



# Autopsies in COVID-related deaths: The need for following the model of German COVID-19 autopsy registry

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Autopsies are an important tool in medicine, dissecting disease pathophysiology and causes of death, thus representing a valuable practice to improve our knowledge for public health purposes, also about COVID-19. As shown by von Stillfried et al., the experience of the German COVID-19 Autopsy Registry (DeRegCOVID), launched in 2020, revealed the effects of SARS-COV2 on pulmonary micro-vessels, as well as the involvement of the nervous system in the frame of systemic viral spread.<sup>1</sup> There is radiological evidence that some COVID-19 patients affected from pneumonia can develop severe respiratory distress, and frequently coagulopathy, thus generating acute pulmonary embolism caused by in-situ thrombosis due to interstitial COVID-19 injury.<sup>2</sup>

Autopsies findings have confirmed these observations, allowing to ascertain several important aspects of the COVID-19 outbreak.<sup>3</sup> Thanks to autopsies, it has been possible to understand the systemic involvement of the vessels in different anatomical districts: not only the lungs, but also heart, kidney, liver, bowel, brain and even the skin. This hypothesis is supported by the massive presence of angiotensin-converting enzyme 2 (ACE2), not limited to endothelial cells of alveolar membranes, acknowledged as the “door” through which SARS-COV2 enters endothelial cells and pericytes.<sup>4</sup> Collecting cadavers’ samples or biological fluids swabs can be also useful in the control of epidemics, as shown during previous SARS or Middle East respiratory syndrome (MERS) outbreaks, where the crucial role of this kind of direct investigation was emphasized.<sup>5</sup> The importance of autopsies has been demonstrated also during the SARS epidemic, providing the basis for therapeutic strategies. Similarly, during the West Africa Ebola epidemic, in the Ebola Virus Disease (EVD) surveillance strategy, the viral RNA was isolated in body fluids days

or months after the onset of the disease both from any living or deceased individual who presented clinical symptoms compatible with EVD. Without performing systematically autopsies on all patients died for COVID-19 disease, it would have been impossible to reach the current status of knowledge and foster the adoption of appropriate treatment strategies (i.e. the introduction of non-steroidal anti-inflammatory drugs and anticoagulants) and the development of new pharmacological therapies. Concerning methods and safety issues related to autopsies, in accordance with the World Health Organization, post-mortem examination for deceased persons infected with COVID-19 should be consistent with those used for any autopsy of people who died from an infectious respiratory illness, following the recommended protective procedures.

Therefore, political and health authorities should be aware that performing systematic autopsies on patients died due to COVID-19 can still provide significant information about the real mechanisms underlying SARS-COV2-related deaths and organ injuries, that can drive preventive strategies. At the same time, encouraging the autopsy practice as a tool of investigation could also help physicians to define effective treatments to reduce mortality. The example of the German Autopsy Registry should be considered a model for Europe and the rest of the world, as it has been proven to facilitate multicentric autopsy-based studies with centralized data collection, analysis and reporting, along with technical and scientific support to the different autopsy centres and researchers at local level.

## Contributors

Cristoforo Pomara, Monica Salerno, Alessandro Miani and Prisco Piscitelli conceived, wrote, approved and revised the manuscript.

## Declaration of Interests

All authors declare no conflict of interests.

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