The Place to Heal and the Place to Die. Patients and Causes of Death in Nineteenth-Century Venice

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Renzo Derosas - Cristina Munno

Abstract. In this article, we used individual-level death records to highlight the main features of mid nineteenth-century Venetian hospitals. At that time the medicalization of hospitals was well under way, the health system had been radically transformed, and new hospitals had been created. The main city hospital, in particular, had up to 1,400 beds, a large medical staff, and a rational structure, all aimed to ensure the best therapeutic practices. By contrasting hospital deaths with those that occurred at home, we ask whether the patterns seen reflect the modernization of the hospital system. Our results show that, on the one hand, those admitted to hospital were mostly poor, elderly, and from outside the city, with little or no support at home, leading us to suspect that social conditions, rather than medical conditions, were more likely to determine whether a person would be hospitalised. On the other hand, there were differences in the causes of death occurring at home and in the hospital, suggesting that doctors in the latter were pursuing some therapeutic specialisation, which attracted also patients of better social standing. Notwithstanding the deep transformation that took place in the nineteenth century, the Venetian experience confirms that the coexistence and interdependency of care and cure are permanent features of hospital history.

KEYWORDS: hospital history; hospital population; medicalization; causes of death; Venice; nineteenth-century.

1. INTRODUCTION

Although only a shadow of its former glory, in the mid nineteenth century Venice was still one of the largest Italian cities, with over 130,000 inhabitants. Each year, there were about 4,000 births and a similar number of deaths. Mortality was above 30 per thousand, among the highest in urban Europe and second only to Naples in Italy. Infant mortality took the heaviest toll, ranging from 20 per cent in the richest parishes to above 30 per cent in the poorest. High mortality on the one hand, and low fertility, nuptiality, and immigration on the other, concurred to the social and economic stagnation the city experienced throughout the nineteenth century.[1]

In this article, we ask where and why Venetians died. More precisely, we contrast the deaths that happened at home with those that happened in the city's main hospital and in other institutions. In the 1870s, hospital deaths made up more than a third of all deaths in Venice. Between 1874 and 1880, 25 per cent of all deaths happened in the city's main hospital and a further 15 per cent in its other hospitals and public institutions.[2] In this respect, Venice was far from unique. At around the same time, the burden of institutional

[1] Notwithstanding a certain improvement, in the early 1900s infant mortality was still above 20 per cent, the highest in Italy and only below Berlin and Moscow in Europe: Renzo Derosas, 'La demografia dei poveri. Pescatori, facchini e industrianti nella Venezia di metà Ottocento', in Stuart J. Woolf, ed, *Storia di Venezia. L'Ottocento e il Novecento, 1797-1918* (Roma: Istituto della Enciclopedia Italiana), VIII: 727. Derosas, 'Suspicious Deaths: Household Composition, Infant Neglect, and Child Care in Nineteenth-Century Venice'. *Annales de Démographie Historique*, 123, 2012, 241; Municipio di Venezia, Giunta Comunale di Statistica, *Statistica del settennio 1874-80* (Venezia: Antonelli, 1881), 34-35.

[2] *Ibid*., CLXII.

mortality in urban Spain ranged from 20 to 40 per cent of all deaths.[3] In London, institutional deaths rose from 16 per cent of total deaths in 1861 to 48 per cent in 1920.[4]

Albeit often neglected in standard demographic analyses, hospitals played a central role in urban mortality, although opinions differ on their exact impact. According to McKeown and Brown, the evidence on 'the contribution of hospitals to reduction of mortality … is far from reassuring'. Cherry suggested instead that, despite their limits, English Voluntary General Hospitals had a positive impact on overall mortality in their local areas, especially in the late eighteenth and early nineteenth centuries. Ramiro Fariñas argued that, by attracting sick people from the countryside, hospitals artificially raised urban mortality rates. However, by sending sick in-migrants back to their place of origin, hospitals may also have contributed to increasing mortality in rural communities.[5]

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[3] Diego Ramiro Fariñas, 'Mortality in Hospitals and Mortality in the City in Nineteenth- and Twentieth-Century Spain: The Effect on the Measurement of Urban Mortality Rates of the Mortality of Outsiders in Urban Health Institutions', in John Henderson, Peregrine Horden and Alessandro Pastore, eds, *The Impact of Hospitals: 300-2000* (Bern: Peter Lang, 2007), 405.

[4] Bill Luckin and Graham Mooney, 'Urban History and Historical Epidemiology: the Case of London, 1860-1920', *Urban History*, 24, 1997, 47.

[5] Thomas McKeown and R. G. Brown, 'Medical Evidence Related to English Population Changes in the Eighteenth Century', *Population Studies,* 1955, 9(2), 124; Steven Cherry, 'The Hospitals and Population Growth, The Voluntary General Hospitals, Mortality and Local Populations in the English Provinces in the Eighteenth and Nineteenth Centuries', *Population Studies,* 1980*,* Part 2, 34(2), 260; Ramiro Fariñas, 'Mortality in Hospitals'; Catalina Torres, Vladimir Canudas-Romo, and Jim Oeppen, 'The Contribution of

In this article, we focus on the conditions of the deceased and the causes of their deaths: did the social and demographic profile of those dying in hospital differ from those dying at home or in other institutions? Were certain conditions more frequently treated in hospitals than at home? Both questions are relevant to the history of European hospitals, in a period when they were undergoing profound transformations, in a process generally referred to as the 'medicalization' of hospitals.

Our study is based on Venice's individual-level death records. They report basic information about the deceased (name, sex, age, birthplace, religion, marital status, and profession), the place of death, how long they were bed-ridden, the cause of death, and the name of the physician who signed the death certificate. We also used the city's population register to trace the household conditions of the deceased. We analysed all deaths recorded in two sample years: 1854 and 1869. In 1854, mortality soared due to a severe economic crisis exacerbated by cholera and measles outbreaks. In total, there were 4,852 deaths in the city that year. 1869 was a more 'normal' year, with only 3,681 deaths. By contrasting these two years, we tested whether and how different conditions affected the hospitals functioning and admission policies.

Our findings show that, on the one hand, hospital patients remained mostly elderly, poor, and those who had little or no support at home. On the other hand, hospitals were not just shelters providing undiversified relief to the destitute. They specialised in the treatment of specific groups of diseases, such as diseases of the cardiovascular system, cancers, and

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Urbanization to Changes in Life Expectancy in Scotland, 1861–1910', *Population Studies*, 2019, 15; Alice Reid, and Eilidh Garrett, 'Mortality, Work and Migration: A Consideration of Age-Specific Mortality from Tuberculosis in Scotland, 1861–1901', *Historical Life Course Studies,* 2018, 6 (Special issue 1), 111–132.

syphilis, whereas diseases of the respiratory tract and infectious diseases were more likely to be treated at home. We conclude that the intertwining of care and cure were a long lasting and enduring feature of hospital institutions.

The remainder of the article is organised as follows. In the next section, we discuss some relevant topics relating to the history of hospitals in general and their evolution in the nineteenth century. Section 3 briefly outlines the situation in Venice in the period under study. In section 4, we analyse the differences between those who died at home and those who died in hospital. Section 5 focuses on the causes of death amongst these two groups. In section 6, we summarize our findings, which indicate long-term continuity in the history of hospitals.

2. HOSPITAL HISTORY: CONTINUITY AND CHANGE.

In recent years, scholars have challenged several long held views in the history of hospitals. One such view is the idea that the 'medicalization' of these institutions was a process which radically transformed them from sites of shelter and segregation of the poor, the derelict and the marginal into places primarily focused on healing patients.[6] Michel Foucault famously set the origin of the modern hospital in the French revolution, viewing the change as a sort of big bang whereby hospital doctors obtained full control

[6] Guenter B. Risse, 'Medicalization: Hospitals Become Sites of Medical Care and Learning' (unpublished paper, March 2004); L. S. Jacyna, 'The Localization of Disease', in Deborah Brunton, ed, *Medicine Transformed: Health, Disease and Society in Europe 1800-1930* (Manchester: Manchester University Press, 2004), 5-9.

over their patients' bodies and their '*regard*' (perception, gaze) defined the new objects of medicine.[7]

This view of the emergence of the modern hospital is now generally rejected, although it is still often rehearsed and recycled. Nevertheless, an evolutionary narrative—centred on the increasing relevance of hospital doctors and the emergence of their therapeutic functions—is still a dominant paradigm in the literature.[8] Although opinions diverge widely on the timing and stages of this process, they tend to converge on "the underlying idea … that there has been a great 'before' and 'after' in hospital history; some pivotal period in

[7] Michel Foucault, *The Birth of the Clinic: An Archaeology of Medical Perception* (London: Routledge 2003; first published in 1963 by Presses Universitaires de France); Thomas Osborne, 'On Anti-Medicine and Clinical Reason', in Colin Jones and Roy Porter, eds, *Reassessing Foucault: Power, Medicine and the Body* (London and New York: Routledge, 2001), 28-47.

[8] Henry E. Sigerist, 'An Outline of the Development of the Hospital', *Bulletin of the History of Medicine*, 1936, 4, 573-81; Lindsay Granshaw and Roy Porter, eds, *The Hospital in History* (London: Routledge, 1989); Guenter B. Risse, *Mending Bodies, Saving Souls: A History of Hospitals* (Oxford: Oxford University Press, 1993); Othmar Keel, *L'avènement de la clinique moderne en Europe 1750-1815* (Montréal: Presses Universitaires de Montréal, 2001); Mary Lindemann, *Medicine and Society in Early Modern Europe* (Cambridge: Cambridge University Press, 1999), 120-154.

which charity gives way to medicine, care to cure, stigma to pride, the mortuary to the recovery room, the poor to the middle classes."[9]

Consistent with this view, hospitals prior to medicalization have been represented as veritable 'gateways to death'. This and similar expressions such as 'death traps', 'hellholes of death', and 'antechambers to the mortuary'[10] were familiar among horrified visitors and reformers until well into the nineteenth century, and were eventually adopted by scholars as apt keywords to summarize the excessive mortality experienced in hospitals. Hospitals were depicted as places that gave little or no hope to inpatients, to whom they constituted a permanent threat of cross-contamination, while also looming large over the health of the communities that hosted them. It was therefore understandable that people looked on admission to hospital as a final resort, to be avoided at all costs by those who could rely on care and support at home.[11]

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[9] John Henderson, Peregrine Horden and Alessandro Pastore, 'Introduction. The World of the Hospital: Comparisons and Continuities', in Henderson, Horden and Pastore, eds, *The Impact of Hospitals*, 32.

[10] Colin Jones, 'The Construction of the Hospital Patient in Early Modern France', in Norbert Finzsch and Robert Jütte, eds, *Institutions of Confinement*: *Hospitals, Asylums, and Prisons in Western Europe and North America, 1500-1950* (Cambridge: Cambridge University Press, 1996), 56; Lindemann, *Medicine and Society*, 160.

[11] Colin Jones, *The Charitable Imperative: Hospitals and Nursing in Ancien Regime and Revolutionary France* (London and New York: Routledge, 1989), 48-55; John Woodward, *To Do the Sick No Harm: A Study of the British Voluntary Hospital System to 1875* (London and Boston: Routledge and Kegan Paul, 1974); Katharine Park, 'Healing the Poor: Hospitals and Medical Assistance in Renaissance Florence', in Jonathan Barry and

An increasing amount of evidence belies this bleak picture. Pre-modern hospitals were certainly charitable institutions, where religious or ethical objectives took precedence over the practice of medicine, but the role of doctors and medicine was nevertheless central: charity and medicine were complementary rather than contradictory.[12] In Renaissance Florence, hospitals were organised in wards provided with pharmacies and libraries, and often undertook medical training. Patients sought to be admitted and belonged to all social strata, not just the poor.[13] Nor was this just the case in the wealthy capital cities of Renaissance Italy, such as Florence and Venice. In Treviso, a provincial town of around 10,000 inhabitants on the Venetian mainland, the local hospital—originally an alms-house for orphans, pilgrims, and the poor—'gradually developed an elaborate system of health care over the course of the fifteenth century, ranging from routine bathing to complex surgical procedures'. The hospital relied on 'a well-organized and well-staffed centralized system', with trained physicians and pharmacies.[14] Wealth obviously helped: the lay confraternity that administered the institution on behalf of the whole community was the

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Colin Jones, eds, *Medicine and Charity Before the Welfare State* (London: Routledge, 1991), 26-45; McKeown, *The Modern Rise of Population*; Eric M. Sigsworth, 'Gateway to Death? Hospitals and Mortality, 1700-1850', in Peter Mathias, ed, *Science and Society 1600-1900* (London: Cambridge University Press, 1972), 97-110.

[12] Jonathan Barry and Colin Jones, 'Introduction', in Barry and Jones, *Medicine and Charity*, 2.

[13] John Henderson, *The Renaissance Hospital: Healing the Body and Healing the Soul* (London: Yale University Press, 2006); Park, *Healing the Poor.*

[14] David Michael D'Andrea, *Civic Christianity in Renaissance Italy: the Hospital of Treviso, 1400–1530* (Rochester, NY: University of Rochester Press, 2007), 85, and chapter 4.

largest landowner within the province.[15] In sum, alongside the dismal hospital sites often recalled in the literature, there were also 'notable havens in which the best and most expensive of contemporary medicine was available free to patients'.[16]

Likewise, the received wisdom depicting extremely high patient mortality is rather exaggerated. In Renaissance Florence, only 5 to 12 per cent of hospital patients died while in hospital.[17] Studies of British hospitals in the eighteenth and nineteenth centuries consistently found mortality rates below 7 per cent.[18] Brändström and Broström found that in one county hospital in Sweden in the late nineteenth century mortality was 10.3 per cent. They also showed that there were large differences in survival, both before and after discharge, depending on the kind of diseases treated, with circulatory disorders being by far the most lethal.[19] Interestingly, Cherry too noticed a significant rise of hospital mortality

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[15] Renzo Derosas, 'The Villas in the Treviso Countryside in the First Half of the 16th Century. A Problem of Classification', *Revue Informatique et Statistique dans les Sciences Humaines*, 1997, 33, 31-78.

[16] Henderson, Horden and Pastore, 'Introduction', 19.

[17] Henderson, *The Renaissance Hospital, 252-261.*

[18] Eric M. Sigsworth, 'A Provincial Hospital in the Eighteenth and Early Nineteenth Centuries', *College of General Practitioners,Yorkshire Faculty Journal*, 1966, 31-36; Steven Cherry, 'The Hospitals and Population Growth', Part 1, 1980, *34(1)*, 59-75; Part 2, 34(2), 251-265; Günter B. Risse, *Hospital Life in Enlightenment Scotland. Care and Teaching at the Royal Infirmary of Edinburgh* (Cambridge: Cambridge University Press, 1986).

[19] Anders Brändström and Göran Broström, 'Life-Histories for Nineteenth-Century Swedish Hospital Patients: Chances of Survival', *Journal of Family History*, 1989, 14(3), 195-209.

in England in the late nineteenth century, due to the growing population pressure on hospital facilities and overcrowding, as well as to changes in admission policies—a higher proportion of serious cases were admitted, including patients with infectious diseases—and to the 'more ambitious surgery' practices which were being adopted.[20] The ongoing process of medicalization and the increases in hospital admissions appear to have raised hospital mortality rather than lowering it.

3. VENETIAN HOSPITALS IN THE NINETEENTH CENTURY

As the examples above show, the mixed nature of hospitals turns out across time and space, refuting the Whiggish narratives of hospital history as a linear progression towards full medicalization. This is also the case of Venetian hospitals in the nineteenth century, where substantial continuities emerge, some reaching back several centuries, despite dramatic changes in the institutional and organisational settings.

Venice boasted a long and rich tradition of charitable institutions. The first hospice for pilgrims was founded as far back as the tenth century, with a second hospital for wounded and injured pilgrims established in the twelfth century. Around 1500, there were no less than 250 confraternities and guilds providing support, refuge and treatment to all kinds of needy individuals, from sick and disabled sailors to widows, abandoned infants, and orphan girls. Individual charity, in the form of rich legacies, also played a part. The Venetian state took on a major role with the establishment of four 'Ospedali Grandi' (Grand Hospitals) in the late fifteenth and early sixteenth century, as spiralling social crises urged

[20] Cherry, 'The Hospitals and Population Growth', Part 2, 263.

the adoption of new policies against beggary and the seclusion of poor 'derelicts', 'incurables' (i.e. syphilitics), and sick beggars.[21]

Despite several efforts to rationalise charitable activities within Venice, the situation—a tangle of private and public initiatives, funding a multitude of different sized establishments hosting heterogeneous inmates seeking a mixture of care, cure, shelter and seclusion—remained substantially unchanged until 1797, when the Venetian Republic came to an end. The city came under French, and then Habsburg, rule. From 1807, governmental commissions took full charge of welfare within the city and the hospital system underwent repeated reorganizations. These culminated in 1825 with the establishment of a Provincial Civic Hospital, autonomously managed and open to all patients. Other, separate hospitals were set up in 1834 to cater for the chronically ill and the military. Finally, in 1855, female lunatics were removed from the Civic Hospital to the island of San Clemente. Male lunatics had been housed on the nearby island of San Servolo since the beginning of the century.[22]

The Civic Hospital was located in the former Beggars' Hospital and in the neighbouring buildings of a Dominican convent, a minor confraternity, and the Scuola Grande di San

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[21] Brian Pullan, *Rich and Poor in Renaissance Venice: The Social Institutions of a Catholic State, 1500 to 1620* (Cambridge, Mass.: Harvard University Press, 1971), 197-372; Dennis Romano, 'Charity and Community in Early Renaissance Venice', *Journal of Urban History*, 1984, 11, 63-82; Richard Palmer, '"Ad una sancta perfettione": Health Care and Poor Relief in the Republic of Venice in the Era of the Counter-Reformation', in Ole Peter Grell and Andrew Cunningham with Jon Arrizabalaga, eds, *Health Care and Poor Relief in Counter-Reformation Europe* (London and New York: Routledge, 1999), 85-98.

[22] Pierluigi Bembo, *Delle istituzioni di beneficenza nella città e provincia di Venezia, studii storico-economico-statistici* (Venezia: P. Naratovich, 1859), 236-253, 313-379.

Marco. The monumental façade of the latter is a Renaissance architectural masterpiece and still forms the main entrance to the hospital today. Covering 38,000 square meters (9.4 acres), the hospital held 1,200 beds (which could be increased to 1,400 in emergencies). These were distributed over 60 wards in two wings, one for males and one for females. Each wing had medical and surgical wards and included sections for infectious patients, children, clergy, Jews, and other non-Catholics. The surgical wards also admitted patients with eye diseases, syphilis, ringworm and scabies, as well as obstetric cases. Treatments included hydrotherapy. The hospital employed 10 head physicians in charge of medicine, surgery, obstetrics, and ophthalmology, 20 surgeons, 2 midwives, and 100 nurses.[23]

Although the new Civic Hospital represented a dramatic break with the past, there was an underlying continuity in its guiding principles. The Hospital's mission, as stated in the first article of the Regulations laid out in 1833, was the reception and treatment of 'the sick poor of this city, and others'.[24] Indeed, the inclusion of 'others' among hospital users

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[23] Pietro Beroaldi, *Quadro storico-statistico dello Spedale Civile Provinciale di Venezia preceduto da cenni storici sulle antiche origini degli ospitali* (Venezia: Gaetano Longo, 1856), 27-28; Bembo, *Delle istituzioni di beneficenza*, 206; Gianmario Guidarelli and Ines Tolic, 'The History of the Civic Hospital in Venice (1797–2011) in the Light of Contemporary Cultural and Urban Challenges', in Donatella Calabi, ed, *Built City, Designed City, Virtual City, The Museum of the City* (Roma: Centro per lo studio di Roma, 2013), 233-53.

[24] Pietro Beroaldi**,** *Dizionario della legislazione austriaca intorno la sanità pubblica continentale e la pubblica beneficenza, emanata nel territorio governativo delle provincie venete a tutto l'anno 1839 […]* (Padova: Angelo Sicca, 1840), I, 79.

marked a major departure from the past. Yet, hospital admission remained a major component of policies aiming both to assist the poor and to seclude the beggars.[25] Under such policies, parish commissioners drew up lists of the poor and provided them with food, clothes, firewood, shelter, cash, employment in workhouses, drugs and medical assistance. In the 1850s, there were some 35,000 to 40,000 registered poor in Venice, around one fourth of the total population, although only about 3,000 received relief each day. Certain groups amongst the poor were excluded from receipt of parish welfare, including the 'undeserving' poor, the homeless, beggars, temporary immigrants, and others living on the margins.[26]

Whether registered or not, all poor individuals who fell sick were entitled to free medical assistance from the parish doctors and any drugs they needed were also supplied for free. As a rule, after three visits and drug prescriptions, the patients were directed to the hospital, unless their conditions could continue to be treated at home. Poor elderly, disabled or chronically ill persons, old beggars, were instead directed to the Rest Home ('Casa di Ricovero'), located nearby in the former Hospital of Derelicts ('Derelitti'), which

[25] A review of welfare policies at the time in Ole Peter Grell, Andrew Cunningham and Robert Jütte, eds, *Health Care and Poor Relief in 18th and 19th Century Northern Europe* (Aldershot, UK: Ashgate, 2002).

[26] Bembo, *Delle istituzioni di beneficenza,* 334; Adolfo Bernardello, *Venezia nel Regno Lombardo-Veneto. Un caso atipico (1815-1866)* (Milano: Franco Angeli, 2015), 231, argued that most poor in the lists were temporarily unemployed workers who registered to receive public relief, while structural poor were about 6 per cent of the population. Yet, still in 1871, one third of the deceased were so poor that their coffins had to be provided by the Municipality: Municipio di Venezia, *Statistica del settennio 1874-80,* CLXXVI.

previously housed orphans and patients with fever or acute diseases, and was equipped with 700 beds.[27]

Those who were not on the poor register had to pay for their hospital stay. Depending on what they were able, or willing, to pay they were entitled to certain privileges, such as a single room, a dedicated servant, and the like. Unfortunately, we do not know the number of paying inpatients in the Civic Hospital but it is likely that they were rather few in number. In a book published in 1859, Pierluigi Bembo, a Venetian nobleman and future mayor of Venice, though praising the virtues of the hospital, argued that treatment at home, with all its comforts and the caring warmth of relatives and friends, was by far preferable to hospitalization. The latter was a last resort for the poor, for those living in dreadful conditions, with nowhere to call home, and no family to rely upon.[28]

4. DEATHS IN VENICE: WHERE DID THEY OCCUR?

In his *Handbuch der Sanitäts-Polizei,* published in Berlin in the same year as Bembo's book, Louis Pappenheim used exactly the same argument when referring to German hospitals: hospitals were meant for the poor who had no home, no clothes, and no food.[29] Data on hospital admissions in early nineteenth-century Germany show, however, that the

[27] Bembo, *Delle istituzioni di beneficenza*, 255-58, 324, 329-30. *Statuto pei medici-chirurghi comunali nel Regno Lombardo-Veneto* (Milano, 31 dicembre 1858).

[28] Bembo, *Delle istituzioni di beneficenza*, 213-14.

[29] Louis Pappenheim, *Handbuch der Sanitäts-Polizei* (Berlin: August Hirschwald, 1859), 2 vols., quoted in Isabelle von Bueltzingsloewen, 'Pour une sociologie des populations hospitalisées: le recours à l'hôpital dans l'Allemagne du premier XIXe siècle', *Annales de Démographie Historique*, 1994, 1, 303-320.

social profile of patients was more varied than the 'hospitalization = misery' equation might lead us to expect.[30]

Unfortunately, there are no hospital admissions data for Venice. To outline the role of Venetian hospitals and the way they functioned, we used instead the city death records. Since these report the deceased's place of death, we know who died in hospital and who did not. Such an approach has both advantages and drawbacks. On the one hand, it allows the socioeconomic and demographic characteristics as well as the ailments of those who died in hospital to be compared with those who died at home. On the other, we have to keep in mind that those who died rather than recovering may not be representative of the total hospital population. In the 1850s, on a daily basis there were in average 1,040 inpatients in the Civic Hospital, and the mortality rate was around 10 per cent.[31] Inferring the characteristics of the surviving 90 per cent from the 10 per cent deceased recommends caution.

Death registration in Venice started as early as 1504. Notwithstanding the impressive continuity and the wealth of information the death records offer, they have seldom been the object of systematic analysis. In one study of the seventeenth and eighteenth centuries, Alex Bamji argued that, while the death records may not be complete, they are of surprisingly high quality. The fact that most of the certificates were signed by physicians suggests that Venetians frequently resorted to medical care when it was needed.[32]

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[30] *Ibid.*

[31] Beroaldi, *Quadro storico-statistico*, 26-27; Bembo, *Delle istituzioni di beneficenza*, 218-19; Municipio di Venezia, *Statistica del settennio 1874-80,* CLX.

[32] Alex Bamji. 'Medical Care in Early Modern Venice', *Economic History Working Papers,* 2014, 188.

In the nineteenth century, the role of physicians was strictly regulated. District doctors on the City payroll were expected to visit their patients every two or three days, daily if the patient was seriously ill. When a death occurred at home, a doctor was expected to go to the deceased's place of residence, examine the body, and complete a death certificate. The information would then be conveyed to the registrar who recorded the details described above in the register of deaths. Without a doctor's certificate, burial could not take place. We assume that in the vast majority of cases the doctor who treated the deceased in their last illness would fill out the death certificate. Given that a medical professional familiar with the case diagnosed the cause of death, we consider this item of information relatively reliable.[33]

[33] Interestingly, we found a very few cases where the cause of death could not be identified since no doctor had intervened. The death registers from 1811 onwards are in the Historical Archive of the Commune of Venice. Those pertaining the aristocratic period are in the State Archive of Venice. In the Kingdom of Lombardy-Venetia, medicine was practiced under strict public control. Only doctors who had graduated from a university in one of the states under Austrian rule were accepted, and they had to pass a further examination to be licensed. In Venice, hospital doctors had to go through two to eight years of training, during which they had to reside in the hospital locals: Bembo, *Delle istituzioni di beneficenza*, 209. Public medical positions were competitive and both public and private doctors were regarded as public officials and required to follow the Government regulations. See *Statuto pei Medici-Chirurghi Comunali nel Regno Lombardo-Veneto* (Milano, 31 Dicembre 1858). Beroaldi, *Dizionario della legislazione austriaca*, II, 21-66, reports the legislation governing the medical profession in the Italian territories

Table 1 displays a series of bivariate distributions based on the death registers of 1854 and 1869, contrasting the characteristics[34] of individuals dying at home with those of individuals dying in the Civic Hospital and in other institutions. The latter include the city's other hospitals as well as its hospices, foundling home, prisons and boarding schools.

under Habsburg rule. The Government Instructions of 23 January 1816, article 16, which laid down how death certificates were to be completed, are in vol. I: 88.

[34] Socioeconomic status was grouped into five categories according to supposed average income and its regularity. The lowest level includes unskilled workers without fixed employment such as day labourers, fishermen, boatmen, and porters. Very few were classified as poor or miserable. Wage workers are assumed to be semi-skilled and to earn their salary on a more regular basis in local factories. The third group includes artisans, retailers, peddlers of different kinds, and low rank employees. The fourth group ranges from members of the lower bourgeoisie, clerks, and teachers, to officers, civil servants, landowners, bankers, and nobles. Cases where no occupation was reported are included in the fifth group.

Table 1. Deaths registered in Venice (1854 and 1869). Distribution by year, place of death and individual characteristics of the deceased.

	Home	Civic Hospital	Other Institutions	Total	% Home	% CH	% OI
Year							
1854	3400	1165	287	4852	70.1	24.0	5.9
1869	2366	1044	271	3681	64.3	28.4	7.4
Birthplace (1869 only)							
Venice	1994	607	166	2767	72.1	21.9	6.0
Elsewhere	372	437	105	914	40.7	47.8	11.5
Gender							
Male	2884	1002	429	4315	66.9	23.2	10.0
Female	2882	1207	129	4218	68.4	28.6	3.1
Age							
0	1645	56	215	1916	85.9	2.9	11.2
1 – 15	2041	175	27	2243	91.0	7.8	1.2
16 – 55	940	893	236	2069	45.4	43.2	11.4
56+	1140	1085	80	2305	49.5	47.1	3.5
Socioeconomic Status							
poor, day labourer	444	596	118	1158	38.3	51.5	10.2
wage worker	416	509	98	1023	40.7	49.8	9.6
artisan, shopkeeper	414	199	58	671	61.7	29.7	8.6
middle, upper class	666	26	12	704	94.6	3.7	1.7
Unknown	3826	879	272	4977	76.9	17.7	5.5

Source: Venetian death registers, 1854, 1869. Percentages may not add up to 100 due to rounding.

The table reveals some interesting features. First, somewhat surprisingly, the mortality crisis of 1854 is not reflected in a corresponding increase in hospital deaths. In fact, it was thought best that cases of infectious diseases were kept out of hospital.[35] Second, six

[35] As we shall see below, pulmonary tuberculosis was by far the most frequent cause of death in Venetian hospitals. However, it was not considered a communicable disease until the discovery of the tubercle bacillus in 1882. On the definition and impact of infectious diseases see Flurin Condrau and Michael Worboys, 'Second Opinions: Epidemics and Infections in Nineteenth-Century Britain', *Social History of Medicine*, 2007, 20, 147-158; Graham Mooney, 'Infectious Diseases and Epidemiologic Transition in Victorian Britain?

immigrants out of ten died in an institution, twice as many as the native-born Venetians. Unfortunately, we are unable to distinguish between long-term migrants and recent newcomers. Both groups, however, would have lacked the support from family, friends and neighbours, which most Venetians could rely on. Third, there is little difference in the place of death between men and women, although women were more likely to die in hospitals, and men in hospices. Fourth, more than half of the adults and the elderly died in an institution, the great majority in the Civic Hospital. Finally, although we lack information on the social status of more than half of the deceased, the data available show a clear social divide, with only 38 per cent of deaths amongst the poor occurring at home, whereas 95 per cent of the deaths amongst the wealthiest group took place at home. Few rich died in hospital, probably because they were rarely hospitalized. The overall picture seems to support Bembo's remarks, that those who resorted to hospital care were mostly poor and had little or no support from their families.

In order to extend the findings above, we turned to a different dataset and a different approach. We made use of a longitudinal dataset drawn from the local population register. This dataset covers 31,200 individuals registered as living in four Venetian parishes from 1850 to 1869, along with the members of the city's Jewish Community in the same

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Definitely', *Social History of Medicine*, 2007, 20, 595–606; Andrew Noymer and Beth Jarosz, 'Causes of Death in Nineteenth-Century New England: The Dominance of Infectious Disease', *Social History of Medicine*, 2008, 21, 573–8. Flurin Condrau and Michael Worboys, 'Second Opinions: Final Response. Epidemics and Infections in Nineteenth-Century Britain', *Social History of Medicine*, 2009, *22*, 165–171.

period.[36] The database records each individual's life course across the twenty-year period. Those individuals recorded in the database as dying in 1854 and 1869 were linked to the record of their death in the city's death registers. The death register established where and why they had died, while the population register provided the composition of the household to which they belonged at the time of their death. To increase our sample size, we included in the analysis the individuals in the population register dataset who died in 1865 and traced them in the corresponding death register. We chose 1865 mainly because a census of the city was taken in the same year and the population register was checked and updated accordingly. Overall, of the 1,299 individuals in the population register dataset deceased in the three sample years, we were able to link 1,147 individuals (88.3 per cent) to the corresponding record in the death registers.[37]

[36] The population register is in the Historical Archive of the Commune of Venice. The four parishes are those of Sant'Angelo Raffaele, Santa Eufemia, San Luca, and San Geremia. More precisely, the dataset concerns those who dwelt in the parishes in 1869, when a new population register replaced the old one. Since residential mobility was rather frequent, events and conditions reported in the dataset may concern different areas of the city. For more details on the dataset and source material, see Renzo Derosas, 'The Joint Effect of Maternal Malnutrition and Cold Weather on Neonatal Mortality in Nineteenth-Century Venice: An Assessment of the Hypothermia Hypothesis', *Population Studies*, 2009, 63:3, 233-251. Further details on household mobility in Renzo Derosas, 'Residential Mobility in Venice, 1850-1869', *Annales de Démographie Historique*, 1999, 35-61.

[37] We used a logistic regression, with outcome variable linked/not linked, to test whether the linkage process introduced any bias in the sample data. We found no effect of religion, place of birth, socioeconomic status, and number of adult males. Unsurprisingly, the

We used a logit model to estimate the factors that affected the probability of dying in the Civic Hospital as opposed to dying at home. Our model includes a control for the year, the individual's gender, age, and religion, plus the socioeconomic status (SES) of the household head and the number of adult men and women—i.e. those aged 16 to 55—present in the household. More formally:

$$\text{Logit}(P_{hosp}) = \text{Log}(P_{hosp}/1-P_{hosp}) = ß_0 + ß_1*\text{Year} + ß_2*\text{Gender} + ß_3*\text{Age} + ß_4*\text{SES} +$$

$$+ ß_5*\text{Adult Men} + ß_6*\text{Adult Women} + ß_7*\text{Religion}$$

where $\text{Logit}(p_{hosp})$ is the log of odds, and odds are the probability of observing an event – a hospital death, in this case – divided by the probability of observing an alternative event, which in this case is a death at home. Table 2 displays the results of the regression[38].

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linkage was more successful for year 1865. Similarly, males, adults and elderly, and the number of adult females in the household turned out more likely to be found than the corresponding reference category (results are available on request). Still, it seems reasonable to assume that our ability to establish a linkage was not related to the place of death, which is what matters most here. Paul D. Allison, *Missing Data*, (Thousand Oaks, CA: Sage, 2001, 7) argues that "if the probability of missing data on any variable depends on the value of the dependent variable but does not depend on any of the independent variables, then logistic regression with listwise deletion yields consistent estimates of the slope coefficients and their standard errors".

[38] In the case of a categorical covariate, the odds ratio compares the effect of the index category with that of the reference category. With a quantitative covariate, as in the number of adults in the household, it shows the effect of an increase by one unit of that covariate. For instance, in Table 2 the odds ratio of 1.75 for the poor and day labourers (a categorical variable) means that their odds of dying in hospital—that is, the probability of

Table 2. Effect of individual and household characteristics on the odds of dying in the Civic Hospital versus dying at home. Venice (1854, 1865, 1869).

Covariates	Mean	Odds Ratio	P-value
Year			
1854	0.397	(ref)	
1865	0.387	1.19	0.404
1869	0.215	0.65	0.120
Gender			
Male	0.528	(ref)	
Female	0.471	0.68	0.061
Age			
0	0.271	0.22	0.007
1 – 15	0.316	(ref)	
16 – 55	0.187	9.01	0.000
56 +	0.226	10.05	0.000
Household Head's Socioeconomic Status			
poor, day labourer	0.327	1.75	0.023
wage worker	0.345	(ref)	
artisan, shopkeeper	0.218	0.93	0.823
middle, upper class	0.062	0.80	0.557
Unknown	0.046	1.46	0.333
No. of Adults (16-55) in the Household			
Men	1.3	0.84	0.199
Women	1.3	0.79	0.033
Religion			
Catholic	0.916	(ref)	
Jewish	0.083	0.40	0.015
Constant		0.088	0.000
Number of dead individuals	1147		
Log Likelihood	-363.873		
LR chi^2	248.69		
Pseudo R^2	0.2547		

Source: Venetian population register and death registers 1854, 1865, and 1869. Proportions may not add up to 1 due to rounding.

observing a hospital death divided by the probability of observing a death at home—was 75 per cent higher than that of the wage workers, who form the reference category. In contrast, the presence of each adult woman living in the household to which the deceased belonged (a quantitative variable) decreases the odds of dying in hospital by 21 per cent (1 – 0.79). The corresponding p-values of 0.023 and 0.033 are both below the conventional threshold of 0.05, assuring that both estimates are statistically significant.

The characteristics of those dying in hospital stand out quite clearly. They were mostly adult or elderly males—in contrast to the findings in Table 1—and belonged to the lowest social status. While the poor were 75 per cent more likely to die in hospital than wage workers, the differences between the latter and the better off were not significant. The divide neatly opposed the lowest social ladder to the rest of society. Furthermore, the families of those dying in hospital were small, with few or no other adults they could rely on. Interestingly, while the effect of an additional adult woman in the household decreased the odds of dying outside the home, there was no such effect in the case of an additional man: strongly suggesting that women, much more than men, played a supportive role within households.[39] Finally, Jews were much more likely to die in their own bed than the Catholics, although there were Jewish wards in the Civic Hospital.

5. DEATHS IN VENICE: WHY DID THEY OCCUR?

In this section, we focus on the causes of death and investigate what the most common conditions were and whether particular diseases were more likely to cause the patient's death at home or in hospital. Table 3 displays the 14 most frequent single causes of death reported in the death registers of Venice in 1854 and 1869, along with the corresponding

[39] Renzo Derosas, 'Fatherless Families in Nineteenth-Century Venice', in Renzo Derosas, and Michel Oris, eds, *When Dad Died. Individuals and Families Coping with Distress in Past Societies* (Bern: Peter Lang, 2002), 433-464; Derosas, 'Suspicious Deaths', 95-126.

code representing that cause in the International Classification of Diseases, 10th revision (ICD10).[40] These 14 causes of death account for 60 per cent of all the deaths reported.

[40] World Health Organisation, 'International Statistical Classification of Diseases and Related Health Problems, 10th Revision', (https://www.who.int/classifications/icd/icdonlineversions/en/). The reliability and interpretation of historical records of causes of death have been the object of intense debate and is still controversial. A useful summary of the questions involved in Günter B. Risse, 'Cause of Death as a Historical Problem', *Continuity and Change*, 1997, 12(2):175-188.

Table 3. Major causes of death by place of death. Venice (1854, 1869).

Local definition	Definition	ICD10 Code	Home		Civic Hospital		Other Inst.		Total	% Home	% CH	% OI	% Total
			No	Rank	No	Rank	No	Rank					
Tisi polmonare; Tubercolosi	Tuberculosis	A16	431	*2*	258	*1*	59	*2*	748	57.6	34.5	7.9	8.8
Marasma	Nutritional marasmus	E41 R54	456	*1*	138	*3*	55	*3*	649	70.3	21.3	8.5	7.6
Pneumonite	Unspecified respiratory infection	J22	384	*6*	169	*2*	46	*4*	599	64.1	28.2	7.7	7.0
Enterite	Other diseases of intestine	K63	400	*4*	94	*7*	27	*5*	521	76.8	18.0	5.2	6.1
Gastroenterite; diarrea	Gastroenteritis, unspecified origin	A09	385	*5*	66	*9*	20	*6*	471	81.7	14.0	4.2	5.5
Spasmo	Convulsion of new-born, cause unknown	P90	422	*3*	1	*14*	2	*12*	425	99.3	0.2	0.5	5.0
Apoplessia	Stroke, not specified	I64	222	*8*	92	*8*	8	*9*	322	68.9	28.6	2.5	3.8
Morbillo	Measles	B05	273	*7*	11	*13*	3	*11*	287	95.1	3.8	1.0	3.4
Bronchite	Bronchitis	J20	135	*10*	109	*5*	13	*7*	257	52.5	42.4	5.1	3.0
Immaturo	Short gestation, low birth weight, not classified	P07	142	*9*	11	*12*	67	*1*	220	64.5	5.0	30.5	2.6
Anasarca	Oedema, not elsewhere classified	R60	113	*11*	61	*10*	13	*7*	187	60.4	32.6	7.0	2.2
Arteriosi	Other disorders of arteries and arterioles	I77	63	*13*	115	*4*	1	*13*	179	35.2	64.2	0.6	2.1
Paralisi	Other paralytic syndromes	G83	43	*14*	98	*6*	9	*8*	150	28.7	65.3	6.0	1.8
Febbre tifoidea	Typhoid fever	A01	99	*12*	40	*11*	5	*10*	144	68.8	27.8	3.5	1.7

Source: Venetian death registers, 1854, 1869. Percentages may not add up to 100 due to rounding.

The table also reports the number of cases for each cause of death and their relative rank according to the place of death. For instance, phthisis and pulmonary tuberculosis combined were the most important cause of death, representing 8.8 per cent of the total. However, they were also the foremost cause in hospital but formed only the second most important cause of death at home and in other institutions. Other diseases of the respiratory system, such as pneumonia (2^{nd}) and bronchitis (5^{th}), were among the other most frequent causes in hospital. Overall, these three causes represented one quarter of all hospital deaths.

The second group of diseases that caused a considerable proportion of deaths in the Civic Hospital was made up of degenerative and age-related diseases, such as circulatory disorders, dropsy, stroke, paralysis. Marasmus was numerically the second most important cause of death, but it ranked first among deaths at home and third among deaths in both the hospital and other institutions. It must be remembered that the term marasmus can be used to refer to infant and childhood nutritional dysfunctions, typical of the malnutrition-infections syndrome,[41] but also to senile debility. Young children who died of the former were more likely to do so at home, whereas older people suffering from the latter were more likely to be admitted to hospital and die there. Similar considerations apply to other causes of death that were typical of the early stages of life such as immaturity, convulsions and, to some extent, diarrhea and gastro-enteritis, which were frequently contracted during or after weaning.

Our next step was to group the causes of death together. In doing so, we followed a nineteenth century classification template[42] rather than the modern ICD10. Since our main

[41] B. van Norren and H.A. van Vianen, *The Malnutrition-Infections Syndrome and its Demographic Outcome in Developing Countries: a New Model and its Application* (The Hague, Netherlands: Programming Committee for Demographic Research, 1986).

[42] See Municipio di Venezia, *Statistica del settennio 1874-80*, 98-105. The adoption of a proper classification scheme can have a decisive impact on the interpretation of long-term processes in mortality history (Alice Reid, Eilidh Garrett, Chris Dibben and Lee Williamson, "'A Confession of Ignorance": Deaths from Old Age and Deciphering Cause-of-Death Statistics in Scotland, 1855-1949', *The History of the Family*, 2015, 20(3):320-344). However, our scope here is much narrower, being restricted to hospitals activity in a short range of time. We privileged internal coherence over precision.

purpose was to highlight the conditions that prompted doctors to hospitalise their patients, it seemed appropriate to use a classification familiar to contemporaries, rather than a more accurate but anachronistic one.

The classification scheme we used comprises five main orders of disease: 1) 'infant diseases', 2) 'fevers', 3) diseases related to specific 'organs', 4) other diseases, and 5) violent and sudden deaths, which were then divided into varying numbers of sub-groups. Typhus and typhoid were the major causes of 'fevers'. Diseases related to specific organs covered conditions of the central nervous system (which included eclampsia, meningitis, encephalitis and apoplexy), the respiratory system (bronchitis, pleurisy, pneumonia, croup, tuberculosis), the 'circulatory system' (vasculitis, arteritis, pericarditis, aneurism, heart defects), the 'digestive' organs (gastritis, enteritis, peritonitis, cirrhosis), the 'urinary and sexual' organs (nephritis, cystitis, puerperal eclampsia), and 'locomotion diseases' (arthritis, myositis). The 'other diseases' category included: lymphatic diseases (mesenteric tuberculosis or *tabes mesenterica*), skin diseases (gangrene, erysipelas), blood diseases (anaemia, dyshemia), contagious diseases (diphtheria, measles, scarlet fever, smallpox, miliary tuberculosis), 'constitutional' diseases (marasmus, dropsy, rickets, scrofula, pellagra, cancer). Sudden deaths were not further differentiated, while violent deaths included both accidental and intentional ones (homicides, suicides, infanticides).

Table 4 displays the distribution by place of death of the causes of death, grouped according to the template described above, in the two years under study. The death registers report 111 cases of 'senility', a cause of death that is not mentioned in the classification scheme. We preferred to place deaths from 'senility' as a separate category in Table 4, rather than adding them to the 'not classified' group. We also recategorized 'violent and sudden deaths' by shifting all sudden deaths to the 'not classified' category as 'sudden deaths', strictly speaking, do not indicate what the real cause of death was.

Table 4. Grouped causes of death by place of death. Venice (1854, 1869).

	Home	Civic Hosp.	Other Inst.s	Total	% Home	% CH	% OI	% Total
1. Infant	725	27	81	833	87.0	3.2	9.7	9.8
2. Fever	145	51	9	205	70.7	24.9	4.4	2.4
3. System diseases								
Nervous	729	249	39	1017	71.7	24.5	3.8	11.9
Respiratory	1010	527	118	1655	61.0	31.8	7.1	19.4
Cardio-Circulatory	298	237	15	550	54.2	43.1	2.7	6.5
Digestive	1065	235	71	1371	77.7	17.1	5.2	16.1
Sexual	62	32	1	95	65.3	33.7	1.1	1.1
Locomotion	18	33	2	53	34.0	62.3	3.8	0.6
4. Other diseases								
Constitutional	888	448	123	1459	60.9	30.7	8.4	17.1
Lymphatic	81	3	1	85	95.3	3.5	1.2	1.0
Skin	90	105	19	214	42.1	49.1	8.9	2.5
Blood	14	4	2	20	70.0	20.0	10.0	0.2
Contagious	369	58	11	438	84.3	13.2	2.5	5.1
5. Violent	103	50	8	161	64.0	31.1	5.0	1.9
Not classified								
Senility	21	90	0	111	18.9	81.1	0.0	1.3
Others NOC	149	59	58	266	56.0	22.2	21.8	3.1
Total	5767	2208	558	8533				100

Source: Venetian death registers, 1854,1869. Percentages may not add up to 100 due to rounding.

If we omit infant deaths, six disease categories represent three quarters of all deaths shown in Table 4: the 'respiratory', 'constitutional', 'digestive', 'nervous', 'circulatory', and 'contagious' diseases. However, when we consider hospital deaths, other groups of diseases become more important in relative terms. Four out of five deaths from 'senility' happened in hospital. The second cause of death occurring more frequently in hospital than elsewhere was 'locomotion' disorders, such as arthritis and rheumatism. Both suggest that a patient's need of support because of age or other disabilities was a primary factor in their admission to hospital. There were however other groups of diseases – 'skin', 'circulatory', 'sexual', 'respiratory', 'violent', 'constitutional', 'fever', 'nervous', 'blood' where between 20 and 50 per cent of all deaths occurred in hospital, implying that a considerable proportion of patients suffering from these diseases had been admitted to hospital for

treatment. On the other hand, fewer than 20 per cent of deaths from contagious, digestive and lymphatic diseases occurred in hospital.

It is worthwhile asking why some diseases were much more likely than others to result in a hospital death. Was it for social or medical reasons? On the one hand, we need to consider the peculiarity of the hospital population: they were mostly poor in the Civic Hospital, and foundlings, elderly, insane in the 'other institutions'. For instance, the large number of hospital deaths from tuberculosis might reflect the fact that this disease was widespread among the lowest social strata. On the other hand, even though the Civic Hospital primarily addressed its services to 'the sick poor of the city', it also admitted 'others',[43] people who would not qualify as poor, and had to pay for the services they received. Whereas the hospitalization of the poor was (also) meant to make up for their lack of basic resources at home, independently of the disease they suffered from, the 'others' voluntarily resorted to the hospital on the assumption that it gave access to treatments otherwise unavailable or of lesser quality.

The hospitalization of paying inpatients—as long as it is reflected by hospital deaths—might provide an interesting clue about the therapeutic specialization of the hospital, a key feature of the ongoing medicalization process. Were there diseases more likely to be treated in the Civic Hospital, independently from the patients' social status, or even positively related to it?

To answer this question, we used a competing-risk approach. In a competing-risk analysis, multiple events are possible, but the occurrence of one event prevents the observation of

[43] See above, fn. 24.

another.[44] In our case, the competing events are the causes of deaths, classified into the following nine groups, as described in table 4: fever, nervous, respiratory, cardio-circulatory, digestive, contagious, constitutional, others, and not classified.[45] Having to deal with a polytomous outcome, we used a multinomial (or polytomous) logit model, a generalization of the binary logit model that allows to evaluate the probability of a categorical membership. In multinomial models, one of the categories of the outcome

[44] This approach is the preferred method in hospital epidemiology, when multiple outcomes are considered, being easy to implement and interpret, and providing more robust results than alternative and more sophisticated methods. See e.g. Rebecca A. Piercea, Justin Lesslera and Aaron M. Milstone, 'Expanding the Statistical Toolbox: Analytic Approaches for Cohort Studies with Healthcare-Associated Infectious Outcomes', *Current Opinions in Infectious Diseases*, 2015, 28(4):384-91; Inga Poguntke, Martin Schumacher, Jan Beyersmann and Martin Wolkewitz, 'Simulation Shows Undesirable Results for Competing Risks Analysis with Time-Dependent Covariates for Clinical Outcomes', *BMC Medical Research Methodology,* 2018: 18-79; Paul Allison, 'For Causal Analysis of Competing Risks, Don't Use Fine & Gray's Subdistribution Method', *Statistical Horizons*, March 24, 2018, https://statisticalhorizons.com/for-causal-analysis-of-competing-risks.

[45] Somewhat arbitrarily, we added 'senility' to the 'constitutional' group, which includes other diseases typical of the old age, such as senile marasmus and cancer. Of course, other attributions are as legitimate. Reid et al., 'A Confession of Ignorance', 330-32, argue that in late nineteenth-century Scotland deaths attributed to old age were likely due to respiratory or cardiovascular diseases.

variables is selected as reference and each of the other levels is compared with this reference.[46] We arbitrarily chose 'respiratory' as the reference category.[47]

The dataset we analyzed concerns all the deaths recorded in the death registers of 1854 and 1869 that happened either at the deceased's home or in the Civic Hospital. We dropped all deaths in other institutions, since medical treatment was not their primary goal. We also discarded all deaths below one year of age, since infants were de facto excluded from hospitalization.[48] Our model includes the place of death and socioeconomic status as exposure variables, and year, sex, and age as controls. Since to our purpose the relevant divide is between poor (presumably non-paying) patients and non-poor, paying patients, we collapsed the non-poor group into one level,[49] and added another level to account for

[46] David G. Kleinbaum, Mitchell Klein, *Logistic Regression: A Self-Learning Text* (New York: Springer, 2002, 2nd ed.), 267-300; David W. Hosmer, Stanley Lemeshow, *Applied Logistic Regression* (New York: John Wiley & Sons, 2000, 2nd ed.), 260-287.

[47] To highlight the relative position of respiratory diseases, we run a logistic regression contrasting respiratory to all other causes of death (not included here, available on request). Relative to all other causes, deaths from respiratory diseases were less likely to happen in hospital by 25 per cent (odds ratio 0.75, p-value 0.000), all other variables being held constant.

[48] All of the 27 infant deaths in the Civic Hospital reported in table 4 concerned newborns, aged few hours or days, and almost certainly born in the maternity ward.

[49] As shown in table 2, there is no significant difference in the risk of a hospital death among the non-poor group.

those whose status is unknown.[50] Finally, we fitted an interaction term to allow the effect of the place of death to vary by socioeconomic status. The likelihood-ratio test showed that the interaction significantly improved the goodness of fit of the model in comparison with the more parsimonious model without interaction (p-value = 0.001), confirming that status is indeed an effect modifier of place. Table 5 displays the results of the multinomial regression of the final model.

[50] Unfortunately, the socioeconomic status of 48 per cent of the deceased is unknown. This is a serious drawback for our analysis, where socioeconomic status is a key variable. Among the different methods to deal with missing values, we preferred the dummy variable adjustment, since it uses all the information available about the missing value, although it is not devoid of inconveniences and can produce biased estimates of the coefficients (Allison, *Missing Data*, 9-11). However, we carried out several alternative regressions, both dropping the missing data by listwise deletion and using subsets with different missing value distributions, and always found a remarkable stability of the coefficients of interest, the only difference concerning the size of the standard errors.

Table 5. Multinomial logistic regression: the effect of individual characteristics on the risk ratios of dying from different causes of death groups relative to 'respiratory' causes of death (reference). Venice (1854, 1869).

	Fever		Nervous		Cardio-circulatory		Digestive	
Year	RRR	p-value	RRR	p-value	RRR	p-value	RRR	p-value
1854	(ref.)		(ref.)		(ref.)		(ref.)	
1869	0.96	0.809	0.75	0.002	1.00	0.980	0.45	0.000
Gender								
male	(ref.)		(ref.)		(ref.)		(ref.)	
Female	1.27	0.134	1.00	0.989	0.97	0.808	1.17	0.076
Age								
1 – 15	(ref.)		(ref.)		(ref.)		(ref.)	
16 – 55	0.33	0.000	0.29	0.000	0.92	0.740	0.15	0.000
56 +	0.10	0.000	0.83	0.309	3.52	0.000	0.26	0.000
SES								
Poor	(ref.)		(ref.)		(ref.)		(ref.)	
Others	1.19	0.679	0.98	0.903	1.29	0.230	0.99	0.972
Unknown	1.65	0.255	0.99	0.960	1.41	0.204	1.23	0.337
Place of death								
Home	(ref.)		(ref.)		(ref.)		(ref.)	
Civic Hospital	1.28	0.612	0.78	0.302	1.58	0.078	1.81	0.006
*SES*Place of death*								
others*Civic Hospital	1.26	0.685	1.03	0.924	0.97	0.924	0.55	0.031
unknown*Civic Hospital	0.57	0.337	1.04	0.891	0.81	0.541	0.40	0.001
Constant	0.20	0.001	0.97	0.883	0.12	0.000	2.26	0.000
	Contagious		**Constitutional**		**Others**		**Not classified**	
Year	RRR	p-value	RRR	p-value	RRR	p-value	RRR	p-value
1854	(ref.)		(ref.)		(ref.)		(ref.)	
1869	0.34	0.000	0.57	0.000	0.74	0.005	0.85	0.374
Gender								
male	(ref.)		(ref.)		(ref.)		(ref.)	
Female	1.19	0.154	1.24	0.012	0.70	0.001	0.85	0.375
Age								
1 – 15	(ref.)		(ref.)		(ref.)		(ref.)	
16 – 55	0.11	0.000	0.17	0.000	0.33	0.000	0.17	0.000
56 +	0.05	0.000	0.37	0.000	0.60	0.011	0.30	0.001
SES								
Poor	(ref.)		(ref.)		(ref.)		(ref.)	
Others	0.82	0.533	0.94	0.738	1.02	0.943	0.97	0.948
Unknown	0.93	0.819	1.10	0.660	0.81	0.404	0.85	0.734
Place of death								
Home	(ref.)		(ref.)		(ref.)		(ref.)	
Civic Hospital	1.62	0.171	2.91	0.000	1.50	0.100	2.45	0.049
*SES*Place of death*								
others*Civic Hospital	0.48	0.128	0.44	0.001	0.98	0.955	0.93	0.901
unknown*Civic Hospital	0.42	0.046	0.60	0.048	1.72	0.089	0.71	0.547
Constant	1.59	0.156	1.78	0.008	0.80	0.400	0.26	0.005
Number of obs: 5948	LR chi2(72): 1481.52		Prob > chi2: 0.000		Pseudo R2 0.0625		Log likel: -11113.991	

Source: our computation from Venetian death registers, 1854, 1869.

Results are shown in the form of relative risk ratios.[51] For instance, in the 'digestive' section, the relative risk ratio of 1.17 for females means that the relative risk of observing a death from diseases of the digestive system over deaths from diseases of the respiratory system is 17 per cent higher for females than for males, given all other predictor variables are held constant.

Table 5 highlights several aspects featuring the different groups of causes. Deaths from respiratory diseases were more likely in 1854 than in 1869, compared to most other causes, with the exception of 'fevers' and 'cardio-circulatory' diseases. Contagious diseases were the most prevalent cause of death in 1854 as that year's cholera epidemic raged alongside an economic crisis. These events also explain the weight of 'constitutional' (mostly marasmus) and 'digestive' (mostly gastroenteritis) disorders in that year.

Females were relatively disadvantaged with 'digestive' and 'constitutional' diseases. Age was a powerful discriminant, and worked in the expected direction: for instance, relatively to the younger age groups, deaths from respiratory diseases were more likely for the elderly than for most other groups of causes, with the notable exception of the diseases of 'cardio-circulatory' group.

Our main interest, however, lies in the way the different groups were related to the place of death and the socioeconomic status of the deceased. To appreciate their joint effect we

[51] Relative risks are ratios of probabilities. For instance, the relative risk of a death from a 'digestive' disease over a death from a 'respiratory' disease for men is the ratio of the probability of a 'digestive' death for men divided by the probability of a 'respiratory' death for men. The relative risk ratio for females is the ratio between the relative risk of females and the relative risk of men.

cannot just consider the estimated coefficients, but need to take into account both the main effects (place, SES) and the interaction terms (place*SES). The easiest way is to combine them, as shown in table 6.

Table 6. Combined effect of socioeconomic status and place of death on the risk ratios of dying from different causes of death groups relative to 'respiratory' causes of death (reference). Venice (1854, 1869).

	Home	p-val	C.H.	p-val	CH/H		Home	p-val	C.H.	p-val	CH/H
Fever						*Contagious*					
Poor	1		1.28	0.612	*1.28*	Poor	1		1.62	0.171	*1.62*
Others	1.19	0.679	1.92	0.128	*1.62*	Others	0.82	0.533	0.64	0.265	*0.78*
Unknown	1.65	0.255	1.20	0.696	*0.73*	Unknown	0.93	0.819	0.63	0.204	*0.68*
Nervous						*Constitutional*					
Poor	1		0.78	0.302	*0.78*	Poor	1		2.91	0.000	*2.91*
Others	0.98	0.903	0.79	0.263	*0.81*	Others	0.94	0.738	1.21	0.360	*1.28*
Unknown	0.99	0.960	0.81	0.331	*0.82*	Unknown	1.10	0.660	1.92	0.001	*1.76*
Cardio-circulatory						*Others*					
Poor	1		1.58	0.078	*1.58*	Poor	1		1.50	0.100	*1.50*
Others	1.29	0.230	1.97	0.003	*1.53*	Others	1.02	0.943	1.50	0.077	*1.48*
Unknown	1.41	0.204	1.80	0.017	*1.27*	Unknown	0.81	0.404	2.08	0.001	*2.58*
Digestive						*Not Identified*					
Poor	1		1.81	0.006	*1.81*	Poor	1		2.45	0.049	*2.45*
Others	0.99	0.972	0.99	0.973	*1.00*	Others	0.97	0.948	2.22	0.064	*2.29*
Unknown	1.23	0.337	0.90	0.637	*0.73*	Unknown	0.85	0.734	1.48	0.390	*1.74*

Source: our computation from table 5.

What matters here is to point out what causes of death were relatively more likely to be observed in the Civic Hospital than at home, and whether there were differences among the poor and the non-poor or 'others'. Again, we need to remind that we deal here with relative risk ratios. For instance, in the 'cardio-circulatory' section, the relative risk ratio of 1.29 for the 'others' means that for the non-poor the relative risk of observing a death at home from a 'cardio-circulatory' disease, over deaths at home from diseases of the respiratory system, is 29 per cent higher than for the poor.[52] To put it more simply, as far

[52] The combined effect is computed multiplying the main and interaction effects. For instance, 1.97 (relative risk ratio for others of dying in hospital from a cardio-circulatory disease) = 1.29 (main effect of 'others') * 1.58 (main effect of CH) * 0.97 (interaction effect

as the ‘cardio-circulatory’ diseases are concerned, the poor were more likely to die at home than the ‘others’ were. Indeed, for the poor who died in the Civic Hospital, the relative risk ratio is 1.58, 58 per cent higher than that of their counterparts dying at home. In other words, when the disease resulting in their death involved the cardio-circulatory system, the poor were much more likely to end their life in hospital than at home. However, something similar also happened for the better off. In fact, for the group of others the relative risk ratio of dying in the Civic hospital is 1.97, 53 per cent higher than that of dying at home (1.29). Also in the group whose social condition is unknown, the risk of a hospital death is 27 per cent higher than that of a domestic death. In short, in comparison with respiratory diseases, those affecting the cardio-circulatory system were much more likely to result in a hospital death. Secondly, this relative attractiveness of the Civic Hospital was irrespective of the patients’ socioeconomic status: rich and poor, paying and non-paying, preferred hospitalization to treatment at home.

Figure 1 displays the relative risk ratios of dying in the Civic Hospital compared to dying at home by group of diseases and social status (columns CH/H of table 6). Values above unit suggest preference for (or prevalence of) hospital, and below unit, for home.

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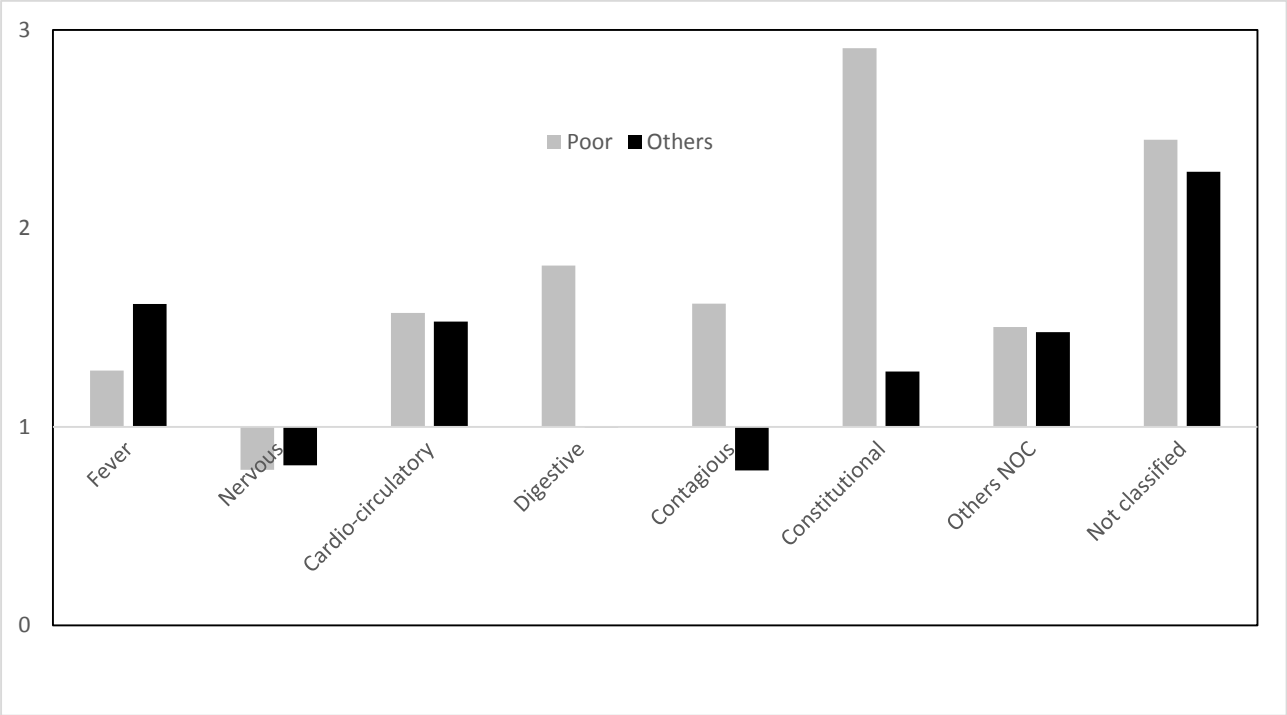
others*CH). P-values are obtained from a regression using combined covariates instead of interactions.

Fig. 1. Relative risk ratios of dying in the Civic Hospital vs dying at home by group of diseases and social status (SES unknown omitted). Reference: respiratory diseases



Source: table 6, columns CH/H.

The diseases of the cardio-circulatory system stand out as an unequivocal example of the appeal that the Civic Hospital could exert at the time. For other groups of diseases the evidence is not as neatly defined. For instance, in the case of fevers, the preference for hospitalization concerns both poor and non-poor, while the unknown group goes in the opposite direction; furthermore, the estimates are not statistically significant. For the 'constitutional' diseases, the preference for hospitalization was much stronger for the poor and the unknown, but still relevant also for the non-poor. There was instead a clear social divide as far as the diseases of the digestive system and the contagious diseases are concerned, with a much larger risk of hospital deaths for the poor but not for the other social groups: an outcome to frame in the epidemic and economic crisis of 1854. The only other groups of causes that display a strong and significant preference for hospitalization are the 'others' and the 'not identified' groups. Unfortunately, in both cases we lack enough information to put forward an interpretation, yet it is interesting to notice at least that there

were more diseases, albeit unidentified, for which hospitalization seemed a recommended option.

Overall, an in-depth, qualitative investigation in the history of the Civic Hospital would be required to substantiate our analysis. Nevertheless, our results show that hospital admissions were quite selective. Although all diseases were present among hospital deaths, they were not equally represented. The fact that in some cases the hospital attracted also paying patients strongly supports the idea that this reflected the hospital's specialization in specific therapies that could not be undertaken in a domestic setting.

6. GATEWAYS TO DEATH, FOR REAL.

In this article, we have used death records from Venice to highlight the main features of the city's hospitals in the second half of the nineteenth century. Their dual nature, as places of shelter and centres for medical treatment, emerged quite clearly. Following the end of the aristocratic regime in 1797, the Venetian health system underwent dramatic changes, which culminated in the founding of the Provincial Civic Hospital. Since 1825, the primacy of this hospital in the city's medical care system was firmly established and its organization had become fully developed. The breach with the past could not be more evident. Yet, the hospital's leading principles were not very different from those that had inspired the city's welfare policies for centuries. The hospital's mission was primarily the relief of the poor. Even the creation of a maternity ward, with the associated school of obstetrics, was specifically meant for two kinds of patients: married women who were too poor to deliver safely in their *tuguri* or 'dismal hovels', and unmarried women who wanted to conceal their condition. The two groups were housed in separate wards and given the utmost privacy.[53] Despite the hospital's transformation into a veritable 'healing machine'

[53] Bembo, *Delle istituzioni di beneficenza*, 207.

(*machine à guérir*)[54], inpatients remained the traditional ones: the poor, destitute, elderly, and solitary, who could not afford to distinguish between care and cure. Still, some distinctions between the new order and the old were becoming evident. There were differences in the frequency of the conditions being treated in hospital that suggest the doctors were pursuing some degree of medical specialisation. To some extent, the medicalization of the hospital seemed to proceed faster than the medicalization of its patients.

Was this the result of a temporary misalignment between increasing medical expertise and the larger expectations of society, between supply of medical care and demand for more traditional assistance? It was, but only partially.

Nowadays, nobody would ever consider defining hospitals as gateways to death. Yet they are still by far the most frequent place where people die. In a survey of 45 countries since 2001, 21 reported on the percentage of deaths that occurred in hospitals, ranging from 20 per cent in China to 78 per cent in Japan, with a median figure of 54 per cent.[55] In the United States, 60 per cent of deaths occurred in hospitals and 20 per cent in nursing

[54] Michel Foucault, Blandine Barret Kriegel, Anne Thalamy, François Beguin, Bruno Fortier, *Les machines à guérir: Aux origins de l'hôpital moderne; dossiers et documents* (Paris: L'institut de l'environnement, 1976).

[55] For the other 24 countries, data were not available or not comparable. 54 is the median of the percentage distribution. See Joanna B. Broad, Merryn Gott, Hongsoo Kim, Michal Boyd, He Chen and Martin J. Connolly, 'Where Do People Die? An International Comparison of the Percentage of Deaths Occurring in Hospital and Residential Aged Care Settings in 45 Populations, Using Published and Available Statistics', *International Journal of Public Health*, 2013, 58, 257-267.

homes.[56] The corresponding figures for British Columbia, Canada, between 2004 and 2008 were 51 and 29 per cent.[57] In France and Sweden (2009), hospital deaths were respectively 58 and 62 per cent of the total.[58] In England in 2010, only 21 per cent of all deaths took place at home and, on current trends, by 2030 less than 10 per cent of those dying there will die at home.[59] Only Germany represents a partial exception, with around half of all deaths happening at home.[60]

Yet, the majority of people in each country declare that they would rather die at home than elsewhere. In England, for instance, over 60 per cent of the population would prefer to die at home and in some studies the proportion is as high as 80-90 per cent.[61] There are

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[56] Sherry Weitzen, Joan M. Teno, Mary Fennell and Vincent Mor, 'Factors Associated with Site of Death: A National Study of Where People Die, *Medical Care*, 2003, 41(2), 323-335.

[57] Jyothi Jayaraman and KS Joseph, 'Determinants of Place of Death: A Population-Based Retrospective Cohort Study', *BMC Palliative Care*, 2013, 12-19.

[58] Sophie Pennec, Joëlle Gaymu, Alain Monnier, Françoise Riou, Régis Aubry, Silvia Pontone and Chantal Cases, 'Le dernier mois de l'existence: les lieux de fin de vie et de décès en France', *Population*, 2013-4, 68, 585-615.

[59] Barbara Gomes and Irene J Higginson, 'Where People Die (1974–2030): Past Trends, Future Projections and Implications for Care', *Palliative Medicine*, 2008, 22, 33-41.

[60] Steffen T. Simon, Barbara Gomes, Peyla Koeskeroglu, Irene J. Higginson and Claudia Bausewein, 'Population, Mortality and Place of Death in Germany (1950-2050) -- Implications for End-Of-Life Care in the Future', *Public Health*, 2012, 126, 937-946.

[61] Barbara Gomes, Natalia Calanzani and Irene J Higginson, *Local Preferences and Place of Death in Regions within England 2010*, Cicely Saunders International, report August

several reasons – not all negative – that explain the gap between people's preferences on this issue and the reality.[62] However, when we look to see who is most likely to die in hospital, in all countries we find that it is those with a small family network and no relatives to take care of them: the single, widowed or divorced, the childless or those with no daughters. They are often also less well off, less educated, immigrants; in the U.S. they are black, or Mexican Americans.[63]

Thus, although the faces of poverty have changed over time, the overall picture of hospitals functioning remains all too familiar. Notwithstanding the huge transformations involving medical knowledge and technology, sanitary systems, economy and society that have taken place, there has been remarkable continuity in the way hospitals provide a combination of both social care and medical treatment. They are still the places where people go to heal, but also to die.

2011; Barbara Gomes and Irene J Higginson, 'Home or Hospital? Choices at the End of Life', *Journal of the Royal Society of Medicine*, 2004, 97(9), 413-14.

[62] Kristian Pollock, 'Is Home always the Best and Preferred Place of Death?', *British Medical Journal*, 2015, 351: h4855.

[63] Ann Bowling, 'The Hospitalization of Death: Should More People Die at Home?', *Journal of Medical Ethics*, 1983, 9, 158-161; Aline Desesquelles and Nicolas Brouard, 'The Family Networks of People Aged 60 and Over Living at Home or in an Institution', *Population* (English Edition), 2003, 58(2), 181-206; Jayaraman and Joseph, 'Determinants of Place of Death'; Theodore J. Iwashyna and Virginia W. Chang, 'Racial and Ethnic Differences in Place of Death: United States, 1993', *Journal of the American Geriatrics Society*, 2002, 50, 1113-1117; Pennec et al., 'Le dernier mois de l'existence'; Weitzen et al. 'Factors Associated with Site of Death'.

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