

Articoli/Articles

THE HISTORICAL EVOLUTION OF SOME INTRINSIC
DIMENSIONS OF QUARANTINE

*^o^ANDREA A. CONTI, *^o^GIAN FRANCO GENSINI

*Dipartimento di Area Critica Medico Chirurgica,
Università degli Studi di Firenze, I

^oFondazione Don Carlo Gnocchi, IRCCS Firenze, I

^Centro Italiano per la Medicina Basata sulle Prove, Firenze, I

SUMMARY

The word “Quarantine” makes its first recorded appearance in the English language in the seventeenth century. It was originally a thirty-to-forty day period in which subjects suspected of carrying a contagious disease were subjected to detention and segregation with selective restraint regulations regarding circulation. Five dimensions are implicit in this original use of the term: “time”, “disease”, “context”, “restraint” and “segregation”. These dimensions have undergone modification through time, and more recently the term has come to indicate a more variable time period, adopted with reference to the compulsory physical separation not only of groups of human beings potentially exposed to contagious disease, but also of animals, goods and various means of transportation. Currently, “new” pathologies such as SARS and avian influenza must also be considered, and the context dimension has become much more various than in the past, while the restraint dimension is now connected with personal liberty and autonomy and not only with medical-health risks. Finally, the original palliative, rather than curative, segregation dimension has left space to specialised therapeutic quarantine units, in this way completing the medical and figurative evolution of the concept of quarantine through time.

Introduction

According to the *Webster’s Third New International Dictionary*

Key words: Quarantine - History of medicine - Health care - Epistemology

1976 (1909)¹ the etymology of the word “Quarantine” is presented as having two possible origins. In a legal sense it is retained to be a partial modification of the French “quarantaine”, from Old French, from “quarante” (forty), from Latin “quadraginta”, from quadra- (akin to quattuor, four) + -ginta (akin to viginti, twenty). In its other senses, which are the ones that are relevant here, it is considered a modification of Italian “quarantena” (quarantine of ships), from the Italian “quaranta” (forty), from Latin “quadraginta”. It may therefore be concluded that the history of the term, though always ultimately deriving from Latin, is complex, since it arrives in English both from Italian and French.

The word “Quarantine” makes its first recorded appearance in English, according to the *Oxford English Dictionary*², in the seventeenth century (1663). It is documented with the following meaning:

A period (originally of forty days) during which persons who might serve to spread a contagious disease are kept isolated from the rest of the community; especially a period of detention imposed on travellers or voyagers before they are allowed to enter a country or town, and mix with the inhabitants; commonly, the period during which a ship, capable of carrying contagion, is kept isolated on its arrival at a port. Also, a period of seclusion or isolation after exposure to infection from a contagious disease. After a brief mention of a possible transferred meaning, the entry continues: Hence, the fact or practice of isolating or of being isolated in this way.

In the present paper five dimensions are proposed as implicit in this original use of the term, namely “time”, “disease”, “context”, “restraint”, and “segregation”.

The five dimensions in the original use of the term Quarantine

With regard to “time”, ancient Arabic medicine had already contemplated the practice of quarantine, and the *Old Testament* (*Leviticus* 13) indicated how individuals affected by diseases, in particular plague and leprosy, were to be separated from others for a variable period of time³. The time period was already precisely defined in Hippocratic medicine, in the V century B.C.⁴. In effect,

Hippocratic teaching had established that an acute illness only manifested itself within forty days, and the case of plague was representative with respect to this, since a disease manifesting itself after forty days could not be plague⁵. Therefore forty days became the time period for quarantine. In the course of the following centuries, the temporal dimension, even if oscillating essentially between thirty and forty days, remained fundamental for the definition of quarantine⁶. For example, in 1377 the Rector of the seaport of Ragusa, today called Dubrovnik (Croatia), officially issued the so-called “trentina” (an Italian word derived from “trenta”, that is, the number 30), a thirty-day isolation period⁷. Ships coming from infected or suspected infected sites were to remain at anchor for thirty days before docking. This same period of time became 40 days for land travellers, and therefore the attention dedicated by the Ragusan officials to the plague was responsible for the creation of what is probably the first “official” quarantining as a legal system aimed at defending both health and commercial aspects in the western world⁸.

With reference to the dimension of “disease”, this was supposed to be a contagious one^{9,10}. Before the nineteenth century the term infectious could not be used in a proper way for illnesses, since the birth of infectiology dates back only to that century. However, contagious pathologies have always been caused by infectious agents, and plague (by the *Yersinia pestis*) and leprosy (by the *Mycobacterium leprae*) were the major epidemic diseases of the past. In the definition of quarantine, the dimension of disease has thus been essential; in any case, clinical and transmission features have until recent times always been very much privileged, as compared with microbiological and epidemiological ones¹¹.

The “context” dimension is very interesting in the following of the evolution of the concept of quarantine through time. In effect, if by context we refer to the environment in which the quarantine is made to operate, it should be noted that persons and ships were virtually the only subjects of quarantine before the nineteenth century, while after this temporal threshold other “things” become quarantining material, including vehicles, animals and materials¹². This

historical consideration also appears relevant for the understanding of the evolution of laws, rules and regulations aimed at defining, implementing and extending quarantine.

The “restraint” parameter, namely, the specific kind of stoppage on movement, in terms of entry, leaving, circulation and transportation, is important since it opens up a perspective on another dimension of quarantine through time, the economic one. The medical-clinical, the medical-hygienic and the legal dimension have been already mentioned for quarantine; the commercial meaning of quarantine, that is the need to protect the quality and safety of the commercial network (rather than potentially infected people), must also be recognized because, depending on the historical period and on the region of the world specifically considered, one dimension has prevailed over the other determining the major stigma of quarantine in selected times and places¹³.

Last but not least, the “segregation” dimension needs to be carefully considered, not only because it is relevant from a historical and methodological viewpoint, but also because it deserves special attention whereas it is often neglected¹⁴. The dimension of segregation, in fact, was not explicit in the typologies and systems of measures and regulations introduced to render the segregation itself effective; rather, it was implicit in the reference to the “practice of isolating or of being isolated in this way”¹⁵. This indication suggests a palliative, rather than a curative, role for the method of quarantine, and it must be remembered in a historical perspective since recent boosts of “new” contagious diseases, such as the severe acute respiratory syndrome (SARS) and the avian influenza, have prompted not only real social phobias (the so-called “alektorophobia” in the case of avian influenza) but also methodological reflection on the role and function of quarantine^{16,17}.

In this contribution, with regard to the evolution of the medical and figurative concept of quarantine through time, two main periods will be distinguished and analysed: the eighteenth and the nineteenth centuries, and the twentieth. However, a preliminary historical and methodological reference to the seventeenth century will

here be proposed, since modifications in some of the above presented dimensions of the use of the term quarantine were already operative in the sixteen hundreds, and, furthermore, a figurative use of the term was also then already identifiable¹⁸.

The seventeenth century

Even if in the seventeenth century the disease (“disease” dimension) most commonly feared and against which quarantine was essentially implemented was the classical plague, as documented (1691) by Narcissus Luttrell, who, in his *A Brief Historical Relation of State Affairs 1678-1714*, (II. 185, ed. 1857), writes that “*Those that come from Naples are obliged to perform a quarantine before they come to Rome, because of the plague in that Kingdom*”, modifications in the dimension of time were already operative. The citations furnished by the *Oxford English Dictionary* itself clearly indicate this oscillating change, since the forty day period had already in the seventeenth century become longer or shorter in time, according to the context and the restraint dimensions.

In 1663, the year of the first registered occurrence of the term quarantine in English (1628 in the form “quarentine”) Samuel Pepys already comments in his Diary (*Memoirs. Comprising his Diary from 1659 to 1669, and a Selection from his Private Correspondence*, 26 Nov., ed. 1825) on the time manipulation: “*Making of all ships coming from thence to perform their ‘quarantine for thirty days’, as Sir Richard Browne expressed it contrary to the import of the word (though, in the general acceptation, it signifies now the thing, not the time spent in doing it)*”. Already in its first documented use, therefore, the word quarantine had lost its restrictive (and etymological) meaning of forty days¹⁹.

Moreover, in the seventeenth century the term was already adopted for a time period not necessarily associated with prophylactic and/or protective measures from infection, as well exemplified by Thomas Fuller who, in his 1639 *History of the Holy Warre* (iii. xxii. 147), writes: “*When their quarantine, or fourty dayes service, was expired*”, thus indicating by quarantine merely a temporal

unit, in this case of forty days as in the original formulation, and not a period strictly tied to diseases and their prevention.

Finally, there further existed a figurative sense in the expression “free quarantine”, exemption from quarantine, as in Samuel Butler, *Remains* (I. 209, 1680, ed. 1759): “*Where she denies Admission, to intrude Unless they have free Quarentine from her*”. Here “quarantine” has the evident meaning of “access” to something that is not contagious in the medical sense, instead of that of isolation from somebody or something that is infectious and therefore physically dangerous.

The eighteenth century

In the eighteenth century the medical sense of quarantine dominates, as documented by great writers, including Daniel Defoe who, in 1722, in his *A Journal of the Plague Year* (204, ed. 1884) writes that “*The Family were oblig’d to begin their Quarantine anew*”, mentioning therefore quarantine in its health dimension. However, awareness of flexibility in the use of the term was spreading in this period, given that the same Defoe also writes, again in 1722 (*Plague*, 235, ed. 1756) “*Not a Quarentine of Days only, but Soixantine, not only 40 Days but 60 Days or longer*”. This extended use of the same term for different time periods is quite modern; today, in fact, as will be discussed below, quarantine has become extremely variable in length on the basis of the different incubation periods of different diseases²⁰. Defoe proposes a period longer than forty days, but other Authors, such as E. Stanley (1799) in Archibald Duncan, *A Correct Narrative of the Funeral of Horatio Lord Viscount Nelson* (112, ed. 1806), propose considerably shorter courses for quarantine, as can be read in his passage beginning with: “*Having finished their quarantine of thirteen days*”.

The nineteenth century

In the nineteenth century the term quarantine continues to be used for the precautionary measures taken to impede the spread of diseases, now less plague and leprosy, and more particularly

cholera²¹. In this century not only does the epidemiological attention of the medical community shift from classical pathologies to emerging diseases, but it also focuses on living beings other than humans. There is now documentation of the use of the term for the isolation of animals as possible transporters of disease (“*All strange hogs must be kept in quarantine for fourteen days before being allowed to run with healthy herds*”, *Investigation of Diseases of Swine, Special Report number 12*, US Department of Agriculture, 151, 1879) and this appears particularly important in Great Britain, where a rooted tradition of hermetically sealing the ports to animals, either isolating them for extended periods of time (many months) or even forbidding them to enter the island, is active.

Additional relevant developments occur in the nineteenth century, since, from a linguistic point of view, the earliest attested use of the attributive use of the word quarantine makes its appearance, as documented by the following expressions reported in the *Oxford English Dictionary*: “quarantine laws” (1805), “quarantine ground” (1808), “quarantine flag” (1835), “quarantine-officer” (1861-2). These terms well express the underlying interest, typical of the nineteenth century, in precise legal regulations and rules in the area of quarantine²². It is not by chance that it is in the nineteenth century that quarantine politics undergo a boost, as formally indicated by the brisk discussion of quarantine practices held during the First International Sanitary Conference (Paris, 1851), where the need for quarantine for things and materials (and not only for humans and animals) was stressed.

Another major point to underline with reference to the semantic history of quarantine in the nineteenth century is without doubt the extension of the figurative use of the term. Now non-infectious objects, and not just contaminated things, are also said to undergo quarantine. The dominant motivation for this transference of meaning is the attribution to objects of a danger analogous to that of a contagious disease; this appears understandable if one considers how the nineteenth century was profoundly marked by widespread social diseases, including cholera, puerperal fever and tuberculo-

sis²³. Consequently, in an extension of the term, not only do choleric persons have to undergo quarantine to solve a major medical-health problem, but also harmful and potentially destructive objects such as weapons and whisky:

A rigid quarantine against fire arms and firewater on the reservations of the Northwest is one of the prime requirements of the Indian problem (Boston Journal, 7 January 2/3, 1891).

In this way in this period different social issues are placed on the same danger-fraught level by the common linguistic link of quarantine.

A final interesting evolution of the term quarantine in this period collocates itself again in the social area, and it is the growing association of the term itself with a form of social discrimination, evident in the use of a remarkable expression such as “perpetual quarantine” with regard to leprosy (“*The lepers often sought a voluntary death as the only escape from their perpetual quarantine*”, John M. Jephson and L. Reeve, *Narrative of a Walking Tour of Brittany*, vi. 77, 1859). In effect, the fear of contagious diseases was extremely strong throughout the nineteenth century, despite the fact that it was precisely in this century that the first microbiological agents responsible for a number of these diseases (cholera, tuberculosis) were identified.

The twentieth century

Entering the twentieth century, the medical use of the term quarantine, applied to people, obviously continues, now reinforced by infectivological achievements. In addition, various novel elements are introduced following achievements in sectors different from those of medicine and health. In the last decades of the nineteenth hundreds the concept was in effect extended to new areas to be quarantined, to potential contaminants deriving from the moon, for example, whether really and technically contagious or not. Thus both objects brought from the moon (things), and the astronauts themselves (persons), were quarantined after the space missions, as the prestigious *Scientific American* documents two years after the first human landing on the moon:

The changing meaning of Quarantine through time

To guard against the possibility of introducing pathogenic organisms from the moon, the lunar samples were placed in quarantine for seven weeks (Scientific American, October 49/2, 1971).

Still in this context the *Oxford English Dictionary Supplement of 1976* provides the following explanation of the abbreviation LRL (Lunar Receiving Laboratory):

building where astronauts and lunar samples are quarantined for a period after returning from the moon.

It should be noted that the length of quarantine is indicated, for people coming back from the space, in fifty days.

With regard to the figurative use of the term quarantine, the twentieth century documents the extension of the term, and thus of the underlying concept, to the sphere of politics, and F.D. Roosevelt is retained to have been the first (1937) to use the word quarantine with the meaning of political isolation in one of his public speeches. In this new political (if compared with the “political” meaning of the term in Medieval times) perspective, dictionaries record a new entry, and the *Oxford English Dictionary* provides the following definition of this novel figurative use of the term:

Any period, instance, etc., of detention or seclusion compared to the above; spec. in international politics, a blockade, boycott, or severance of diplomatic relations intended to isolate a nation, or the isolation caused by such action.

Many examples of this new use of the old term quarantine are furnished by newspapers (*New York Herald Tribune*, October 6 1937) reporting President Roosevelt’s speeches (“Quarantine of aggressors”), and such a usage becomes a normal semantic extension during the following years (*Sun of Baltimore*, November 16 1938; *Richmond News-Leader*, October 4 1945). In 1953 Paul C. Berg, in his *A Dictionary of New Words in English*, inserted the following meaning of quarantine as verb: “to isolate (a nation)”, and the Cuba crisis (1962) brought the term back into particular favour.

This is particularly interesting from a historical and epistemological point of view, since this twentieth century quarantine meaning takes up again, at least to a certain extent, the medieval concept of quarantine as a social defence. In effect, at the end of the fourteenth century in Ragusa and in the rival Republic of Venice, ships arriving at the ports had to stay at anchor for thirty days before docking to impede people carrying disease from infecting the state; in the twentieth century ships are blocked to impede a cargo considered dangerous from imperilling the security of the state (the U.S.A. in the case of Russian missiles in Cuba).

A recent, further intriguing evolution of the term quarantine should be noted, and precisely the passage of the term into the sphere of interpersonal relations, in the sense of an emotional ostracising of another person (*“Putting him in emotional quarantine”*, W. Garner, *Mobius Trip*, ii. 60, 1978). This is particularly interesting because it shifts the interest of quarantine from the physical to the psychological and emotional dimensions, anticipating the current interest in personal liberty and autonomy.

With regard to the current renewal of medical interest in quarantine, the appearance in the western world of “new” diseases, such as the severe acute respiratory syndrome and the avian influenza, has again called attention, from a different perspective, to the health meaning of quarantine at the beginning of the twenty-first century.

The historical and epistemological evolution of the dimensions of the term “Quarantine”

In synthesis, the historical sources, the medical and figurative examples as also the literary quotations analysed and synthesised in this contribution indicate that the five dimensions proposed as implicit in the original medical use of the term quarantine (“time”, “disease”, “context”, “restraint”, “segregation”) have undergone deep and extensive evolution through time, with substantial modifications in the course of the history of medicine and public health.

The “time” period has in fact become longer or shorter, according to the disease involved. The temporal meaning of forty days has

only survived in the mere word, but not at all in its practical application. Nowadays, everybody and/or everything may be quarantined for any period of time.

The “disease” dimension has totally changed as well. Quarantine is currently not necessarily associated with physical infectious disease; many of its current uses, in terms of the frequency of quotations in the overall literature, come in effect from areas different from the medical one. It is, in fact, now assimilated to the idea of social contagion, having shifted from the specific issue of the illness problem to the more general issue of social contact.

The “time” and “disease” dimensions have become closely linked, due to the fact that improvements in the theoretical comprehension of the causes and of the course of infectious diseases have had a practical impact on the consequent length of quarantine. From the nineteenth century onwards in particular, the definition of a systematic microbiological approach has permitted, on the one hand, the identification of causative agents of contagious diseases, and on the other, the more precise quantification of the incubation time necessary to scientifically set the temporal limits of quarantine. Moreover, the “disease” dimension has undergone further epistemological and technical variation since “new” pathologies have appeared, such as SARS and the avian influenza, for which new applicative forms of the old concept of quarantine have been proposed and implemented, and quarantine has been re-introduced on a vast scale (*The New York Times*, May 5 2003)²⁴.

The “context” parameter has also undergone profound modification. To the classical framework of persons and ships, many other elements have been added, including airplanes, earth vehicles, materials, and also new settings, such as outer space. Now astronauts returning from the moon are put in quarantine, and this indirectly points to the moon as a possible new source of infection. However, to what extent the moon is a “new” determinant of illness may be questioned, since the history of western medicine clearly teaches that from times immemorial the moon has been considered a “cause” of disease (the medical technical term “influenza” histor-

ically comes from a more ample expression defining the “*bad influence of planets on human health*”²⁵. Twentieth century dictionaries reporting definitions of quarantine interestingly mirror the notable changes in the context dimension of the term quarantine. Among them the recent *The American Heritage Dictionary of the English Language* 2000²⁶ may be cited, in which the entry for quarantine (“*A period of time during which a vehicle, person, or material suspected of carrying a contagious disease is detained at a port of entry under enforced isolation to prevent disease from entering a country*”) underlines the possibility, and the opportunity, of quarantining vehicles and materials, other than people. *The Macmillan Dictionary* 1977 (1973)²⁷ focuses on the importance of isolating animals, objects and places in addition to the “classical” persons; its entry for quarantine reads: “*isolation imposed on a person, animal, place, or object affected with, or considered to be a carrier of, an infectious disease, in order to prevent the spread of the disease*”. A comparison of the definition of quarantine of this same dictionary with that of *The Shorter Oxford English Dictionary* 1962 [1933]²⁸ (“*A period (orig. of forty days) during which persons who might spread a contagious disease (esp. travellers) are kept isolated; commonly, the period during which a ship, suspected of carrying contagion, is kept isolated on its arrival at a port*”) is extremely pertinent for the evaluation of the context dimension. In effect, despite the fact that the two dictionaries both date back to the last few decades, the older one exclusively concentrates on persons or ships as the subjects of quarantine, while the more recent one extends the concept from human beings to animals, and from moving ships to fixed places and objects. The “context” dimension of quarantine currently spaces from political ideology to international affairs, from arms to drugs, involving the “restraint” dimension in the idea of impeding something considered inimical or damaging to one’s own society or nation. The current global village seems to need more general semantic networks than in the past; in effect, nations are seen as tainted or diseased in the quarantine perspective, and this view is complemented by the idea of limiting hypothetical

enmity, leading to the paradoxical conclusion (if the origin and the history of the medical term quarantine is considered) that quarantine may be useful for all that which embodies a potential danger to man, even if not infectious.

With regard to the specific “restraint” dimension, this paper has already stressed that the original medical (clinical and hygienic) feature of this aspect has, in the course of time, been flanked and even superseded by supervening characteristics, including the social and the political ones. In more recent times the restraint dimension has had to confront the problematic issue of what is involved in operating restrictions on personal liberty and individual autonomy. The recent (twenty-first century) cases of quarantine for SARS have well evidenced this last and overwhelming privacy feature of restraint, an aspect virtually absent in the original concept of the term.

With regard to the “segregation” dimension, the idea of substituting movement with fixedness intrinsic in the original meaning of the term has undergone ulterior evolution. In a world, like the present one, where everybody and everything is continuously moving and changing state and place, the dominating priorities in applying quarantine in the medical field are the adoption of specialised therapeutic units and the limitation of segregation as much as is compatible with essential health necessities. Furthermore, as has been seen, in the current social, rather than individual, and global, rather than isolated, perspective of quarantine, the concept itself is now firmly associated with the idea of keeping something or somebody out of the social body, of impeding something or somebody from forming part of a community^{29,30}.

Concluding remarks

Current selective attention towards the community aspects of quarantine, as a form of social isolation, is impressive and the concept of isolation itself would deserve a full analysis of its historical evolution; but this is another story. With regard to the story of this contribution, the fascinating journey of the evolution of the concept of quarantine has come to an end, even if we suspect that its progress in the health and semantic spheres continues through time^{31,32}.

BIBLIOGRAPHY AND NOTES

Acknowledgements:

The Authors would like to thank Professor Luisa Camaiora, B.A., M.Phil., for her correction of the English.

1. *Webster's Third New International Dictionary*, Chicago, London, Encyclopaedia Britannica Inc., 1976 [1909].
2. *The Compact Oxford English Dictionary*, 2nd edition, Oxford, Oxford University Press, 2002 [1991]. All the citations in this paper are taken from this Dictionary.
3. SEHDEV P.S., *The origin of quarantine*. Clin. Infect. Dis. 2002; 35: 1071-2.
4. KNOWELDEN J., *Quarantine and Isolation*. In: The New Encyclopaedia Britannica, 15th edition, Chicago, Helen Hemingway Benton, 1979, pp. 326-7.
5. SLACK P., *The black death past and present. 2. Some historical problems*. Trans. R. Soc. Trop. Med. Hyg. 1989; 83: 461-3.
6. MAFART B., PERRET J.L., *History of the concept of quarantine*. Med. Trop. 1998; 58: 14-20.
7. STUARD S.M., *A state of deference: Ragusa/Dubrovnik in the medieval centuries*. Philadelphia, University of Pennsylvania Press, 1992.
8. FRATI P., *Quarantine, trade and health policies in Ragusa-Dubrovnik until the age of George Armmenius-Baglivi*. Med. Secoli 2000; 12: 103-27.
9. KILWEIN J.H., *Some historical comments on quarantine: part one*. J. Clin. Pharm. Ther. 1995; 20: 185-7.
10. KILWEIN J.H., *Some historical comments on quarantine: part two*. J. Clin. Pharm. Ther. 1995; 20: 249-52.
11. MATOVINOVIC J., *A short history of quarantine (Victor C. Vaughan)*. Univ. Mich. Med. Cent. J. 1969; 35: 224-8.
12. MAGLEN K., *Politics of Quarantine in the 19th century*. J.A.M.A. 2003; 290: 2873.
13. FIDLER D.P., *International law and infectious diseases*. Oxford, England, Oxford University Press, 1999.
14. LACEY C., *Abuse of quarantine authority. The case for a federal approach to infectious diseases containment*. J. Leg. Med. 2003; 24: 199-214.
15. GURSKY E.A., *Quarantine and isolation*. Md. Med. 2006; 7: 18-20.
16. HO W., *Guideline on management of severe acute respiratory syndrome (SARS)*. Lancet 2003; 361: 1313-5.
17. CLEM A., GALWANKAR S., *Avian influenza: preparing for a pandemic*. J. Assoc. Physicians India. 2006; 54: 563-70.
18. GENSINI G.F., CONTI A.A., *The evolution of the concept of "fever" in the history*

The changing meaning of Quarantine through time

- of medicine: from pathological picture per se to clinical epiphenomenon (and vice versa)*. J. Infect. 2004; 49: 85-7.
19. GENSINI G.F., YACOUB M.H., CONTI A.A., *The concept of quarantine in history: from plague to SARS*. J. Infect. 2004; 49: 257-61.
 20. MUSTO D.F., *Quarantine and the problem of AIDS*. Milbank Q. 1986; 64 Suppl 1: 97-117.
 21. AL-ATEEG F.A., *Isolation versus quarantine and alternative measures to control emerging infectious diseases*. Saudi Med. J. 2004; 25: 1337-46.
 22. BOOKER M.J., *Compliance, coercion, and compassion: moral dimensions of the return of tuberculosis*. J. Med. Humanit. 1996; 17: 91-102.
 23. CONTI A.A., LIPPI D., GENSINI G.F., *Tuberculosis: a long fight against it and its current resurgence*. Monaldi. Arch. Chest. Dis. 2004; 61: 71-4.
 24. ZAMBON M., NICHOLSON K.G., *Sudden acute respiratory syndrome*. B.M.J. 2003; 326: 669-70.
 25. CONTI A.A., *Quarantine through history*. In: HEGGENHOUGEN K., *Encyclopedia of Public Health*. Oxford (UK), Elsevier, 2007 in press.
 26. *The American Heritage Dictionary of the English Language*, 4th edition, Houghton Mifflin Company, 2000 [1995].
 27. *The Macmillan Dictionary*, Macmillan Educational Corporation, New York, P.F. Collier, Inc., London and New York, 1977 [1973].
 28. *The Shorter Oxford English Dictionary*, revised and edited by C.T. Onions, Oxford, Oxford University Press, 1962 [1933].
 29. BARBERA J., MACINTYRE A., GOSTIN L., INGLESBY T., O'TOOLE T., DEATLEY C., TONAT K., LAYTON M., *Large-scale quarantine following biological terrorism in the United States*. J.A.M.A. 2001; 286: 2711-6.
 30. SHEPIN O.P., YERMAKOV W.V., *International Quarantine*. Madison, CT, International Universities Press, 1991.
 31. ROSEN G., *A History of Public Health*. Baltimore, Johns Hopkins University Press, 1993.
 32. ANGELETTI L.R., *Environment and political institutions between antiquity and contemporary medicine*. Med. Secoli. 1995; 7: 415-23.

Correspondence should be addressed to:

Andrea Alberto Conti, Dipartimento di Area Critica Medico Chirurgica, Università degli Studi di Firenze, Viale Morgagni 85, I-50134, Firenze, Italia. E-mail:aa.conti@dac.unifi.it

