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You know nothing, John Snow.

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²First of Her Name

³The Unburnt

⁴Queen of the Andals, the Rhoynar and the First Men

⁵Queen of Meereen

⁶Khaleesi of the Great Grass Sea

⁷Protector of the Realm

⁸Lady Regnant of the Seven Kingdoms

⁹Breaker of Chains

M.D.: Mother of Dragons

Cholera affects an estimated 3 to 5 thousand people in Westeros each year. Its spatial distribution is largely characterized by sporadic outbreaks following the onset of Winter. The common dogma in Cholera epidemiology is that transmission spreads through water sources contaminated with the bacterium *Vibrio cholerae*. However, we used species distribution modeling to demonstrate that the incidence of Cholera cases has no association with the distance to any water sources (Sunset Sea, Narrow Sea, Trident, or either Fork). Thus, the original insight gained from famous epidemiologist, John Snow, in the 1800's is brought into question.

1. Introduction

Cholera was classified as a pandemic as of 18 (AC; After Conquest) in Westeros.[1] Children are mostly affected.[1][10] The risk of death among those affected is usually less than 5 per cent but may be as high as 50 per cent.[1] No access to treatment results in a higher death rate.[1]

In Westeros, Cholera primarily appears in sporadic outbreaks marked by widespread geographic variation.

Areas with high ongoing risk of disease include the North and south-east High Garden.[1]

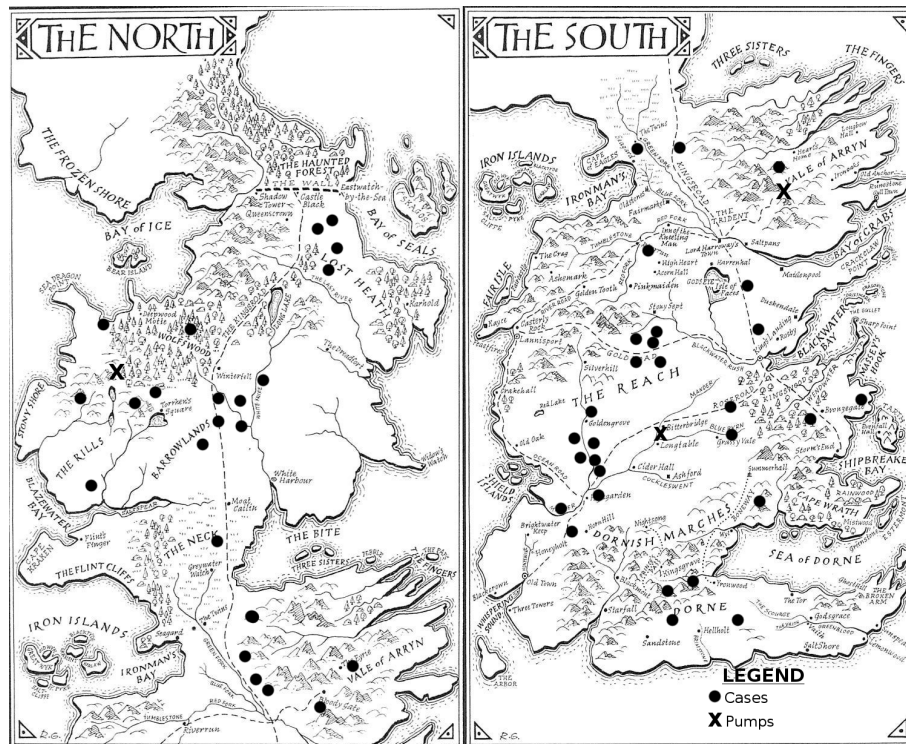


Figure 1. Map of Cholera cases and water pumps across Westeros in the North and South.

Descriptions of cholera are found as early as the 1 AC in the Common Tongue.[4] Parallel studies of cholera in land far away by John Snow between 1849 and 1854 led to what would seem to be significant advances in the field of epidemiology.

In this study, we analyze the spatial distribution of Cholera across at a large spatial scale by assessing variables such as the distance to fresh and salt water. We show that there is absolutely no relationship between the distribution of Cholera cases and water-based metrics. The results from this study seem to refute the developments of the famous epidemiologist John Snow and suggest the Cholera instead follows a miasmatic transmission route.

2. Methods

Cholera cases were reported to each of the Seven Wardens and subsequently mapped. We measured the distance to water bodies using Euclidean Distance as well as distance along main roads. All covariates were then used in a gradient boosted model (GBM) to predict the incidence of cholera. Variable importance was assessed via the change in AUC following permutation.

3. Results and Discussion

The distribution of Cholera cases was found to be highly stochastic throughout space and time. No environmental covariates had any strong effect on model performance, as shown by the lack of change in AUC following permutation. This leads us to believe, in agreement with maesters, that cholera is in fact miasmatic.

Future research should confirm the miasmatic transmission theory for other relevant infectious diseases. Greyscale is a rare but often fatal directly transmitted cutaneous infection. While the direct route of transmission has been witnessed on multiple occasions, the origins of the pathogen

could have included a miasmatic virus. Evolutionary analysis of genomic sequences is required to fully validate this hypothesis.

Ethics. This study is fully ethical.

Data Accessibility. All data to reproduce results in this study can be found in the restricted section of the Citadel.

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Disclaimer. The author has an interest in the full dismissal of Cholera's roots in Germ Theory given the recent outbreak in the North attributed to contaminated water and Westerosian's outrage with the governing party.

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