

## Dubrovnik's Invention of the Quarantine and the Transfer of Knowledge about the Spread of Epidemics\*

It is rather well-known fact that the concept of the modern quarantine was “invented” in Dubrovnik. Although the modern quarantine and rules governing patient isolation are subject to the judgement of physicians and epidemiologists, in medieval Dubrovnik the first quarantine was the result of purely empirical observation and the experience of several disastrous plague outbreaks. Namely, in 1377, Dubrovnik's authorities proclaimed an ordinance against the spread of disease without any medical knowledge about contagions. Moreover, in subsequent decades, they elaborated these measures to create the first (public) health office by the end of the 14<sup>th</sup> century. Dubrovnik's anti-plague measures were rather quickly adopted throughout the Mediterranean, and even further elaborated, so in the mid-15<sup>th</sup> century Venice prolonged the isolation period from the original 30 to 40 days (*quaranta*), which consequently bequeathed its name to this particular preventive isolation to combat the plague. In the following centuries this concept of the quarantine was widely applied, especially to prevent spread of epidemics across the borders with the Ottoman Empire.

Research into epidemics and diseases over the course of history cannot simply be defined as exclusively historiographic or medical, and without inter-, trans- and multidisciplinary approaches one cannot achieve any manner of reliable results.<sup>1</sup>

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<sup>1</sup> This article largely relies on the research results already published but scattered through various relevant scholarly journals, monographs and collected proceedings from the relevant conferences, and particularly on the work of the late Prof. Mirko Dražen Grmek (GRMEK 1980: 9-55) and Zlata Blažina Tomić (BLAŽINA TOMIĆ 2015), who in their research thoroughly investigated the emergence of the quarantine and the development of the (public) Health Office in old Dubrovnik. With respect to the conference theme, i.e., transfer of knowledge, one must further note that their research results largely depended not so much on their own archival research, but rather on the information extracted from archival sources by certain previous researchers, such as Risto Jeremić and Jorjo Tadić (JEREMIĆ & TADIĆ 1938). Moreover, information about the later development of health care and anti-epidemic systems was gathered from various relevant sources and literature. For more, see the list of bibliographic references at the end of this paper.

Even in the present day, as we struggle with an almost entirely new epidemic, historical knowledge and experience proved to be of paramount importance in the fight against COVID-19. In that respect, the concept of quarantine – once again – proved to be one of the most effective ways to fight an “unknown” disease.

Today term and concept of quarantine is tightly connected to medicine and medical and bio-medical expertise. But it is rather peculiar fact that the “invention” of the first quarantine had little to do with the medical knowledge and medical expertise of the times when it was introduced, i.e., the late Middle Ages.

Thus, it seems important to comprehend how the knowledge and practices that originated as a basically “administrative” measure became a global medical concept in the struggle against contagious disease. In that respect, the history of the transfer and circulation of knowledge a virtually novel field of research provides insight that is sometimes lacking in the research conducted by historians of science and the historical sciences in general.<sup>2</sup> Therefore, perhaps one should review the transfer of knowledge as a practice of circulating knowledge as a component of communication, and also as cultural transfer, especially among communities that share common cultural, intellectual or even commercial interests.<sup>3</sup> Bearing this in mind, and focusing attention back to the concept of quarantines, one should reconsider the history of the emergence and use of quarantine measures in order to identify and track the reasons and means for the spread of this unquestionably important medical and anti-epidemic practice.

Although in the assertion that the quarantine originated in late medieval Venice can quite often be found in the literature dealing with the history of epidemic diseases, and this view is still sometimes highlighted in the public sphere and the mass media in Italy and in some English-speaking countries,<sup>4</sup> the fact is that already in late 1970s Mirko Dražen Grmek, a Croatian physician and medical history researcher, demonstrated that first efficient quarantine was introduced in late medieval Dubrovnik.<sup>5</sup> Namely, the ordinance of Dubrovnik’s Grand Council entitled *Veniens de locis pestiferis non intret Ragusinum vel districtum*, issued on July 27, 1377, clearly reveals that this was the first anti-pestilence ordinance in the Western Hemisphere aimed at preventing the spread of an epidemic without removing the city/commune from the map of trade and communication in the then contemporary world.<sup>6</sup>

<sup>2</sup> RECORD 2004: 654-672.

<sup>3</sup> RECORD 2004: 657-661.

<sup>4</sup> KREKIĆ 1972: 99-101; STEVENS CRAWSHAW 2012: 19 cf. 74; DREWS 2013: 66; DART-FORD 2021; TOTH STUB 2020; Chi ha inventato la quarantena 2020; COCCHI 2020.

<sup>5</sup> GRMEK 1989: 44.

<sup>6</sup> See e.g.: BLAŽINA TOMIĆ 2015: 106-109, with the cited literature. The ordinance is published in: *Liber Viridis* 1984.

The Grand Council's ordinance specified a set of orders and measures that could protect the city and its population from the potential spread of epidemics, and at the same time it marked the beginning of the Public Health Office in Old Dubrovnik. The order is preserved in the volume collecting of the Council's conclusions called *Liber viridis* (The Green Book) and states:

- (1) citizens or visitors from plague-endemic areas would not be admitted into Ragusa until they had first remained in isolation for 1 month;
- (2) no person from Ragusa was permitted go to the isolation area, under penalty of remaining there for 30 days;
- (3) persons not assigned by the Grand Council to care for those being quarantined were not permitted to bring food to isolated persons, under penalty of remaining with them for 1 month;
- (4) whoever failed to observe these regulations would be fined and subjected to isolation for 1 month.<sup>7</sup>

By ordering 30-day isolation for healthy, or seemingly healthy, sailors and traders, Dubrovnik's officials showed a remarkable understanding of the incubation period, though – as far as one may glean from contemporary sources – they did not have any formal medical knowledge about the spread of infections.<sup>8</sup> Namely, new arrivals might not have exhibited symptoms of disease, but according to the ordinance they would be held in quarantine long enough to determine if they were in fact disease-free or not.

Since Dubrovnik's officials did not have any formal medical knowledge about a pathogen's infection cycle and the etiology of disease, the question arises as to how and why these officials arrived at this unique idea that still stands as one of the pillars of anti-epidemic measures in infectious disease cases. Though there is no exact and explicit proof in extant relevant sources, one can make several assumptions related to the transfer of knowledge and measures against plague epidemics within the pre-modern Mediterranean zone.

Namely, it is rather known that already in 1374 officials and authorities in Genoa and Venice began to monitor ships and merchants coming from infected regions.<sup>9</sup> Although such monitoring was not followed by any formal orders or prohibition of potentially infected arrivals, such a practice could have served as a solid and sound foundation for the legislative action that ensued in Dubrovnik.

Moreover, the entire Eastern Adriatic coast had long-standing experience with another infectious disease that tormented the entire Mediterranean since Antiquity,

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<sup>7</sup> *Liber Viridis* 1984: cap. 49.

<sup>8</sup> The pathogen of the plague was discovered only in 1894, during the great epidemic in Hong Kong (China) almost simultaneously by Alexandre Yersine and Shibasaburo Kitasato. For more about this, see e.g.: YERSIN 1894; BRAMANTI-STENSETH-WALLOE-LEI 2016: 6-10.

<sup>9</sup> GRMEK 1980: 44-45; DREWS 2013: 66.

and that was leprosy. And the most effective “cure” and response to this calamity was separation and isolation of the sick. The infected and sick were to be banned from the community to some isolated place, but never too far from the city. Consequently, at some point these communities of the infected were accommodated in constructed facilities but without any official organized medical care.<sup>10</sup>

Similarly, during the plague outbreak in 1374, the authorities in Milan ordered strict isolation and expelled all infected individuals from the city, which ultimately led to the death of the infected, but at the same time prevented the spread of the disease.<sup>11</sup> A similar practice of strict isolation, but in the form of confining infected individuals in their homes was recorded in 1348 as an anti-plague measure in certain Italian city-states. For example, at the first news of the epidemic in 1348, the Milanese archbishop ordered that the first three houses in which the plague was discovered be boarded up with their occupants inside, enclosing the well, the ill, and the deceased in a common cell. Whether or not it was due to his promptness, Milan’s death toll was relatively low.<sup>12</sup>

Again, it is important to note that the isolation and separation of those infected with virulent diseases were practiced since ancient times: especially in cases of leprosy and other highly contagious diseases.<sup>13</sup> Consequently, such practices and their (at least) partial success probably inspired Dubrovnik’s authorities to incorporate them into their anti-plague regulations. But in contrast to these previous practices of complete isolation, which, for example, happened in Milan, the regulation issued by Dubrovnik’s authorities in 1377 did not lead to complete isolation that would exclude the city from trade routes, since the prescribed isolation was not permanent but temporary.<sup>14</sup>

It is quite probable that Dubrovnik’s authorities were well informed and aware of anti-pestilence practices and measures in Italian and Mediterranean cities. Namely, preserved records from Dubrovnik’s councils reveal that during the 1380s and 1390s the authorities monitored the plague situation in their neighborhood.<sup>15</sup>

<sup>10</sup> BAKIJA-KONSUO 2018: 66-68; COSMACINI 2016: 51, 77-84; MILLER & NESBITT 2014: 118-138; NERALIĆ 2007. Regarding leprosy as a deadly infectious disease, see e.g.: SEHGAL 2006: 8-31.

<sup>11</sup> AYALON 2014: 34; HORROX 1994: 203; CARMICHAEL 1991: 215.

<sup>12</sup> TUCHMAN 1979: 108; ZIEGLER <sup>2</sup>1998: 54.

<sup>13</sup> COSMACINI 2016: 10-11, 78-79; On leprosy and the historical development of the disease, see e.g.: SEHGAL 2006: esp. 12-19; MILLER & NESBITT 2014: *passim*.

<sup>14</sup> It is important to note that the duration of temporary isolation changed at the time, and very often the duration of the quarantine varied from case to case, depending on the discretion of quarantine officials. See: MIOVIĆ 2018: 20-27, 30-32; BONDIOLI 2018: 92; BILIĆ 2018: 113.

<sup>15</sup> Unfortunately, records of the Dubrovnik councils that cover the period between 1368 and 1378 have been lost, and thus cannot provide any reliable information about the monitoring of the

Information and news were gathered from merchants and other travelers, and at the first word of a possible epidemic in some more or less remote region or city certain anti-pestilence measures were imposed.<sup>16</sup> Sometimes this meant imposing quarantine measures, and sometimes even a ban on traveling to infected areas.

Even though there is no detailed study dealing with the means of transferring knowledge on anti-pestilence measures, i.e., the modes of functioning of and the participants in the information network that provided data for decision-makers regarding anti-pestilence policies in pre-modern Dubrovnik, it is rather easy to assume how this network operated. Namely, it is well known that already as of the late 13<sup>th</sup> century the authorities in Dubrovnik regularly employed physicians and surgeons, who originally hailed from various cities on the Apennine Peninsula.<sup>17</sup> Consequently, it is rather obvious that these physicians brought their medical knowledge and practices, gathered during their long years of service in other cities in Italy and elsewhere around the Mediterranean. Moreover, there are also several cases of Dubrovnik physicians who served in various cities in Italy.<sup>18</sup> Some of them also served as diplomats on behalf of the Ragusan Republic.<sup>19</sup>

Although, as already noted, the measures of 1377 were not inspired by any formal medical knowledge, and as far as it can be ascertained, Dubrovnik's authorities did not consult any physicians<sup>20</sup> who were in the paid service of the city, this does not mean that physicians were not consulted in some cases when plague threatened the city, though their knowledge was rather limited due to the facts already noted in the introduction.<sup>21</sup>

The impact of these measures was not entirely successful, but the quarantine proved to be effective since Dubrovnik did not suffer any major plague outbreaks until 1391.<sup>22</sup> Moreover, these anti-plague measures helped to restore a sense of order within the commune. In 1390, Dubrovnik's authorities appointed the three

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arrivals of pestilence in this period. However, the preserved letters of Dubrovnik's authorities covering this period reveal constant communication with many Mediterranean and Balkan trading centers. Therefore, one may assume that the authorities were also well informed of plague outbreaks in these regions. These letters (*Lettera e Commisioni di Levante*) are published in: GELCICH 1896: 113-155.

<sup>16</sup> E.g., DINIĆ 1951: 115, 191, 193, 237-238, 240, 297-299; LONZA 2015: 76, 80, 133, 135, 331-332.

<sup>17</sup> BLAŽINA TOMIĆ 2015: 71-92, esp. table 73-82.

<sup>18</sup> BLAŽINA TOMIĆ 2015: 93-94.

<sup>19</sup> BLAŽINA TOMIĆ 2015: 94-99.

<sup>20</sup> MILOŠEVIĆ 2018: 72, 75.

<sup>21</sup> E.g., DINIĆ 1964: 307; MILOŠEVIĆ 2018: 22, 38, 75 (note 56).

<sup>22</sup> JEREMIĆ & TADIĆ 1938: 69, 102-104; BLAŽINA TOMIĆ 2015: 42-52; BAZALA 1962: 55-65.

Anti-Plague Officials, and in 1391, when a major plague outbreak struck the city once again, the authorities issued a new anti-plague regulation restricting travel by Dubrovnik citizens to infected regions. In 1395, the anti-plague Office was reinforced with two more officials, and all of these regulations led to the establishment of the first public health office, which followed in 1397, when the Grand Council adopted the regulation entitled *De ordinibus contra eos qui veniunt de locis pestiferis*. The Dubrovnik Health Magistrate was fully organized by 1426.<sup>23</sup>

By the same token, the Venetian authorities issued similar quarantine orders in 1403, and their first stone-built quarantine dates back to 1423, when the Venetian authorities decided to build the first lazaretto on the Lazzaretto Islands in the Gulf of Venice.<sup>24</sup> It is also important to stress that the Venetian authorities prolonged the isolation and separation period to 40 days, which ultimately gave the name to this anti-plague measure – quarantine, which comes from Italian *quarantino* i.e., *quaranta giorni*.<sup>25</sup> Moreover, in subsequent years Venice perfected the quarantine, creating a true maritime cordon with a complex system to track arriving ships suspected of carrying disease and signaling the central authorities of their position and arrival, after which they would be kept in the lazaretto (i.e., quarantine) for 40 days.<sup>26</sup> One should not doubt that the Venetian authorities were probably very well informed about the practices established in Dubrovnik, since their diplomatic and trade network was far larger than Dubrovnik's.<sup>27</sup> Still, as far as I know, there is no published research that could verify or refute whether the Venetian authorities explicitly discussed Dubrovnik's quarantine measures in the process of their decision making.<sup>28</sup>

The practice of building a stone lazaretto to quarantine the potentially infected became a standard during the 15<sup>th</sup> century and Dubrovnik's authorities built the first such lazaretto in 1431 on the island of Supetar.<sup>29</sup> In 1467, Genoa adopted the Venetian system, and in 1476 a hospital in Marseille for persons with leprosy was converted into a lazaretto.<sup>30</sup> Lazarettos were located far enough away from centers

<sup>23</sup> BLAŽINA TOMIĆ 2015: 109-119.

<sup>24</sup> STEVENS CRAWSHAW 2012: 3, 19; TOGNOTTI 2013: 255.

<sup>25</sup> STEVENS CRAWSHAW 2012: 7-8; History of Quarantine 2020; ROOS 2020.

<sup>26</sup> TOGNOTTI 2013: 255; COHN Jr.-ALFANI 2007: 182; COSMACINI 2016: 49-50.

<sup>27</sup> E.g., FUBINI 2000: 25-48; ZANNINI 2000: 109-148; PRAJDA 2018: 26-64; KUNČEVIĆ-MADUNIĆ 2016: 173-21; KUNČEVIĆ 2010: 179-211; MITIĆ 1988; KRIZMAN 1957.

<sup>28</sup> In order to resolve the afore-mentioned supposition, one should thoroughly investigate the relevant extant Venetian sources. Some of these historical sources covering Venetian relations with the eastern Adriatic seaboard are published in: LJUBIĆ 1871-1891.

<sup>29</sup> JEREMIĆ-TADIĆ 1938: 112; BLAŽINA TOMIĆ 2015: 295 cf. 81; JANEKOVIĆ RÖMER 2004: 248.

<sup>30</sup> TOGNOTTI 2013: 255; RASIN 2020. Even so, evidence from 15<sup>th</sup> century Milan shows that such measures sometimes could not prevent the spread of epidemics. See: CARMICHAEL 1991: 215-221.

of habitation to restrict the spread of a disease but close enough to transport the sick. Where possible, lazarettos were located so that a natural barrier, such as the sea or a river, separated them from the city; when natural barriers were not available, separation was achieved by encircling the lazaretto with a moat or ditch.<sup>31</sup>

Regarding the 40-day prescribed isolation period, it is interesting to note that in Western civilization the number 40 has a kind of special significance in medical as well as religious contexts. Though it is not known why 40 days was chosen as the length of the isolation time needed to avoid contamination, there are several possible suppositions that correspond to the spirit of the Middle Ages. On the one hand, it was believed, in accordance with Hippocrates' theory of *miasma* (from the 4<sup>th</sup> century BC) that 40 days constitute the time necessary for the dissipation of pestilential miasma from bodies and goods through the quarantine system of isolation and disinfection. On the other hand, in the biblical sense, the number 40 has a special meaning since the ordeal of Jesus in the desert lasted 40 days.<sup>32</sup>

In the subsequent centuries, quarantine systems were perfected and knowledge about the spread of disease and contamination processes gradually increased.<sup>33</sup> Thus, in the 16<sup>th</sup> century, Italian physician Girolamo Fracastoro posed the hypothesis that small particles were able to transmit disease.<sup>34</sup> Even though the pathogen and etiology of epidemics were still unknown, Fracastoro's concept provided a very remote but solid basis for modern epidemiology and health sciences. Moreover, regarding the development of public health, during the 16<sup>th</sup> century many city states introduced bills of health, which included various quarantine measures, and certification documents for ships and travelers who were free of disease.<sup>35</sup> A good example of such practice in the territory of present-day Croatia was the *Splitska skela*:<sup>36</sup> a market and quarantine station in Split opened in 1588 for merchants coming from the Ottoman Empire.

In the Early Modern period, Dubrovnik's quarantine system, similar to the Venetian, was further perfected, and by the mid-17<sup>th</sup> century the authorities developed a flexible and efficient cordon sanitaire.<sup>37</sup> This anti-pestilence system and its

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<sup>31</sup> TOGNOTTI 2013: 255; NERALIĆ 2007: 272-274.

<sup>32</sup> Moreover, in the Pythagorean theory the number 4 has a special value since it represents justice. Thus, these 40 days of quarantine could be interpreted as a period during which just persons will be purified from contamination. For more on this, see: STEVENS CRAWSHAW 2012: 7, 82-84; TOGNOTTI 2013: 254, 255.

<sup>33</sup> KRALJ BRASSARD 2016: 119.

<sup>34</sup> STEVENS CRAWSHAW 2012: 28; GENSINI-YACOB-CONTI 2004: 259; COSMACINI 2016: 122-124.

<sup>35</sup> GENSINI-YACOB-CONTI 2004: 259.

<sup>36</sup> PEROJEVIĆ 2012: 36-39; PEROJEVIĆ 2002: 119-133; MORPURGO 1962: 210, 222, 227, 237, 238-239.

<sup>37</sup> See: MILOŠEVIĆ 2018: passim; KRALJ BRASSARD 2016: 117-119; KRALJ BRASSARD 2021: 15-19 and 26-29.



efficiency, similar to the quarantines in Italy and later in the Habsburg Monarchy, depended largely on the vast network of gathering and sharing information about the spread of the diseases in the region and surveillance of trade routes.<sup>38</sup>

Regarding the transfer of knowledge, it is interesting to note that the first English quarantine regulations stipulating the confinement of ships suspected of carrying plague-infected passengers in the Thames estuary were issued only in 1663.<sup>39</sup> Soon afterward, similar regulations were issued in North America for the purpose of preventing an outbreak of yellow fever (New York in 1668 and Boston in 1693).<sup>40</sup>

The next important step regarding the development of the quarantine was taken in the 18<sup>th</sup> century. Namely, with the development of the proto-modern state, anti-plague measures became one of the pillars of the public health system.<sup>41</sup> In that respect, the organization of an elaborate sanitary cordon along Croatian-Ottoman border became a paradigmatic example of an effective quarantine system that protected the Habsburg Monarchy from various epidemics that could come from the Ottoman side. Though initially the efficiency of the sanitary cordon depended exclusively on the organizational abilities of the local authorities, the introduction of the General Health Regulations (1770) transformed the sanitary cordon into a permanent institution with a clear hierarchy.<sup>42</sup> Regarding the operation of these quarantine stations, it is important to stress that people who worked there had sufficient medical knowledge, and they were civil servants who had served in the military. Moreover, it is important to note that decontamination and other services in these quarantine stations in the sanitary cordon had to be paid by merchants and other travelers who used their services, and all offenders and those who tried to avoid the quarantine could be fined or even sentenced to death.<sup>43</sup>

Though quarantine stations and the sanitary cordon were originally constructed as an measure to combat the plague, during the 19<sup>th</sup> century it proved to be quite effective in preventing and suppressing other infectious diseases like cholera,

<sup>38</sup> KRALJ BRASSARD 2016: 119.

<sup>39</sup> TOGNOTTI 2013: 255; TYSON 2004. However, it would seem that these measures were not entirely effective, as in 1665/66 London experienced the so-called, the Great Plague, which was the last major bubonic plague epidemic that occurred in England. For more about the Great Plague of London, see e.g.: MOOTE 2006.

<sup>40</sup> TOGNOTTI 2013: 255; CAVANAUGH 2015. However, some scholars claim that the first quarantine in North America was already established in Boston in 1648. See e.g.: DONOHUE 2014: 133-134; CALDWELL CROSBY 2007. See also the timeline in: *Yellow Fever. History of Vaccines*. <https://www.historyofvaccines.org/timeline/yellow-fever> (retrieved 26 August 2021).

<sup>41</sup> SKENDEROVIĆ 2005: 126-129; HORBEC 2015: 57-61, 85-120; SKENDEROVIĆ 2021: 92.

<sup>42</sup> HORBEC 2021: 29-31; HORBEC 2015: 85-110; SKENDEROVIĆ 2005: 131-139.

<sup>43</sup> Similar quarantine acts were issued in England in 1710, 1722, 1733 and 1743 during outbreaks of the plague in Sicily. TOGNOTTI 2013: 255; RESTIFO 1992: 1116-1117; COHN Jr. 2008: 75-79, 89.



yellow fever, etc. This implementation of the quarantine concept complied with contemporary medical knowledge and the idea that contagion was spread through interpersonal transmission of germs or by contaminated clothing and other articles.<sup>44</sup>

At that point, in the mid-19<sup>th</sup> century, at a time of extensive intercontinental trade between various political and economic entities, it became clear that all of these quarantine measures could not be sufficiently effective if they were not coordinated worldwide. Therefore, in the 1850 the first international sanitary conference was organized in Paris with the task of addressing the standardization and synchronization of quarantine measures.<sup>45</sup> Soon after, in 1869, when the Suez Canal was opened, this question of standardization became particularly important since some perceived this canal as a “gateway for the diseases of the Orient.”<sup>46</sup>

Still, when influenza pandemic struck the entire globe after World War I, it became clear that multilateral health surveillance and quarantine systems, slowly built throughout the latter half of the 19<sup>th</sup> century, were not sufficient and effective since much of the infrastructure was demolished and destroyed during the war. Moreover, the International Office of Public Hygiene, founded in Paris in 1907, was not able to effectively respond to the influenza pandemic: vital information about the necessity of quarantines and wearing masks was not distributed and often neglected.<sup>47</sup> Still, importance of the quarantine concept as a control measure was confirmed when a similar ‘Asian flu’ epidemic struck again in 1957, although quarantining proved unable to stop the pandemic because of a shorter incubation period.<sup>48</sup>

On the other hand, at the beginning of the 21<sup>st</sup> century, the use of quarantine measures again became important and rather effective during the SARS epidemic.<sup>49</sup> Similarly, with the Covid-19 pandemic, the quarantine concept still proved to be a vital medical and anti-epidemic measure in the struggle for better public health.<sup>50</sup>

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<sup>44</sup> Regarding the development of (bio)medical knowledge and science, it is important to remember that the plague pathogen was discovered by the end of the 19<sup>th</sup> century during a plague outbreak in Hong Kong, which proved the hypothesis that the disease was caused by “small particles” or “germs” i.e., the *pasterula pestis* or *Yersinia pestis* bacteria. See cf. 6. TOGNOTTI 2013: 256; BARNES 2014: 94-95.

<sup>45</sup> BARNES 2014: 100.

<sup>46</sup> HUBER 2006: 465; TOGNOTTI 2013: 256.

<sup>47</sup> TOGNOTTI 2013: 257; GENSINI-YACOB-CONTI 2004: 261; KILBOURNE 2006: 9.

<sup>48</sup> TOGNOTTI 2013: 257. For more on influenza pandemics in the 20<sup>th</sup> century, see e.g.: KILBOURNE 2006; GLEZEN 1996.

<sup>49</sup> For more about severe acute respiratory syndrome (SARS) and the struggle against it, see e.g.: SARS 2006: passim.

<sup>50</sup> TANG et al. 2020: 288.

Therefore, the example of the quarantine clearly reveals and underscores the importance and value of the transfer of knowledge. The history of quarantines clearly resembles the conclusions and results of research into the struggle against certain other virulent diseases, and that is that the circulation of knowledge can transform knowledge itself, showing that the practices of transferred knowledge can even change the primary purpose as to why the practice was established in the first place.<sup>51</sup> In this particular case, this huge step in the development of public health began in the small aristocratic, pre-modern Republic of Dubrovnik, and its end has yet to be determined. It seems to me that this story about the quarantine and its importance to the health of the entire world truly resembles Google Scholar's slogan: "Stand on the shoulders of giants."

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<sup>51</sup> HOLMBERG 2018: 228-229.

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## Dubrovački izum karantene i prijenos znanja o širenju epidemijskih bolesti

Razmjerno je poznata činjenica da je suvremeni koncept karantene „izumljen“ u Dubrovniku. Iako su moderna karantena i mjere pacijentove izolacije danas predmet prosudbe liječnika i epidemiologa, u srednjovjekovnom Dubrovniku prva karantena bila je rezultat jednostavnog empirijskog promatranja i iskustva nekoliko razornih epidemija kuge. Naime, 1377. godine dubrovačke su vlasti proglasile odredbu protiv širenja epidemije bez ikakvog stvarnog medicinskog znanja o zaraznim bolestima. Štoviše, tijekom sljedećih nekoliko desetljeća Dubrovčani su te mjere dodatno produbili i na taj način stvorili prvu (javnu) zdravstvenu službu koja je svoje osnovne forme zadobila krajem 14. stoljeća. Te dubrovačke protuepidemijske mjere razmjerno su se brzo proširile sredozemnim bazenom, a neke od njih dodatno su razrađivane. Tako, primjerice, polovicom 15. stoljeća Venecija je produžila trajanje izolacije (karantene) s izvornih 30 na 40 dana (quaranta), što je zapravo i postalo naziv za tu protuepidemijsku preventivnu izolaciju. Tijekom kasnijih stoljeća ovaj karantenski koncept pronašao je široku uporabu u borbi protiv različitih zaraznih oboljenja, posebice na graničnom pojasu s Osmanskim Carstvom.

*Ključne riječi:* karantena, protuepidemijske mjere, epidemije, kuga, Dubrovnik, prijenos znanja

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