

Article

Impact of the Cholera Epidemic of 1867–1868 on the Global Excess Deaths of the Resident Population in the Province of Córdoba

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Abstract: Cholera, a disease originating in India, until the beginning of the 19th Century had rarely manifested itself in the West. The disease arrived in Argentina for the first time in an epidemic form in 1859. Since that date, cholera has entered the country on other occasions and spread to the interior, causing serious disorders, which sometimes added to other tragic events, such as the War of Paraguay or the yellow fever epidemic. The aim of this study was to calculate the excess deaths associated with the cholera epidemic from 1867 to 1868 in the province of Córdoba, a population of more than 175,000 inhabitants. Parish data on excess deaths precisely respond to this need. The excess mortality associated with the cholera epidemic was calculated as being seven times higher than the previous year; that is, the number of deaths from the disease was 1767 cases in the province of Córdoba. During the peak of the disease, in January 1868, mortality rose to 12.2 times higher. Excess deaths are an essential measure to monitor the impact of the epidemic.

Keywords: cholera; epidemic; pandemic; Córdoba; Argentina; Latin America



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1. Introduction

Cholera is a great and fabled pandemic disease which for centuries has horrified humans [1]. Descriptions of a disease thought to be cholera are found in Sanskrit in as early as the 5th Century BC, and the disease has existed on the Indian subcontinent for centuries [2]. In 1817, cholera spread beyond the Indian subcontinent and there were six world-wide cholera pandemics between 1817 and 1923 [3]. The cause of cholera, *Vibrio cholerae*, was detected and described by Robert Koch in a report from Alexandria 1883, when he was sent out as a leader of a commission to Egypt and India to investigate the cause of cholera in 12 patients admitted to a Greek, a German, and an Egyptian hospital [4]. The patients were children and adults from Germany, Austria, Greece, Nubia, and Turkey. He detected the cholera vibrio by microscopy, in cultures of rice-water-like stools and the intestinal contents of the patients, but he found no spread to their blood or organs. Plagues, pestilence, and disease constitute fertile terrain for problematizing, evoking, and representing sociocultural issues. The literature contains innumerable pages on conditions; notably cholera [5]. The contextualization of these extraordinary events has sparked interest and led to a variety of differing hypotheses. During the second half of the 19th Century and the beginning of the 20th Century, Argentina was hit by different epidemics that triggered important economic, social, demographic, and health impacts.

Cholera is a rare disease with a serious prognosis which, until the 19th Century, implied almost certain death due to a lack of medication [6]. The invention of the steam engine was the starting point of the Industrial Revolution, transforming society and, in turn, the way of moving [7]. Consequently, the steamship and the locomotive were developed, developing the speed of communications and, at the same time, the contact of Europe with peripheral countries [8].

Cholera, with its rapid onset and violent, definitive symptoms, was linked to migrations, ports, contaminated water, lack of sanitation, a certain moral debility, and poverty in

the populations affected [9]. Cholera was one of the main diseases that spread due to these processes. Previously, the reservoir of the choleric disease had been found in the Ganges, with the impossibility of expanding since the carriers died shortly after contracting the infection [10]. In this way, the disease was isolated to its area of origin. However, the steam locomotive caused the displacement of the infected, and consequently, the spread of the epidemic throughout the Mediterranean and the West [11].

During the development of the world economy, contagious endemic diseases and, above all, epidemics, continued to be a source of death in the European population and, from the 16th Century onwards, in American populations. It is important to note that these deaths were closely related to the living conditions of the population, economic flows, and wars [12].

In Argentina, cholera epidemics had a great impact on the population, generating mortality crises aggravated by hygienic conditions and lifestyle. This motivated the state and Argentine medicine to become concerned about health problems that led to a “social issue” [13].

It is probable, according to the consensus of most historians, that the first cholera epidemic occurred in the city of Bahía Blanca, in January 1856. The Bahian epidemic did not have the repercussions and magnitude of the other attacks of the disease, due to being located far from other populations [14].

The second appearance of cholera took place between 1867 and 1869, during the development of the Paraguayan War [15]. In 1867, cholera had invaded the cities of Buenos Aires, Rosario, Corrientes, and Entre Ríos, and also impacted the army installed in the Argentine Northeast as a result of the war with Paraguay, taking a few more months to reach the province of Córdoba [16]. Although cholera was raging in other provinces, the population and the state of Córdoba had taken some precautions [17]. Despite forecasts (an observation lazaretto had been installed in Río Segundo), in December 1867, cholera made its entry into the territory of the province of Córdoba: on 6 December there were some cases in the town of Villa Nueva and Villa María, and on 16 December it invaded the city of Córdoba [18].

The outbreak reached the city of Córdoba from the east, starting in Rosario and San Nicolás in the summer of 1867. Located 700 km from Buenos Aires on the margins of the Pampas region, Córdoba was devastated for a year from a demographic perspective. At that time, the province of Córdoba had a population of over 200,000 people (>35,000 in the city of Córdoba) distributed over a provincial area of 165,310 km².

Although there are no reliable data on its consequences, it can be calculated that approximately 8% of the population of the city of Córdoba died as a result of cholera, and between 2 and 3% of the province as a whole. The case of the town of Totoral stands out due to its high mortality. Garzón Maceda proposes that the epidemic lasted almost a month; with the first case diagnosed on 15 December 1867, and the last case diagnosed on 19 January 1868, with the campaign ending on the 27th of the same month. During that month, cholera caused terror in the population, and escapes and processions were the strategies used by individuals to save themselves from the disease [13].

Due to the limitations of medicine and the state at that time, the reports of this disease were approximate, including similar pathologies that aroused suspicion of cholera [19]. The excess mortality associated with the epidemic is a measure used to quantify the direct and indirect effects of the epidemic [20]. Excess mortality is understood as the difference between the total number of deaths estimated for a given place and a given period, and the number that would be expected in the absence of the epidemic (hypothesis without cholera) [21]. Accurate measurements of death are also needed to understand the determinants of variation in the infection–fatality ratio across populations, and are a direct input into forecasting the pandemic and investigating alternative policy options [22]. This difference not only includes direct deaths from the epidemic, but also deaths from secondary effects on health systems and society [23].

The objective of this study was to calculate the excess mortality associated with the cholera epidemic from 1867 to 1868 in the province of Córdoba.

2. Materials and Methods

Due to the diagnostic limitations of the medicine of the time, excess deaths [24] are needed as an essential measure to monitor the impact of the cholera epidemic in the province of Córdoba from 1867 to 1868.

Specifically, for estimates of excess mortality, the model uses relationships that have been quantified using data from parishes with high-quality data reporting systems [25]. Parish records on excess mortality precisely respond to this need.

The methodology used for this work consisted of reviewing primary sources:

- Consultation of the death certificates of the parishes of the province of Córdoba, excluding the city of Córdoba. Three periods were determined: (1) pre-epidemic 1866–1867 (December–January–February); epidemic 1867–1868 (December–January–February); and post-epidemic 1868–1869 (December–January–February).
- In cases of incomplete information (age, marital status, etc.), baptism or marriage certificates were consulted to verify the information.
- The data crossed with those of the 1869 census were analyzed to control the social conditions of the territory.

It is not within the scope of this study to describe the national information systems and the solutions adopted. However, the proposed approach can help resolve the misunderstanding around the differences between total death data and estimates of relative deaths, and can lead to similar analyses in regions of the country and provide useful information to build a common platform for discussion and intervention. Given the difficulties in using reported data on cholera cases and deaths, excess mortality is considered a more objective and verifiable measurement that considers the direct and indirect effects of the epidemic.

3. Results

Epidemiological Characteristics of Cholera in the Province of Córdoba

Table 1 shows the cases of death associated with the cholera epidemic in the province of Córdoba from 1867 to 1868, distributed across the months of the epidemic and compared to the season before and after the disease. The excess mortality associated with the cholera epidemic was calculated seven times higher than the previous year; that is, the number of deaths from the disease was 1772 cases in the province of Córdoba. During the peak of the disease, in January 1868, mortality was 12.2 times higher.

Table 1. Mortality associated with the cholera epidemic in the province of Córdoba from 1867 to 1868.

Month	Pre-Cholera 1866/7	Cholera 1867/8	Post-Cholera 1868/9
December	114	225	94
January	113	1377	87
February	67	464	47
Total	294	2066	228

Table 2 shows the development of the disease in percentages of cases of death in provincial mortality. For example, in the cases of Río Cuarto, Villa del Rosario, or Santa Rosa de Río Primero, the percentage of mortality is relatively similar as in non-epidemic situations, despite the growth in the number of cases of deaths during the epidemic; the percentage of deaths related to the provincial level remained without statistically significant variations concerning provincial mortality. The same happens in the cases of Villa Ascasubi and San Agustín, where it is evident that, while mortality increased 3.5 times during the epidemic, the percentage of deaths related at the provincial level decreases from 4.1–5.8% to 2.1–3.0% in terms of provincial mortality, respectively.

Table 2. Percentage of deaths according to the distribution by parishes.

Parish	Pre-Cholera 1866/7		Cholera 1867/8		Post-Cholera 1868/9	
	n	%	n	%	n	%
Achiras	6	2.0	43	2.1	1	0.4
Alta Gracia	-	-	167	8.1	8	3.5
Bell Ville	15	5.1	83	4.0	16	7.0
Cosquín	3	1.0	47	2.3	1	0.4
Dean Funes	-	-	33	1.6	-	-
Jesús María	6	2.0	55	2.7	-	-
Río Cuarto	57	19.4	399	19.3	33	14.5
Salsacate	11	3.7	1	0.0	21	9.2
San Agustín	17	5.8	61	3.0	1	0.4
San Bartolomé	5	1.7	20	1.0	15	6.6
San Carlos Minas	13	4.4	15	0.7	1	0.4
San Francisco del Chañar	12	4.1	12	0.6	3	1.3
Santa Rosa de Río Primero	34	11.6	201	9.7	26	11.4
Tegua	2	0.7	62	3.0	3	1.3
Totalal	20	6.8	212	10.3	13	5.7
Tulumba	13	4.4	29	1.4	3	1.3
El Tío	8	2.7	123	6.0	13	5.7
Villa Ascasubi	12	4.1	43	2.1	13	5.7
Villa del Rosario	46	15.6	296	14.3	28	12.3
Villa María	4	1.4	24	1.2	4	1.8
Villa Nueva	10	3.4	140	6.8	25	11.0
Total, n	294		2066		228	

In the epidemic period, in the province of Córdoba, the mortality of women was 47.6%, a decrease of 3% compared to the non-epidemic period. When considering the marital status of the population, it was shown that 35.6% of the cases of death were married, compared to the pre- (21.9%) and post-epidemic (26.1%) periods. Considering the age (mean, standard deviation, SD) for cases of death, it was 27 ± 23.5 years during the epidemic period, compared to 18 ± 23.7 and 20 ± 23.4 years in the pre- and post-epidemic periods, respectively (Table 3).

Table 3. Baseline demographics.

	Pre-Cholera 1866/7	Cholera 1867/8	Post-Cholera 1868/9
Gender, woman %	50.7%	47.7%	50%
Marital status, married %	21.9%	35.5%	26.1%
Age, mean (SD)	18 ± 23.7	27 ± 23.5	20 ± 23.4

4. Discussion

Throughout our historiography, the need to study certain past problems that, when observed in contemporary terms, become key central themes, has been recently evidenced with greater intensity. The present work wishes to respond to this need, since, although in the historiographical field the history of health and disease has experienced considerable growth, over the decades these works were carried out by doctors, which offered little historical, sociological, and anthropological discussion concerning the analysis of the problems suffered by the population. Our results consolidate historical accounts of pandemic cholera with data to show the importance of local lineages, presenting an integrated view of cholera that is important to the design of future disease control strategies. In 2010, Carbonetti expressly mentioned that “in the mid-1970s and 1980s, a renewal of all disciplines related to the social sciences would take place in Latin America. This renewal involved addressing new issues and problems about societies, that is, about their past and present” [13]. Understanding the true mortality impact of the cholera epidemic is crucial for public health decision-making.

The objective of this study was to calculate the provincial excess mortality associated with cholera from 1867 to 1868. Cholera epidemics occupy a privileged place in this scenario because, at the end of the 20th Century, they made their reappearance in Latin America [26]. With comparison to the COVID-19 pandemic, the WHO [23] does not always receive the complete morbidity figures attributable to COVID-19 [27]. These underestimates are explained by factors such as the failure to carry out diagnostic tests on all the deceased, the definition of each country of “death from COVID-19”, and not including indirect deaths due to the overload of health systems or the fear of becoming infected from patients by going to health centers [28].

The highest ratios of excess deaths to reported cholera deaths were observed in Tio and Villa Nueva (east-Córdoba). These high ratios are unlikely to be fully explained by dramatic increases in other causes of death during the epidemic, and must at least partly be related to a paucity in extensive testing, medical practices, or state guidance on what should count as a death from cholera.

Some countries have recorded a lower than expected total number of deaths during the pandemic, due to restrictions on interpersonal contact and mobility. This has led to a reduction in mortality related to infectious diseases, as well as a decrease in deaths related to transport and injuries [29–32]. Reported mortality figures from COVID-19 do not reflect these factors [33]. Taking into account the difficulties of using data reported on cholera cases at the time or of current COVID-19 and deaths caused by this disease, excess mortality is considered to be a more objective and verifiable measure that takes into account the direct and indirect effects of the epidemic/pandemic [34]. The conditions which favor development of epidemics and pandemics are: (a) growing populations living in megacities that facilitate rapid spread of infections; (b) humans living close to domesticated and wild animals which facilitate zoonotic microbes to adapt to humans and become infective, and also the intensive husbandry of food animals and food birds which facilitate the spread of zoonotic microbes between the animals and birds, and further to the farmers and consumers; (c) intensive and fast national and international travel and migration which facilitate a local epidemic to become a pandemic; (d) wars and natural disasters which destroy the infrastructure and hygienic conditions, and generate refugees in overpopulated refugee camps; and (e) change of climate, which leads to migration of people and intermediate hosts such as mosquitoes and their microbes [35,36].

The WHO uses statistical modeling in all its global health estimates, often with the advice of technical experts, to ensure that robust statistical standards are followed and to facilitate global comparability [24]. This is the usual approach followed by other United Nations agencies to make global estimates as well. The model that has been adopted to estimate excess mortality does not respond to a universal approach [37]. That is why, for excess mortality, we calculate the difference between the total number of estimated deaths (based on pre- and post-cholera data) for the province of Córdoba, and a specific period determined by the state of the period, which we call the epidemic period. This difference is assumed to include deaths directly attributable to the epidemic.

The cholera epidemic left a very strong mark on Argentine society, and especially on Córdoba, since it was devastating in demographic and social terms. It can be seen that cholera not only generated action by the state and medicine against the disease, but also became an element for the development of all kinds of transactions to generate salvation against the epidemic. The development of the disease in the entire area of the Argentine coast and the setting of the war with Paraguay, coinciding with outbreaks in Brazil and Uruguay during the year 1867, generated great fear in city populations. It was a little-known and strange ailment that produced spectacular symptoms before death, and doctors did not reach an agreement about its spread, origin, or lethality. Faced with these fears, recipes and articles that were intended to prevent anxiety began to appear in the only newspaper in Córdoba. Many of these products, potions, etc., were related to the conceptions about how the disease was transmitted and circulated in popular culture [13].

The appearance of cholera in Argentina coincided with the moment the state was in the process of being formed. Adrián Carbonetti delved into the historiography of Córdoba, to consider various features of the development of this disease toward the end of the 19th Century, and showed that there was a tendency to understand the incidence of cholera epidemics in the institutional and political contexts of the period, and that State structures would be considered weak, mainly in the health sector, while the medical elite was still at the peak of consolidating its power [38]. Throughout his investigative work, Carbonetti resorted to unpublished sources from the Historical Archive of the Province of Córdoba, together with other published sources, such as the Compilation of Laws and Decrees of the Province of Córdoba, articles from the press of the time (*El Porvenir* and *El Eco de Córdoba*), as well as specialized medical journals (such as the *Revista Médico Quirúrgica*) [13].

Carbonetti also studied the tensions and conflicts that took place inside and outside the Cordovan state between the different agents who undertook to combat the appearance of the first epidemic outbreak of cholera in 1867. This concept was developed by Evans, who explained the role of the epidemic as a source of social and political conflict and tension.

On the one hand, this focused on the emergence of social issues as part of the country's modernization process, as well as one of the main concerns of the Creole elite. On the other hand, it exhibited the presence of conflicts within the state, due to the antagonisms developed between different organizations that intended to act against the epidemic. Conflicts arose as a result of an unclear delimitation of their functions, or due to divergences regarding the strategies to be implemented to combat the disease. There was a difference of opinion between the Hygiene Commission (made up of qualified doctors) and the police; between the Church and the state, to achieve a monopoly on the treatment of the disease; between citizens for private reasons and between doctors and the state, in addition to the pre-epidemic tensions between citizens and the state itself.

At the height of his research work, the author focused on the variety of cholera preservative and curative products shown by the written press at the time of the first epidemic outbreak of this disease [4], considering the value and sense of security offered by the study of these "goods", since society had to assume certain strategies to prevent or cure this disease that threatened with its proximity to death. The author considered the hypothesis that the products offered were intended for the sectors of the population with the greatest economic power, and that these products did not constitute normal commercial transactions for the population in non-epidemic circumstances. Added to the existence of these products was the relevance of offering rooms for those who wished to flee the city, as well as efforts to divert the reader's attention to issues unrelated to the development of the disease. The response to the cholera pandemics of the 19th Century led to the development of systems to provide safe water and adequate sanitation; but 1 billion people still lack access to safe water and remain at risk of cholera today [39]. Continued progress in providing safe water and adequate sanitation is a Millennium Development Goal, but may take decades to achieve [40]. During a cholera outbreak, the major response should focus on case detection, rehydration-based treatment, and provision of safe water, in conjunction with adequate sanitation, hand-washing, and safe food preparation. These goals have been used for decades in areas that remain at risk for cholera, without reducing the ongoing impact of this disease, suggesting that consideration of additional control strategies, such as vaccination, is warranted [41].

The study has some limits, as any model is an approximation of reality. The models are subject to trade-offs, not least of which is the balance between completeness and understandability. The estimates in this study of the excess mortality associated with the 1867–1868 cholera epidemic in the province of Córdoba are also approximations. Specifically, for estimates of excess mortality, the model uses relationships that have been quantified using data from parishes with high-quality data reporting systems.

Epidemics must be understood as something more than the natural spread of disease since they cannot be considered as isolated events; rather, they should be considered as

conjunctural processes that begin when their existence is officially announced, to subsequently show a process of socialization and forms a new daily life. On the other hand, the risk of the appearance of old or new epidemics is latent and can even increase in the face of countless circumstances, as is currently considered. The great diseases show devastating scenarios, which force society to rethink ethical, individual, and collective actions to be supported, thereby guaranteeing the development of fairer societies free from the dividing lines between their different social strata [42]. It can be said that, true to our species, although epidemics may be treated with new and better medicines, we will continue to need each other. According to these conditions, it is likely that new pandemics [43] caused by mutated or recombined avian and swine influenza viruses will occur, and that new SARS-CoV-2 mutants or other zoonotic coronaviruses from bats also will be able to cause pandemics in the future. There are, however, several other infections which have caused smaller and larger epidemics, which until now did not become pandemics.

5. Conclusions

In this paper, the prevalence of excess mortality due to cholera was analyzed. The estimates of excess mortality associated with the cholera epidemic provide a valuable set of comparable estimates by region to better understand the impact of the epidemic. Therefore, it is vitally important that these estimates are made promptly available and regularly updated to recognize inequalities and gaps in health information, civil registration, and vital statistics systems, which will help determine the potential future vulnerabilities and target interventions.

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References

1. Midtvedt, T. Cholera. *Tidsskr. Den Nor. Laegeforening* **1992**, *112*, 1811.
2. Harris, J.B.; LaRocque, R.C.; Qadri, F.; Ryan, E.T.; Calderwood, S.B. Cholera. *Lancet* **2012**, *379*, 2466–2476. [[CrossRef](#)]
3. Clemens, J.D.; Nair, G.B.; Ahmed, T.; Qadri, F.; Holmgren, J. Cholera. *Lancet* **2017**, *390*, 1539–1549. [[CrossRef](#)]
4. Kanungo, S.; Azman, A.S.; Ramamurthy, T.; Deen, J.; Dutta, S. Cholera. *Lancet* **2022**, *399*, 1429–1440. [[CrossRef](#)]
5. Pascual, C.M. The cholera epidemic as condenser of meanings: Urban cultures, clinical narratives, and hygiene policies in Rosario, Argentina, 1886–1887. *Hist. Cienc. Saude-Manguinhos* **2017**, *24*, 295–311. [[CrossRef](#)]
6. Hoiby, N. Pandemics: Past, present, future: That is like choosing between cholera and plague. *Apmis* **2021**, *129*, 352–371. [[CrossRef](#)]
7. Mercer, A. Protection against severe infectious disease in the past. *Pathog. Glob. Health* **2021**, *115*, 151–167. [[CrossRef](#)]
8. Agüero, A.L.; Isolabella, M. El cólera en la argentina durante el siglo XIX. *Rev. Argent. De Salud Pública* **2018**, *9*, 51–54.
9. Ganin, V.S. Cholera and war. *Voen. Meditsinskii Zhurnal* **2009**, *330*, 83–88.
10. Lippi, D.; Gotuzzo, E.; Caini, S. Cholera. *Microbiol. Spectr.* **2016**, *4*, 1–6. [[CrossRef](#)]
11. Stephane, B.; Even, P. A predicted epidemic. The appearance of cholera in 1832 in southwest France. *Hist. Des Sci. Med.* **2009**, *43*, 417–428.
12. Nadal, J. Bautismos, Desposorios y Entierros: Estudios de Historia Demográfica. *Rev. de Econ. Apl.* **1992**, *1*, 219–228.
13. Carbonetti, A. Cólera y conflicto en la ciudad de Córdoba, Argentina (1867–1868). *Boletín Mex. De Hist. Y Filos. De La Med.* **2007**, *10*, 71–78.
14. Fiquepron, M.R. Places, attitudes and moments during the epidemics: Representations of yellow fever and cholera in the city of Buenos Aires, 1867–1871. *Hist. Cienc. Saude-Manguinhos* **2018**, *25*, 335–351. [[CrossRef](#)]
15. Lockwood, J.A. Insects as weapons of war, terror, and torture. *Annu. Rev. Entomol.* **2012**, *57*, 205–227. [[CrossRef](#)]
16. da Mota Gomes, M. Historical Features Regarding the Neuropathic Outbreaks in Brazilian Troops in the Paraguayan War. *Wilderness Environ. Med.* **2021**, *32*, 385–391. [[CrossRef](#)]
17. Aulet, O.; Silva, C.; Fraga, S.G.; Pichel, M.; Cangemi, R.; Gaudio, C.; Porcel, N.; Jure, M.A.; de Castillo, M.C.; Binsztein, N. Detection of viable and viable nonculturable *Vibrio cholerae* O1 through cultures and immunofluorescence in the Tucuman rivers, Argentina. *Rev. Da Soc. Bras. De Med. Trop.* **2007**, *40*, 385–390. [[CrossRef](#)]

18. Carbonetti, A.; Rodriguez, M. Las epidemias de cólera en Córdoba a través del periodismo: La oferta de productos preservativos y curativos durante la epidemia de 1867–1868. *História Ciências Saúde-Manguinhos* **2007**, *14*, 405–419. [[CrossRef](#)]
19. Lyngge, E.; Holmager, T.L. Excess mortality in the Lolland-Falster region in Denmark is associated with migration. *Ugeskr. Laeger* **2021**, *183*, V05210399.
20. Bottcher, L.; D’Orsogna, M.R.; Chou, T. Using excess deaths and testing statistics to determine COVID-19 mortalities. *Eur. J. Epidemiol.* **2021**, *36*, 545–558. [[CrossRef](#)]
21. Elimian, K.; Yennan, S.; Musah, A.; Cheshi, I.D.; King, C.; Dunkwu, L.; Mohammed, A.L.; Ekeng, E.; Akande, O.W.; Ayres, S.; et al. Epidemiology, diagnostics and factors associated with mortality during a cholera epidemic in Nigeria, October 2020–October 2021: A retrospective analysis of national surveillance data. *BMJ Open* **2022**, *12*, e063703. [[CrossRef](#)]
22. COVID-19 Excess Mortality Collaborators. Estimating excess mortality due to the COVID-19 pandemic: A systematic analysis of COVID-19-related mortality, 2020–2021. *Lancet* **2022**, *399*, 1513–1536. [[CrossRef](#)]
23. Organización Mundial de la Salud. Exceso Mundial de Mortalidad Asociado a la Pandemia de COVID-19. Available online: <https://www.who.int/es/news-room/questions-and-answers/item/global-excess-deaths-associated-with-the-COVID-19-pandemic> (accessed on 10 October 2022).
24. Giudicessi, J.R. Excess out-of-hospital sudden deaths during the COVID-19 pandemic: A direct or indirect effect of SARS-CoV-2 infections? *Heart Rhythm* **2021**, *18*, 219–220. [[CrossRef](#)]
25. Evans-Mesa, R. Carga global de enfermedad: Breve revisión de los aspectos más importantes. *Rev. Hispanoam. De Cienc. De La Salud* **2015**, *1*, 107–116.
26. Kelly, B.D. Plagues, pandemics and epidemics in Irish history prior to COVID-19 (coronavirus): What can we learn? *Ir. J. Psychol. Med.* **2020**, *37*, 269–274. [[CrossRef](#)]
27. Global Burden of Disease Health Financing Collaborator Network. Tracking development assistance for health and for COVID-19: A review of development assistance, government, out-of-pocket, and other private spending on health for 204 countries and territories, 1990–2050. *Lancet* **2021**, *398*, 1317–1343. [[CrossRef](#)]
28. Domman, D.; Quilici, M.L.; Dorman, M.J.; Njamkepo, E.; Mutreja, A.; Mather, A.E.; Delgado, G.; Morales-Espinosa, R.; Grimont, P.A.D.; Lizarraga-Partida, M.L.; et al. Integrated view of *Vibrio cholerae* in the Americas. *Science* **2017**, *358*, 789–793. [[CrossRef](#)]
29. Gerolamo, M.; Penna, M.L. Cholera and living conditions, Brazil. *Rev. De Saude Publica* **2000**, *34*, 342–347. [[CrossRef](#)]
30. Kodama, K.; Pimenta, T.S.; Bastos, F.I.; Bellido, J.G. Slave mortality during the cholera epidemic in Rio de Janeiro (1855–1856): A preliminary analysis. *Hist. Cienc. Saude-Manguinhos* **2012**, *19* (Suppl. 1), 59–79. [[CrossRef](#)]
31. Olsvik, O. The cholera epidemic in Latin America. *Tidsskr. Den Nor. Lægeforen.* **1992**, *112*, 1843–1846.
32. Tickner, J.; Gouveia-Vigeant, T. The 1991 cholera epidemic in Peru: Not a case of precaution gone awry. *Risk Anal. Int. J.* **2005**, *25*, 495–502. [[CrossRef](#)] [[PubMed](#)]
33. Matta, S.; Chopra, K.K.; Arora, V.K. Morbidity and mortality trends of COVID-19 in top 10 countries. *Indian J. Tuberc.* **2020**, *67*, S167–S172. [[CrossRef](#)] [[PubMed](#)]
34. Santos, A.M.D.; Souza, B.F.; Carvalho, C.A.; Campos, M.A.G.; Oliveira, B.; Diniz, E.M.; Branco, M.; Queiroz, R.C.S.; Carvalho, V.A.; Araujo, W.R.M.; et al. Excess deaths from all causes and by COVID-19 in Brazil in 2020. *Rev. De Saude Publica* **2021**, *55*, 71. [[CrossRef](#)] [[PubMed](#)]
35. Davies, H.G.; Bowman, C.; Luby, S.P. Cholera—Management and prevention. *J. Infect.* **2017**, *74* (Suppl. 1), S66–S73. [[CrossRef](#)]
36. Naruszewicz-Lesiuk, D.; Stypulkowska-Misiurewicz, H. Past and present history of cholera epidemics. Hundred years of operation of National Institute of Hygiene for the prevention and control of cholera. *Prz. Epidemiol.* **2017**, *71*, 661.
37. Moryson, W.; Stawinska-Witoszynska, B. Excess Mortality of Males Due to Malignant Lung Cancer in OECD Countries. *Int. J. Environ. Res. Public Health* **2021**, *18*, 447. [[CrossRef](#)]
38. Carbonetti, A. Medicalización y cólera en Córdoba a fines del siglo XIX. Las epidemias de 1867–68 y 1886–87. *Anu. De Hist. Reg. Y De Las Front.* **2016**, *21*, 285.
39. Farmer, P.; Almazor, C.P.; Bahnsen, E.T.; Barry, D.; Bazile, J.; Bloom, B.R.; Bose, N.; Brewer, T.; Calderwood, S.B.; Clemens, J.D.; et al. Meeting cholera’s challenge to Haiti and the world: A joint statement on cholera prevention and care. *PLoS Negl. Trop. Dis.* **2011**, *5*, e1145. [[CrossRef](#)]
40. Ryan, E.T. The cholera pandemic, still with us after half a century: Time to rethink. *PLoS Negl. Trop. Dis.* **2011**, *5*, e1003. [[CrossRef](#)]
41. Ivers, L.C.; Farmer, P.; Almazor, C.P.; Leandre, F. Five complementary interventions to slow cholera: Haiti. *Lancet* **2010**, *376*, 2048–2051. [[CrossRef](#)]
42. Armus, D. La enfermedad en la historiografía de América Latina Moderna. *Cuad. De Hist. Ser. Econ. Y Soc.* **2000**, *3*, 7–25. [[CrossRef](#)]
43. Piret, J.; Boivin, G. Pandemics Throughout History. *Front. Microbiol.* **2020**, *11*, 631736. [[CrossRef](#)]