distinct zone) is used to counterbalance the influence stemming from the prevalence of deaths during the initial gameplay stages.

## Clustering Technique

This analysis uses clustering as the primary mechanism for identifying and grouping common causes of death. Clustering is an unsupervised learning technique where data points are grouped based on their characteristics.

In this scenario, the goal is to cluster death records together based on the similarity of each death – with the added caveat that we are trying to identify the most common causes of death. However, in this scenario “common” can mean a few things. Using Elwynn Forest as an example, Figure 6 illustrates that the most common mob to cause character death within the zone is the Kobold Miner. However, that insight isn’t too interesting, since it doesn’t control for how many Kobold Miners exist (there are a lot) and it doesn’t account for areas of the map where there are many aligned mobs with different names (which also happens a lot).

##### Figure 6. Example of Mob Statistics in Zone (Elwynn Forest)

A screenshot of a computer screen

Description automatically generated

Plotting the location of each death record on a map partially resolves this issue. Now we can see exactly where each character death occurs (Figure 7). However, this approach reveals another problem – character death occurs virtually everywhere. Without a method of categorizing death records it becomes difficult to visualize exactly what is happening in each zone.

##### Figure 7. Example of Regional Death Records Plotted in Zone (Elwynn Forest)

A map of a stormwind

Description automatically generated

This is where our clustering algorithm comes in. This analysis uses a DBSCAN (Density-Based Spatial Clustering of Applications with Noise) clustering algorithm to categorize data based on the spatial density of observations within a region.

This means the algorithm will create clusters based on:

* Proximity: The algorithm looks at how close records are to each other. If records are close enough, they are aggregated into the same group, or cluster.
* Density: It also considers how many records are close to each other. If many records are close together, it's more likely that they represent a significant group, or cluster.

Categorizing clusters based on their spatial density has a few advantages in the context of this research:

1. It highlights specific areas of each zone with the highest concentration of death records.
2. It controls for deaths that occur in the same local area from different mobs.
3. It reduces noise that occurs from sparse death records dispersed throughout the zone.
4. It allows the number of clusters by zone to change dynamically without manual intervention.

The result is a clearer illustration of where and how characters are dying within each zone (Figure 8). While the size and density of clusters present within the visual can be altered by adjusting the model parameters, the culmination is a clear depiction of the most concentrated clusters of death records.

##### Figure 8. Example of Regional Death Clusters Plotted in Zone (Elwynn Forest)

A map of a video game

Description automatically generated

This clustering technique allows this analysis to categorize the most common causes of death within each zone. The consequence is that each region can now be analyzed qualitatively (by researching each location of interest and the surrounding threats) to identify the primary threats within each cluster.

Here is an excerpt from the appendix showing our interpretation of Figure 8:

* As the human starting zone, Elwynn Forest introduces players to distinct perils common in the Hardcore Challenge. One peril arises as early as level 5: cave networks. These low visibility, high mob density areas frequently hinder retreat due to random creature spawns. New players are especially at risk in the Fargodeep Mine & Jasperlode Mine (inhabited by kobold miners). Another hazard involves named NPCs, often the culmination of major quest chains, posing their own challenge. Instances like Hogger's Gnoll Camp and Princess's Porcine Entourage demonstrate the danger of tackling these challenges prematurely. Additionally, the high spawn rate of the northeast murloc camp proves problematic for players in the initial stages of their campaigns.

# Analysis & Discussion:

## Overview of Findings

This research first identifies preliminary trends in player death records at a high level, assesses common causes of death at a regional level, and aggregates these findings to provide a comprehensive overview of the distribution and factors influencing player mortality across the game world.

## Preliminary Findings

The following section is meant to provide context about the general attributes and performance of players throughout the Hardcore Challenge.

#### Most Players are Choosing the Alliance

Figure 9 illustrates the distribution of death records in this analysis by character race. This distribution should show a representative sample of what races players are choosing to play during the challenge.

Most of the deaths recorded are for Alliance players and the most common character race is Human. While some of the Horde races offer competitive benefits, the Alliance racial abilities in Classic WoW are often viewed as stronger and the Alliance community is generally larger across most servers.

##### Figure 9. Total Deaths Recorded by Race

A group of colored squares

Description automatically generated

#### The most Popular Classes are Warrior, Hunter, Rogue, & Mage

Figure 10 illustrates the distribution of death records in this analysis by character class. This distribution should show a representative sample of what classes players are choosing to play during the challenge. This breakdown indicates that Warriors, Hunters, Rogues, and Mages are the most popular classes.

##### Figure 10. Total Deaths Recorded by Class

A row of squares with different colors

Description automatically generated

#### Most Players die before Level 20

Figure 11 and 12 illustrate the percentage of players alive by level, with Figure 11 depicting a probability density function of player mortality through level 60, and Figure 12 depicting the percentage of players alive at key milestones.

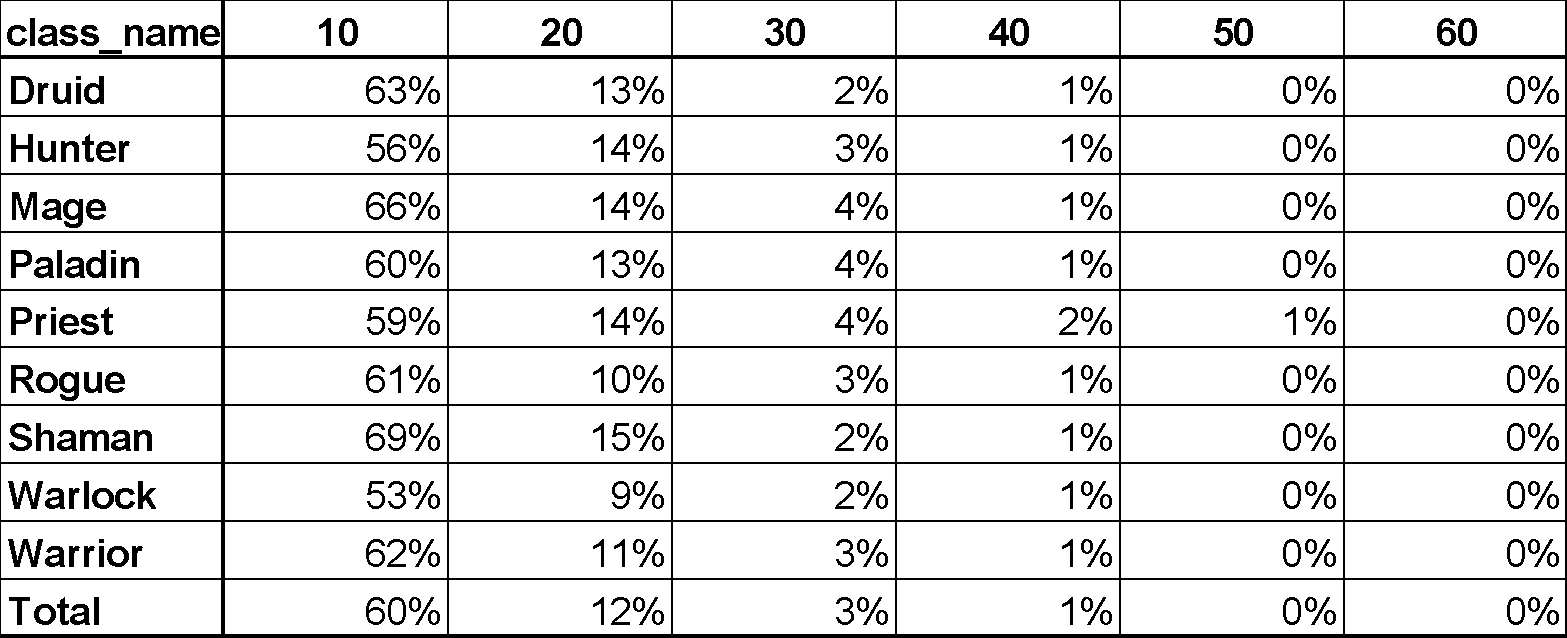
The data suggests that nearly 40% of all characters die before reaching level 10 and nearly 90% of players die before reaching level 20. A very minute fraction of players live to complete the Hardcore Challenge.

##### Figure 11. Estimated Percentage of Players Alive by Level (Chart)

A graph showing the value of a number of people

Description automatically generated with medium confidence

##### Figure 12. Estimated Percentage of Players Alive by Level (Table)



## Regional Analysis

The regional analysis outlined in the Methodology of this report has been synthesized into Figure 13, which depicts the total number and categorization of clusters by cause of death in each zone.

Out of the 39 zones analyzed, 190 unique clusters were identified using our clustering algorithm. These clusters were then researched using data from our analysis, mob data from WoWhead.com and by entering the game-world itself to investigate each cluster. This qualitative approach allowed our team to categorize clusters into common causes of death based on the following perils we defined:

* Caves: Combat arenas with reduced visibility and escape opportunities
* High Spawn Density: Combat arenas with patrolling enemies and high mob density
* Tough Enemies: Encounters with enemy mobs primarily 2-5 levels above the player
* Ambushes: Encounters with enemy mobs primarily 5+ levels above the player
* Bosses: Encounters with named mobs, often at the culmination of quest chains
* Griefing: Encounters where other players intentionally cause character death
* Other: Clusters that were not categorized within this analysis

##### Figure 13. Categorization of Clusters by Cause of Death by Zone

A white sheet with many lines

Description automatically generated with medium confidence

## Aggregate Analysis

Aggregating the data from the regional analysis into Figure 14 illustrates the most common perils we cataloged by cluster. Nearly 2/3 of all clusters were able to be categorized into 6 main causes of death based on the location and death records within each cluster:

##### Figure 14. Summary of Common Causes of Death

A white rectangular box with black text

Description automatically generated with medium confidence

Additional Analyses

#### Clustering A*lgorithm Analyzing Death Record Data at an Aggre*gate Level

We tried using class\_id, player level, map\_id, race\_id, source\_id, npc\_start\_level, npc\_end\_level, npc\_avg\_level, npc\_less\_player\_level, death x coordinate, and death y coordinate. We ran the algorithm using 3, 5, and 7 clusters but really only did analysis on the 7 clusters to see if there were any interesting insights that could be gathered. A pivot table analysis of the results did not provide any insights that were clearly obvious. There was no one factor that seemed to influence the clusters the most since the different factors seemed to be in multiple clusters and no one cluster had only a concentration of one factor. A good number of the clusters had the same factors as the highest number in that cluster. This would make sense since there are more Hunters and Warriors than the other classes that are playing the game. It also shows that most people are dying in early levels in the starting zones. Further work would take a closer look into the inputs of the classifier to see if we could get a better understanding of how to classify the deaths that are happening. One path forward would be to do more analysis on the results of the clustering algorithm to get a better understanding of what the clusters are saying. One way to do further analysis would be to map out the clusters on the world maps to see if there is an influence on where a death is happening on a map to what cluster it is in. Another option would be to remove the X and Y coordinates from the clustering algorithm to remove that influence so that it could focus on other aspects of the death data.

#### Classification A*lgorithm for the Prediction of Enemy Types to Avoid*

We also created a classifier using class, level, race, and map to predict what type of enemy a player should look out for. Types of enemies included Beast, Humanoid, Demon, and Elemental. This could be used when a player is entering a new zone and is wondering what are the likely enemies that he should be on the lookout for. This way they will be able to watch out for that class of enemy and not be too reckless when exploring. Below is a table of a few examples that we entered into the classifier and the results that were provided. Further work could be done to improve the classifier based on more data, experiment with what parameters are used, use different hyperparameters, and even try different classification algorithms. With more work, we may be able to provide a classifier that does more than just predict the type of enemy to look out for.

| Class | Level | Race | Location | Result |
| --- | --- | --- | --- | --- |
| Warrior | 10 | Gnome | Alterac Mountains | Humanoid |
| Hunter | 5 | Human | Hillsbrad Foothills | Humanoid |
| Druid | 20 | Troll | Feralas | Beast |
| Mage | 8 | Night Elf | Azshara | Demon |
| Warrior | 1 | Tauren | Mulgore | Beast |

# Conclusion:

## Key Findings

Our research findings distill the multitude of deaths examined within this challenge into essential themes that players should bear in mind as they embark on the Hardcore Challenge themselves.

#### Know your Exit

In the context of the Hardcore Challenge, death transpires when a player confronts an insurmountable obstacle and lacks the means to withdraw, resulting in character demise. This primarily unfolds in combat arenas characterized by limited visibility and escape routes, such as caves, or when engaging adversaries who are stronger or more numerous. This advice pertains to 52% of the identified clusters in this analysis (Cave, Boss, Tough Enemies, High Spawn). Charting an escape strategy before engaging in combat facilitates survival should the encounter become unfavorable.

#### Understand your Capabilities

Although comprehending a character's potential is challenging without pushing its limits, consistently testing these boundaries poses a perilous approach, likely resulting in repeated deaths within the Hardcore Challenge. Given that the average leveling time in Classic WoW can extend approximately 180 hours or more, each minor risk undertaken jeopardizes the entire journey by inviting character death. Researching each encounter beforehand and grasping the risks associated could assist players in surmounting obstacles in 25% of the identified clusters in this analysis (Boss, Tough Enemies). The Hardcore Challenge is for knowing your limits, not testing them!

#### Be Aware of your Surroundings

The Hardcore Challenge punishes players that do not have adequate game knowledge or preparedness. Approximately 14% of the identified clusters in this analysis are due to players being unaware of their surroundings (Ambushes, Griefing). Being well-versed in the locations of elite mob spawns and anticipating potential griefing scenarios from other players will yield significant benefits while navigating the game world.

## Limitations

While this report offers valuable insights into the challenges and trends of player deaths within the Hardcore Challenge in World of Warcraft, it's essential to recognize several limitations that influence the breadth and depth of our findings. These limitations stem from the nature of the available death logs, the potential omission of critical factors contributing to player deaths, and the constrained quantity of data records for analysis.

#### Early-Game Emphasis

* A primary limitation of this study is the concentration of player deaths within the early stages of the Hardcore Challenge journey, particularly within the first 20 levels. This emphasis on early-game deaths may result in a skewed representation of challenges and trends, potentially overlooking nuances and difficulties encountered by players at higher levels of progression.

#### Exclusion of Max-level Players

* An inherent limitation stems from the absence of data on players who have successfully reached the maximum level without experiencing death. Since their death records are absent, the analysis cannot provide insights into the strategies and gameplay patterns that enable players to attain high levels of achievement without succumbing to character death.
* Thankfully this is a temporary problem – the curators of the Hardcore Challenge are in the process of publishing a ranking system that keeps track of players that have achieved max level. However, at the time of this analysis, this data is currently unavailable.

#### Incomplete Capture of Factors Contributing to Player Death

* The death logs utilized in this study, while informative, have inherent limitations in capturing the entirety of factors that contribute to a player's death. Dynamic interactions and certain environmental influences are not fully reflected in the structured death log data, potentially leading to an incomplete understanding of the complexities surrounding player deaths.

#### Limited Quantity of Data Records

* A notable limitation pertains to the relatively modest dataset size, comprising approximately 50,000 recorded deaths. This restricted quantity of data records may not encompass the entire spectrum of player deaths within the Hardcore Challenge, potentially omitting rare or exceptional circumstances that could offer unique insights into player experiences.
* Thankfully this is a temporary problem – the tools the hardcore addon team has built to track player death logs are relatively new, with the Death Log addon itself being created in March 2023. Data scarcity should cease to be an issue in follow-up analyses.

## Ethical Considerations

This report identifies two primary ethical issues that were considered during the inception of this report: informed consent and maintaining the integrity of the Hardcore Challenge.

#### Informed Consent

* While players voluntarily download the Hardcore Challenge addon and its intent is clearly communicated to publicly track player progress, it may not be clear whether players are fully aware of the extent to which their data will be used and shared. While some players may be comfortable with their data being part of published research, others may not anticipate its public dissemination beyond use by local players and the curators of the Hardcore Challenge.
* Nevertheless, given the online nature of MMORPGs and the dissemination of publicly available information in virtual worlds, this research assumes that players are adequately informed about basic non-identifying information about the game world being made publicly available. Since the only identifying information being shared is the identity of the virtual character in use, this information alone should not be enough to identify the actual human player being tracked.

#### Maintaining Challenge Integrity

* Any analyses that can identify successful strategies for overcoming the Hardcore Challenge could inadvertently trivialize the challenge and reduce gameplay to a set of successful strategies that can more-or-less guarantee success. Since the Hardcore Challenge initially developed from a community of players seeking to avoid conventional gameplay strategies by engaging with WoW in a less understood area of the game, the introduction of overly successful gameplay strategies could harm the integrity of the challenge and make it less enjoyable for those involved.
* Since this study observes common causes of deaths at a high level and provides strategic advice for the challenge versus tactical guides about individual quests or courses of action within specific zones, the conclusions of this research should not be specific enough to harm the integrity of the challenge.

## Statement of Work

Our team of three had numerous shared responsibilities throughout the project. However, the workload distribution was generally as follows:

* Aaron Evans: Data Analyst, Report editor
  + Aaron created a clustering algorithm in parallel with the regional analysis, and edited the written report.
* Andrew Daulton: Project Manager, Report Editor, Data Analyst
  + Andrew secured and cleaned the data used in the analysis, created and tuned the regional clustering analysis, and edited the written report.
* Zhentao Wang: Data Visualization Specialist, Report Publisher
  + Zhentao assisted in the creation of many of our visualizations and developed interactive tools to publish our report online.

# References:

* Carter, M., Gibbs, M., & Wadley, G. (2013). Death and dying in DayZ. In IE '13: Proceedings of The 9th Australasian Conference on Interactive Entertainment: Matters of Life and Death (pp. 1–6). <https://doi.org/10.1145/2513002.2513013>
* Classic Hardcore. Home. Retrieved June 23, 2023, from <https://classichardcore.com/>
  + Description: Classic Hardcore is a community-driven website dedicated to the Hardcore Challenge in World of Warcraft, providing resources, guides, and discussions for players participating in the challenge.
* Joana. Joana's 1-60 Vanilla WoW 4 day, 20 hour [WR] Speedrun - Video Trailer [Video]. YouTube. Retrieved June 23, 2023, from <https://www.youtube.com/watch?v=mJaQJw1Wf2s>
* Kelly, M. How long does it take to reach max level in WoW: TBC Classic? Dot Esports. Retrieved June 23, 2023, from <https://dotesports.com/wow/news/how-long-does-it-take-to-reach-max-level-in-wow-tbc-classic>
* Klastrup, L. (2006). Death matters: Understanding gameworld experiences. In ACE '06: Proceedings of the 2006 ACM SIGCHI international conference on Advances in computer entertainment technology (pp. 29–es). <https://doi.org/10.1145/1178823.1178859>
* Klastrup, L. (2008). What makes World of Warcraft a world? A note on death and dying. In Digital Culture, Play, and Identity: A World of Warcraft® READER (pp. 143-166). The MIT Press.
* Lutins, E. (2017, September 5). DBSCAN: What is it? When to Use it? How to use it. Medium. <https://elutins.medium.com/dbscan-what-is-it-when-to-use-it-how-to-use-it-8bd506293818>
* RuneScape. (2023). Ironman Mode. Retrieved August 1, 2023, from <https://www.runescape.com/game-guide/ironman>
* Sharma, A. (2020, September 8). How to Master the Popular DBSCAN Clustering Algorithm for Machine Learning. Retrieved from <https://www.analyticsvidhya.com/blog/2020/09/how-dbscan-clustering-works/>
* Warcraft Tavern. Rested Experience in WoW Classic. Warcraft Tavern. Retrieved June 23, 2023, from <https://www.warcrafttavern.com/wow-classic/guides/rested-experience/>
* WillE. I Have Leveled Every Class To 60 Without Boosts! [Video]. YouTube. Retrieved June 23, 2023, from <https://www.youtube.com/watch?v=y5cc_vJPXBM>
* WoWhead. WoWhead Classic NPCs. Retrieved June 23, 2023, from <https://www.wowhead.com/classic/npcs>
* WoWhead. WoWhead Maps. Retrieved June 23, 2023, from <https://www.wowhead.com/maps>
* Wowpedia. Experience to Level. Wowpedia. Retrieved June 23, 2023, from <https://wowpedia.fandom.com/wiki/Experience_to_level>
* Yazpad. (2023). Deathlog [Add-on]. CurseForge. <https://www.curseforge.com/wow/addons/deathlog>
  + Description: Curseforge user ‘yazpad’ is a developer of the Hardcore Challenge addon and the Death Log addon. Yazpad assisted our team in understanding how the deathlog data was gathered by his addon and provided access to the deathlogs he compiled through a GNU General Public Use license.

# Appendix:

## Regional Analysis

### Starting Zones (1-10)

#### Elwynn Forest

* As the human starting zone, Elwynn Forest introduces players to distinct perils common in the Hardcore Challenge. One peril arises as early as level 5: cave networks. These low visibility, high mob density areas frequently hinder retreat due to random creature spawns. New players are especially at risk in the Fargodeep Mine & Jasperlode Mine (inhabited by kobold miners). Another hazard involves named NPCs, often the culmination of major quest chains, posing their own challenge. Instances like Hogger's Gnoll Camp and Princess's Porcine Entourage demonstrate the danger of tackling these challenges prematurely. Additionally, the high spawn rate of the northeast murloc camp proves problematic for players in the initial stages of their campaigns.

#### Dun Morogh

* Like the Human starting zone, Dun Morogh, the Dwarf and Gnome starting area, is replete with caves and high-spawn-rate enemies. Notably challenging are the early wendigo cave, frostmane hideouts, and trogg mines. Interestingly, certain wild animals (boars, wolves) also pose problems near Kharanos.

#### Teldrassil

* While the central barrow dens mark an iconic hazard for new Night Elf players, Teldrassil features few natural caves. Nonetheless, it stands as one of the riskier starting zones due to the prevalence of early bosses and 'outdoor caves.' These settings often lead players into overwhelming combat situations with no easy retreat. Prime illustrations of this include Lord Melenas and Ursal – who each represent difficult encounters with little escape opportunities.

#### Durotar

* Durotar serves as the starting area for Orc and Troll players. While a few caves dot the landscape, the Kul Tiras Barracks on the eastern coast poses a great challenge. Notably, the leading cause of death in Durotar is encountering formidable enemies with unexpected spells. Examples include the Burning Blade Apprentice summoning a voidwalker minion and the Voodoo Troll's healing prowess.

#### Mulgore

* Mulgore stands as the Tauren starting zone. The early appearance of a rare spawn, Snagglespear, presents an unexpected challenge for many players. Additionally, the Venture Company mining operation and Dwarven digsite are cave sites that complicate retreat.

#### Tirisfal Glades

* Tirisfal Glades serves as the Forsaken starting zone. While deaths in the area vary, the primary reason is venturing into high-spawn-rate zones with limited retreat options. Examples include the northern crypts with Rotting Ancestors and the coastal murloc villages in the northwest. Engaging rare spawns within the starting region also contributes to common fatalities.

### Secondary Zones (10-25)

#### Westfall

* Westfall, the second zone most Alliance players venture into, also boasts one of the highest hardcore death rates. The prevalent dangers are the Defias Trappers and Pillagers who control the farms and caves. Although cave entries contribute to fatalities, the Defias Trapper stands out as a major threat. These NPCs pioneer a mechanic that restricts retreat: the net, limiting players' escape from combat.

#### Loch Modan

* Loch Modan, the secondary leveling zone for Dwarves and Gnomes, highlights two prominent themes: dense enemy populations and cave-related fatalities. Up north, deaths occur when players explore kobold-infested mines. In the south, fatalities result from engaging an overwhelming number of foes in the trogg valley.

#### Darkshore

* Darkshore, the secondary leveling zone for Night Elves, exhibits deaths dispersed throughout but emphasizes two primary patterns: Firstly, players prematurely engaging high-level foes, as seen with the satyr Xebraxxis and Dark Strand Fanatics in the northeast. Secondly, venturing into high-spawn zones, like the greymist murloc coasts, leads to ambushes by murlocs with unpredictable patrol patterns.

#### The Barrens

* The Barrens, a sprawling Horde questing hub, features numerous cities and subzones to explore. Amid deaths distributed across the zone, clustering highlights that the most substantial challenge for hardcore players arises from wandering packs (e.g., kolkar areas) or caves (e.g., Kul Tiras stronghold).

#### Silverpine Forest

* Silverpine Forest, a secondary questing area for the Forsaken, sees the prevalent cause of death as ambushes by the Son of Arugal (Worgen) rare spawns patrolling its northern border. Given these mobs' substantial level advantage, encountering a worgen during one's journey leaves players with limited counterplay options.

### Early Leveling Zones (15-35)

#### Redridge Mountains

* The Redridge Mountains serve as an early leveling zone for Alliance. Unlike other early zones with diverse threats, deaths in Redridge are dispersed but converge on a pivotal concern: ambushes by higher-level enemies. Predominantly, deaths stem from underestimated Black Dragon Whelps, which are stronger than anticipated at low levels, followed by Blackrock Outrunners, spawning near the town of Lakeshire where players may hold a false sense of security.

#### Stonetalon Mountains

* Stonetalon Mountains, an early contested leveling zone, maintains a primary cause of death through encounters with the rare spawn Basseleth, trailed by Kobold miners. Alongside the hazards of facing high-level rares and exploring caves, Stonetalon encompasses several high-density mob leveling zones, notably the Grimtotem tribes in the southeast.

#### Ashenvale

* Ashenvale, an expansive contested leveling zone, lacks distinct thematic patterns likely due to its size and diverse questing areas. Deaths frequently cluster around water (naga, murlocs, elementals), and encountering demons, especially for lower-level characters, shows some evidence of heightened risk. Nonetheless, overall deaths are widely dispersed across the zone without clear correlations.

#### Duskwood

* Duskwood, an early Alliance questing area, introduces distinctive challenges for mid-level characters in their twenties. While deaths in caves and standard encounters are less common, the zone features select perilous engagements. Two of these, fighting the high-level undead rares Mor'Ladim or Eliza, pose notable risks. The third threat, Stitches—an immensely high-level undead—is triggered by a quest chain. As any player can initiate this questline leading to Stitches' assault on an unsuspecting questing hub, there is limited counterplay if low-level players are unaware of the danger.

#### Hillsbrad Foothills

* Hillsbrad Foothills serves as an early questing area for both Alliance and Horde players (with a heavier Horde presence in hardcore mode). Surprisingly, the prevalent cause of death in Hillsbrad is Alliance players entering the region to access Alterac Valley. A patrol of Tarren Mill Deathguard catches these Alliance players off-guard when they approach Tarren Mill.

#### The Wetlands

* The Wetlands holds a unique significance in the Hardcore Challenge. Amidst deaths occurring organically, this region stands out for low-level players attempting to journey between starting zones before meeting prerequisite level requirements. As a result, clusters of deaths involve encounters with Crocolisks and other creatures ten or more levels higher. After accounting for this, the primary cause of death in the Wetlands becomes venturing into cave systems within the mountains.

#### Thousand Needles

* Thousand Needles, an early level questing area, exhibits varied deaths throughout. However, the prevailing cause of demise is attributed to encounters with the Screeching Roguefeather and Highperch Consort, typically occurring within cave locations.

### Middle Leveling Zones (30-50)

#### Alterac Mountains

* The Alterac Mountains, a modest questing hub connecting surrounding zones, features a handful of prevalent causes for deaths. Notably, a cluster emerges in the southwest, where Horde players encounter Dalaran (Alliance) mages prematurely. Following this, a recurring theme involves battling bosses significantly underleveled, such as Narillansanz.

#### Arathi Highlands

* The Arathi Highlands, a contested mid-level zone, witnesses frequent deaths due to the proximity of Horde and Alliance towns to main roads, catching unaware player in the sphere of influence of patrolling guards. Subsequently, the following most common cause of death involves entering cave-like areas like Witherbark Village or Stromgarde.

#### Desolace

* While Desolace lacks ample death records in the current analysis due to its lower popularity as a leveling zone in Classic, a notable portion of documented deaths is concentrated in the southeast valley, teeming with undead. The northern Burning Blade stronghold also ranks high in recorded fatalities. Both locales are densely populated, affording limited means to disengage from combat.

#### Stranglethorn Vale

* Stranglethorn Vale, a mid-level questing zone, presents an array of hazards. However, the prevailing cause of death often arises from faction conflicts. Grom'gol Grunts target unsuspecting Alliance players, while Booty Bay Bruisers are responsible for fatalities in a well-known flight master griefing encounter.

#### Dustwallow Marsh

* Dustwallow shares similarities with the Wetlands in that most deaths in the zone result from encounters with higher-level enemies during traversal. A significant number of these fatalities occur along the coastline or while swimming between land masses. Players often fail to perceive the elevated threat level posed by underwater or concealed enemies within Dustwallow's dense swamp terrain.

#### Badlands

* The Badlands, a contested mid-level zone, exhibits dispersed deaths without discernible patterns evident from the available player statistics.

#### Swamp of Sorrows

* The Swamp of Sorrows, a mid-level questing zone, sees the highest frequency of player deaths occurring in two primary locations: the Lost Ones encampment and along the coastal area near murloc villages.

#### Feralas

* Feralas features a distinctive and significant threat: the Hatecrest Sorceress, a mob spawning on the Isle of Dread. This enemy possesses highly potent abilities, including Blizzard and Frostbolt, which effectively hinder movement and retreat, catching players off guard during encounters.

#### The Hinterlands

* The Hinterlands, a contested mid-level questing zone, has a limited number of recorded deaths primarily attributed to boss encounters with the Vilebranch troll tribe.

#### Tanaris

* Tanaris, a mid-level questing zone, harbors three notably perilous areas. The first resides within Gadgetzan, the main local quest hub. As a shared city, players often inadvertently engage in PvP combat near the flight master, leading to swift elimination by the local guards. Another cluster of deaths emerges at the waste wanderer camp in the northeast, featuring mobs with demon-summoning abilities, often surprising unaware players. Lastly, the Bloodsail Buccaneer outpost to the east, enclosed by walls, introduces numerous cave-like dangers.

#### Searing Gorge

* The Searing Gorge, a mid-level questing zone, lacks a clear overarching death theme. However, recurring causes of death stem from encounters with rare spawns and ambushes by significantly higher-level mobs catching players off guard.

### Late Leveling Zones (45-58)

#### Azshara

* Azshara, a higher-level leveling zone, lacks inadequate player records for identifying discernible patterns in causes of death.

#### Blasted Lands

* The Blasted Lands, a higher-level questing zone, lacks inadequate player records for identifying discernible patterns in causes of death.

#### Un’Goro Crater

* Un'Goro Crater, a late-game leveling zone, possesses limited available death records. Nonetheless, two prevalent death patterns are noticeable. Firstly, the Gorishi Silithids pose a threat to individuals within their caves, and secondly, roaming elementals, integral to a unique elemental invasion event, contribute to the common fatalities.

#### Felwood

* Felwood, a higher-level questing zone, witnesses frequent deaths concentrated in two distinct areas: the demon-infested territory of Jaedenar and the Furbolg cave in Deadwood. Notably, both regions are cave environments.

#### Burning Steppes

* The Burning Steppes, a higher-level leveling zone, lacks inadequate player records for identifying discernible patterns in causes of death.

#### Western Plaguelands

* The Western Plaguelands, a higher-level leveling zone, lacks inadequate player records for identifying discernible patterns in causes of death.

### Endgame Leveling Zones (53-60)

#### Eastern Plaguelands

* The Eastern Plaguelands, a higher-level leveling zone, lacks inadequate player records for identifying discernible patterns in causes of death.

#### Winterspring

* Winterspring, an endgame leveling zone, offers limited player data due to its advanced stage. However, a discernible cluster of deaths emerges from encounters with the Watery Invader, attributable to an elemental invasion event akin to the one experienced in Un'Goro Crater.

#### Moonglade

* Moonglade is a tranquil zone designed for specific purposes rather than traditional leveling. With insufficient player records, discerning patterns in causes of death remains challenging.

#### Silithus

* Silithus, a higher-level leveling zone, lacks inadequate player records for identifying discernible patterns in causes of death.