Opening and closing the doors of the lockdown in Italy without forgetting lung cancer patients

Luca Bertolaccini (iD) [a,*] and Lorenzo Spaggiari (iD) [a,b]

[a] Department of Thoracic Surgery, IEO, European Institute of Oncology IRCCS, Milan, Italy
[b] Department of Oncology and Hemato-Oncology, University of Milan, Milan, Italy

* Corresponding author. Department of Thoracic Surgery, IEO, European Institute of Oncology IRCCS, Via Ripamonti 435, 20141 Milan, Italy. Tel: +39-2-57489665; fax: +39-2-56562994; e-mail: luca.bertolaccini@gmail.com (L. Bertolaccini).

Abstract

Coronavirus disease-19 (COVID-19) has rapidly spread to more than 200 countries all around the world, which are facing challenges in controlling its spread. The Italian Government initiated an unprecedented public health intervention to contain the epidemic by shutting down all people movements. Two weeks after the start of the lockdown period, the daily rate of patient admissions to hospitals significantly decreased. After 2 months, the quarantine progressively came to an end. A practical issue at this time is when and how the lockdown interventions should be relaxed since, without an effective vaccine, the general public still remains vulnerable. However, patient should not be placed at an increased risk of dying of lung cancer just to avoid COVID-19. Attention must be paid to all types of cancers and people should not hesitate to go to the hospital to be treated in time. All necessary actions should be taken by hospitals to minimize the risks of potential contagion, by designating differentiated routes and areas for patients potentially affected by COVID-19, while maintaining the highest standard of oncological care. If this 'cancer amnesia' situation persists, the mortality from lung neoplasms would far exceed that directly associated with the COVID-19 pandemic.

Keywords: Coronavirus • Coronavirus disease-19 • SARS-CoV-2 • Lung cancer • Healthcare reorganization • Biostatistics

Two and a half months after the first coronavirus disease-19 (COVID-19) patient was registered in mid-February 2020 in Codogno (northern Italy), over 221 216 positive cases have been identified in Italy, with a death toll of 30 911 [1, 2]. COVID-19 has rapidly spread to more than 200 countries all around the world, which are facing the challenges in controlling its blowout. In the early days of this outbreak, there was much uncertainty regarding the scale of the epidemic. Even if Lombardy was and is the epicentre of the Italian COVID-19 outbreak, the mode of how COVID-19 spread to Italy remains unclear. On 9 March 2020, the Italian Government initiated an unprecedented public health intervention to confine the epidemic by drastically limiting all human movement in the country (the 'Stay at Home' Law Decree), the first such quarantine in its history. Nonetheless, a complete lockdown was started only on 22 March 2020 (the 'Closing Italy' Law Decree). After 2 months, the quarantine progressively came to an end, starting on 4 May 2020.

The measures of lockdown, and the resulting reduced social contact, has decreased the count of COVID-19 cases, as well as the export of cases to other cities in Italy (in particular, in the southern regions). To estimate the effects of social distancing and the lockdown interventions in Italy, mobility data may be compared to the number of new hospital and intensive care unit admissions. To this end, the mobility data were retrieved from the Apple Mobility Trends Reports website (https://www.apple.com/covid19/mobility), in which the relative volume of directions requests per country were compared to a baseline volume on 13 January 2020. Data sent from user devices to the maps service is associated with random, rotating identifiers, so Apple does not have a profile of movements and searches. The proportion of Italian citizens using Apple Mobile systems is 24.4% (https://gs.statcounter.com/os-market-share/mobile/italy). Google has also created their own Community Mobility Reports with the similar aim of providing insights into policies aimed at combating COVID-19 (https://www.google.com/covid19/mobility/). However, each report data set highlights the percentage variation in places like grocery stores and parks within a geographic area. Consequently, we decided to use the data derived from the Apple Mobility Trends Reports with an approximation to one-quarter of the Italian population. We calculated the mean and standard deviation of the three modes of transport recorded (car, pedestrian and public transportation) up to the partial reduction of the lockdown measures in Italy (on 3 May 2020). We calculated, in the same time period, the daily variation of the overall
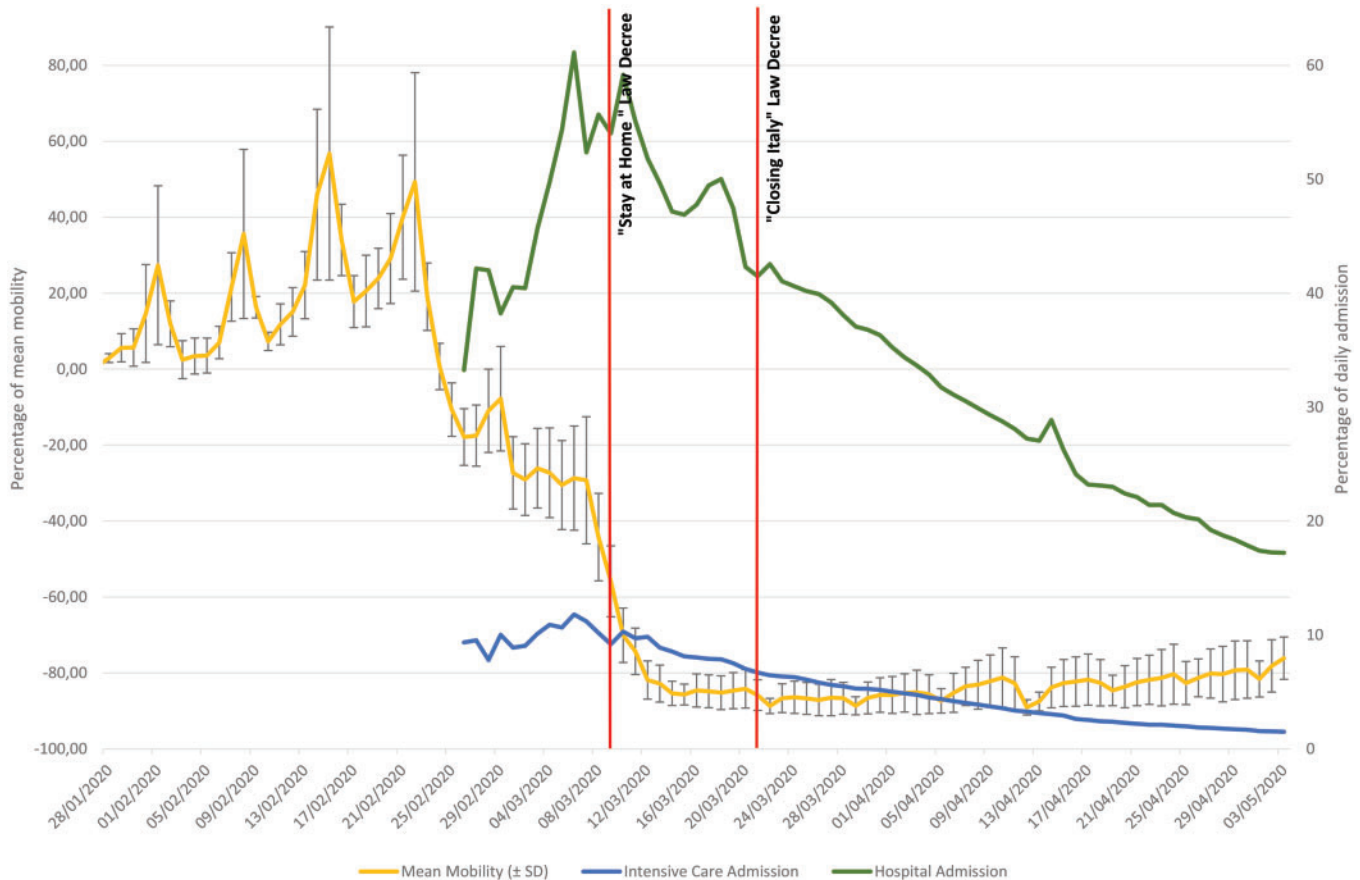
Figure 1: The indirect effect of lockdown measures in terms of the number of new hospitalization and intensive care admissions in Italy for COVID-19 up to 3 May 2020 (partial reduction of lockdown measurements in Italy). Mobility data were retrieved from the Apple Mobility Trends Reports website (https://www.apple.com/covid19/mobility); hospital data were retrieved from the COVID-19 database of Italian Civil Protection [2]. SD: standard deviation.

Italian hospitalizations and the intensive care unit admissions for COVID-19, retrieved from the database of Italian Civil Protection [2].

Only 2 weeks after the start of the lockdown period, the volume of patients admitted to hospitals significantly decreased (Fig. 1). A similar trend was reflected on the mobility curve, suggesting that aggressive public health intervention caused the flattening of the infection curve and a better overall outcome. During the first weeks of circulation of the virus in Italy, the reproduction number (R0), or how contagious COVID-19 is, was estimated to be 3 (an ill person will transmit the disease to an average of three others). The lockdown intervention resulted in a limited outbreak, as well as containment of the export of cases. Even if some mathematical models have suggested that an earlier lockdown may have significantly reduced disease transmission by up to 70%, nowadays, the Italian R0 is 0.5–0.7. Undetected asymptomatic or mild cases could also be a factor in this apparent decrease in over time. If asymptomatic or mildly symptomatic, but infectious cases constituted an essential fraction of the total infection, R0 could be higher than the estimated, since detecting and isolating these cases would be extremely challenging [3]. However, all these numbers only make sense in their respective context, and it is recommended that values derived from different models should not be compared with one another. R0 numbers show variations as they depend on multiple factors, including the number of susceptible individuals exposed to infected COVID-19 patients. The overall international spread of

COVID-19 remains concerning, and it is assumed that figures are grossly underreported [4].

A practical issue of these days is when and how the lockdown intervention could be relaxed since, without an effective vaccine, the general public remains vulnerable. Far be it from us to contradict epidemiologists or politicians these days, but patients should not be put at an increased risk of dying of lung cancer to avoid COVID-19. Two articles from the National Cancer Database demonstrated a reduction in 5-year survival for stage I lung cancer patients if the time-to-treat interval was greater than 8 weeks [5]. On the other hand, a delay greater than 3 months between induction therapy and surgery resulted in a shorter median survival in stage III lung cancer patients [6]. If this 'cancer amnesia' situation continues to persist, the mortality from lung neoplasms would far exceed that directly associated with the COVID-19 pandemic. Therefore, people must continue to pay attention to all cancers and not hesitate to go to the hospital to be treated in time. First results from the Thoracic cancERs international coVid 19 cOLlaboraTion registry showed a surprisingly high mortality rate of COVID-19 in thoracic cancer patients not associated with any specific type of treatment or comorbidity. Most of these deaths were caused by COVID-19 infection alone [7]. All necessary actions should be taken in hospitals (as it was done in our comprehensive cancer centre) to minimize the risks of potential contagion, designating differentiated routes and areas for patients potentially affected by COVID-19, while maintaining the highest

standard of oncological care and testing all lung cancer surgery patients for COVID-19 with a baseline swab.

CONCLUSION

The temporal dynamics, and characteristics of the COVID-19 epidemic in Italy, showed a positive effect of the lockdown interventions. Such findings should guide the relaxation of quarantine measures in Italy to partially open the doors of the lockdown. Although it is difficult to predict the duration of this emergency at this stage, it is still essential to continue the daily battle against lung neoplasm. Lung cancer patients, indeed, face the double challenge of avoiding an infection and fighting their own oncological disease (more dangerous for them than the COVID-19 itself).

Funding

Conflict of interest: none declared.

Reviewer information

Interactive CardioVascular and Thoracic Surgery thanks Lucio Cagini and Douglas West for their contribution to the peer review process of this article.

REFERENCES

[1] Bertolaccini L, Spaggiari L. The hearth of mathematical and statistical modelling during the coronavirus pandemic. Interact CardioVasc Thorac Surg 2020; 30: 801–2.

[2] Dipartimento della Protezione Civile. COVID-19—Situazione in Italia. http://opendatadpc.maps.arcgis.com/apps/opsdashboard/index.html#/b0c68bce2cce478eaac82fe38d4138b1 (17 April 2020, date last accessed).

[3] Ji T, Chen HL, Xu J, Wu LN, Li JJ, Chen K et al. Lockdown contained the spread of 2019 novel coronavirus disease in Huangshi city, China: early epidemiological findings. Clin Infect Dis 2020. doi: 10.1093/cid/ciaa390.

[4] Lau H, Khosrawipour V, Kocbach P, Mikolajczyk A, Schubert J, Bania J et al. The positive impact of lockdown in Wuhan on containing the COVID-19 outbreak in China. J Travel Med 2020; 27: taaa037.

[5] Samson P, Patel A, Garrett T, Crabtree T, Kreisel D, Krupnick AS et al. Effects of delayed surgical resection on short-term and long-term outcomes in clinical stage I non-small cell lung cancer. Ann Thorac Surg 2015;99:1906–12; discussion 13.

[6] Samson P, Crabtree TD, Robinson CG, Morgensztern D, Broderick S, Krupnick AS et al. Defining the ideal time interval between planned induction therapy and surgery for stage IIIA non-small cell lung cancer. Ann Thorac Surg 2017;103:1070–5.

[7] Garassino M. TERAVOLT (Thoracic cancERs international coVid 19 cOLlaboraTion): first results of a global collaboration to address the impact of COVID-19 in patients with thoracic malignancies. In: American Association for Cancer Research Virtual Annual Meeting, 2020. https://www.abstractsonline.com/pp8/#!/9045/presentation/10927.

THORACIC