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Discourses of Health, Wellbeing, and Sanitation in the Victorian Anti-Vaccination Popular Press: A Corpus-assisted Discourse Analysis of the VicVaDis Corpus

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Abstract

The study explores discourses of health, wellbeing, illness, disease, and sanitation in Victorian anti-vaccination literature through a corpus-assisted discourse analysis of the VicVaDis corpus performed using the LancsBox tool. The analysis reveals that Victorian anti-vaccinationists consistently framed vaccines as dangerous, disturbing the natural state of health, and linked them to various diseases. They advocated for sanitation and hygiene over vaccination, expressing scepticism towards emerging medical practices. The conclusions highlight the continuity of themes in anti-vaccination rhetoric from the Victorian era to the present, where similar arguments against vaccination persist, focusing on natural health, mistrust of medical authority, and anecdotal evidence.

Keywords: Health, Sanitation, Victorian Anti-Vaccination Movement, VicVaDis Corpus, Wellbeing

Introduction

The topic of vaccine hesitancy has undoubtedly become central to much political and social discourse, especially during and in the aftermath of the COVID-19 pandemic. However, it is not a new phenomenon, as its origins, and the existence of an organized anti-vaccination movement, can be traced back to 19th century England (Eisen 2021).

1. Vaccination Enforcement and Anti-Vaccination Movements in Victorian England

The Anti-Vaccination Movement in Victorian England emerged within a complex historical context marked by both scientific advancements and public health challenges. The roots

of vaccination in England can be traced back to the early 18th century, when Lady Mary Wortley Montagu introduced variolation – a method of inoculating individuals with material from smallpox sores – from Turkey to England (Halsall 1998; Grundy 2001). This practice laid the groundwork for the development of modern vaccination, marked by the publication of Edward Jenner's *An Inquiry into the Causes and Effects of the Variolæ Vaccinæ* in 1798, which introduced the concept of vaccination using cowpox to protect against smallpox (Stewart and Devlin 2006). Despite Jenner's breakthrough, between 1837 and 1840 a severe smallpox epidemic killed 41,000 people in England and Wales (Bonanni and Santos 2011). In response to this public health crisis, the government issued the first Vaccination Act in 1840, which made variolation illegal and provided free vaccinations to the poor. The enforcement of a second Vaccination Act in 1853, imposing fines on parents who failed to vaccinate their infants by the age of three months, ignited significant public opposition, which soon became a widespread and organized movement: for example, the Anti-Compulsory Vaccination League (ACVL) was founded in 1866 (Durbach 2005). As the century progressed, the government further enacted a series of Vaccination Acts to implement vaccination more stringently, with the 1867 Act explicitly allowing for the compulsory vaccination of children and penalizing non-compliers (Williamson 2007). Despite these efforts, another devastating smallpox epidemic between 1870 and 1873 resulted in over 42,000 deaths in England and Wales. In response, the 1871 Vaccination Act mandated that local authorities establish vaccination officers to enforce the law, and the 1874 Act granted greater control to central government authorities over vaccination efforts. In the meantime, opposition to compulsory vaccination was escalating: the ACVL dissolved in 1873, but was replaced by the National Anti-Compulsory Vaccination League (NACVL) in 1874; the London Society for the Abolition of Compulsory Vaccination (LSACV) was established in the capital in 1880, and later reformed in the National Anti-Vaccination League (NAVL) in 1896 (Tafari *et al.* 2014; Callender 2016). The social and political pressure exerted on the government by these associations led to the formation of a Royal Commission on Vaccination between 1889 and 1896, appointed to study more closely the procedure, its potential benefits and side effects, and the consequences of its mandatory enforcement. The Commission's final report maintained the necessity of compulsory vaccination but recommended the introduction of a "conscience clause" to allow individuals the right to opt out. This led to the passage of the 1898 Vaccination Act, which formalized the right to conscientious objection, followed by the 1907 Act, which further simplified the process for parents to opt out of vaccinating their children (Klondrlik 2020).

1.1 Anti-Vaccination Claims and Anti-Vaccination Publications in Victorian England

Throughout the period, Victorian anti-vaccinationists voiced their opposition through a prolific array of publications. One of the benchmarks for the Victorian anti-vaccination movement was the serialised periodical *Vaccination Inquirer*, which was the official organ of the LSACV, established by William Tebb in 1879. Other particularly prolific anti-vaccination activists were John Gibbs, who authored the first anti-vaccination pamphlet, William Young and Garth Wilkinson, who wrote a series of *Vaccination Tracts* between 1877 and 1879. The renowned writer George Bernard Shaw also publicly endorsed the NAVL with a letter to its secretary Charles Gane in 1906 (Yang 2014).

A prominent argument against the state's enforcement of vaccination centred around the infringement on individual rights, with many critics viewing mandatory vaccination as an overreach of state power into personal and family decisions. Some historians have argued that these concerns were also deeply intertwined with issues of class consciousness, because mandatory vaccination was perceived as particularly onerous for the working classes, who could not afford to

pay fines (Durbach 2000). Additionally, research has shown that at that time vaccination could be carried out improperly, especially in public vaccination stations, where the procedure was performed arm-to-arm and vaccine matter was obtained from previously inoculated patients: the lymph thus extracted could be contaminated, or the stations themselves could be unsanitary, with the result that the poorer families who could not afford to have their children vaccinated at home did risk suffering side effects from such inadequate hygienic conditions (2005, 113-49). Likewise, the very safety and efficacy of the smallpox vaccine were hotly debated, as critics feared the potential side effects and doubted the scientific basis for the vaccine's effectiveness. Religious and moral objections also played a role, with some opponents arguing that vaccination was unnatural, defying God's laws of nature, or against divine will, interfering with God's plans for the physical and spiritual health of humankind (Fajri Nuwarda *et al.* 2022).

1.2 Vaccination, Sanitation, and the Germ Theory of Disease

Vaccination debates at the time were also deeply entrenched in medico-scientific debates on the validity of the new germ theory of disease, discovered by Louis Pasteur in the mid-19th century and expanded by Robert Koch towards the end of the century. The germ theory of disease, stating that ailments are caused by pathogens, micro-organisms, or "germs", was struggling to supersede the miasma theory of disease, holding instead that diseases are to be traced back to noxious and poisonous vapours which proliferate in contaminated water, "bad air", and poor hygienic conditions.

Victorian anti-vaccination authors produced counter-narratives which portrayed vaccination as a dangerous, un-hygienic practice which disturbed, rather than boosted, children's immune system; in this sense they feared it to bring rather than prevent illness upon otherwise healthy bodies, and to interfere with the natural course of illness and recovery. These beliefs were often anchored in an adamant refusal of the germ theory of disease and in scepticism towards the possibility to "fight disease with disease [...] violating the doctrine of asepsis by introducing foreign bodies into the blood" (Baldwin 1999, 284). Conversely, they often were supporters of the miasma theory of disease and consequently strongly advocated in favour of sanitation and hygiene, preventive measures which they saw as opposed rather than complementary to vaccination. Health and wellbeing thus depended on "cleanliness of water, streets, housing, and persons" (Jenson 2009, 209). Some Victorian authors pointed out that these measures were also destined to improve the everyday living conditions of the working and poorer classes – although others noted that these also required massive state intervention directly into these families' dwellings and thus could be perceived as equally draconian as compulsory vaccination, and possibly more intrusive. Other anti-vaccinationists asked for isolation and quarantine to prevent the spreading of contagious illnesses, sometimes likening isolation with sanitation. These authors likely interpreted both methods as ways to purify the environment and to keep it clean and free of disease, despite the fact that they rely on two largely opposing ways to understand contagion: namely, through contact with other infected human beings, or through unsanitary environmental conditions. As noted by Porter and Porter: "Sanitarianism [...] was often confusingly represented in the *Inquirer*; sometimes it was seen as a system of environmentally-based structural engineering on the one hand, and as a system of isolation and notification on the other" (1988, 245); and again:

On the one hand, the *Inquirer* claimed that in Leicester, the money extracted in fines from defaulting would be better spent to "secure pure air in their rooms, cleanliness in their habits, and good drainage in their houses, the neglect of which was after all the real cause of smallpox and all similar diseases."

On the other hand, the anti-vaccinationists accepted that smallpox was carried by contagion, and that the isolation system thus provided the community with complete immunity from this disease. (247)¹

1.3 Rationale for the Analysis and Research Questions

As stated above, Victorian anti-vaccinationists were prolific in their writings, and produced a wealth of pamphlets, articles, and books to argue their case. These publications ranged from scientific critiques to emotive appeals, and they contributed to a vibrant public discourse on the risks and ethics of vaccination.

From this perspective, the texts produced by Victorian anti-vaccinationists which survived to the present day have been studied by historians (in addition to those already mentioned: Weber 2010) but have recently become of interest to linguists, too. For example, Klondrlik (2020) examined the discursive representation of professional identity and the debate in response to the introduction of the conscience clause as they unfolded in late Victorian socio-medical journals. Arnold and Arnold (2022) instead examined medical discourse in the British periodical *Monthly Review* through statistical topic modelling, revealing the presentation and prevalence of various public medical discourses, as well as their diachronic variation in the course of the periodical's almost 100 years. However, some authors have noticed the lack of comprehensive linguistic enquiries examining large corpora of texts. To this end, scholars at Lancaster University have recently compiled the Victorian Anti-Vaccine Discourse (VicVaDis) Corpus (Hardaker *et al.* 2023), that is the first extensive dataset specifically designed to facilitate large-scale analyses of historical vaccine hesitancy, instrumental in uncovering patterns that may not be immediately apparent through manual analysis of smaller datasets.

The present study uses the VicVaDis corpus as its primary source of data. The aim is to explore how Victorian anti-vaccinationists discursively constructed vaccination within contemporary notions of disease prevention, sanitation and isolation, and to understand whether and how such discourses were related to overarching discourses of health, wellbeing, illness, and disease.

2. Materials and Methods

The analysis is carried out following a corpus-based approach grounded in (critical) discourse analysis theory (Fairclough 1995; McEnery and Wilson 2001). Discourse is here defined as the use of language within a specific socio-cultural and geographical context, reflecting and shaping social realities, identities, and power relations (Gee 2014). Corpus-based approaches entail interrogating the corpus to verify, validate, or refute hypotheses and existing descriptions of language (Tognini-Bonelli 2001, 65-66), as opposed to corpus-driven approaches, whereby the corpus itself constitutes the source of hypotheses about language. The corpus chosen for the analysis is the Victorian Anti-Vaccination Corpus, fully described in Hardaker *et al.* (2023); following is a brief summary of its main characteristics.

The VicVaDis corpus is a principled corpus of anti-vaccination texts from the Victorian era. The compilers decided to focus on the types of literature most likely to have been accessed by the general public, and therefore to have influenced public opinion: consequently, they included ephemeral literature such as pamphlets, newsletters, non-academic tracts, periodicals,

¹ On the significance of the Leicester anti-vaccination movement, see also Charlton (1983) and Swales (1992).

and letters to newspaper editors, and excluded technical legal, scientific and medical works. The digitalised texts were obtained by cross-checking data from multiple archives. The resulting corpus thus comprises 133 texts (3.5 million words and 3,488,959 tokens) from a wide variety of authors (sixty-six unique declared authorship designations) and published between 1854 and 1906 (with a mean average of 2.5 documents per year).

The analysis performed here uses the LancsBox tool (Brezina and Platt 2024) and exploits quantitative and qualitative corpus techniques (frequency, distribution, collocations and collocation networks, concordances) to look for the discursive representation of concepts of health, wellbeing, hygiene, sanitation, illness and disease in Victorian anti-vaccination texts. Frequency and collocations are quantitative measures that reveal the prominence and the associations of terms within the dataset: frequency analysis identifies the most common words and phrases, while collocation analysis uncovers how words tend to co-occur, thus unveiling recurring themes and narratives (Stubbs 2002). A collocation network is an extended collocation graph that shows shared collocates and cross-associations between several nodes (Brezina and Platt 2024, 18). A closer qualitative reading of concordances and full texts is then undertaken in order to interpret such patterns.

3. Results and Discussion

3.1. Health, Wellbeing, Illness, and Disease

The first aim of the quantitative analysis was to extract the frequency and distribution of the terms “health”, “well(-)being”, and “illness”. The frequency of the term “disease/s” was discussed by Hardaker *et al.* (2023, 11), who found 12,078 hits (see also below). One possible antonym of the term “well(-)being”, that is, “ill(-)being”, was also explored, but the search returned 0 results. The results of the frequency and distribution analyses are reported in Table 1.

Item	Raw frequency Relative frequency*	Distribution
Wellbeing	12 3.43	4/133 (3%)
well-being	47 13.44	27/133 (20.3%)
health	2757 768.81	122/133 (91.7%)
illness	318 90.92	56/133 (42.1%)
illnesses	19 5.43	12/133 (9%)

Tab. 1 – Frequency and distribution of the terms “well(-)being”, “health”, and “illness/es” in the VicVaDis corpus²

Figure 1 shows the chronological dispersion of the lemmas across the years covered by the texts in the corpus (the singular and plural forms were here grouped, as well as the hyphenated

² Relative (or normalized) frequency (RF) is calculated as the absolute frequency of a search query divided by the total number of words searched (the number of words in the corpus or sub-corpus). This number is usually multiplied by an appropriate basis for normalization (e.g., 10,000) (Brezina and Platt 2024, 45).

variants; relative frequencies instead of raw frequencies were calculated, to take into account the differing sizes of the sub-corpora). The lemma “disease” was also considered for this analysis.

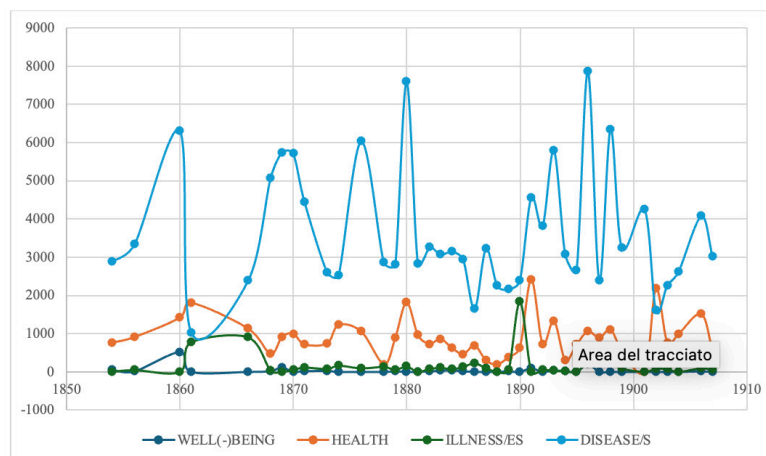


Fig. 1 – Chronological dispersion of the terms “well(-)being”, “health”, “illness/es”, and “disease/s” in the VicVaDis corpus (relative frequencies) (author’s elaboration)

Although no general conclusions can be drawn from the frequency and distribution data presented here, given that the corpus does not include all the surviving anti-vaccination literature from the period (and even if it did, it is possible that the surviving texts are not representative of the whole Victorian anti-vaccination production), some interesting insights can still be gained and commented on.

First, it can be noted that, from a strictly quantitative point of view, terms referring to illness and disease are discussed much more frequently than terms referring to health and wellbeing: the combined raw frequency of the lemma “disease” and of the lemma “illness” is 12,415, while the combined raw frequency of “well(-)being” and “health” is 2,816, and the former is particularly rare (only 59 hits in the corpus). The term “well(-)being” is also not evenly distributed in the corpus, being present in roughly 20% of the texts; the term “illness/es” is more common, being discussed in nearly half of the texts in the corpus; and the term “health” is pervasively mentioned in almost all of the texts in the corpus. The same is true for “disease/s”, which is present in 126 texts (almost 95% of the corpus). The chronological dispersion of these lemmas shows a spiky profile and uneven distribution for each of the terms considered. Interestingly, though, it seems possible to identify similar curves, perhaps suggesting that they are at least sometimes discussed in conjunction. A closer look at the concordance lines allows a deeper understanding of their usage in context.

Hardaker *et al.*’s (2023, 11) analysis of the occurrences of the lemma “disease” found that the word could variably refer to smallpox or to other ailments (including, but not limited to: erysipelas, leprosy, meningitis, blood poisoning, and syphilis). However, it was not used to neutrally refer to these conditions, but it regularly formed part of an overarching discourse against the effectiveness of vaccination, causally linking it to these and other harms. The same can be said for the lemma “illness”, as in the following examples:

1. When the power of nature fails to throw the vaccine poison out of the body, woe be to the patient. Its retention will be to him the source of many subsequent evils, and

often, often alas! of death, the sufferers commonly ignorant of the true cause of their illness. These are the penalties of violated nature, inflicted because of our transgressions. Physical law shuts up the blood for safety within three coated vessels. To open them with a lancet is a violation of that law. (Fraser 1871, *An Attempt to Prove that Vaccination with Its Compulsory Law, Instead of Being a General Blessing, Is a Universal Curse*)

2. Vaccination is a cause of illness when it is not the only one—a cause in cases of latency, or of the subject’s own dyscrasia, as well as when conveying disease. (Fox 1890, *The Question of Compulsory Vaccination, Illustrated by Fifty-six Unpublished Cases of Illness and Death*)

In the first extract, the author employs emphatic language (such as the exclamation “alas!”) to reveal the “true” causes of their illness to the otherwise ignorant patient; he describes the vaccine as “poison” and the practice of vaccination as a violation of natural laws, which also possibly acquires moral and religious connotations in that it is described as a hubristic “transgression”. The second excerpt is an example of more rigorous medico-scientific prose, which however is equally unequivocal in stating that “vaccination is a cause of illness”.

Similarly, the analysis of the concordances of the term “health” revealed that when the noun is used in conjunction with “vaccination” it forms discourses whereby authors argue that the procedure is a threat to health, as in the following examples:

3. By questioning closely, we not unfrequently find that children never enjoy good health after vaccination, however firm it might have been before. (Gibbs 1856, *The Evils of Vaccination*)
4. In an experience of twenty years, I have been witness to very many instances in which this destructive art, vaccination, has ruined the health of whole families. (Pearce 1870, *Vaccination, Its Source, Nature and Effects*)
5. I have frequently met with parents who told me that their children who were radiant with health had been poisoned by vaccination. (1882, from *The Vaccination Inquirer and Health Review*)

The examples are illustrative of two further aspects of such discourse, namely the fact that vaccination is perceived as actively disturbing (“destructive”, “poisoned”) otherwise good health (“however firm it [health] might have been before [vaccination]”; “were radiant with health”); and that the evidence of its side effects is often gathered through direct personal experience (“I have been witness to many instances”; “I have frequently met with parents who told me”). Although frequently criticised by advocates of vaccination, who tended to appeal to the persuasive power of expert testimony and statistical figures to argue their case (Broad 2022), the particularly emotionally charged language used by popular anti-vaccination authors benefitted from the narrative elements introduced by these personal stories, whose evidential value takes second place to their rhetorical effectiveness.

Likewise, the closer qualitative analysis of the concordances of “well(-)being” showed that the term was frequently associated with arguments against vaccination, which was depicted as a threat to children’s wellbeing and as a practice that parents should unite against. These vocal pleas are also intertwined with dire warnings equating vaccination with blasphemy:

6. Mothers and Fathers!—Those little ones are a precious trust to you from your and their Maker, to whom you are responsible for their wellbeing. Think you that He has made them so imperfectly as to make it necessary to have their blood mixed with poisonous matter, in order to preserve health or prevent disease [...] The very thought is blasphemy! (Pickering 1873, *The Anti-Vaccinator and Public Health Journal*)

7. [Saying that] the creature whom an all-good, all-wise, all-powerful Being formed in his own image, is so ill-adapted to fulfil the conditions of existence, that the performance of a filthy operation [...] is essential to his well-being, is to imitate the logic of that audacious blasphemer, who wished that he had been present at the creation to have saved the Creator from the commission of so many blunders. The laws of God are fixed [...]. (Gibbs 1856, *Compulsory Vaccination Briefly Considered*)

In both texts, vaccination is described as a “filthy operation” whereby human blood is “mixed with poisonous matter”. This preoccupation with cleanliness, filth, and poison is reflected in the other main discourse surrounding wellbeing in the VicVaDis corpus, namely its connections to good hygienic conditions. More precisely, adequate food, good quality of air and water, and spacious and clean dwellings are considered essential to wellbeing, as in the following:

8. Wholesome food is rather more essential to health and well-being than any kind of physic whatever [...]. (Gibbs 1854, *Our Medical Liberties*)
9. Breathing-space, pure air, pure water, and wholesome conditions of life generally, are necessary to all, to secure the safety and wellbeing of all. (Wilkinson 1879, *Vaccination Tracts*)

According to these authors, adequate hygiene plays a role in both the prevention and treatment of diseases such as smallpox; vaccination, instead, is in itself a disease, and it debilitates the body as much as poverty and uncleanness do:

10. We have seen the common sense hygienic conditions of patients, their well-being, followed everywhere by an abatement of the malignity of the symptoms and legacies of smallpox. We have seen that misery and want are the beds of smallpox; and that Vaccination is inevitably also one of its beds, because every disease – the Vaccine disease – increases the weakness of the body. (Wilkinson 1871, *Small-Pox and Vaccination*)

Notably, Wilkinson’s main argumentative point is here backed by reference to sensory evidence collectively experienced (“we have seen”, repeated twice), and anchored to the public’s supposedly shared assumptions, as hygienic conditions are described as “common sense”. It is perhaps useful to note at this point that in 1848 the first Public Health Act had been issued, promoted by Edwin Chadwick; this act aimed at advancing the building of sewers and the provision of clean water, and was based on wide consensus across the social and political spectrum. As Jenson explains, “there was little dispute that cleanliness of water, streets, housing, and persons was important. Indeed, ‘it was a commonplace of educated opinion by the beginning of the 19th century’ ” (2009, 209). Jenson’s main argument is that the dispute was on how to do it, which measures to implement, and which view of cleanliness and sanitation to adopt. To further explore how these themes intersected with public understanding of vaccination at the time, the analysis of the VicVaDis corpus was then expanded to include the terms “hygiene”, “cleanliness”, “dirt”, and “filth”.

3.2 *Hygiene, Cleanliness, Dirt, and Filth*

Table 2 and Figure 2 show the frequency and distribution of the lemmas “hygiene”, “cleanliness”, “dirt”, and “filth” in the VicVaDis corpus.

Item	Raw frequency Relative frequency	Distribution
Hygiene	133 38.03	35/133 (26.3%)
cleanliness	274 78.34	57/133 (42.8%)
Dirt	61 17.44	24/133 (18.04%)
Filth	306 87.49	48/133 (36%)

Tab. 2 – Frequency and distribution of the terms “hygiene”, “cleanliness”, “dirt”, and “filth” in the VicVaDis corpus

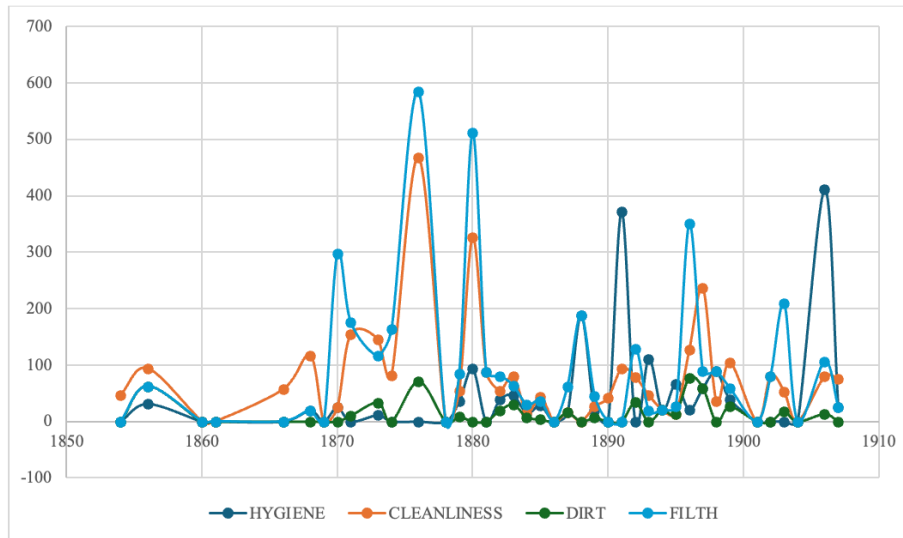


Fig. 2 – Chronological dispersion of the terms “hygiene”, “cleanliness”, “dirt”, and “filth” in the VicVaDis corpus (relative frequencies) (author’s elaboration)

Contrary to previous findings about health and illness, the sheer frequency data of terms referring to cleanliness and dirt seem to suggest a rather balanced discourse, as the combined frequency of the terms “hygiene” and “cleanliness” is 407, while the combined frequency of the terms “dirt” and “filth” is 367. Conversely, the chronological dispersion of these terms suggests that they are not evenly distributed across the years covered by the corpus, although similarities in their distribution across the various texts can be detected. More precisely, the terms “cleanliness” and “filth” follow similar trends between the 1870s and the 1890s; conversely, the term “hygiene” seems to have been most frequently used in the last decades of the century, when it started following a different trend than the other terms analysed, peaking in the 1890s and 1910s.

The term “hygiene” also appears to have a multifaceted meaning in the VicVaDis corpus, and to be part of a variety of discourses which are well captured by its most common collocates. The parameters used to retrieve these collocates are reported in Table 3, while the results of the search are shown in Table 4. These collocates include some lemmas suggesting that hygiene is something that has to be achieved: it indicates positive progress (“improved”) and benefits the community

(it is “public”). Its “principles” appear to be based on medico-scientific and academic research, with collocates such as “University”, “professor”, “journal”, and “statistics”, while its enforcement is in the hands of the government, as suggested by the collocates “Congress” and “laws”.

The most common collocates of the noun “cleanliness”, retrieved through the same parameters and shown in Table 5, seem to point to a moral as well as medical dimension (“godliness”, “temperance”, “purity”). They also include the aspects which authors think should go along with cleanliness (“ventilation”, “air”, “food”), which again point to an overarching view of “sanitation” (itself a frequent collocate of “cleanliness”) as foundational to public health.

Statistic ID	Statistic name	Statistic cut-off value	L and R span	Minimum collocate freq. (C)	Minimum collocation freq. (NC)	Filter
4b	MI2	3	L5-R5	5	1	no filter applied
4b-MI2(3), L5-R5, C5-NC1						

Tab. 3 – Parameters used to retrieve collocation, reported following the standard Collocation Parameters Notation

Collocate	Freq. (collocation)	Freq. (corpus)	Log Dice	MI	Delta P1	Delta P2
improved	10	242	9.8	10.9	0.04	0.07
university	5	180	9.0	9.5	0.04	0.03
professor	12	671	8.9	8.9	0.09	0.02
principles	5	282	8.6	8.9	0.04	0.02
congress	5	319	8.5	8.7	0.04	0.02
journal	9	827	8.3	8.2	0.07	0.01
sanitation	5	463	8.1	8.2	0.04	0.01
medicine	9	1,048	8.0	7.8	0.07	0.009
sanitary	9	1,185	7.8	7.7	0.07	0.008
treatment	7	1,180	7.4	7.3	0.05	0.006
laws	6	1,121	7.3	7.1	0.04	0.005
health	12	2,727	7.1	6.9	0.09	0.004
science	5	1,124	7.0	6.9	0.04	0.004
public	9	3,386	6.4	6.1	0.07	0.003
statistics	5	1,888	6.3	6.1	0.04	0.003

Tab. 4 – Fifteen most frequent collocates of the term “hygiene” in the VicVaDis corpus, presented with their collocation frequency, frequency of the collocate anywhere in the corpus, and all relevant statistical measures

Collocate	Freq. (collocation)	Freq. (corpus)	Log Dice	MI	Delta P1	Delta P2
Ventilation	22	106	10.9	11.4	0.08	0.2
Godliness	13	18	10.5	13.2	0.05	0.7
Temperance	13	47	10.4	11.8	0.05	0.3
Personal	29	478	10.3	9.6	0.1	0.06
Domestic	12	142	9.9	10.1	0.04	0.08
Air	25	628	9.8	9.0	0.09	0.04
Municipal	9	99	9.6	10.2	0.03	0.09
Versus	8	60	9.6	10.8	0.03	0.1
Filth	11	300	9.3	8.9	0.04	0.04
Food	13	407	9.3	8.7	0.05	0.03
Want	15	520	9.3	8.6	0.05	0.03
Fresh	13	416	9.3	8.7	0.05	0.03
Incautiously	5	15	9.1	12.1	0.02	0.3
Thorough	6	103	9.0	9.6	0.02	0.06
Purity	6	124	8.9	9.3	0.02	0.05
Sanitation	11	463	8.9	8.3	0.04	0.02

Tab. 5 – Fifteen most frequent collocates of the term “cleanliness” in the VicVaDis corpus, presented with their collocation frequency, frequency of the collocate anywhere in the corpus, and all relevant statistical measures

The function word “versus” is also among the most frequent collocates of “cleanliness”; the analysis of its contexts of occurrence reveals discourses whereby vaccination is explicitly opposed to other preventive measures, as in the following:

11. In 1740 it was cleanliness *versus* inoculation. It is now cleanliness (municipal cleanliness) *versus* vaccination. (1879, from *The Vaccination Inquirer and Health Review*, italic in original)

These concordances illustrate the fact that the anti-vaccination press often framed the procedure as dirty, prescribing the injection of a substance of dubious origin into a healthy body. Vaccination was thus pitted against other preventive measures aimed at improving the hygiene and cleanliness of people and environments, and consequently struggled to fit into broader discourses about possible disease prevention measures. These results confirm what Jenson (2009, 222) and Durbach (2005, 150) explain about the relationship between the Victorian anti-vaccination movement and sanitarians:

The emergence of germ theory in the 1870s and 1880s provided anti-vaccinators with “a new, authoritative medical language to articulate what they continued to identify as smallpox’s material and social cause: dirty environments and compromised constitutions”. Thus they could make claims to the very sanitary idea [...] They could argue that as citizens who were responsible – and therefore almost by definition “clean” – working-class parents ought to be able to make their own decisions about their children’s bodies. They could make claims [...] for the respect of their bodily integrity and against the surveillance and intervention of [...] interfering middle-class sanitarians. (Jenson 2009, 222)

This passage can also be interpreted in light of (critical) discourse analysis theory, which explicitly links language to the construction of personal and social identities, as well as to power relationships and social class. To further explore these results, and to conclude the overview of discourses about sanitation in the Victorian anti-vaccination press, the occurrences of the terms “sanitation”, “prevention”, and “quarantine” in the VicVaDis corpus were also examined.

3.2 Sanitation, Isolation, and Quarantine

Table 6 and Figure 3 show the frequency and distribution of the terms “sanitation”, “isolation”, and “quarantine” in the VicVaDis corpus.

Item	Raw frequency Relative frequency	Distribution
sanitation	466 133.23	49/133 (36.8%)
Isolation	249 71.19	40/133 (30%)
Quarantine	75 21.44	19/133 (14.28%)

Tab. 6 – Frequency and distribution of the terms “sanitation”, “isolation”, and “quarantine” in the VicVaDis corpus

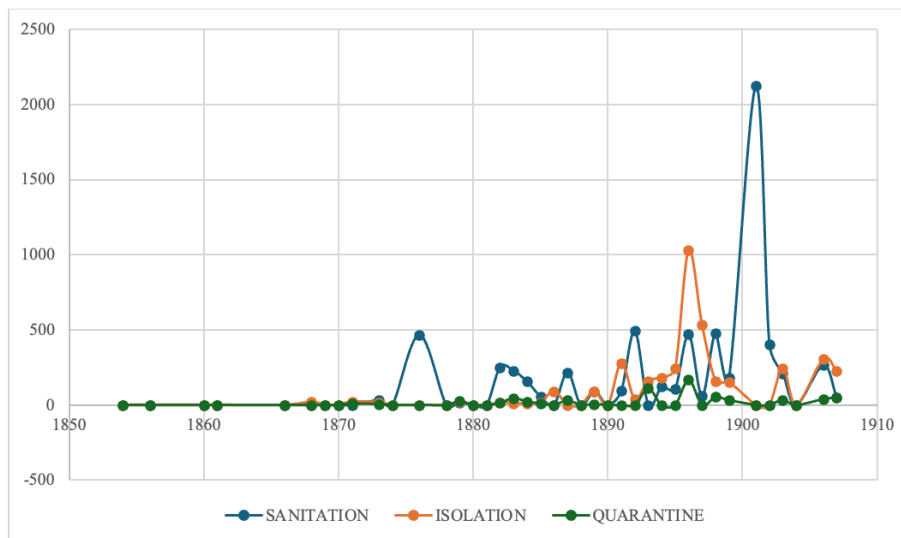


Fig. 3 – Chronological dispersion of the terms “sanitation”, “isolation”, and “quarantine” in the VicVaDis corpus (relative frequencies) (author’s elaboration)

Among these terms, “sanitation” seems to be the most frequently and consistently used in the corpus, with an evident peak in the early 1900s. The term “isolation” is distributed similarly across the texts in the corpus, but its overall frequency is lower; while “quarantine”, i.e., a very specific public health measure aimed to prevent the spreading of contagion by isolating early diagnosed patients, is used more sparingly in the corpus.

As previously argued, Victorian anti-vaccinationists often advocated for the implementation of sanitation and isolation measures, in order to prevent the spreading of contagious illnesses. Both methods were often interpreted as opposed, rather than complementary, to vaccination (Porter and Porter 1988). This was likely because sanitation and isolation seemed efficient and possibly self-evident ways to keep the environment and people clean and free of disease; this, despite the fact that the arguments in favour of sanitation often relied on the miasma theory of disease, focussing on cleanliness of air, food, water, and environments, whereas the arguments in favour of isolation relied on the idea that contagion spread through direct contact with infected people. Still, it seems possible to posit that the two preventive measures appeared to Victorian anti-vaccinationists as equally tending to reach overall cleanliness and purity, which was seen as closely connected to health and wellbeing, whereas vaccination was interpreted as a way to unnecessarily introduce diseases and thus contaminate the body.

In order to explore if, and how, these terms were used in conjunction with “vaccination” in the VicVaDis corpus, their collocational networks were also retrieved and examined for shared collocates (Phillips 1985). The results seem to indicate that there are few shared collocates, possibly pointing to discourses which largely do not overlap. This seems to be especially true for the terms “isolation” and “quarantine”, which do not share significant collocates with “vaccination”. Instead, “sanitation” and “vaccination” seem to sometimes discursively overlap, as the two nouns share a number of collocates, as shown in Figure 4.

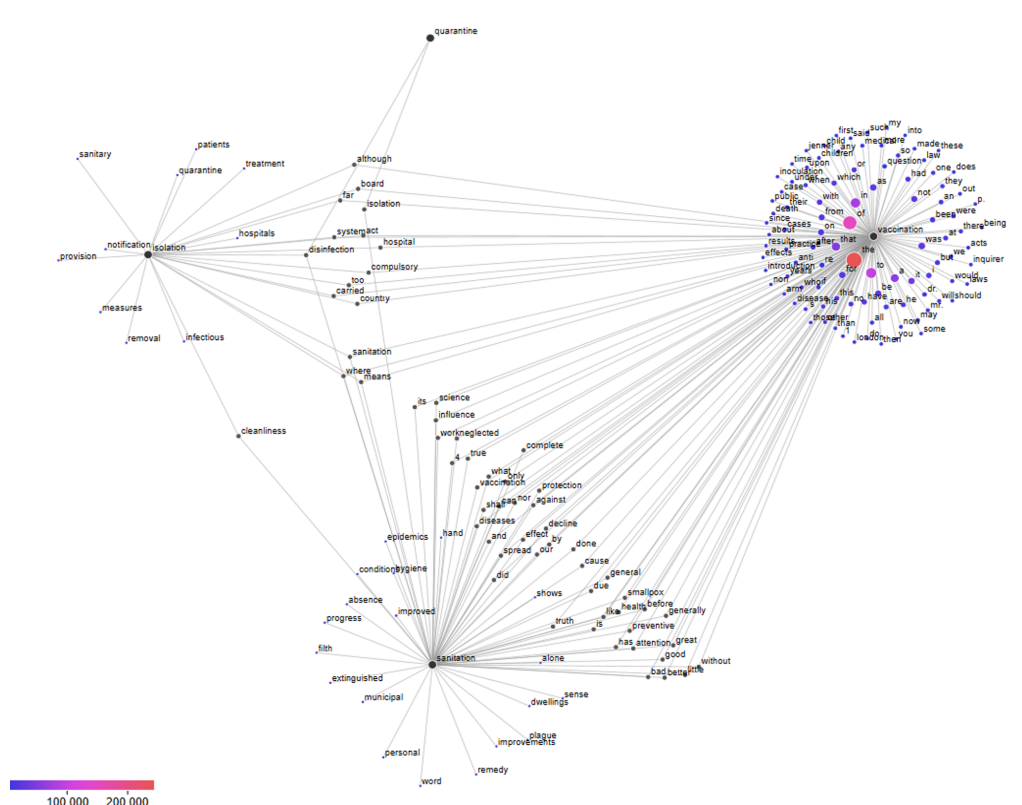


Fig. 4 – Collocation network of the terms “vaccination”, “isolation”, “quarantine” and “sanitation” in the VicVaDis corpus, created through the GraphColl function in LancsBox (100 collocates displayed in graph)

In order to further explore this insight, a search string was used to elicit concordances where the word “sanitation” appeared within a 4-word span to the word “vaccination”: the search string [word=“sanitation”][0,4][word=“vaccination”] returned 42 hits (relative frequency: 12,01) across 16 texts (12% of the corpus); conversely, the string [word=“vaccination”][0,4][word=“sanitation”] returned 40 hits (11,44) across 20 texts (15%). The close reading of these concordances reveals that sanitation is indeed consistently framed as opposed to vaccination. They are not seen as complementary public health measures with the potential to improve the wellbeing of the general population: vaccination is negative (“filthy”), whereas sanitation is the only effective preventive measure against smallpox, and diseases in general. See, for example, the following:

12. Cleanliness, or sanitation, in its widest signification, is the only protection against all epidemic influences. [...] smallpox is a filth disease, its antidote is sanitation. [...] Vaccination is blood-poisoning, it is an infective process, and can only originate or intensify disease-conditions. (Pickering 1876, *Anti-Vaccination: The Statistics of the Medical Officers to the Leeds Small-pox Hospital Exposed and Refuted*)
13. Smallpox (like the other members of the class of zymotic diseases to which it belongs) originates in, and is fostered by, insanitary conditions, and is only effectually combated by their removal; that Vaccination is inoperative upon mortality where Sanitation is defective, and superfluous where Sanitation prevails. (White 1884, *Sir Lyon Playfair Taken to Pieces and Disposed of*)
14. The only protection is in widespread sanitation: and it is sanitation alone, *in spite of vaccination*, which has dispelled the smallpox and other epidemics which, in the middle ages, were the terror of Europe. And I shall hope to show that the only treatment which can mitigate an attack of smallpox consists in the use of sanatory remedies. (Pickering 1892, *Which? Sanitation and Sanatory [sic] Remedies, or Vaccination and the Drug Treatment?*, italic in original)

Indeed, one of the texts included in the corpus, written by William Tebb in 1881, is tellingly titled *Sanitation, not Vaccination, the True Protection Against Smallpox*. The close reading of the text shows the presence of each of the discourses highlighted throughout the analysis: in one early passage, Tebb quotes an official 1876 report by Dr. Farr, where contagion and unsanitary environments are ambiguously mentioned as causes for diseases (example 15); then, he reaffirms that vaccination is useless compared to sanitation, and that it is actively dangerous (example 16); finally, he lists the actions that people should undertake in order to improve their sanitary conditions, and consequently, their health (example 17). Interestingly, these actions hint at a bucolic return to nature and simplicity, possibly in the face of modern progress (“come back to the first-fruits of the earth for food”) and also include a moral dimension (“do no impure act”); moreover, they are explicitly perceived as empowering the patient, who is thus freed from the mandates of science and medicine:

15. Experience has shown that the various forms of plague are influenced to a large extent by sanitary conditions. All zymotic diseases are most fatal in the densest districts, and although this may be due in part to contagion, it is certainly due in part to the concentrated impurities of towns.
16. [...] smallpox can be extirpated by means of sanitation alone, a remedy which, besides being absolutely efficacious, can be adopted by municipalities and by individuals with the certainty that it is attended with none of the dreaded evils inseparable from the compulsory injection of lymph of doubtful origin and unknown virulence and power.

17. Let every man and wife be their own sanitarians and make their house a centre of sanitation. Let in the sun; keep out the damp; separate the house from the earth beneath; connect the house with the air above; [...] eat no unclean thing; come back to the first-fruits of the earth for food; drink no impure drink; wear no impure clothing; do no impure act; and all the good that science can render you is at your absolute command.

Conclusions

The study has several limitations: first, the adoption of a corpus-based instead of a corpus-driven approach entails that the terms for the analysis were selected by the author, and the choice was based on pre-existing hypotheses about discourses and language, rather than on objective frequency data (although the analysed lexical items were reasonably frequent in the corpus). This allowed to focus on one specific aspect of anti-vaccination discourses; however, other important discourses may have been overlooked. Second, as said, the VicVaDis corpus itself is made of a selection of surviving texts from the Victorian popular press, and therefore may not be representative of all the texts produced in that period. Third, although corpus-assisted approaches strive for objectivity in the extraction of the results, the choice of specific parameters – for example, to retrieve collocations – influences the results obtained. Moreover, their interpretation is still subject to, and possibly biased by, the investigator's own sensitivity.

Nevertheless, the analysis of the VicVaDis corpus has provided insights into how anti-vaccination sentiments in Victorian England were intricately tied to broader concerns about health, wellbeing, illness, and disease. The findings reveal that Victorian anti-vaccinationists framed their opposition within a multifaceted discourse that combined scepticism toward emerging medical practices and an alternative vision of health rooted in sanitation and hygiene as opposed to medical interventions and medications. These discourses arguably offer a compelling historical parallel to modern-day anti-vaccination movements, which similarly question the safety, efficacy, and ethical implications of vaccination, and which have become central to much public discourse since the COVID-19 pandemic (see Jaworska 2021 for a corpus-assisted analysis of media discourses about COVID-19).

First, the analysis of the VicVaDis corpus showed that vaccines were consistently portrayed as agents of disease, believed to introduce harmful substances into otherwise healthy bodies. This narrative of vaccines as a source of illness is echoed in modern anti-vaccination rhetoric, where concerns about vaccine safety, adverse effects, and long-term health implications are frequently raised. For instance, contemporary anti-vaccination groups often cite cases of purported vaccine injuries, despite scientific consensus on the rarity of such events, or despite extensive research disproving a causal nexus (see, for example, Deer 2020 on the controversy surrounding the MMR vaccine). Closely linked to this aspect is Victorian anti-vaccinationists' reliance on personal testimonies to support their claims, which mirrors the strategies used by modern anti-vaccination movements. The excerpts from the corpus presented in the paper included stories of children whose health allegedly deteriorated after vaccination, and activists used emotionally charged language to bolster their arguments. Similarly, today's anti-vaccination discourse often emphasizes personal stories of vaccine injury over statistical evidence, appealing to emotions rather than empirical data (Greenhalgh 2016; Fiammenghi 2023). Furthermore, modern discourses about vaccination frequently use figurative language, which arguably creates vivid, intersubjectively accessible descriptions of otherwise personal experiences, also making medico-scientific concepts more easily understandable; indeed, much linguistic research into the discourses of the COVID-19 pandemic has focused on metaphors, discovering that metaphors

may be more helpful than literal language in facilitating further social communication about vaccines (Semino 2021; Liu and Li 2025; Flusberg, Mackey and Semino 2024). Lastly, Victorian anti-vaccinationists' critiques of the smallpox vaccine were grounded in a broader scepticism toward the emerging germ theory of disease. They advocated for preventive measures centred around sanitation, hygiene, and natural living, believing these were the true and only protectors of health. This preference for "natural" approaches over medical interventions is a hallmark of modern anti-vaccination discourse as well, where proponents often argue for natural immunity, alternative medicine, and holistic health practices over vaccination (Kata 2010) instead of conceiving them as complementary measures to achieve better health and general wellbeing.

Thus, it seems possible to state that in both historical and modern contexts, anti-vaccination movements have thrived on a combination of mistrust in medical authority, fear of medical interventions, and a belief in alternative forms of health and wellbeing. While the scientific, social, and political landscapes have changed since the Victorian era, the underlying concerns and rhetorical strategies of anti-vaccinationists have remained remarkably consistent. Therefore, this analysis underscores the importance of understanding both the historical roots of vaccine hesitancy and the rhetorical strategies used by anti-vaccination advocates, which arguably have played a pivotal role in effectively spreading messages which continue to shape public perceptions of vaccination, more than a century later.

References

- Arnold, Whitney, and Corey Arnold. 2022. "Medicine in the 'Monthly Review': Revealing Public Medical Discourse through Topic Modelling". *Digital Scholarship in the Humanities* vol. 37, no. 3: 611-29.
- Baldwin, Peter. 1999. *Contagion and the State in Europe, 1830-1930*. Cambridge: Cambridge University Press.
- Bonanni, Paolo, and José Ignacio Santos. 2011. "Vaccine Evolution". *Perspectives in Vaccinology* vol. 1, no. 1: 1-24. doi: 10.1016/j.pervac.2011.05.001.
- Broad, Juliana. 2022. "A Vaccination Romance: Rider Haggard's *Dr. Thorne* (1898) in the Vaccination Debate". *Medical History* vol. 66, no. 4: 287-303. doi: 10.1017/mdh.2023.1.
- Callender, David. 2016. "Vaccine Hesitancy: More than a Movement". *Human Vaccines and Immunotherapeutics* vol. 12, no. 9: 2464-68. doi: 10.1080/21645515.2016.1178434.
- Charlton, Christopher. 1983. "The Fight Against Vaccination: The Leicester Demonstration of 1885". *Local Population Studies* vol. 30: 60-66.
- Deer, Brian. 2020. *The Doctor Who Fooled the World: Andrew Wakefield's War on Vaccines*. Melbourne-London: Scribe Publications.
- Durbach, Nadja. 2000. "They Might as Well Brand Us: Working Class Resistance to Compulsory Vaccination in Victorian England". *Social History of Medicine* vol. 13, no. 1: 45-62.
- . 2005. *Bodily Matters. The Anti-Vaccination Movement in England, 1853-1907*. [London-]Durham: Duke University Press.
- Eisen, Erica X. 2021. "The Mark of the Beast': Georgian Britain's Anti-Vaxxer Movement". *The Public Domain Review*. <<https://publicdomainreview.org/essay/the-mark-of-the-beast-georgian-britains-anti-vaxxer-movement>> (01/2025).
- Fairclough, Norman. 1995. *Critical Discourse Analysis: The Critical Study of Language*. London: Longman.
- Fajri Nuwarda, Rina, Iqbal Ramzan, Lynn Weekes, et al. 2022. "Vaccine Hesitancy: Contemporary Issues and Historical Background". *Vaccines* vol. 10, no. 10: 1-21. doi: 10.3390/vaccines10101595.
- Fiammenghi, Carlotta. 2023. "Argumentative Pro-Vaccination and Anti-Vaccination Narratives in the MMR Vaccine-autism Controversy: A Discourse Analysis of Readers' Letters to the Editor and Facebook Comments". *Communication & Medicine* vol. 18, no. 3: 284-96.
- Flusberg, Stephen J., Alison Mackey, and Elena Semino. 2024. "Seatbelts and Raincoats, or Banks and Castles: Investigating the Impact of Vaccine Metaphors". *PLoS ONE* vol. 19, no. 1. doi: 10.1371/journal.pone.0294739.

- Gee, James P. 2014 [1999]. *An Introduction to Discourse Analysis: Theory and Method*. London-New York: Routledge.
- Greenhalgh, Trisha. 2016. *Cultural Contexts of Health: The Use of Narrative Research*. Copenhagen: World Health Organization Regional Office for Europe.
- Grundy, Isobel. 2001 [1999]. *Lady Mary Wortley Montagu: Comet of the Enlightenment*. New York-Oxford: Oxford University Press.
- Halsall, Paul. 1998. "Lady Mary Wortley Montagu (1689-1762): Smallpox Vaccination in Turkey". *Modern History Sourcebook*. <<https://origin-rh.web.fordham.edu/halsall/mod/montagu-smallpox.asp>> (01/2025).
- Hardaker, Claire, Alice Deignan, Elena Semino, et al. 2023. "The Victorian Anti-Vaccination Discourse Corpus (VicVaDis): Construction and Exploration". *Digital Scholarship in the Humanities* vol. 39, no. 1: 162-74. doi: 10.1093/llc/fqad075.
- Jaworska, Sylvia. 2021. "Investigating Media Representations of the Coronavirus in the UK, USA and Germany: What Can a Comparative Corpus-based Discourse Analysis Contribute to Our Understanding of the Covid-19 Pandemic?". In *Viral Discourse*, edited by Rodney H. Jones, 26-36. Cambridge: Cambridge University Press.
- Jenson, Jane. 2009. "Making Sense of Contagion: Citizenship Regimes and Public Health in Victorian England". In *Successful Societies: How Institutions and Culture Affect Health*, edited by Peter A. Hall and Michèle Lamont, 201-25. Cambridge: Cambridge University Press.
- Kata, Anne. 2010. "A Post-modern Pandora's Box: Anti-Vaccination Misinformation on the Internet". *Vaccine* vol. 28, no. 7: 1709-16.
- Klondrlik, Kristin E. 2020. "Conscientious Objection to Vaccination and Failure to Solidify Professional Identity in Late Victorian Socio-medical Journals". *Victorian Periodicals Review* vol. 53, no. 3: 338-71.
- Liu, Yufeng, and Dechao Li. 2025. "War, Tool, Race or Building? A Comparison of Vaccine Metaphors between (Translated) Media and Scientific Reports in the Age of COVID-19". *Journalism* vol. 26, no. 1: 128-48.
- McEnery, Tony, and Andrew Wilson. 2001 [1996]. *Corpus Linguistics: An Introduction*. Edinburgh: Edinburgh University Press.
- Phillips, Martin. 1985. *Aspects of Text Structure: An Investigation of the Lexical Organisation of Text*. Amsterdam-New York-Oxford: North-Holland.
- Porter, Dorothy, and Roy Porter. 1988. "The Politics of Prevention: Anti-Vaccinationism and Public Health in Nineteenth-century England". *Medical History* vol. 32, no. 3: 231-52. doi: 10.1017/S0025727300048225.
- Semino, Elena. 2021. "'Not Soldiers but Fire-fighters': Metaphors and Covid-19". *Health Communication* vol. 36, no. 1: 50-58. doi: 10.1080/10410236.2020.1844989.
- Stewart, Alexandra J., and Philip M. Devlin. 2006. "The History of the Smallpox Vaccine". *Journal of Infection* vol. 52, no. 5: 329-34.
- Stubbs, Michael. 2002 [2001]. *Words and Phrases: Corpus Studies of Lexical Semantics*. Oxford: Blackwell.
- Swales, John D. 1992. "The Leicester Anti-Vaccination Movement". *Lancet* vol. 340, no. 8826: 1019-21.
- Tafari, Silvio, Serena M. Gallone, Maria Giovanna Cappelli, et al. 2014. "Addressing the Anti-Vaccination Movement and the Role of HCWs". *Vaccine* vol. 32, no. 38: 4860-65.
- Tognini-Bonelli, Elena. 2001. *Corpus Linguistics at Work*. Amsterdam-Philadelphia: John Benjamins.
- Weber, Thomas P. 2010. "Alfred Russel Wallace and the Antivaccination Movement in Victorian England". *Emerging Infectious Diseases* vol. 16, no. 4: 664-68. doi: 10.3201/eid1604.090434.
- Williamson, Stanley. 2007. *The Vaccination Controversy. The Rise, Reign and Fall of Compulsory Vaccination for Smallpox*. Liverpool: Liverpool University Press.
- Yang, Jennifer. 2014. "Contemporary Debates on Vaccination Policies Have Historical Parallels in Ransom Center's Collections". *Ransom Center Magazine*. <<https://sites.utexas.edu/ransomcenter-magazine/2014/10/16/vaccination-policies/>> (01/2025).

Software

Brezina, Vaclav, and William Platt. 2024. *#LancsBox X 4.0.0*. Lancaster: Lancaster University.