

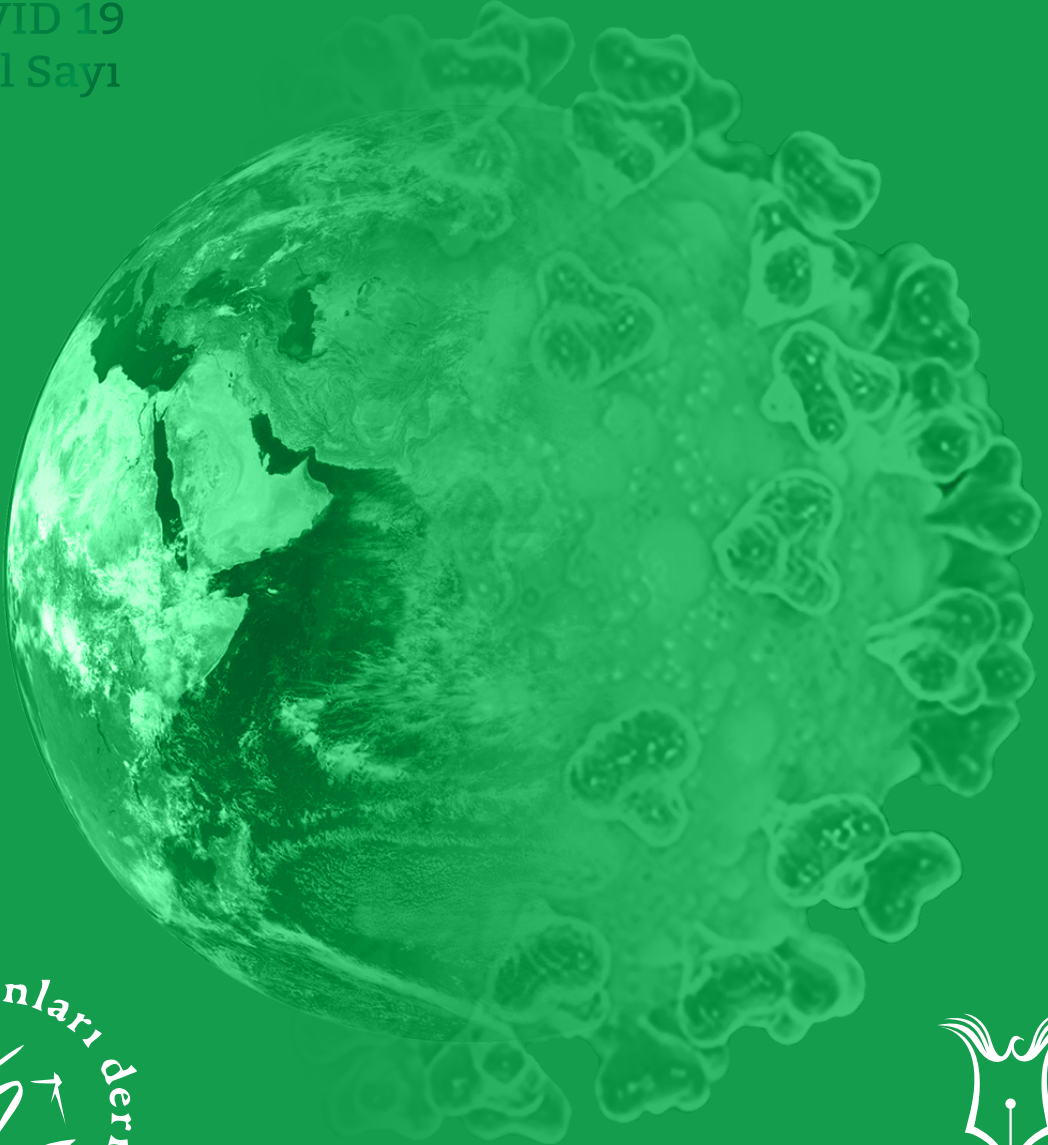
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COVID-19 Pandemic and Forensic Medicine- Special Section

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# The Bulletin of Legal Medicine

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## EDITORIAL

The world has experienced epidemics many times ...

Epidemics have a major impact on the world's history; economic-political changes, increase in colonialism, collapse of dynasties, global climate changes... In the Justinianus Plague Outbreak (541-542), one of the biggest plague outbreaks, 40% of the population died. In the Spanish Influenza Epidemic (1918-1920) that emerged during the First World War, 20 million people died. Throughout the world history, it has experienced millions of losses with influenza, plague and cholera epidemics...

In December 2019, humanity met a new virus. The virus, which appeared for the first time in Wuhan, China, quickly crossed the borders, caused a pandemic and began to spread to everyone without discrimination. This new disease is the COVID-19 infection. We are witnessing one of the most important turning points in the world history. This epidemic dramatically changes the way millions of people live around the world, with healthcare professionals' also... Healthcare professionals have taken the heavy burden of the epidemic. According to the data of the Turkish Medical Association, the number of healthcare workers infected with the disease in our country has exceeded three thousand, and 24 healthcare workers have lost their lives until the end of April.

Since the new type of coronavirus epidemic has emerged, epidemiologists, public healthcare professionals, scientists have given great efforts to better understand the virus, its effects and predict what might happen. Numerous studies have been conducted on the pathophysiology, immunology, diagnosis and treatment, causes of death, autopsy procedures, but we still do not know what will happen to us despite the past 6 months.

According to the World Health Organization's daily reports; on 05/20/2020, there are 152.587 patients in Turkey, and it ranks 9th in the world. Turkish Ministry of Health daily reports give the total number of patients, the number of daily tests, the number of positive patients, the number of recovering patients and the number of death.

Despite daily reports, many questions are still looking for answers; the number of hospitalized patients, the number of PCR test positive patients, the number of PCR test negative but clinically and radiologically positive patients, the number of patients in the service, intensive care units and outpatient treatment, while being treated with the diagnosis of COVID-19 (PCR negative or PCR positive) the number of death, the number of recovering patients, the number of infected healthcare personnel, the comparison of the number of deaths per day based on provinces in last five years, the age and gender of the patients and the deceased, situation in public centers such as warehouse hospitals, nursing homes, prisons, military areas... The answers are certain to make us more prepared for other epidemics that may be encountered in the future.

The COVID-19 epidemic, which affects academic and all social environments, is also on the agenda for forensic medicine and forensic science professionals. In this period, we prepared this special edition in order to share and discuss information. We are here with a wide range of topics ranging from mental health, emergency organization, changing patient's profile, burial procedures, immunopathology of the virus, wastewater monitoring, domestic violence, violence against women and child abuse in epidemic. I would like to thank all the authors here. Finally, it was presented that 'Statement of the Ethics Committee of Turkish Medical Association on Disease Outbreaks'. Available also; <http://www.ttb.org.tr/635yi1>.

The Bulletin of Legal Medicine celebrates its 25th anniversary this year. In its journey that started in 1995, it has become a source of pride in our field as a scientific platform. We hope that it will complete its journey in recent years and will soon be a journal scanned by international indexes. For this, you, the valuable researchers, have an important role in the citation of the published articles.

I congratulate the 25th anniversary of the Bulletin of Legal Medicine. Always in the light of science and always referring to truth, to beauty and to good practice, I wish you healthy days and pleasant reading...

20.05.2020, Muğla

Ümit Ünüvar Göçeoğlu







## COVID-19: Understanding a New Disease through Global Efforts

### COVID-19 : Global Bir Çaba Olarak Yeni Hastalığı Anlamak

Arzu Akçay\*, Kubilay Kınoğlu, Ayşe Özgün Şahin

**Abstract:** **Objective:** COVID-19, the disease caused by the novel coronavirus SARS-CoV-2 which was first reported in Wuhan, China in December 2019, is seen to have left its mark in the history with a global pandemic. As a novel member of the coronavirus family, SARS-CoV-2 represents a new kind of disease in regard to viral pathogenesis and tissue changes. To comprehend the pathogenicity of the virus totally, one has to follow the pathways which a virus travels and inflicts damage through. What starts out as a simple fever and coughing carries the potential to lead to shock, multi – organ failure and death even in the most unsuspected of cases. When faced with a challenge as contagious, deadly and widespread as this, one should put all the efforts that they have in order to overcome this obstacle. In the case of COVID-19 this cumulative effort has shaped itself into a globalized form. In an attempt to see the wider picture as to the whole pathogenesis of COVID-19, the medical and scientific society should recall the importance of a fundamental discipline, namely, autopsy. Even though, conducted in small numbers at the time, autopsies of COVID-19 cases have provided the literature with many important information. The role of autopsy in understanding disease, the immune system and pathogenesis is one that should not be disregarded and conversely, should be further developed and praised. The same ideology would apply to COVID-19 and any further pandemics to come.

**Keywords:** COVID-19, Pandemic, Pathogenesis, Autopsy

**Öz:** **Amaç:** Aralık 2019 tarihinde Çin’inde Wuhan kentinde ortaya çıkan, yeni tip bir Korona virus olan SARS-Cov2’nin etkeni olduğu hastalık (COVID-19), tüm dünyayı etkisi altına alan bir pandemi ile insanlık tarihine damgasını vurmuş görünmektedir.

Korona virus ailesinin en yeni üyesi olan SARS-CoV-2 gerek viral patogenezi, gerekse doku düzeyinde gösterdiği değişiklikler açısından özellikle SARS-CoV ile benzerlik gösterse de yepyeni bir hastalık tablosu ortaya koymaktadır. Virüsün sahip olduğu patojeniteyi kavrayabilmenin ilk koşulu virüsün hareket ettiği ve hasar verdiği yolları takip etmekten geçer. Basit bir ateş ve öksürük olarak başlayan bir durum, şok, multiorgan yetmezliği ve hatta en beklenmedik vakalarda ölüme sebep olabilir. Böylesine bulaşıcı, ölümcül ve genele yayılmış bir zorluk ile karşılaşıldığı takdirde, eldeki bütün imkanlar en iyi şekilde değerlendirilmelidir. COVID-19 isimli hastalığın durumunda ise bu çabalar birikmiş bir hale gelerek, evrensel bir şekle bürünmüştür. COVID-19 hastalığının patogenezinin anlaşılmasında, tıbbi ve bilimsel toplulukların otopsi disiplinin önemini hatırlamaları gerekmektedir. Az sayıda gerçekleştirilmiş olmalarına rağmen, COVID-19 otopsipleri, literature oldukça önemli bilgiler kazandırmışlardır. Hastalığın, bağışıklık sisteminin ve patogenizin anlaşılmasında otopsinin rolü göz ardı edilmemeli, tam tersine, daha çok geliştirilmeli ve el üstünde tutulmalıdır. Aynı düşünüş tarzı, gerek COVID-19 gerekse gelecekteki pandemiler perspektifinde oturtulmalıdır

**Anahtar Kelimeler:** COVID-19, Pandemi, Patogenez, Otopsi

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#### **Ethical Declaration**

Our study was written in accordance with the Helsinki Declaration, and the ethics committee approval was not obtained because of the review study.

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## Introduction

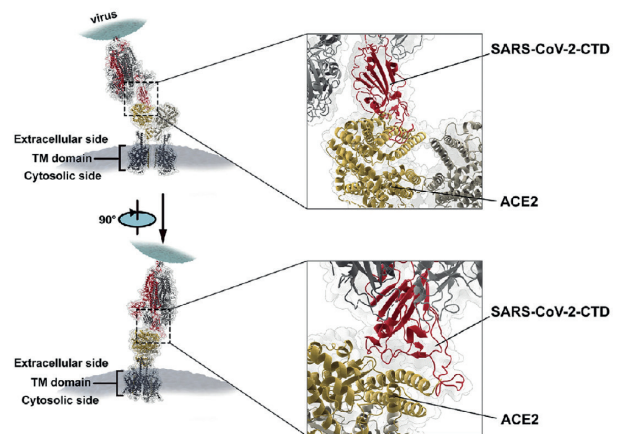
COVID – 19, the disease caused by the novel coronavirus SARS-CoV2 which was first reported in Wuhan, China in December 2019, is seen to have left its mark in the history with a global pandemic. The family of coronaviruses includes a large number of zoonotic viruses which cause infections in both the upper and lower respiratory tract, gastrointestinal system, central nervous system and hepatic cells of humans and vertebrates (1-4)

The human dominant ecosystem, migrations, increasing human dynamism and human – animal contact, are to be considered as unimpeachable factors of risk when it comes to the occurrence of various viral infections. The coronaviruses which have caused similar outbreaks in the past hundreds of years, have adapted to the human organism and are known to cause mild, seasonal, community acquired infections in general. (1,2,4) However, epidemics caused by the novel coronaviruses SARS (Severe Acute Respiratory Syndrome) – CoV, MERS (Middle East Respiratory Syndrome) – CoV and SARS – CoV2 demonstrate the potential of these newly evolved viruses in causing drastic risks in regard to global health (2). SARS – CoV2, much like SARS – CoV, binds to the integral membrane protein ACEII (Angiotensin Converting Enzyme II) through the receptor binding region of the spike glycoprotein and diffuses through the cellular membrane, thereby, SARS - CoV2 regards all ACE II expressing cells as potential hosts (5-7). Even though there exist many similarities between SARS – CoV2 and SARS – Cov, in regard to viral pathogenesis and tissue level manipulations, SARS – CoV2 presents a new case of sickness. Concerning the active treatment of patients and the research conducted on vaccines and pharmaceuticals, it has become a global effort to understand COVID – 19.

## Viral Pathogenesis

Viral infections occur from the binding of viral agents to specialized receptors, localized throughout the cellular membrane. Therefore, receptor recognition is a key point in the determination of tissues and cells which, a virus will infect (8).

SARS – CoV2 is a positive sense single stranded RNA (+ssRNA) virus in the family *Coronaviridae* and the genera *Betacoronavirus*, that is reported to infect target cells through recognizing the angiotensin converting enzyme – II (ACE II) which is located on the membranes of mammalian cells. (7,8) Transmembrane Protease Serine II (TMPRSS2), Cathepsin L and B (CTSL/B) have been reported to act as mediators of viral diffusion through the



**Figure 1.** SARS-CoV 2, binds to the integral membrane protein ACEII through the receptor binding region of the spike glycoprotein and diffuses through the cellular membrane

cellular membrane. (6,9) The coronavirus SARS-CoV is known to infect cells through ACE II affinity as well, however, SARS – CoV and SARS – CoV2 show very noteworthy antigenic differences (10). The C – terminal domain, located on the spike protein of the SARS – CoV2, binds to human ACE-II, much like SARS – CoV, and infiltrates the cell. However, the distinct amino acid sequencing observed within the ectodomain of the SARS-CoV2 spike protein revealed that SARS-CoV2 binds to ACE-II with almost 10 to 20 times the affinity of its relative SARS – CoV. This high capacity of receptor binding eases the infiltration of the cell and possibly increases the rates of human to human infections. Type 1 and type 2 pneumocytes, macrophages, gut enterocytes, endothelial, corneal epithelial cells, cardiomyocytes, pericytes, olfactory sustentacular cells, hepatic and renal epithelial cells are common cells with ACE II expression and are therefore, common spots of replication for the virus (6) The respiratory system, cardiovascular system, central nervous system, gastrointestinal system and the urogenital system are discussed to be important bodily systems which are capable of being affected by COVID – 19.

## COVID – 19 and Acute Respiratory Distress Syndrome

The droplet transmitted SARS – CoV2, can generally infect ACEII carrying type I and type II pneumocytes, macrophages and endothelial cells. Patients, proven to carry SARS – Cov2, show symptoms in the lungs both in clinical and radiological fashion. Pneumonia, along with fever and coughing, is the most common clinical condition seen in SARS – CoV2 infections. 20 - 30% of the COVID – 19 induced pneumonia cases, require mechanical ventilation procedures for their treatment. SARS

– CoV2 shows significant resemblances to both SARS – CoV and MERS – CoV, as the viral interstitial pneumonia is complicated even further with the development of ARDS (11). Research conducted by Richardson et.al. reported that out of 2634 cases, 14.2% required intensive care treatments while 12.2% needed invasive mechanic ventilation procedures. It is also reported that 21% of the treated patients were died. (12) The alveolar epithelial and endothelial damage caused by SARS – CoV2, induces a strong inflammatory response and results in ARDS, which is a systemic condition rather than a lung specialized pathology. Under histopathological borders, ARDS is shown with Acute Lung Injury / Diffuse Alveolar Damage (ALI/DAD). Therefore, the interstitial and peribronchial mononuclear infiltration caused by COVID – 19 based viral pneumonia, is accompanied by ALI/DAD originated alveolar and septal edema, fibrin exudation and the formation of the hyaline membrane within the alveoli necrotic debris, micro thrombosis formation within the interstitial capillary lumens, change in fibroblastic response according to the phase of the infection and alveolar epithelial proliferation (13). Since the beginning of the pandemic, even if in low amounts, core biopsies and limited or full autopsies are conducted to provide data as to the histopathology of the disease. However, the number of autopsies remains to be insufficient, as the procedures are hindered in order to protect physicians, who conduct autopsies, from the virus. The first data of ALI/DAD were acquired by Tian et.al. (14) from the lobectomy of two SARS – CoV2 diagnosed lung cancer patients. A procedure conducted by Carsana et.al., which included the autopsies of 38 COVID – 19 patients, reported the differences in the lung tissue to be correspondents of ALI/DAD and that broad microvascular thrombosis was detected. In this work, SARS – CoV2 particles were shown to be present within the alveolar epithelial cells ultra – structurally (15). Varga et.al. have presented proof in two COVID – 19 autopsy cases, through electron microscopy, that there existed viral particles within the vascular endothelium and glomerular capillary endothelium in addition to the mononuclear cellular infiltration seen in lungs, hearth, kidneys and the gut. Through this finding, they have also reported that endothelial dysfunction caused by endolitis may play a part in the pathogenesis of the disease (16). In a work where Barton et.al. evaluate two COVID – 19 full autopsies, it is reported that only one of the cases that was PCR verified through the nasopharyngeal samples, contained ALI/DAD symptoms and the changes caused by the viral pneumonia. The cause of death for the other case is determined to be the aspiration pneumonia. The evaluation of the information that is acquired from this

work concluded death from COVID – 19 is quite different from death in the presence of COVID – 19 (17). The information that we have, shows that the virus SARS – CoV2 causes multiple organ failure – shock and death, through infecting ACE II carrying respiratory epithelial and endothelial cells and generating a strong systematic inflammatory response (SIRS) (18) Severe COVID – 19 patients, show high concentrations of CRP, Ferritin and D – Dimer; in addition, the neutrophil/lymphocyte ratio shifts in the favor of neutrophils. Lymphopenia too is another very important finding. The cytokine and chemokine profiles of these patients resemble the ones seen in Cytokine Secretion Syndrome/Macrophage Activation Syndrome. This gave birth to the hypothesis that the increase of IL – 6, IL – 7, TNF, CCL2, CCL3, CCL10 and IL2R alpha being the cause of the uncontrolled activation of the mononuclear phagocyte compartment and COVID – 19 related hyperinflammation. (19)

The natural immune response, that is generated against viruses, starts with the receptors present on the membranes of the immune system cells, recognizing the exogen pathogen (PAMP) damage patterns. Primary pattern recognizing receptors are transmembrane Toll – like receptors (TLRs), cytosolic (PRRs) and nucleotide bound oligomerization domain like receptors (NLRs) (20). Under normal conditions there exists M1 phenotype macrophages within the alveoli, however, when the inflammation is initiated M2 phenotype macrophages and neutrophils migrate from the bloodstream to the lung (18,20,21) Macrophages, monocytes and neutrophils take part in the secretion of proinflammatory cytokines such as proteases, reactive oxygen derivatives, eicosanoids, phospholipids, IL – 1, IL – 6, IL – 8, IL – 12 and TNF –  $\alpha$  (20) . The generated cytokine response and the migrating inflammatory cells further exaggerate the epithelial and endothelial damage. (20,22). The activation of the coagulation system due to the generation of the inflammatory response is a highly important component of ARDS pathophysiology. Endothelial damage exposes subendothelial collagen and allows expression of the tissue factor (TF) and the Von Willebrand Factor (VWF) on the endothelial cell surfaces, which in return activates the coagulation system. TF builds the basis for the formation of the micro thrombosis through converting prothrombin into thrombin and fibrinogen into fibrin (23,24). In the absence of endothelial damage, however, activation of coagulation is initiated through the recognition of TF expressing monocytes by the endothelial cells. A strong macrophage response and the accompanying activation of the coagulation system may be the reason as to the occurrence of COVID – 19 related hyperinflammation. This

could most probably have the potential to bring along a phase of tissue repair and fibrosis (19).

Interferons are cytokines which are known for their antiviral effects. There exist three main families of interferons, namely, Type I (IFN alpha/beta), Type II (IFN gamma), Type III (IFN delta). Once they are secreted from the infected cells, newly synthesized interferons bind to their respective receptors and initiate the JAK/STAT pathway (25). Through this pathway, interferon stimulated genes (ISG), such as ACE II, are activated (26). These genes not only work in the synthesis of antiviral effectors and molecules but also regulate interferons either positively or negatively (4). A postponed or faulty interferon response would make it harder for the virus to be contained while increasing the chances of tissue damage (19).

### Cardiovascular System and COVID-19

SARS-CoV 2's affinity for ACE II on mammalian cells, makes possible to infect cardiac myocytes and pericytes, in addition to pneumocytes. The presence of an underlying comorbid disease, the possibility of the development of severe COVID - 19 pneumonia and death increases. Huang et al(11) have founded, hypertension (%15), cardiac diseases (%15) and diabetes mellitus as comorbid diseases (%20) in 41 patients, whom they treated at the hospital. Richardson et al. (12) in the series of 5700 cases they followed and treated at the hospital, have reported that they found hypertension (56,6%), obesity (41,7%) and diabetes mellitus (33,8%) as prominent comorbid diseases. Although the causes of comorbidity are similar, it is clear that their frequencies vary significantly with according to the populations. In addition to the presence of comorbidity, age, systemic inflammation, hypercoagulability and immobilization comprise important risk factors for cardiac complications in COVID-19. Arrhythmias, myocarditis, myocardial infarction and thromboembolism are the main cardiovascular pathologies anticipated in COVID-19 (27). It has been reported that patients with COVID - 19 consulted the hospital with symptoms such as chest pain, dysrhythmia, and acute left heart failure in addition to fever, cough and weakness (28-30). The most common cardiac complication in infections of SARS-COV2 are arrhythmias. Wang et al. have reported an incidence of 16.7% in the occurrence of arrhythmias in hospitalized patients, whereas, the rate of the symptoms increased up to 44.4% in those who required intensive care (30) In addition, the information acquired from past works concerning SARS - CoV, MERS - CoV and Influenza, could lead to the conclusion that these forms of viral infections display signs of cardiac arrhythmias

as well (31-34). Yu CM et al. have reported the sighting of sinus tachycardia in 72% and sinus bradycardia in 14.9% of total SARS CoV cases (35). Hypoxemia and ischemia seen in severe COVID-19 pneumonias can be involved in the arrhythmia pathogenesis by disrupting the electrical activity of the myocardium. Increased cytokine release, myocyte damage and electrolyte imbalance have the potential to cause arrhythmias. Regarding the cardiac conduction system, direct viral infection and lymphocyte mediated immune damage are discussed to be the reasons as to the provocation of arrhythmias (36, 37).

According to the Chinese National Health Commission (NHC) 11.8% of patients, who died from COVID-19, were diagnosed with myocardial damage affiliated high levels of Troponin I during the follow ups(38). It has been reported that myocardial damage presented with high troponin levels, varied between 7-17% in hospitalized patients while this ratio increased to 22-31% in patients which were treated intensive care units.(11, 29, 30). Furthermore, viral load studies and clinical findings mostly indicate to the presence of myocarditis in these patients. However, myocarditis has been histopathologically proven in only one full autopsy case and has been defined as fulminant myocarditis.(39). In addition, myocarditis has not yet been detected in most limited or complete autopsy studies(39-41). It is deemed necessary, to conduct a lot more COVID - 19 related autopsies if the myocardial damage pathogenesis is to be understood to the full extent.

Myocyte damage may be caused from the direct infection of the cardiomyocyte, an enhanced immune response or ischemia based on microvascular damage which is originated from an infection in the endothelium or the pericytes. The binding of SARS - CoV2 to the integral membrane protein ACE II, prohibits the cleavage of Ang II into Ang I - 7. The increasing concentrations of Ang II induces the secretion of cytokines and is thereby discussed as one of the possible means of cytokine mediated myocyte damage (42).

Heart failure is a common manifestation for patients of COVID -19. Studies have reported that 23-24% of patients consult to the hospital with symptoms and signs of acute heart failure (29, 43). Zhou et al have presented that the mortality in patients with heart failure tends to be higher (29). The discussion regarding the origin of the heart failure should be given the utmost importance as the origins of the condition should be determined to be either viral myocarditis or the decompensation of the underlying heart failure (44). Therefore, there exists a great need for any autopsies which are to be conducted in this area (45).

Acute coronary syndrome is another pathology that results in Tn elevation, which in return, provides ST segments and T wave abnormalities in the ECG procedure, much like a case of myocarditis. This situation, makes it a lot more difficult to conduct a differential diagnosis (46-48). It should be remembered that the increase in metabolic demand, due to the systemic inflammation, can cause acute myocardial infarction in patients which have underlying coronary artery diseases (49, 50). In addition, excessive release of cytokines has the ability to rupture the atherosclerotic plaques (51, 52). Damaging endothelial cells may cause endothelial dysfunction and therefore lead to acute myocardial infarction (53, 54). Therefore, acute myocardial infarction is an expected pathology in COVID-19 disease.

The endothelial and microvascular damage, inflicted by the cytokines, possess the ability to induce an increase in the permeability of the vessels, vasospasm and a decrease in the cardiac perfusion (55). The microvascular damage mechanism can explain the relation between COVID-19 and Kawasaki disease with small-medium vessel involvement particularly in pediatric group (56-58). Additionally, the acute renal damage, diagnosed in some Covid -19 patients, is thought to be originated from the microangiopathic changes seen in the glomerular capillary tuft (16,29,59).

The number of acknowledgements regarding the increase in the number of thromboembolic complications, seen in COVID - 19 patients, has been increasing gradually. Hypercoagulability, old age and immobility during the phase of intensive care which accompany the hyperinflammation, increase the risk in development of thrombosis and embolisation (60,61).

### Drugs Used in the Treatment of COVID-19 and Cardiovascular Complications:

There are many drugs which are used in the Covid - 19 treatment modality, many of which are primarily antihypertensive, antiarrhythmic and anticoagulant drugs. In addition, many antiviral (Remdesivir, ribavirin, Lopinavir / ritanovir) and antimalarial (Choloroquine, hydroxychloroquine) drugs, antibiotics (Azithromycin), corticosteroids and biological drugs (tocilizumab) are included in the treatment.

Chloroquine and Hydroxychloroquine can lead to electrolyte imbalance and QT prolongation by disrupting the intracellular pH (62, 63). HCQ is hypothesized to prolongate the action potential through its interaction with ion channels which are regulated through hyperpolarization, namely funny current ion channels, and L - type

Ca<sup>++</sup> channels. (64). They are also known to interact with antiarrhythmic drugs.

The drugs Lopinavir and Ritonavir are known to cause cardiac side effects through the elongation of the QT and PR intervals (65). Furthermore, this drug has been recorded to react with anticoagulants (66). Based on the relation of SARS - Cov2 with the ACE II receptors, those who have administered ACE inhibitors are expected to experience a higher viral pathogenicity due to the upregulation of the ACE II receptors (67).

### Central Nervous System and COVID – 19

Due to structural and functional damage that they inflict on the nervous system, viral infections are known to be responsible in the occurrence of severe central nervous system conditions, such as encephalitis, toxic encephalopathy and demyelinating disease (68). Pathogenesis of SARS – CoV2, regarding the central nervous system, resembles those of the other novel coronaviruses MERS – CoV and SARS – CoV (69,70).

The sighting of severe neurological symptoms that require urgent medical attention, such as epileptic seizures, impaired consciousness and acute cerebrovascular disease, other than mild clinical symptoms, like headaches, dizziness, nausea – sickness and partial or full loss of smell and taste for instance, in patients diagnosed with COVID – 19 sparked the discussion regarding the effects of SARS – CoV2 on the nervous system and their similarities between SARS – CoV and MERS – CoV. The procedure conducted by Mao et.al., which includes 214 COVID – 19 patients who have been molecularly verified and have ARDS symptoms, indicate that 78 of the patients (36.4%); show central (24.8%), peripheral (8.9%) and skeletal system (10.7%) symptoms which coincide with neurological findings, while severe COVID – 19 pneumonia is accompanied with neurological symptoms in 40 (45.5%) of 88 (41.1%) total patients (71). Chen et.al. has reported that 9% of 99 COVID – 19 pneumonia patients had symptoms of confusion while %8 had headaches (72). In research conducted by Li et.al. 22 of 183 (12%) child patients who show acute encephalitis were reported to be anti – Cov IgM positive (73).

Based on the ability of SARS – CoV2 to create similar symptoms as the past coronaviruses MERS – CoV and SARS – CoV, it is discussed that the same neurotropic mechanisms may be put to use by the given examples (74,75). Due to ACE II present within the glial cells and the neurons, they are discussed to be potential targets for SARS – CoV2. Therefore, the virus is believed to inflict neurological damage through both viral impact and the immune response of the host organism (76).

## The Neuroinvasion Mechanisms of SARS – CoV-2

### Direct Viral Effect

SARS – CoV2 is thought to reach neuronal tissues through two fundamental mechanisms, namely hematogenous spread (viremia) and transsynaptic spread (neuronal retrograde) and as a consequence, cause direct viral damage.

Because the hematogenous spread of the virus induces the secretion of Interleukins and a variety of cytokines, the permeability of the blood brain barrier increases. Through this pathway, the virus is believed to cause direct neuronal damage. Past works on SARS – CoV displayed the presence of viral particles within the cerebrospinal fluid of the patients. Consequently, SARS – CoV2 was expected to be able to pass through the blood – brain barrier as well (76,77). Proving this, Zhou et.al. reported the presence of SARS – CoV2 in the cerebrospinal fluid of a 56-year-old patient (78). Furthermore, Moriguchi et.al. have diagnosed the presence of SARS – CoV2 in a 24-year-old patient with a negative nasopharyngeal swab test, who showed signs of impaired consciousness and convulsion (79). In addition, Duong et.al. reported a 41 – year – old female patient who showed no signs of respiratory symptoms, however, had isolated meningoencephalitis findings (80). The slow circulation of the virus within the microcirculatory system, is considered to ease the binding of the virus to the ACE II carrying capillary endothelial cells. Therefore, with the occurrence of endothelial damage due to the viral particles, an endothelial rupture based cerebral hemorrhage has the possibility to occur before any neuronal damage (77).

Trans – synaptic spread is discussed to result in a partial (hyposmia) or total loss of smell (anosmia) due to its pathway which runs through the olfactory neuron by basing itself to the cribriform plate of the ethmoid bone. In addition, due to the presence of ACE II within the neuronal cells and the quick initiation of the viral replication cycle, the virus is expected to cause neuronal damage via demyelination before any signs of inflammation show in the early stages (77). Past experiments conducted on animals show that the human CoV is capable of making its way up to the dorsal nuclei in the brainstem and the olfactory nuclei in the pyriform cortex through bipolar epithelial cell mediation and intranasal inoculation (81,82). In 8 SARS autopsies performed by Gu et.al., histopathologic changes in both the cortex and the hypothalamus were diagnosed (74). Examinations conducted on SARS patients in the beginning of the 2000s demonstrated the presence of viral particles within the thalamus and the brainstem.

Some coronaviruses are known to have the affinity to spread to the medullar cardiorespiratory system through the trans – synaptic pathway. Therefore, the possibility of neuro – invasion should be regarded in both the treatment and the prevention of COVID – 19 induced acute respiratory insufficiency (83). COVID – 19 autopsies play a key role in understanding the neuro - invasive properties of the virus. Neuronal retrograde transport is also discussed to take place through the vagal neuron extensions in the lung tissue and the sympathetic neuron extensions within the gastrointestinal enteric system. Furthermore, the direct neuronal damage inflicted by the virus has the possibility of inducing neurodegenerative disease at a later stage (84, 85).

### Host Dependent Indirect Viral Effects

Host dependent damage mechanisms, which can be classified as hypoxic damage, immune damage, ACE II related damage and other mechanisms, are built on the indirect effects of the virus.

The development of severe hypoxemia in COVID – 19 patients, results in an increase in the collection of acid at the brain through the anaerobic metabolism and consequently, cause a headache due to cerebral vasodilatation, edema and disruption of the cerebral blood flow. The persistence of this condition could lead to the formation of neurologic symptoms such as acute ischemic stroke, due to a pressure build up within the head (86).

The antiviral systemic cytokine response and the secreted local cytokines from the microglia and astrocytes, due to viral stimulation, are discussed to cause inflammation and damage in the brain tissue (76,87). Poyiadji et.al. have reported the sighting of acute hemorrhagic necrotizing encephalopathy symptoms in the radiological examination of a confirmed COVID – 19 patient. Acute hemorrhagic necrotizing encephalopathy, also seen rarely in other viral infections, is believed to be caused from the disruption of the blood brain barrier due to the cytokine storm within the brain (88).

In ACE II related damage mechanisms, the virus increases levels of Ang II within the body. Based on the damage inflicted on the regulatory mechanisms of the blood pressure regulation and anti – atherosclerotic mechanisms of both the central nervous system and the striated muscle tissue, the probability of hypertension and cerebral hemorrhage is considered to increase indirectly (76,89). A work by Conde et.al. reported the sighting of massive intracerebral hemorrhage in a 79-year-old COVID – 19 patient and discussed the reason as to the occurrence of this condition to be either direct vascular endothelial damage or ACE II related hypertension (82).

The lack of major histocompatibility (MHC) antigens in central nervous system cells, necessitates the usage of cytotoxic T cells which, in return, is discussed to induce the apoptotic phase in mature neurons (76, 90).

**In conclusion;** COVID – 19 is a disease which has not been treated or documented until this recent pandemic. Proper diagnosis, treatment methods and the development of vaccines and drugs, are all possible through a well established understanding of viral structure, virus – human cell interaction and the human immune system. The conceptualization of all this information, relies heavily on the guidance of autopsy practices. Indeed, the increase in the amount of information regarding COVID – 19 since the administration of complete autopsies, should not come as a surprise. Both modern medicine and medicine as a discipline of sciences have been heavily developed through the fundamentals of autopsy throughout 19<sup>th</sup> and 20<sup>th</sup> centuries. Autopsy tells of the diseases of the humankind. Yet once again, autopsy has proven itself as one of the most important circles within the scientific methodology in the light of the current events.

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Review

### Organization of Emergency Departments and Changing Patient Profile During COVID-19 Outbreak: A University Hospital Experience in Turkey

#### COVID-19 Pandemisinde Türkiye’de Acil Servislerin Organizasyonu ve Değişen Hasta Profili: Bir Üniversite Hastanesi Deneyimi

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**Abstract: Objective:** During the COVID-19 epidemic, emergency departments played an important role in identifying patients, isolating, preventing in-hospital infections, and informing public health authorities. It is necessary to identify the possible patients quickly and isolate them from others.

It was necessary to reorganize the emergency departments, which will be the first place of admission for the majority of patients. Emergency patient care should continue in emergency departments even in disasters, and in many countries, emergency departments operate at maximum capacity in their normal routines. For all these reasons, policies are required to prevent crowding in health centers and to control them, especially identify patients in the emergency departments, before hospital admission if possible.

In this study, we explain how an emergency department of a university hospital was organized during the COVID-19 pandemic, and the organization of care of infected patients, other emergency patients, and forensic cases who admitted to the emergency department.

**Keywords:** COVID-19, Pandemic, Emergency Department, Organization, Emergency patient, Forensic case

**Öz: Amaç:** COVID-19 salgını sırasında acil servisler hastaların tanımlanması, izolasyonu, hastane içi enfeksiyonları önlenme ve halk sağlığı otoritelerini bilgilendirmede önemli görevler üstlenir. Olası olgunun hızlı tanımlanması ve diğer hastalardan izole edilmesi gereklidir. Acil servisler doğası gereği afet durumlarında dahi hasta alımının devam etmesi gereken bakım alanlarıdır ve birçok ülkede acil servisler normal rutinlerinde maksimum kapasite ile çalışmaktadır. Tüm bu nedenlerle sağlık merkezlerinde yayılmayı önlemek ve kontrol altına almak için, özellikle acil servislerde kalabalıklığın önlenmesi ve mümkünse hastaların hastane başvurusundan önce tanımlanmasına yönelik politikalar gereklidir.

Bu çalışmada COVID-19 Pandemisi ile birlikte bir üniversite hastanesi acil servisinin organizasyonun nasıl düzenlendiği paylaşılmış, acil servise başvuran acil enfekte hasta ve adli olguların organizasyonu anlatılmıştır.

**Anahtar Kelimeler:** COVID-19, Pandemi, Acil Servis, Organizasyon, Acil hasta, Adli olgu

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Figure 1 adopted from reference 15 and reproduced with permission of Emergency Medicine Association of Turkey (EMAT). We thank to the Emergency Medicine Association of Turkey.

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#### Ethical Declaration

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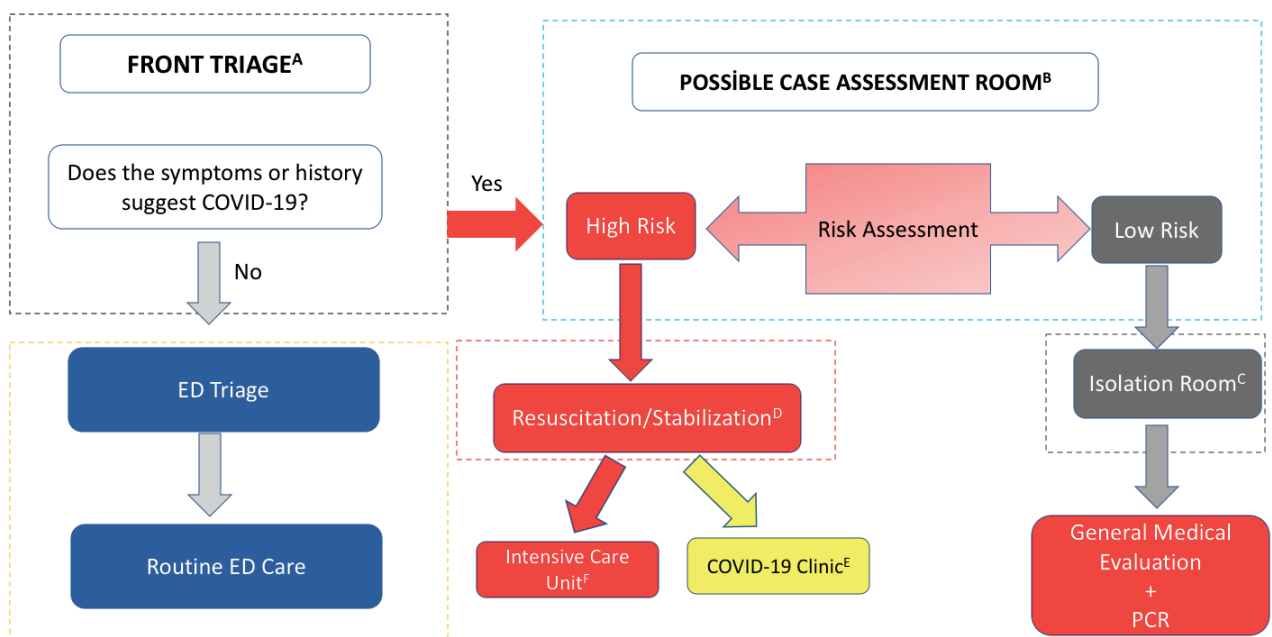
## Introduction

China National Health Commission announced 27 cases of pneumonia with unknown causes on December 31, 2020. The novel coronavirus (SARS-CoV-2) was isolated approximately a week later (1). In the following weeks, it was confirmed that the disease could transmit human-to-human, and healthcare personnels were reported to be infected (2). By the February 11th, 1716 healthcare providers were infected in China, and five of them (0.3%) died (3). The World Health Organization (WHO) declared a pandemic on March 11, 2020, with the increasing number of cases and deaths outside China (4).

Adequate protective equipment was essential for healthcare providers to safely work in the early period of pandemic (5). It has been reported that 3.5% of patients in China are the healthcare personnels (6). Therefore, the use of appropriate personal protective equipment (PPE) was necessary for the prevention of occupational exposure and infection in healthcare professionals evaluating possible or suspected patients (7). However, the PPEs such as N95 masks, eye protection, and protective clothing were not routinely used in the daily routine of hospitals and

many hospitals did not have sufficient equipment (4). At this stage, hospitals needed to plan their logistics in addition to upgrading their prior established plans.

During the COVID-19 epidemic, emergency departments (EDs) played an important role in identifying patients, isolating, preventing in-hospital infections, and informing public health authorities. It is necessary to identify the possible patients quickly and isolate them from others (8). Simultaneously, other patients' medical care should continue in reserved areas (Figure 1). It was necessary to reorganize the ED, which will be the first place of admission for the majority of patients. Emergency patient care should continue in EDs even in disasters, and in many countries, EDs operate at maximum capacity in their normal routines. For all these reasons, policies are required to prevent crowding in health centers and to control them, especially in EDs, identify patients before hospital admission if possible. During the COVID-19 outbreak, it has been reported that identification and follow-up of patients by online visits or methods such as home follow-up before admission to the hospital may prevent overcrowding (9,10).



**Figure 1.** Triage of possible COVID-19 patients in ED and needed care areas\*

\*Adopted from reference 15 and reproduced with permission of Emergency Medicine Association of Turkey (EMAT).

- A. Pre-acceptance area may be outside or inside ER, depending on eligibility, but outside the routine ER triage.
- B. Special area for initial and risk assessment of possible COVID-19 patients. Depending on its suitability, this field may be outside or inside ED, but outside the routine ER triage.
- C. Isolation area for patients with isolation indication but no need for urgent treatment. Should be outside of ER and preferably away from other clinics
- D. Resuscitation area for possible COVID-19 patients who require stabilization or resuscitative intervention in ER
- E. Inpatients clinics designated for COVID-19 patients who need inpatient treatment but do not need intensive care unit.
- F. Intensive care unit reserved for COVID-19 patients who need follow-up and treatment in intensive care unit.

The probability of the patient surge to EDs was one of the biggest concerns who might not receive adequate care if healthcare system capacity was overloaded. Protecting these patients from infection during hospital admissions is another challenge. Also, healthcare providers have an increased risk of infection due to prolonged working hours. (6). During the COVID-19 outbreak, interventions, such as the separation of high-risk and low-risk patients, reducing non-emergency appointments and operations, thereby supporting other staff of the hospital to the ED and the separation of areas, in this way, directing the limited supply to the staff who need the most protection have been shown to reduce cross infections (9).

The first patient with COVID-19 was detected in Turkey on March 11, 2020. Until this date, hospitals had made the necessary preparations in most of the country due to the experiences of China and Italy. The scientific committee, formed by academicians from different specialties by the Republic of Turkey Ministry of Health, and they created a comprehensive guide including many topics related to the management of patients such as patient identification, sampling, triage, hospitalization indications, treatment algorithms and presented. This guide has been constantly updated (12). On 20.03.2020, the Ministry of Health defined some of the hospitals as Pandemic Hospital, which employ at least two of the specialist physicians from the branches of infectious diseases, thoracic diseases, and internal diseases, and have a 3rd level adult intensive care bed (13). In these hospitals, the clinics and intensive care units were separated to follow the patients diagnosed with COVID-19 and other patients. The standards of practices related to the use of PPE equipment, the arrangement of patient rooms, patient transfers by ambulance, and infection control in radiology units have been announced by the scientific committee to prevent the spread of the disease in hospitals (12). Until May 9, 2020, 1,334,411 patients were tested across the country and 137,115 COVID-19 patients were detected. 2.7% of these patients died and 65.3% recovered at the time of writing this article (14).

In Turkey, the majority of EDs are overcrowded ordinarily and It is reported approximately 130 million ED visits in 2019. The Ministry of Health Public Hospitals Authority reported that 28.4% of all applications to all hospitals were made through EDs in 2017 (16). As a result, EDs were probably the primary admission places for pandemic patients. The experience of Italy showed that the EDs encountered a large number of patients with respiratory distress shortly after the onset of the outbreak, and flowcharts had to be developed for the management of patients (17). In this period, it was important to prepare

the EDs for new patient applications besides routine patient care. The increase in the number of patients could lead to more PPE needs than expected and exhaustion of the healthcare providers.

While the preparation was underway around the country, in mid-March 2020, 80% of the suspicious patients who were evaluated in the ED in Italy were hospitalized and the fatality rate of the disease was reported as 8.37% (17). During this period, preparation was made for long-term care of critical patients when many EDs were needed. Interventions such as endotracheal intubation, aspiration, cardiopulmonary resuscitation, non-invasive ventilation causing high aerosol formation frequently performed in the EDs. Additionally, necessary equipment for special operations such as video laryngoscope, helmet type mask, closed suction sets were not available in many EDs. In this period, besides accumulation of materials not used frequently in daily practice, it was necessary to create areas where high-risk interventions would be made. The World Health Organization suggested that procedures with a high risk of aerosol generation should be carried out in rooms with adequate ventilation or negative pressure. At this stage, hospitals without negative pressure rooms had to create alternative solutions.

EDs in Turkey created triage and patient care areas where possible COVID-19 patients will be evaluated in line with the facilities of the hospitals during the early outbreak in our hospital, with the first case in the country, the central endoscopy unit next to the ED and the operating room complex where the operations were performed without hospitalization were reserved for the care of pandemic patients. Apart from the emergency circulation to this area, a second triage section, a quick view area where patients will be evaluated quickly, and an intermediate intensive care unit with 5 beds for critical patients were created. This intensive care unit had all the necessary equipment for mechanical ventilation, non-invasive ventilation, as well as equipment such as video laryngoscope, helmet type mask, which are important in interventions for COVID-19 patients. In addition, three operating room modules in this area were prepared for intubation and noninvasive ventilation. Although PCR is used for the diagnosis of COVID-19, it is known that the rate of false negativity is high. Therefore, it is recommended to use a highly sensitive computed tomography (CT) (18). However, CT is one of the frequently used tests in the ED, and patients who are examined in the ED also need to be protected from infection. For this reason, the radiology unit belonging to our ED was used for the examinations of possible COVID-19 patients, and the CT in the radiology department was used for emergency patients.

During the pandemic period to avoid excessive virus load personnel's working time periods are reduced. Since it was not possible to operate a second area with only emergency personnel and short shifts, administration decided that all physicians who were not working inpatient care services in the medical faculty would work in this area. Thus, together with the emergency medicine residents and experts, approximately 240 physicians from the medical faculty started working in the COVID-19 outpatient clinic for up to 8 hours of shifts. In addition, a sufficient number of nurses and assistant personnel were assigned to each shift.

At this stage, patients with all fever and/ or respiratory symptoms began to be evaluated at the COVID-19 outpatient clinic and taken to the ED if needed. Patients who were evaluated in the ED and identified as possible cases in the follow-up were started to be taken to areas appropriate for their condition (Figure 2).

It is recommended to separate the waiting areas of different risk groups to reduce in-hospital infections (19). Accordingly, COVID-19 patients were followed up in areas appropriate for their condition after risk assessment.

However, effective triage of patients is an important problem. COVID-19 is a disease that can be presented with different clinical findings and cases presenting with conjunctivitis, delirium or abdominal pain have been reported (20,21). Atypical admissions can be seen in patients with special features such as elderly and immunosuppressed patients (22). Therefore, infection rates of the healthcare professionals working outside the areas reserved for infected patients are higher than expected. Working with insufficient protection measures may be the cause of infections seen in healthcare workers in the early period of the epidemic (23). Likewise, after the establishment of the ED and COVID-19 outpatient clinics, the first contamination in our healthcare personnel occurred while working in the ED, which was considered as a 'clean area'. Even though the PPEs were determined differently in the dirty and clean area at the beginning, it was decided the full PPE should be used in both areas. After this arrangement, there was no healthcare personnel infected in both areas, and there were no infected from doctors and nurses working in the pandemic outpatient clinic throughout the entire process.

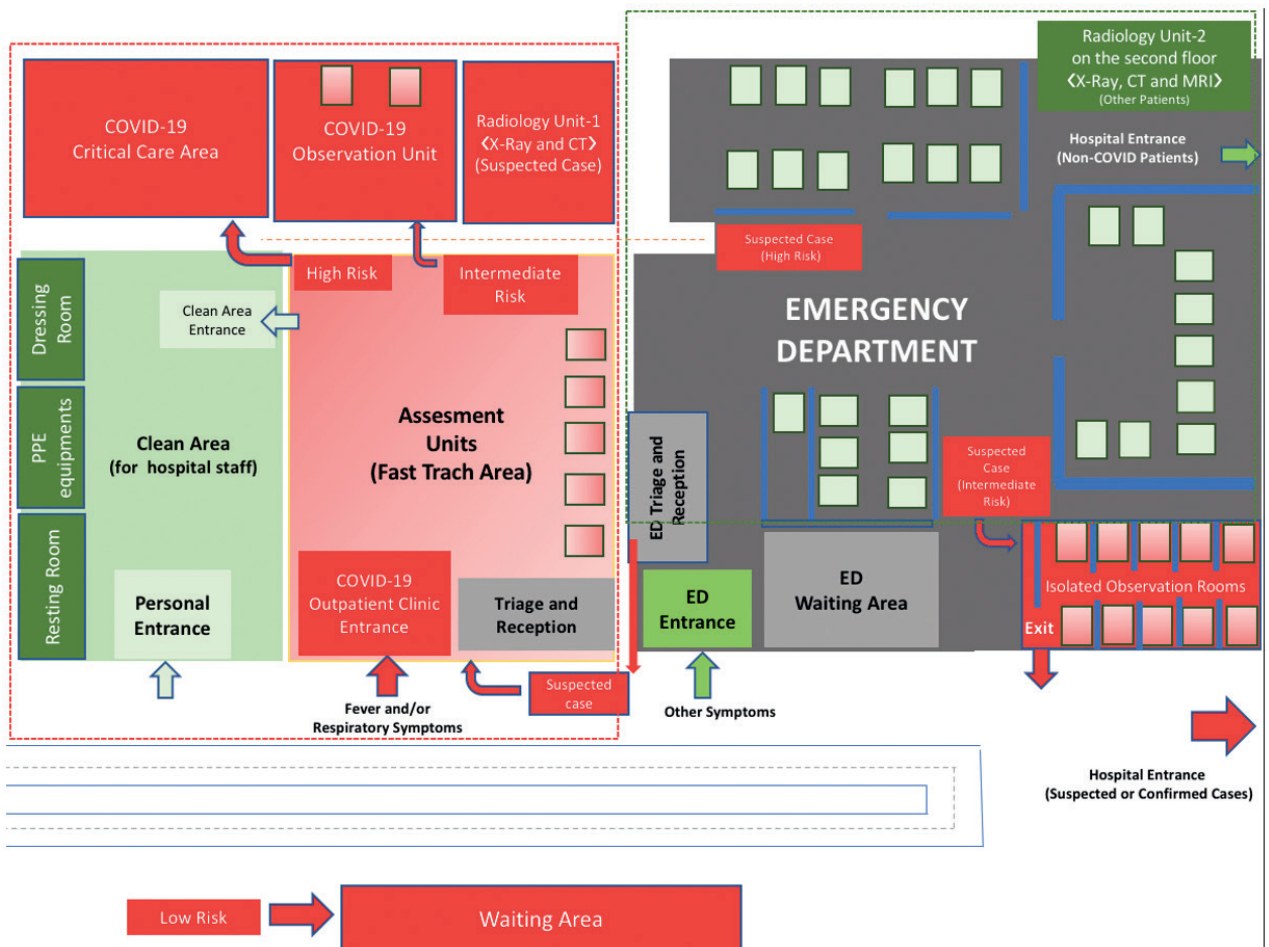


Figure 2. COVID-19 Outpatient Clinic and ED Organization Scheme in our institution.

## Changes in patient visits to EDs

After the onset of the pandemic, the increase in the number of emergency patients in many countries was, therefore, the most important concern in the care of other patients and the excessive workload of the staff. However, contrary to expectations, it was reported that the number of ER patients decreased in some countries. It has been reported that ED patient admissions in China have decreased to 30-40% (9). In a study examining the effect of the pandemic on emergency applications in Cuneo, Italy, it was reported that after the date of 21 February 2020, when the first case was reported in the country, the emergency patient applications decreased by 50% and this decline increased to 68% with the occurrence of the disease in the region. Despite this decrease in the number of patients, it was noteworthy that the proportion of patients who needed hospitalization increased 2 times compared to the previous year. It was reported that while the number of pneumonia increased, trauma and cardiovascular diseases decreased significantly. In the same period, the increase in applications due to depression was interesting. It was reported that this change in the patient profile was not only effective in the primary care of chronic patients, but also the interruption of social activation of individuals and anxiety to become infected (24).

Visits for non-urgent reasons to EDs in Turkey is quite common and is thought to be more than half of the ED for non-urgent reasons (25). Shortly after the COVID-19 pandemic was seen in our country, there was a significant decrease in the number of patients in EDs (25). This may be one of the reasons why there is no problem in the management of possible COVID-19 patients in the country. Normalization of the EDs normally performed in chaotic settings helped healthcare workers focus on potential COVID-19 patients.

Our institution which is one of the three public university hospitals in Izmir, the third-largest city in the country, and served as a pandemic hospital during this period. Our ED was serving as overcrowded until this period (26). In our ED, we observed that there was a 31% decrease in ED visits in March 2020 and a 55% decrease in April. We think that there is a decrease in the number of patients admitted to the ED due to their anxiety. We also observed significant changes in the patient profile. In this period, there was a significant decrease in the number of applications due to trauma, probably due to the restriction of curfew. It is also noteworthy that acute coronary syndromes and stroke patients who require urgent intervention should apply to the ED late. Physicians from different regions in the country report that patients with

urgent intervention are concerned about the disruption of their treatment (27).

## Forensic medicine in the EDs with COVID-19

Services provided in university hospitals' EDs in cooperation with forensic medicine, especially outside of working hours; it is important to have a multidisciplinary approach to patients (forensic medicine, psychiatry, pediatric psychiatry, gynecology, neurosurgery, etc.), to collect medical evidence from patients in a timely manner and for the healthy functioning of forensic case reporting processes and thus to prevent loss of rights.

Special cases include patient groups such as victims of domestic violence, torture, and sexual assault in the practice of forensic medicine. Providing the necessary medical standards for the forensic medical evaluations of these patients in addition to the diagnosis, treatment and rehabilitation processes in accordance with the medical standards and examining them in accordance with internationally accepted workflows and patient privacy, obtaining the opinions of other specialties, collecting biological material that may be of medical evidence and medicolegal opinion (reporting) is required. There are examination protocols to be used in forensic medical evaluations and forensic report preparation of traumatized patients, as well as occupational disease notification forms (28).

With the COVID-19 pandemic, the cooperation with psychiatry and other units under the management of the forensic and emergency medicine clinic in the university hospital were tried to continue in order to ensure that victims have access to healthcare and forensic medical documentation. The forensic case reporting process also continued. The emergency clinic of our hospital has continued to be an application center during the COVID-19 pandemic patients of trauma victims, and it has been an exit door where special cases such as domestic violence are accepted.

It is reported that there is a 70% decrease in forensic autopsy requests in Italy, and centers, where victims of sexual assault and domestic violence apply, are closed or there is a 50% decrease in application (29). In this instance, the victims, especially women and children, live in their homes with violence practitioners without medical treatment, evidence collection, and documentation. In some sources, it is suggested to review the forensic services after the COVID-19 pandemic (29-32).

In Turkey, which is the center of providing such services within the university Forensic Medicine Department and Emergency clinic; It provides expertise



and consultancy services 24/7 to trauma applications on many issues such as interpersonal violence, human rights violations, family violence, sexual violence.

Forensic Medicine Department, which cooperates with psychiatry, related clinics, and ED, evaluates after the application of the traumatized person or legal representatives to the Forensic Medicine Clinic, gives information about the process, after the necessary preliminary examination of the claims/arguments, performs evaluations.

Prior to the official announcement of epidemics and pandemics regarding COVID-19, applications were received in official expertise and individual applications that were not different from the previous years. In the pandemic process, since the requests from the official authorities ceased, the number of patients who were given medical expertise services by making medical evaluation was limited. There is a significant decrease in consultation services for forensic cases requested by other services. However, in cases of domestic violence, especially those who applied to the ED, there were 2-3 fold increases compared to the same months of 2019.

Although it is thought that there will be no formal expertise due to the pandemic, it is thought that expert opinions or individual applications to the emergency clinic for forensic medical evaluation will come to the fore, but this assumption has not been realized due to the reasons such as stagnation in the process of seeking legal rights in parallel with the situation in the judicial system.

In the process of COVID-19 Pandemic (for clinical forensic medical services maintained 24/7);

1. No formal expertise request
2. A decrease in violence incidents that apply to EDs
3. A decrease in health control (detention, exit, etc.) examination requests
4. Increase in work accident-occupational disease notifications
5. The increase was observed in cases such as domestic violence, child abuse/neglect.

With the COVID-19 pandemic, at the time of individual application, access to health services and forensic medical documentation; Difficulties experienced due to the lack of time for patients, attention to privacy, or patients' concerns about legal follow-up have been tried to be overcome with the joint study and attitude of University Hospital Forensic Medicine, Emergency Medicine and Mental Health Clinics.

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# The Bulletin of Legal Medicine

## Adli Tıp Bülteni

Review

### Covid-19 Infection, Postmortem Process and Burial Procedures

#### Covid-19 Enfeksiyonu, Postmortem Süreç ve Defin İşlemleri

Ümit Ünüvar Göçeoğlu\*, Satuk Buğra Yıldırım, Ecesu Ekinci, Yasemin Balcı

**Abstract:** **Objective:** With the outbreak of COVID-19 infection in China in December 2019, the virus started a rapidly spreading pandemia around the world, causing serious health problems and deaths. As of the beginning of March 2020, it has been reported to be seen in over a hundred countries across the world. In our country, the first COVID-19 case was detected at the beginning of March, and the number of death cases has exceeded tree thousand to May.

In this process, forensic medicine specialists and workers face serious risk of transmission in a possible COVID-19 death. This study is a compilation of the definition and epidemiology of the virus causing Covid-19 disease, how to diagnose of postmortem, postmortem examination and possible risks associated with such a case in the autopsy room and how to reduce these risks. In addition, suggestions regarding burials procedures were also presented in case of suspicion of Covid-19 infection.

**Keywords:** COVID-19, Forensic Medicine, Postmortem Examination, Autopsy, Death Certificate, Burial Procedures.

**Öz:** **Amaç:** Çin’de COVID-19 enfeksiyonunun Aralık 2019 tarihinde patlak vermesi ile virüs tüm dünyada hızla yayılan bir pandemi başlatarak, ciddi sağlık sorunları ve ölümlere neden olmuştur. Mart 2020 başı itibariyle Dünya genelinde yüzün üzerinde ülkede görüldüğü bildirilmiştir. Ülkemizde ilk vaka Mart başında saptanmış, Mayıs ayına kadar üçbinin üzerinde ölüm bildirilmiştir.

Bu süreçte adli tıp çalışanları olası bir COVID-19 ölümünde ciddi bulaş riski ile karşı karşıya kalmaktadır. Bu çalışma COVID-19 hastalığına neden olan virüsün tanımı ve epidemiyolojisi, ölüm sonrası COVID-19 tanısının nasıl konacağı, ölü muayenesi ve otopsi odasında olası riskler ve bu risklerin nasıl azaltılacağı konularının ortaya konması amacıyla bir derleme niteliğindedir. Ayrıca COVID-19 enfeksiyonu şüphesinde ölü defin işlemleri ve ölüm belgesi düzenleme ile ilgili ülkemizde yaşanan sıkıntılar tartışılmış ve öneriler sunulmuştur.

**Anahtar Kelimeler:** COVID-19, Adli Tıp, Ölü Muayenesi, Otopsi, Ölüm Belgesi, Defin İşlemleri.

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**Ethical Declaration**

Our study was written in accordance with the Helsinki Declaration, and the ethics committee approval was not obtained because of the review study.

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## Introduction

With the outbreak of COVID-19 infection caused by SARSCov-2 virus in China in December 2019, the virus started a pandemic that spread rapidly all over the world, causing serious health problems and deaths.

Forensic medicine workers may face serious transmission risk in a possible COVID-19 death. With the spread of the disease in our country and the existent of deaths, many problems that had not been experienced before have been discussed. Especially, whether the autopsy will be performed or not in those who have died due to COVID 19 infection or suspicion, how to have autopsy procedures in this case, how to protect forensic medicine workers, how to diagnose and what algorithm of burial procedures has been discussed.

Related organizations in China and in England prepared rapidly guidelines (1-4), and the World Health Organization (WHO) rapidly published guidelines containing algorithms (<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>). In our country, the Ministry of Health (<https://covid19bilgi.saglik.gov.tr/tr/>) and many medical specialty associations published guidelines (5,6), the Forensic Medicine Institute (ATK) prepared “COVID-19 Postmortem Examinations Checklist” and “COVID- 19 Autopsy Instructions’ (7), Forensic Medicine Specialist Association (ATUD) published ‘the COVID-19 Information Guidelines for Postmortem Practices’ (8).

Recent study is a review of the definition and epidemiology of the virus (SAR SCov-2) causing COVID-19 disease, how to postmortem diagnose, postmortem examination and possible risks in the autopsy room and how to reduce these risks. In addition, the problems encountered in our country regarding the burial procedures and death certificate in case of suspicion of COVID-19 infection has been discussed and suggestions have been presented.

## Definition and Epidemiology

Coronaviruses (CoV) are a large family of viruses that can cause self-limiting mild infection symptoms to more serious forms such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) (9,10). WHO reported cases of pneumonia of unknown etiology in Wuhan, China, on 31 December 2019. In the south of Wuhan, collective cases have been reported in a wholesale fish and livestock market staff which is selling different animal species. The agent was identified on January 7, 2020 as a new Coronavirus (2019-nCoV) that has not been detected in humans previously, WHO published the name of the disease as COVID-19 disease, and

the virus was named SARSCoV-2. The disease has start to outbreak very quickly due to its ability to spread from person to person. The first COVID-19 case in our country was detected on March 11, 2020. It was also reported that it is seen in over 100 countries worldwide since the beginning of March 2020 (9). Until 11.05.2020 in our country, according to the Ministry of Health’s data, the total number of cases of Covid-19 infections was 139.771, and total number of deaths was 3841. (<https://covid19.saglik.gov.tr/>).

## Infection and Contamination

Coronaviruses were isolated in camels, cattles, cats and bats. Rarely, animal coronaviruses can infect the humans and then spread among people like MERS-CoV (11). The pathobiology of COVID-19 disease is not completely understood and significant efforts to investigate are ongoing worldwide. The number of deaths increases as the SARS CoV-2 virus continues to spread. The transmission of the virus is thought to be largely by inhalation of respiratory droplets, but it has also been reported to be transmitted through the mouth, nose, eye mucosa and skin by hand contact to the contaminated areas. Fever is usually the first symptom; respiratory symptoms follow that. Although the course of the disease is mild in most of the COVID-19 patients, approximately 20% of them develop a serious disease with a high mortality rate and mortality is associated with advanced age and immunosuppression (2,11). Considering the epidemiological characteristics of the cases in China, it has been observed that the average incubation period is 5- 6 days (2-14 days), and in some cases it may extend up to 14 days. Covid-19 infectious period is not known exactly. It is thought that it starts 1-2 days before the symptomatic period and ends with the disappearance of the symptoms. Coronaviruses are not very resistant to the external environment. There is a residence time that varies according to the humidity and temperature of the environment, the amount of organic substance it is expelled, and the texture of the surface it contaminates. It is generally accepted that it loses its activity within a few hours on inorganic surfaces. When interpreting the activity time on inorganic surfaces, it should be kept in mind that not only the activity of the virus continues, but also the duration of the contamination. It is reported that the virus normally survives outside the host for a few hours, but it can grow up to days in cold and humid conditions (10-12). Currently, long-distance air contamination is unlikely from person to person (2). Considering the evidence of fecal excretion and their viability in conditions that can facilitate fecal-oral transmission, it is thought that it is possible to transmit

SARSCoV-2 in this way (12). The virus is easily neutralized with standard disinfectants such as soap, detergent and ethanol solutions (9). Several guidelines and articles have published on postmortem examinations for morgue workers performing with suspected COVID-19 autopsy from initial detection in December 2019 (2-4). Of course, guidelines and algorithms will be updated with new data and information about the virus in the future.

### COVID-19 Infection Agent Within the Category of Hazardous Groups

The 'Hazardous Pathogens' (HG) classification prepared for the staff of clinical and microbiology laboratories has also been adapted to the morgue staff (2). These hazardous agent groups (HG1-4) are grouped according to their risk of infection in humans, their potential for access to treatment and profiling (Table 1) (13).

**Table 1. Hazardous Groups Categorization**

Hazard Group definitions	
Group 1-HG1	Unlikely to cause human disease.
Group 2- HG2	Can cause human disease and may be a hazard to employees; it is unlikely to spread to the community and there is usually effective prophylaxis or treatment available.
Group 3- HG3	Can cause severe human disease and may be a serious hazard to employees; it may spread to the community, but there is usually effective prophylaxis or treatment available.
Group 4- HG4	Causes severe human disease and is a serious hazard to employees; it is likely to spread to the community and there is usually no effective prophylaxis or treatment available.

While coronaviruses associated with SARS and MERS are both considered HG3 pathogens, most of the other coronaviruses are considered HG2. SARS CoV-2 has been recently categorized as an HG3 pathogen (2,3).

**Preparation:** When the effective utilisation of universal precautions, the risk of morgue staff dealing with these HG3 organisms will be minimized. The best protection in morgue, when conducting an autopsy on a patient with suspected COVID-19, are as follows; risk assessment, understanding of possible pathogens, universal standard precautions and any standard operating procedures for specific HG3 pathogens. (2,3).

Effective use of universal standard precautions will reduce risks as much as possible. As in standard autopsy, in a case with suspected COVID-19; clinical history should be reviewed, first findings in the event scene should be obtained, information is attained from the

patient's clinicians, laboratory records and information from the hospital infection control committee (2-4). If the death is considered to be due to a confirmed COVID-19 infection, an autopsy is not to be necessary and a Medical Certificate of Cause of Death should be given. If the infection is involved in a forensic case, the legal duty is to perform a complete autopsy. However, the guidelines prepared during the pandemic process suggested that post-mortem examination may be limited only to retrieving the samples required to verify COVID-19 infection, or a staged postmortem (2-4). This decision must be made according to the individual case. A staged postmortem may also be considered. This involves taking only diagnostic samples initially and later considering or a more complete autopsy after the results of these diagnostic tests are available. The guidelines recommend this staged technique (2,3). Limited autopsies (needle biopsy sampling or single cavity organ sampling) may be preferred in personnel and resource shortage. Studies include such minimally invasive autopsies; has shown that sampling of blood, lung, liver and spleen can be reliably diagnosed when systemic infection is suspected by viruses and bacteria (2-4). In general, if a death is believed to be caused by an approved COVID-19 infection, autopsy is not required and a 'Death Certificate' which is stating the cause of the medical death should be issued.

**Autopsy Room and Precautions;** In all HG3 pathogens related death, autopsies should be performed in an isolated room that separate from the other morgue area. Adequate and negative pressure ventilation system is important. Whole room ventilation with the draught passing from ceiling height down and across the tables, exiting at floor level, is suitable. Electric skull saws all now come with vacuum evacuation into a separate chamber. All necessary equipment must be ready (eg sample containers, culture bottles, etc.) before starting the autopsy and must not leave the work area and re-enter. In all high risk death cases, autopsy should be limited to a team of three people (forensic expert, autopsy technician, circulatory assistant). The participation of inexperienced young personnel such as trainees, assistants, students in risky autopsy should be evaluated by senior personnel, they can take part in HG3 autopsies under sufficient information and supervision. Although there is no particular infection risk to pregnant staffs if standard universal precautions are followed, they may wish to remove themselves from mortuary work. (2-4).

Personal protective equipment (PPE) is vital (4). It is imperative to protect the health and safety of employees in institutions, and the use of the following personal protective equipment is mandatory for all autopsy employees:

- Surgical scrub suit
- Hat to protect hair
- Clean visor to protect the face, eyes and mouth
- Standard surgical mask N95 or FFP3 mask, which effectively filters small particles of infected material
- A waterproof gown to cover the whole body, including the forearms
- Plastic apron on waterproof gown
- Rubber boots with metal-protected toecaps
- Latex or other equivalent material gloves
- Under latex gloves, protective gloves made of kevlar or neoprene, which are cut-resistant in case of potential blood-borne infection.

One of the most important point is that if the morgue is not sufficiently equipped and safe, the case should be directed to another suitably equipped morgue. It is considered that during autopsy dissection and precautions in all autopsies with suspected HG3 infection are reported as follows (2-4);

- To minimize the risk of incision, blunt, round-tipped scissors and PM40 blades should be used.
- Sharp equipment should be kept to a minimum within the autopsy desk and their whereabouts must be known.
- Limit the number of personnel working in the autopsy suit at any given time to minimum number of people necessary to safely conduct the autopsy
- Limit the number of personnel working on the human body at any given time
- In organ dissections, the organs should be fixed on the dissection table with the help of a sponge and sliced.
- Necessary precautions should be taken to protect hands during autopsy.
- It is recommended to open the skull with a vacuum ventilation system. Alternatively, a manual saw can be used.
- After the body fluids are sampled, needles and syringes should be collected in a special container, the needle tips should never be reused.

**Collecting of Postmortem Specimens for the diagnosis of Postmortem COVID-19 infection:** for serology; 5 mL sample of plain blood (no additive), upper respiratory tract swabs (oropharyngeal-nasopharyngeal) and lower respiratory tract samples (bronchoalveolar lavage, sputum or direct lung tissue swab and lung tissue) (16,17). Lung tissue can also be sampled during swab removal, if swabs are negative, it is not necessary to study the tissue. It is recommended to use one swab for the upper airway and another swab for the lower respiratory tract (2,17). It is recommended that standard samples such as

respiratory tract swabs and tissue samples are sent to the microbiology laboratory at the same time to detect pathogens in differential diagnosis. A complete organ-tissue histopathological sampling is recommended. Standard formalin fixation neutralizes known coronaviruses and known that SARS CoV-2 is to be similarly affected (18). Respiratory samples can be collected with ready-to-use swabs. Where appropriate, blood, urine and cerebrospinal fluid samples should be taken before opening the body cavity and under sterile conditions as much as possible to reduce contamination.

**Postmortem Findings in COVID-19 Infection:** Information on pathological findings in COVID-19 infection is still very limited, despite many publications in recent months (18-20). According to the studies, the macroscopic features of COVID-19 may include pleurisy, pericarditis, lung consolidation and pulmonary oedema. Lung weight may be increased above normal. A secondary infection may be superimposed on the viral infection that can lead to purulent inflammation.

It has been reported that microscopic findings are not specific, they will change in the early and late periods. There may be edema in the lungs, pneumocytic hyperplasia, focal inflammation and multinuclear giant cell formation, widespread alveolar damage with exudates, hyaline membrane disease. In one study, inflammation was predominantly lymphocytic and viral inclusions were not reported, but multinuclear giant cells were seen alongside large atypical pneumocytes (19).

### Process in Turkey

The Forensic Medicine Institute published the “COVID-19 Postmortem Examinations Workflow” and “COVID-19 Autopsy Instruction” on 16.03.2020 (7). The Forensic Medicine Specialist Association also published the “COVID-19 Information Guide for Postmortem Forensic Medicine Practitioners”, which includes information from the Forensic Medicine Institute documents in April 2020 (8). In the documents belonging to both the Forensic Medicine Institute and the Forensic Medicine Specialist Association, considering the possible case definition of the Ministry of Health, it is recommended to test first when there are possible/suspected COVID-19 cases, and to perform an autopsy after the test result is available. However, with the speed at which the virus spreads, at the point reached, everyone is considered should be a possible case and carrier, even if there are no symptoms or signs. The desire of the funeral relatives to bury their relatives as soon as possible, the demand for intercity transportation, the security of those who will carry the funeral have become a problem. In some districts or provinces, the cases

are sent to forensic medicine units for autopsy in cases of forensic death with the opinion of the Prosecutor's Office and the physician performing the first dead examination at the scene, considering that it is not within the scope of a possible case. This situation increases the risk of infection of forensic experts and employees. On the other hand, in post mortem swabs, the possibility of false negative results is also higher. In this case, all autopsies are carried out with the maximum security measures, assuming an infected COVID-19 or carrier. Although limited autopsy is recommended, cases requiring detailed procedures are encountered according to the case. For example, in a case with a history food/foreign body aspiration, the main bronchi and its branches should be examined in addition to the upper respiratory tract.

In the relevant documents, if COVID-19 test result is positive, and autopsy is required, it is recommended that autopsy be performed in negative pressure rooms, and since the negative pressure autopsy room is not found everywhere in the periphery provinces, the cases are sent to the Istanbul Forensic Medicine Directorate. However, because of the difficulty of daily routine procedure, on 23.03.2020, the General Directorate of Public Health of the Ministry of Health reported that ‘... if the morque does not have negative pressurized rooms, autopsy can be

performed by taking the maximum security measures by providing ventilation conditions’. Daily practice is likely as recommended. In summary, the algorithms prepared for the first time have become contradictory with each other. According to the COVID-19 Autopsy Instruction written by the Forensic Medicine Institute; ‘...if the burial is decided during the dead examination, a detailed external examination and a full body radiological examination are performed. It is reported to the Provincial Health Directorate and the Cemeteries Directorate and the body is transferred to the relevant units for burial procedures’. This is also another problematic practice. Because; there is no possibility to perform a full body radiological examination in perifers. It was thought that this record was related for treated patients in the hospital.

**Burial Procedures:** From the letter titled “Measures and Precautions for Morgue and Burial Services” sent by the Ministry of Health, General Directorate of Public Health on 18.03.2020, it is understood that those who died due to COVID-19 will not be shrouded, just directly will buried with a corpse bag. However, because of the different ideas, the subject was discussed again in the Scientific Committee and it was stated that; ‘...the body could be shrouded by following the precautions, not need to corpse bag, and not require a special cemetery’ (Figure 1).

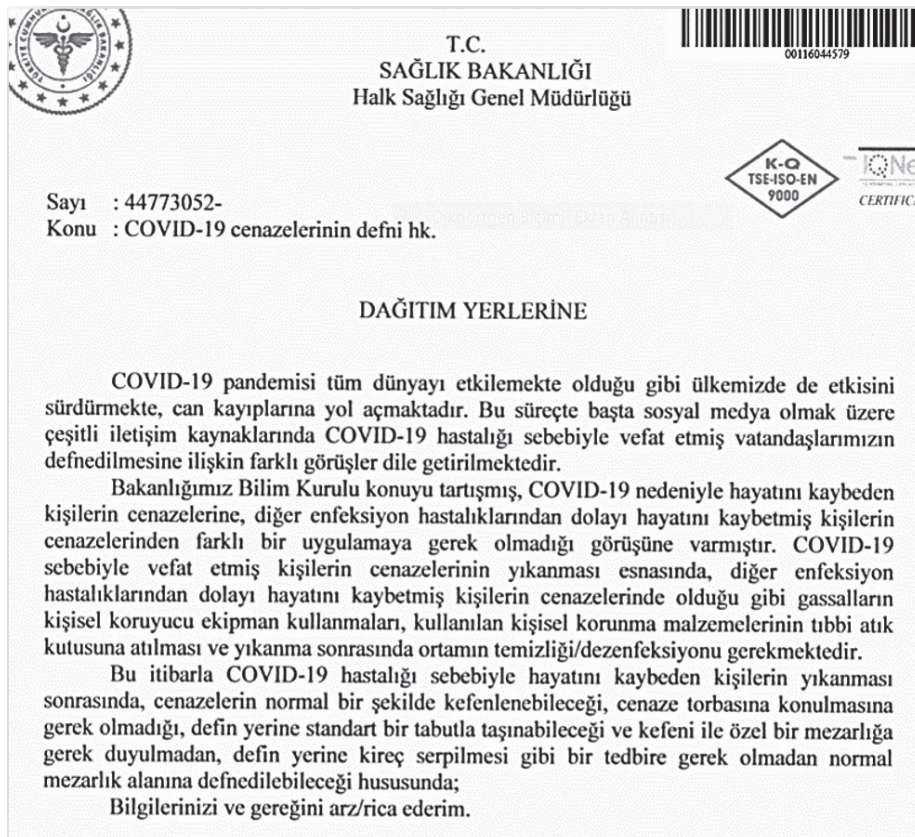


Figure 1. Letter of the Ministry of Health, General Directorate of Public Health dated 03.04.2020

## Death Certificate

Death data are the most important indicator used to compare and measure health status at national and international. Death documentation is recorded by the physician using a standard electronic form with the codes of the International Classification of Diseases-10 (ICD-10) to reach accurate statistical data. In our country, the Death Report System (ÖBS) created by the Ministry of Health is used.

ÖBS is a web application in a single database that can be managed in corporate hierarchical structure and suitable for expansion to collect faster and better way of death statistics by the relevant units of the Ministry of Health, which enables data exchange between Population and Citizenship Affairs General Directorate and Turkey Statistical Institute. (<https://www.saglik.gov.tr/TR,11167/olum-bildirim-sistemiobs-genelgesi.html>).

When someone is died in a health facility; the death certificate is document in electronically, in the provinces and districts it is checked and approved within 24 hours by the electronic signature authority at the Public Health Branch Directorates.

In ÖBS, section H is the cause of death section. While filling the 'H-Cause of Death' section; either 'Login with manual' or 'Login with ICD-10 Encoding' should be

selected. There is no need to use both. In I. part of the cause of death section; line a) the disease or condition will be reported as a main cause of death. Catastrophic results of death such as asystole, respiratory arrest, cardio-respiratory arrest, cardiac arrest, should not be reported as a cause of death. In the lines b), c), d), the previous reasons will be reported in chronologically.

In the II. part of the cause of death section; other important conditions (not directly related with main cause) will be reported.

When the Death Certificate is not duly prepared, it is sent back to the physician for correction the issued document by the controllers at the Public Health Branch Directorates. At this stage, the controller should also have stated the reason for the return. (<https://obs.saglik.gov.tr/Account/Login>).

If the COVID-19 infected patient (laboratory test is positive) died during treatment, for death certificate, a cause of death will be reported with the 'Login with manual' option like as Figure 2.

In terms of "login with ICD-10 encoding"; emergency ICD-10 codes for COVID-19 cases have been determined by World Health Organization on March 25, 2020 (Figure 3) and it was suggested to use these codes in death reports (<https://www.who.int/classifications/icd/COVID-19-coding-icd10.pdf?ua=1>).

H	Bölüm I	Ölüm Nedeni	
<i>(Doğrudan ölüme neden olan hastalık veya durum, Önceki Nedenler, Eğer yukarıda verilen durumlar varsa, alta yatan durum en son belirtilecek.)</i>			
a)	Akut respiratuvar distres sendromu		
b)	Viral pnömoni		
c)	COVID-19		
d)			
<b>Bölüm II</b>		<i>(Ölümün gerçekleşmesinde etkisi olan fakat ölüme neden olan hastalık)</i>	
a)	KOAH		
b)	Sigara kullanımı		

Figure 2. COVID-19 positive, Death Certificate-H-Cause of Death Section- 'Login with manual'

## COVID-19 coding in ICD-10

25 March 2020

This document provides information about the new codes for COVID-19 and includes clinical coding examples in the context of COVID-19. It includes a reference to the WHO case definitions for surveillance.

- New ICD-10 codes for COVID-19
  - U07.1 COVID-19, virus identified
  - U07.2 COVID-19, virus not identified
    - Clinically-epidemiologically diagnosed COVID-19
    - Probable COVID-19
    - Suspected COVID-19

Details of the updates to ICD-10 are available online at <https://www.who.int/classifications/icd/icd10updates/en/>

Figure 3. New ICD-10 codes for COVID-19, WHO



**U07.1: COVID-19, virus identified;** This code is assigned for cases confirmed by laboratory test (PCR).

**U07.2: COVID-19, virus not identified;** This code is assigned for cases clinically-epidemiologically diagnosed COVID-19, probable COVID-19, suspected COVID-19. (<https://www.who.int/classifications/icd/COVID19/en/>).

Similarly, the American Center for Disease Control and Prevention recommends writing “possible COVID-19” to the underlying cause of death for patients diagnosed clinically with COVID-19 (<https://www.cdc.gov/nchs/data/Nvss/vsrg/vsrg03-508.pdf>).

We think that in our country, the Ministry of Health, General Directorate of Public Health should urgently update the ICD-10 code system recommended by WHO. There is no standard in the Death Certificates of laboratory test result is negative, even if the patient has clinical and CT findings. This contrasts with the COVID-19 Guideline created by the Ministry of Health. Likewise, In the Ministry of Health COVID-19 Guideline (9); “*Detection of seasonal respiratory virus or bacteria in the samples from the the possible cases does not rule out the presence of SARS-CoV-2. Seasonal respiratory viruses such as HCoV-229E, HCoV-OC43, HCoV-NL63 and HKU1-CoV are different from COVID-19*”. In the algorithm created by Istanbul Provincial Health Directorate, it is recommended that if the clinical and CT findings positive, but PCR results negative, viral pneumonia should be recorded as a cause of death.

According to the algorithm published under the name of Death Certificate Arrangement Services; for patients who died in the public / private hospital;

- If the PCR result is negative and the CT result is negative, “infectious disease (natural death) entry will be made through ÖBS, and it will be specified as “viral pneumonia” in ICD-10,
- If the PCR result is negative and the CT result is positive, “infectious disease (natural death) entry will be made through ÖBS, and it will be specified as” viral pneumonia “in ICD-10,
- If the PCR result is positive and the CT result is negative, “infectious disease (natural death)” entry will be made through ÖBS, and the cause of death will be specified as COVID-19 in ICD-10,
- If the PCR result is positive and the CT result is positive, “infectious disease (natural death)” entry will be made through ÖBS, and the cause of death will be specified as COVID-19 in ICD-10”.

Scientifically, it has been reported in studies on the subject that the reliability of the PCR test is approximately 60% in determining COVID-19 cases, therefore, it is absolutely necessary thorax CT for diagnosis (17,21).

Likewise, the virus has a high affinity for lung cells, when it descends to the lower respiratory tract and creates symptoms, it is known that false negative test results can be obtained from the upper respiratory tract samples. Wang et al. from China (21) reported that in COVID-19 patients, PCR positivity is 32% in pharyngeal swaps, 63% in nasal swaps and 93% in bronchoalveolar lavage fluid. Ai et al. (22) reported that in 1014 cases, PCR test performed several times, and results were able to change from positive to negative, or negative to positive, so CT was more reliable in terms of diagnosis and follow-up.

Studies show that in patients diagnosed with COVID-19, PCR tests can give false negative results depending on factors such as sampling techniques and sampled regions. Therefore, clinical diagnosis supported by CT findings becomes important.

There are some reports of death numbers related to COVID-19 infection worldwide, but the real numbers are unknown. However, in the login with manuel in ÖBS, the cause of death is to record “**COVID-19, virus not identified**” as suggested by WHO or “**probable COVID-19**” as suggested by the Centers for Disease Control and Prevention (CDC). In the login with ICD-10 encoding, it would be best to use the **U07.2: COVID-19, virus not identified**’ code recommended by WHO. Otherwise;

- It can be claimed that the facts are hidden and covered up.
- Relatives of the deceased may be inattentive to comply with quarantine and other protective measure, thereby it can be risk to public health
- In terms of requirements (mechanical ventilator, intensive care unit, medicine and other materials) in another possible pandemic in the future, thereby the recent correct data will be guide for the future.
- The cause of death registered in ÖBS will be an evidence in terms of causality for insurance and medical law. This will be particularly important for healthcare professionals who have clinical and CT findings are positive, but the PCR test result is negative.

The letter written by the Antalya Provincial Health Directorate (Figure 4), to be notified to the physicians who issues Death Certificate, supports what we have written above. In the recent article, the importance of recording presence of infectious disease in death certificate was emphasized in terms of burial procedures of the deceased.

In summary; if there is a clinical finding and the PCR result is positive, the death certificate must be reported as shown in Figure 2. If clinic supports COVID-19 infection, but PCR test result is negative; recommended codes should be used in ÖBS with Login with manuel option; not identified or possible COVID-19 code should be reported as shown in Figure 5.



T.C.  
ANTALYA VALİLİĞİ  
İl Sağlık Müdürlüğü

Sayı : 67910779-299  
Konu : Corona Virüs Tedbir (Cenaze Hizmetleri ) hk.

DAĞITIM YERLERİNE

**İlgi** : 25/03/2020 tarihli ve 37106781-28485 sayılı yazı.

Çin'in Wuhan kentinde başlayarak dünya genelinde görülen ve Pandemi olarak nitelendirilen (Covid-19) salgınının İlimizi ve vatandaşlarımızı korumak, salgının yayılmasını engellemek amacıyla bir takım tedbirler alınmaktadır.

Bu nedenle; Sağlık İşleri Dairesi Başkanlığı Mezarlıklar Şube Müdürlüğü'ne intikal eden ölüm vakalarına, gerekli defin işlemlerinin yapılabilmesi için Defin Ruhsatı düzenleyen hekimin 'Ölüm Belgesi' evrakına hastanın Ölüm nedeninin hekimin kaşesi ile birlikte manuel yazılarak bildirilmesi, (bulaşıcı hastalık Covid-19 taşıyıp taşımadığı) önem arz etmektedir. Bu yazının tüm sağlık tesislerindeki Ölüm Belgesi dolduran ilgili hekimlere tebliğ edilmesi hususunda;

Gereğini bilgilerinize arz/rica ederim.

Figure 4. Death Certificate sample recommended by Antalya Provincial Health Directorate.

H Bu bölüm sadece hekim tarafından doldurulacaktır.		Ölüm Nedeni	Hastalığın kadar
<b>Bölüm I</b>			
Doğrudan ölüme sebep olan hastalık veya durum*	a)	Akut respiratuvar distres sendromu..... Bağı olarak	1 gün
<b>Önceki nedenler</b>	b)	Viral pnömoni..... Bağı olarak	12 gün
Eğer yukarıda verilen nedene yol açan ölüm ile sonuçlanan durumlar varsa, altta yatan durum en son belirtilecek	c)	Olası COVID-19, virüs tanınmamış..... Bağı olarak	12 gün
	d)	.....	.....
<b>Bölüm II</b>			
Ölümün gerçekleşmesinde etkisi olan, fakat ölüme neden olan hastalık veya durumla ilgili olmayan diğer önemli durumlar yazılacaktır.		Diyabet.....	.....
		Hipertansiyon.....	.....
*Bu bölüme kalp arresti ve solunum yetmezliği gibi ölüm şekilleri değil, ölüme sebebiyet veren hastalık, yaralanma veya komp			

Figure 5. Cause of death sample recommended by WHO in clinically suspected COVID-19 infection

It is also important to fill in the II. part of H. Cause of Death Part in the Death Certificates. Important health problems of individuals such as smoking, alcohol use, cardiac problems, COPD, diabetes, cancers, and diseases affecting immunity should be recorded in the II. part. These records will contribute to identifying accompanying risk factors. On the other hand, even if the PCR result is positive people may die for other reasons. The cases are only carriers and even if viruses are found, this may not contribute to death (eg sudden cardiac deaths). In such cases, COVID-19 should be record in the second part of the death certificate.

It should not be forgotten that the physician is responsible for correct reporting of death certificates. In a

possible legal conflict in the future, the physician will be responsible. When the death certificate is not approved by the controllers in the Public Health Branch Directorates and sent back to the physician who issued the document for correction, the controller should also report the reason for the return. All correction requests, rationale and corrections will be registered in the system.

**Death Statistics:** In the pandemic, the number of deaths (due to COVID-19 infection or the other causes) are increase. Because of the pandemic, people have anxiety and stress and they may postpone their treatment. Scientific data on this subject can be obtained by comparing the death statistics in the pandemic process with the death statistics of the previous and next years.

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Review

### Establishing early warning systems by monitoring Covid-19 (SARS-CoV-2) in wastewater

#### Covid-19 (SARS-CoV-2)'un Atıksularda İzlenmesi ile Erken Uyarı Sistemlerinin Oluşturulması

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**Abstract:** **Objective:** Wastewater based epidemiology studies are a complementary approach used to measure and monitor the presence and prevalence of infectious diseases when clinical testing capacity is limited. It can also help with the detection of coronaviruses in wastewater and how they spread in the society. In the COVID-19 pandemic, SARS-Coronavirus-2 (SARS-CoV-2) is excreted with the feces of infected people and mixed with wastewater. Most people infected with viruses that infect enterically spread their feces and virus into their sewage systems both for the days or weeks before and after symptoms begin to appear. Through the detection of Covid-19 in wastewater, the number of asymptomatic people who do not represent any indication related to diseases but are carriers can be determined, and the total number of people infected in that society can be estimated. Therefore, an early warning system can be created, and it will be possible to take the necessary precautions before the second or third wave occurs.

**Keywords:** Wastewater; SARS-CoV-2; Covid-19; Pandemic; Wastewater based epidemiology

**Öz:** **Amaç:** Atıksu epidemiyolojisi çalışmaları, klinik test kapasitesi sınırlı olduğunda bulaşıcı hastalıkların varlığını ve hatta yaygınlığını ölçmek ve izlemek için tamamlayıcı bir yaklaşımdır. Bu epidemiyoloji koronavirüslerin atık sularda tespiti ile toplumda nasıl bir yayılım gösterdiği hakkında da yardımcı olabilmektedir. COVID-19 pandemisinde, SARS-Coronavirus-2 (SARS-CoV-2) enfekte kişilerin dışkılarıyla birlikte atılmakta ve atık sulara karışmaktadır. Enterik olarak bulaşan virüslerle enfekte olan çoğu kişi, semptomlar başlamadan önce ve başladıktan sonra, günler veya haftalar boyunca dışkıları ile virüsü hem yaymakta ve kanalizasyon sistemlerine atmaktadırlar. Atıksularda Covid-19'un tespiti ile hastalık belirtici göstermeyen ancak taşıyıcı olan asemptomatik kişilerin sayısı da belirlenerek o toplumda enfekte olan toplam kişi sayısı belirlenebilmektedir. Bu sayede erken uyarı sistemi oluşturularak ikinci veya üçüncü dalga gerçekleşmeden, gerekli önlemlerin alınması sağlanabilecektir.

**Anahtar kelimeler:** Atıksu; SARS-CoV-2; Covid-19, Pandemi; Atıksu epidemiyolojisi

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## Introduction

Coronaviruses (CoVs) are a family of pathogenic viruses for humans and animals associated with respiratory and gastrointestinal infections. CoVs are considered small pathogens for humans since they are responsible for common colds or mild respiratory infections in people with a weak immune system. Likewise, the emergence of new and highly pathogenic and zoonotic diseases such as Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS) and the latest coronavirus 2 (SARS - CoV - 2) caused by CoVs, also reveals problems that need to be addressed in order to guide public health response (1).

The emergence of severe acute respiratory syndrome SARS - CoV - 2 in the city of Wuhan, China, quickly led to a global pandemic scenario with more than 2.6 million COVIDs - 19 confirmed cases worldwide as of April 23, 2020. Symptoms of COVID - 19 are varied and often non-specific, including fever, cough, and diarrhea. A non-negligible percentage of infected people develop pneumonia, which can lead to severe respiratory distress, and then mechanical ventilation, organ failure, viral sepsis, and finally, death occur. Stiff and extremely costly epidemiological control measures, including worldwide limitations, were introduced due to the collective nature of pandemics and easy diagnosis based on symptoms as well as due to lack of treatment or vaccine. While RT-qPCR test campaigns are applied in many countries to assess the actual prevalence of the virus, this is not a viable surveillance strategy for the general population in the long run.

Although SARS - CoV - 2 is primarily a respiratory virus, previous studies with relevant SARS - CoV - 1 (the causative agent of the 2003 SARS outbreak) demonstrated the possibility of fecal-oral contamination in patients' feces based on the detection of viral RNA by RT - qPCR. Recent studies also show that SARS - CoV - 2 can be excreted in asymptomatic carriers and with feces of recently recovered patients (2-5). Specifically, viral RNA, regardless of disease severity, demonstrates that even after viral clearance from the respiratory tract, it is detected in feces for up to 10 days (6). This means that wastewater may contain viral particles or viral RNA, and therefore it is possible to utilize wastewater as an epidemiological surveillance tool. Wastewater can also collect viruses from the oral cavity and upper respiratory tract that spilled during personal hygiene. Compared to the systematic testing of individuals, wastewater analysis is clearly less invasive, more straightforward, and cheaper. However, studies on the sensitivity and reliability of this method are still ongoing.

Each individual throws about 100 g of fecal matter per day (7). An infected individual contains  $10^5$  to  $10^9$  enteric virus particles in each gram of stool (8). A live SARS-CoV-2 was detected in stool samples with high RNA copies. A recent study shows that alive SARS-CoV-2 is isolated from the feces and urine of infected people (3). This indicates that SARS-CoV-2 will eventually enter the wastewater treatment system afterward. Additionally, it is stated in another study that this virus can survive for several days in a suitable environment even after it expelled from the human body (8). As the World Health Organization reported, the lifespan of viruses in wastewater is up to 20 days at 4 ° C and 24 hours at 20 ° C (9). Although wastewater is not a critical potential contamination setting for coronaviruses such as SARS-CoV-2, increased circulation of the virus in the population is likely to increase the virus load in the sewage systems of the cities (9). To date, there is limited information on the potential for transmission of coronavirus infection through the environment (10).

Also, inevitably loosening of existing restraint measures taken to protect public health can lead to a recurrence of local outbreaks or importation of cases from other regions. Consequently, it is imperative to create viable and reliable epidemiological monitoring strategies that can enable us to be prepared in future viral emergencies. Besides, this epidemiology can be used as a tool designed to help co-ordinate virus monitoring strategies under the current circumstances when authorities begin to lift measures against coronavirus gradually.

## Monitoring of SARS-Cov-2 with Wastewater Epidemiology

Human enteric viruses enter the sewage system through excretion (feces-urine). Viruses are observed in extremely high amounts in the feces of infected individuals (11). The feces and urine of humans or animals are excreted into the sewage system. Therefore, wastewater contains many biomarkers and pathogens that can enter from the carrier of the disease in the communities, from infected people and patients in hospitals. These pathogens, such as bacteria, viruses, and parasites in wastewater, are risky for humans because they will always have the possibility of causing outbreaks across the populations. However, if these pathogens can be monitored at an early stage, the dangers can be minimized. Some viruses cannot be eradicated from the effluent of wastewater treatment plants, despite decontamination processes commonly used for drinking water and sewage treatment (8).

Therefore, it is necessary to develop new analytical tools that can collect samples from wastewater treatment

plants and monitor these low-level biomarkers/pathogens accurately and quickly. RT-qPCR technology plays an essential role in the quantitative analysis of biomarkers and pathogens in sewage. Detecting biomarkers of diseases in wastewater can provide support in providing real-time data for the assessment of public health. Also, these data have a clear potential for providing early warning systems (11).

Wastewater epidemiology (WBE) has been a strategy successfully used in many countries to monitor the chemical and biological markers of human activity, including illegal drug consumption, drug use/abuse, water pollution, and the formation of antimicrobial resistance genes (8,12,13). Moreover, it was proven to be an innovative and promising tool to monitor the oxidative stress biomarkers such as illegal drugs (12,14), alcohol (15), tobacco use, and F2-isoprostanes with WBE (16,17). This approach includes additional information about the lifestyle, health, and pollutant exposure of a community, which can be revealed by analyzing sewage biomarkers (11).

With the help of WBE, there is great hope for assessing the levels of specific disease biomarkers in wastewater and for monitoring infectious and non-contagious diseases (18). Studies conducted from past to the present show that with WBE, the presence of pathogens/infections such as HIV, tuberculosis, poliovirus, echovirus, hepatitis A, rotavirus, adenovirus, as well as coronaviruses are detected in wastewater (11,16,17,19). Recent research (20–22) and ongoing studies (23–26) acknowledge that studies for COVID-19 detection in sewers have already been started. Preliminary results from a limited number of samples of the studies applied in countries such as China, Australia, the Netherlands, France, and the USA demonstrate the technical possibility of detecting COVID-19 in wastewater. The importance of such analysis is emphasized by team leader Christoph Ort, the Swiss Federal Institute of Aquatic Science and Technology, with his saying, “The wastewater is not lying; it reflects what was thrown by the public within a few hours”. In addition, while the results of the analysis found the high rate of the virus residue in the last samples, they stated that they could not detect the virus in samples they collected in February (27).

In the study of Medema et al. In the Netherlands, SARS-CoV-2 was detected in wastewater, and the number of infected people was calculated. Also, They also acknowledged in this study that SARS-CoV-2 was observed in wastewater, yet at that time, no cases had been reported in the Netherlands. Thus, it contributed to the establishment of an early warning system (23). In a study conducted by Wu et al. In the USA, SARS-CoV-2 was detected in

wastewater and was found to be higher than the clinically determined figures (24). It can be said that these studies also contribute to the shaping of the country’s policies by determining asymptomatic people.

## Methods and Calculations Used in Monitoring SARS-Cov-2 in Wastewater

### Detection of SARS-Cov-2 viral genomes by qPCR Method

The most direct method for detecting SARS-CoV-2 is a nucleic acid-based polymerase chain reaction (PCR) analysis. With this method, it is possible to develop efficient and robust analytical tools to accurately and quickly monitor low-level SARS-CoV-2 sources through WBE and also possible to verify suspicious cases and screen asymptomatic infected cases without central laboratories (28).

The limit of detection for different viruses by qPCR is 6 to 10 viral genomes / 50-μL reaction mix based on the dilution series of the pUC57cl plasmid with a certain amount of all targeted regions cloned into the EcoRV region.

In the equation below, the total prevalence of SARS-CoV-2 infection from wastewater is calculated using the mass balance of the total number of viral RNA copies measured from wastewater by RT-qPCR daily and the number of SARS-CoV-2 RNA copies spilled from the stool by an infected person (Equivalent. (1)) (26).

$$\text{Persons infected} = \frac{\left(\frac{\text{RNA copies}}{\text{liter Wastewater}}\right) * \left(\frac{\text{liters Wastewater}}{\text{day}}\right)}{\left(\frac{\text{g feces}}{\text{person - day}}\right) * \left(\frac{\text{RNA copies}}{\text{g feces}}\right)}$$

### Calculation of the number of patients infected with SARS-Cov-2 with data from wastewater

CT values in qPCR obtained for wastewater samples are used to calculate the number of viral genomes (Ci) by performing a linear regression of CT values obtained from pUC57cl serial dilutions based on the dilutions of the plasmid.

It is assumed that an infected individual secretes  $10^7$  to  $10^{11}$  norovirus, HAV, enterovirus, and adenovirus particles per day. To our knowledge, the number of virus particles excreted daily is not known to other viruses investigated. Therefore, it is assumed that an infected person secretes similar amounts of all viruses investigated. In this study, the calculation of the number of infected people is based on the maximum amount of virus ( $10^{11}$

virus particles/day) excreted from the body by a newly infected person, thus estimating the minimum number of infected people whose viruses are mixed into wastewater. The daily number of virus particles expected to be present in wastewater from the excretion ( $C_{exp}$ ) of an infected person is calculated according to the following equation:

$$C_{exp} = 10^{11} / \{[\Sigma(\text{relevant daily flow})] / 7\}$$

$$C_{exp} = 10^{11} / \text{average daily flow}$$

Number of potentially infected individuals ( $N_{infected}$ ) depending on the presence of the virus in the wastewater;

$$N_{infected} = C_i / C_{exp}$$

$N_{infected}$ : number of infected individuals

CT: Values obtained for wastewater samples in qPCR

$C_i$ : Linear regression of CT values

$C_{exp}$ : number of daily virus particles expected in wastewater

### Determination of SARS-CoV-2 from Wastewater and Its Importance for Public Health

It was reported in clinical studies that some of the SARS-CoV-2 carriers show asymptomatic while some others have no fever and show only mild infection symptoms. In a study conducted in Iceland, it was stated that 50% of patients who were COVID-19 positive had no symptoms at all (29). Since it is not possible to scan asymptomatic patients quickly and effectively, these people are mostly not reflected in the total count of patients. Therefore, rapid and accurate screening of potential virus carriers and the diagnosis of asymptomatic patients are essential for establishing early intervention and prevention strategies.

Healthcare professionals continue a rather challenging process to scan COVID-19 cases practically and effectively. The availability of COVID-19 test technologies and kits are limited. However, as an alternative method, WBE has the potential to provide information about the potential spread of infection by testing infectious agents in wastewater.

By using WBE, early detection of COVID-19 in wastewater will highly likely prevent population spread by restricting population mobility.

### Conclusion

With the data obtained from wastewater epidemiology, existing clinical cases will aid the public in understanding the messages of education and prevention better and will also provide an additional database including asymptomatic people as well. It will also offer further information about the spread of the virus at the regional and local scale based on the correlation between the number of infected people calculated with the help of the RT-qPCR technique applied to water collected from wastewater treatment plants and the number of people carrying the virus detected clinically via COVID-19 the detection test. Regarding the spread of the virus, a road map for Turkey will be prepared both seasonally and spatially; therefore, it will be possible to take measures before the second or third wave appear. SARS-CoV-2 monitoring in the effluent of wastewater treatment plants will also contribute to the procedures required for the elimination of the virus in the waters directed from the treatment facilities to surface waters.

Monitoring this new virus in wastewater is vital in taking protective measures for wastewater treatment plant personnel and determining whether it poses any risk for agricultural areas or surface waters irrigated with wastewater. This study should be used as an alternative study that can complement existing clinical information limited to COVID-19 patients with the most severe symptoms.

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# The Bulletin of Legal Medicine

## Adli Tıp Bülteni

Review

### Isolation, Quarantine, Social Distancing and Mental Health

#### İzolasyon, Karantina, Sosyal Mesafe ve Ruh Sağlığı

Neşe Direk Tecirli\*, Gizem Ucuş, Fatih Özel

**Abstract:** Objective: The COVID-19 pandemic directly affected more than 4 million people worldwide and indirectly affects the entire world due to its social consequences. There are methods such as isolation, quarantine, restriction of social distance, which are accepted all over the world to prevent the spread of infectious diseases considered pandemic. These practices, which are rapidly implemented in the modern age may be resulted in the mental health problems that affects individuals and societies for a long time. In this article, it is aimed to review the effects of these pandemic control practices such as isolation, quarantine and social distance on people's mental health.

These practices lead to different emotional responses such as anxiety and depressive symptoms in people. Depending on the type of coping strategies used to deal with stress and the severity of stress, these practices may cause several mental disorders including anxiety disorders, depressive disorders and stress-related disorders in vulnerable individuals. Delirium is seen frequently in COVID-19 as it has worse prognosis in older adults. People who lost their loved ones may face complicated griefs as the deaths occurs in isolated conditions. In addition, stigmatization, which has serious outcomes, is a dangerous situation that may occur against affected individuals in isolation or quarantine during this period.

It is important to keep these practices as short as possible, to support the society socially and economically, to facilitate access to the health system and to expand the mental health services in order to overcome this process with minimal damage.

**Keywords:** COVID-19, mental health, anxiety, depression, isolation, quarantine

**Öz:** Amaç: COVID-19 pandemisi dünyada 4 milyon üzerinde insanı doğrudan, hemen hemen tüm dünyayı ise toplumsal sonuçları nedeniyle dolaylı yollardan etkileyen bir süreç olarak hayatlarımıza girdi. Pandemi olarak kabul edilen bulaşıcı hastalıkların yayılmasını engellemek için tüm dünyada kabul gören izolasyon, karantina, sosyal mesafenin kısıtlanması gibi yöntemler bulunmaktadır. Modern çağda hızla uygulamaya geçirilen bu yöntemler enfeksiyonların yayılmasını ciddi biçimde engellese de, yarattığı ruhsal sorunlar bireylerin ve tüm toplumun yaşamını uzun süre olumsuz biçimde etkilemektedir. Bu yazıda izolasyon, karantina ve sosyal mesafe gibi uygulamaların insanların ruh sağlığı üzerindeki etkilerinin incelenmesi hedeflenmiştir.

Bu uygulamalar insanlarda başta kaygı ve depresif belirtiler olmak üzere, farklı emosyonel yanıtlara yol açmaktadır. Stresle baş etme biçimi ve stresin şiddetine bağlı olarak, yatkınlığı olan bireylerde bu uygulamalar başta anksiyete bozuklukları, depresif bozukluklar ve stresle ilişkili bozukluklar olmak üzere pek çok ruhsal bozukluğa neden olabilmektedir. COVID-19 enfeksiyonu yaşlı bireylerde daha kötü seyrettiğinden, bu bireylerde sıkça deliryum tablosu görülebilmektedir. Bu süreçte yaşanan ölümler izole ortamlarda olduğundan komplike yas gelişme riski yüksektir. Ek olarak, bireylere ciddi zararı olan stigmatizasyon bu dönemde izolasyon ya da karantinada olan bireyler için gelişebilecek tehlikeli bir durumdur.

Bu sürecin en az zararlı atlatılabilmesi için bu uygulamaların süresinin olabildiğince kısa tutulması, sosyal ve ekonomik açıdan toplumun desteklenmesi, sağlık sistemine ulaşımın kolaylaştırılması ve ruh sağlığı hizmetlerinin yaygınlaştırılması önemlidir.

**Anahtar Kelimeler:** COVID-19, ruh sağlığı, anksiyete, depresyon, izolasyon, karantina

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## Isolation, Quarantine and Social Distancing

Pandemic is defined by the World Health Organization as large-scale epidemics that spread across millions of people from different countries. Pandemics have also guided history several times throughout the history of humanity for economic, social, psychological and economic reasons (1).

Since the date of infection, it has developed different practices that separate the individual with human disease from others in order to control infectious diseases. Isolation is a form of precaution that involves physical restraint methods, which is often required by law, to ensure that an individual with infectious disease is fully separated from individuals considered healthy. There is no need to shuffle the pages of history for this application. In our country, many hospitals still have separate services where tuberculosis patients are kept isolated. As we live these days, there are services that can be quickly converted into isolation services in an acute situation. Depending on the spread of the disease, the way of applying the isolation can change. In the period of COVID-19 pandemic we live today, isolation is applied in a way that requires the use of full personal protective equipment.

Another measure used to prevent spread in infectious situations is quarantine application. It is separation from healthy and contactless individuals. Quarantine application is a form of application. It is an application implemented in the cholera epidemic that occurred in the 19th century and in many epidemics that occurred after it. There are also centers established for this purpose in our country. In fact, there is a district called Quarantine in Izmir and Quarantine Island. Quarantine can be done at the place where the person is noticed (for example, on board, if he has arrived on board), or in his own home. On the other hand, that neighborhood, district and even the city can be quarantined in localized places where multiple cases are detected.

Another form of protection measures is social distance application. In today's sense, social distance is the measures that increase the physical distance between individuals in a way that prevents transmission. It includes measures such as canceling events such as big concerts, sports events, closing schools, closing shopping malls, making arrangements to increase interpersonal distance in markets, public transportation, public institutions and organizations (2-4).

## Mental Health Problems Following Isolation, Quarantine and Social Distancing

In pandemic, there is no single explanatory model that can be used to understand the mental problems that develop as a result of isolation, quarantine and social distance practices. These conditions are prolonged, fear of being infected, frustration and boredom, lack of resources (such as food, water, medicine, clothing), insufficient information, economic problems, stigma are the main causes of stress in this period (5,6). All these and other reactions to stressors deserve an explanation that requires multiple perspectives, consisting of a combination of biology, social and individual psychology, and socioeconomic conditions. The biological effects of infection on the individual and the severity and course of the disease create different reactions. Similarly, if the infection is caused by a factor that does not have much data about COVID-19, it increases social and individual anxiety as it contains too much uncertainty in terms of both social and individual psychology. Psychological causes in different axes such as personality structure, coping mechanisms and accompanying psychiatric diseases will affect the response to isolation conditions. The cultural infrastructure of the society, the way of social structuring, and religious beliefs can be determinative in the response of individuals to the isolation, quarantine or social distance practices applied during the pandemic process. Many economic components will be important in the spiritual response of the individual, such as how all these practices affect the economy of the society and the individual, whether individuals are supported by the state in this process, whether they need this support, whether they have lost profession due to this situation. Although the history of the pandemic is as old as the history of humanity, the effect of modern methods used to spread the pandemic on human psychology has not been explored enough to make detailed comments on all these factors.

In the next part of the article, the mental reactions and diseases caused by the methods implemented to prevent the spread of pandemics will be discussed.

## Depression, Anxiety and Grief

Isolation, as opposed to disasters experienced in the past and bringing the society together physically and socially, makes it necessary to fight the crisis alone (7). It involves a complete separation of infected individuals with those who are not infected. People contacted are often health workers in full personal protective equipment and the time spent communicating with them is very limited.

Medical data that can be obtained from healthcare professionals are also very limited, especially in pandemics such as COVID-19, which is newly developed and that the data is not sufficient in terms of medical aspects. It is more difficult for some individuals to cope with this uncertainty than others, and as a result, different anxiety disorders may occur. In addition, the fear of being infected and infected due to the high risk of transmission of the virus, as a result, excessive cleansing, and behaviors such as repetitive testing of the virus, even if the risk of transmission is minimal, may arise. If social activities, which occur less due to social distances, do not take place electronically, or if social support systems are generally weak, people cannot express their feelings and may become more isolated and experience more anxiety. In addition, individuals may feel lonely because they are away from their support systems due to sudden starting isolation, quarantine and social distance applications. Although there is abundant time to finalize piled up tasks, individuals might experience difficulties at focusing on their job or the activities that they perform in order to relax since this is frequently observed. This might induce both anxiety and depressive symptoms. The feeling that the control that they have over their own life is taken from their hand might lead to emotions such as anger, unhappiness and anxiety with variable intensities. The lack of any positive finding concerning medical treatment despite of prolonged time, isolation, and extended time under quarantine and social distance rules, increasing number of cases might create hopelessness feeling. Such epidemics experienced by whole society and status of being isolated at homes or hospitals might induce desperation feeling on individuals. Especially the ones under isolation might experience the process as a traumatic event by feeling that they are facing death in along with an intense desperation. When the stress that individual experience exceeds the capacity of her/him, symptoms pertaining to psychiatric disease can be observed. During this period, many symptoms such as sleep disturbances, constant anxiety about the effects of the virus, feeling the psychological and physical symptoms of anxiety (such as palpitations, shortness of breath, sweating, flushing or chills), frustration and anger bursts due to uncertainty in the situation, fear of die or desire to die, pessimism, despair, unwillingness, changes in appetite can occur.

The studies conducted on this field are the ones performed during SARS, MERS and Ebola epidemics. Psychological effects of quarantine experience were studied among 1912 people during SARS epidemic occurred in Canada at 2003. In this study, the most frequent mental reactions that individuals reported were emotions such as

boredom, isolation, frustration, discomfort, anxiety, loneliness and fear. In this study where the Post Traumatic Stress Disorder (PTSD) symptom was also screened in individuals using the Impact of Events Scale (IES), the number of individuals scoring 20 and above with this threshold was 148 (8). In another study of 129 people in Canada, individuals who scored 20 points or more, which were the threshold points for PTSD, were examined using IES. Accordingly, it has been shown that 28.9% of individuals have PTSD and the risk of developing PTSD symptoms is higher as the quarantine period increases. In the same study, depressive symptoms were also evaluated and 31% of cases were diagnosed with depression (9). In a study conducted in China regarding COVID-19, it was observed that the participants' negative emotions increased, positive emotions and quality of life reports decreased after the pandemic (10).

It is pointed out that some groups are particularly at risk both in data from previous pandemics and in studies investigating the overall effects of social isolation. Isolation processes for children and adolescents, elderly individuals, minorities, people with low socioeconomic status, people with psychiatric illness, past traumatic event such as retention pose a risk for the development or increase of mental problems (11-13). Apart from all these groups, the COVID-19 pandemic, taking place after some stressful events that refugees experienced such as bureaucracy, poverty, racism and adaptation to the host country after their migration process, is a very challenging process. Obtaining information about the subject in a language other than the mother tongue, daily lifestyle difference, living in refugee camps where social distance will be difficult to implement and access to health services are among the main factors. These factors increase the risk of psychiatric disorders that may occur in refugees (14). In addition, psychic reactions may occur frequently in prisons where collective living is inevitable and support systems are not strong. However, it should be kept in mind that being in isolation due to a virus that spreads rapidly and has fatal consequences, whether in the risky group mentioned or not, involves a serious threat perception.

It is known that mortality is higher in older adults compared to younger people. Some of these people are hospitalized and isolated. They lose their life away from their families, relatives and friends. These people are at risk of developing complicated grief (15,16).

## **Delirium**

Delirium is a fluctuating neurocognitive disorder with acute onset which is characterized by a decline in consciousness, cognitive functions and orientation. It is

mostly related with underlying medical condition and it has high mortality rates (17). Hyperactive delirium is related with mood changes, disturbed treatment compliance and psychomotor agitation whereas hypoactive delirium is related with stupor and lethargy. Hypoactive delirium is often disregarded by the treatment team. However, hyperactive type delirium can be easily noticed by the medical team as the patient has significant agitation and this makes treatment difficult. The presence of hyperactive delirium, especially in pandemic conditions, can cause serious medical and medico-legal problems, causing failure to comply with isolation conditions and disruption of treatment compliance. Conditions that cause delirium are generally the underlying medical diseases and / or environmental conditions. Therefore, the actual treatment of delirium is provided by treating the underlying cause.

The risk of developing delirium is higher in older adults when compared to younger adults. As mentioned above, in addition to many medical conditions, environmental conditions such as isolation is a risk factor for delirium. In an unfamiliar and unstimulated environment, older adults may lose the ability to evaluate the truth and orientation may be lost especially if they already have cognitive problems. In addition, the reasons such as the separation of the older adults from their daily routine in isolation, staying away from social ties, not being able to fulfill their religious or spiritual rituals, not expressing their own feelings and thoughts, and prolonged immobility may increase the risk of delirium during isolation (18). Excitation may be observed when the intense anxiety under these conditions cannot be appropriately relieved. These people may refuse treatment and attack healthcare workers. Since such situations can lead to very dangerous consequences in pandemic conditions, older adults should be monitored in terms of delirium occurrence during isolation. They should be provided with audio and / or video calls with their relatives, and they should have a clock in their rooms and these rooms should not be too bright. It is very important for the treatment team to introduce themselves, tell the date and time, ask how they are and inform their medical condition in a way that the person can understand (17-21). If medical conditions are handled and conditions can be met, it may be a more appropriate approach for these individuals to maintain their treatment in isolation under conditions they are accustomed to (such as home, nursing home). In addition, considering the developments in communication tools in today's conditions, teaching elderly people to use different communication channels may prevent them from being socially isolated in both isolation and quarantine conditions.

## Problems Caused by Personality Traits

The reactions of individuals with different personality traits to isolation, quarantine and social distance practices may be different. Personality traits are dimensional traits that consist of the personality and determine the reactions of the person. Neuroticism is a personality trait that is characterized by rapidly responding to stressful situations in the form of anxiety, irritability and depression. If this personality trait prevails, the individual responds to isolation, quarantine and social distance practices with symptoms such as intense sickness anxiety, anxiety about their loved ones, misinterpreting their physical symptoms, and taking extreme precautions. However, the responses are not limited to these symptoms (22-24). On the contrary, other individuals may believe that the events will affect others rather than themselves, and that they are less at risk for various reasons that is called unrealistic optimization bias. Although the prevalence and structural validity of this feature in the society is not clear, it can be observed that individuals who are thought to have this feature tend not to comply with isolation, quarantine and physical distance practices. They can insist on maintaining their own routines and they may have less compliance to treatment in isolation. The level of anxiety in these individuals will be lower during the measures of isolation compared to other individuals. In addition, these individuals are at risk of transmitting infection due to their behavior (2). Although not specific to these individuals, the rate of full compliance with quarantine conditions was found to be approximately 16% (8).

## Difficulties in Individuals with Pre-existing Psychiatric Conditions

Social distancing, quarantine and isolation may have different effects on people with psychiatric disorders during this time. Those circumstances could increase stress levels, therefore, individuals who have major depressive disorder, bipolar disorder, schizophrenia may experience an exacerbation of the disorder, increased risk of suicidality, difficulties in reaching out for a medical doctor or examination, disrupted drug compliance and symptoms including disturbances on circadian rhythm and reduced personal care.

During isolation, people with alcohol and substance misuse may have withdrawal symptoms which could be life-threatening. Thus, habits of alcohol and substance use should be examined amid pandemic; if necessary, detoxification must be performed (25).

Contamination obsessions and cleaning compulsions are widely seen in obsessive-compulsive disorder. Throughout pandemic, the severity of symptoms could

increase in obsessive-compulsive disorder. Increased symptoms could be presented as spending more time on cleaning, doing more rituals on cleaning (particularly on handwashing), stockpiling masks and disinfectants; since these behaviors could be regarded as normal by other people, symptoms could worsen more (26).

## Stigmatization

Stigmatization is another condition that could cause problems among people who get recovered from the infection. Stigmatization is an act that may cause being shunned by society because of a feature, facing discrimination due to stereotyped thoughts, social isolation and losing social status as a result of those. Stigmatization is frequently seen in psychiatric disorders and infectious diseases with chronic and lethal consequences. Individuals who are infected with HIV have been shunned and this still continues with the reduced rate (27). Although there are fewer people who have been affected compared to COVID-19; since its high infectivity and mortality, stigmatization from the micro and macro environment has been causing psychosocial distress on people infected with the Ebola virus (28,29).

Treated individuals at hospitals under isolated conditions could also be stigmatized by their family and left lonely. Despite of existing proper conditions for isolations, they could be rejected from their own home. Families could tend to hide the state of a recovered person, since they could think that they would be left alone or ashamed in case of any disclosure of an infected person. Even though healthcare workers are seen as heroes by media or authorities, they could experience stigmatization as well. Healthcare workers who work at intensive care units, inpatient or outpatient units for pandemic and contact with patients could be faced discriminative attitudes in their neighborhoods or buildings that they live in. They could be forced not to use common spaces or to move out. Some of these people could live without their family and be isolated for different periods, particularly when they see themselves as exposed to high viral load. Because of the aforementioned reasons, they may have to deal with mild to severe mental problems (25).

## Treatment Approaches

Psychological first aid and teaching people how to cope with mental stress are highly important as conducting quarantine and isolation during and after the pandemic (30). Psychological support could help to diminish excessive anxiety in the early phases of pandemic, it has also beneficial effects on traumatic experiences including witnessing death and losing the loved ones in

the later phases. Psychological first aid contains checking and leading for basic needs in a respectful, understanding, patient and supportive manner. These provide self-esteem protection and the sense of holding the control of decisions and life. There are additional interventions including the normalization of symptoms of stress and bereavement, awareness of own mental status and physical symptoms, teaching relaxation and breathing techniques in psychological first aid. People who practice those interventions and still have existing psychiatric symptoms and functional impairment must get psychiatric help (31-33).

As researches with SARS reveal, stress-related disorders could arise during the time of infectious diseases. In the case of stress-related disorders, cognitive-behavioral therapy or similar approaches could be used to reduce symptoms via online systems throughout pandemic (13,34).

## Conclusion and Recommendations

One of the most important interventions to prevent unfavorable effects of quarantine, isolation and social distancing on mental health is providing accessible information for everyone. Information should be provided to the whole society and all individuals who are in quarantine or isolation in their homes or at hospitals by healthcare organizations. Wide evaluations of these practices and rapid supply are necessary for the mental health of individuals. Society's, risky individuals' and healthcare workers' access to personal protective equipment must be organized in a fast and sustainable way. Accessible, free, preferably online supportive systems for mental health should be employed and arrangements should be done for supervision and sustainability of these systems. Facilities with less infection risk should be ready for people who have pre-existing or newly diagnosed psychiatric disorders. There should be procedures for people who have been using drugs and the need for long term pharmacotherapies due to their psychiatric disorders. Providing information, psychiatric evaluation and rapid implementation of psychiatric support systems are important for the prevention, detection and treatment of mental problems which could be caused by restrictions during pandemic.

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## Evaluation of Child Abuse Cases Affected by COVID-19 Pandemic

### COVID-19 Pandemisinde Etkilenen Çocuk İstismar Olgularının Değerlendirmesi

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**Abstract:** **Objective:** As a result of the measures and restrictions taken in our country during the COVID-19 Pandemic period, it was aimed to analyze the quantitative decrease in the number of cases applied to Antalya Child Monitoring Center and to develop recommendations against its effects. **Methods:** A total of 309 cases applied to Antalya Center for sexual abuse in 2019 March-April and 2020 March-April were included in the cross-sectional study. Both groups were examined in terms of socio-demographic parameters and evaluations made at the center. **Results:** 211 cases were evaluated in March-April 2019 and 98 cases were evaluated in March-April 2020 in Antalya Center. The age range of all cases varied between 1-18, and the average age was  $12.95 \pm 3.24$ . 257 (83.2%) of the cases were girls. Definitive sexual abuse findings were detected in 225 cases. Considering the reporters and their rates, it was found that the most frequent reporters in the control group were teachers, then parents, while the most frequent reporters in the study group were parents, then teachers. While the ratio of the offender to be lover-friend in the control group was 40.8%, this ratio decreased to 24.5% in the study group. **Conclusion:** While the risk factors of child sexual abuse increased during the pandemic period, the rate of reporting decreased during the same period. In this study, the role of teachers in reporting abuse was revealed. In terms of multidisciplinary approach among legal and medical professionals, there was no significant difference in this period.

**Keywords:** Child abuse, Child Monitoring Center, pandemic, COVID-19, informing.

**Öz:** **Amaç:** COVID-19 Pandemi döneminde ülkemizde alınan önlemler ve kısıtlamaların bir sonucu olarak Antalya Çocuk İzlem Merkezine müracaat ettirilen olgu sayılarındaki nicel azalmanın analizi ve etkilerine karşı öneriler geliştirilmesi amaçlanmıştır. **Gereç ve Yöntem:** Kesitsel çalışmaya 2019 Mart-Nisan ve 2020 Mart-Nisan aylarında cinsel istismar nedeni ile Antalya Çocuk İzlem Merkezine müracaat ettirilen toplam 309 olgu alınmıştır. Her iki grup sosyo-demografik parametreler ve merkezde yapılan değerlendirmeler açısından incelenmiş, istatistiksel analizler yapılmıştır. **Bulgular:** Antalya Çocuk İzlem Merkezinde 2019 yılı Mart-Nisan aylarında 211 (%68.3); 2020 yılı Mart-Nisan aylarında 98 (%31.7) olgu değerlendirilmiştir. Tüm olguların yaş aralığı 1-18 arasında değişmekte olup yaş ortalaması  $12.95 \pm 3.24$ 'tür. Olguların 257'si (%83.2) kadındır. 225 (%72.8) olguda kesin cinsel istismar bulguları saptanmıştır. Bildiren kişilere ve oranlarına bakıldığında kontrol grubunda en sık öğretmenler (%39.3) ardından ebeveynler (%37.4) iken; çalışma grubunda en sık ebeveynler (%35.1) ardından öğretmenler (%30.9) olduğu saptanmıştır. Kontrol grubunda failin sevgili-arkadaş olma oranı %40.8 iken, çalışma grubunda (pandemi döneminde) bu oran %24.5'e düşmüştür. **Sonuç:** Pandemi döneminde çocuk cinsel istismarı risk faktörleri artarken aynı dönemde ihbar edilme oranlarının düştüğü saptanmıştır. Çalışmamızda öğretmenlerin istismarın ihbar edilmesindeki rolü ortaya konmuştur. Hukuk ve tıp profesyonellerinde multidisipliner yaklaşım açısından bu dönemde anlamlı bir fark saptanmamıştır.

**Anahtar Kelimeler:** Çocuk istismarı, Çocuk İzlem Merkezi, pandemi, COVID-19, bildirim

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## Introduction

Child abuse and neglect is an important worldwide problem with physical, mental and social consequences in the short and long term (1). However, reporting rates are low in the world and in our country. Therefore, efforts should be made to identify and prevent risk factors and protective factors before child abuse and neglect occurs. The efforts of child health professionals, the state and general policies of the state in the country in question are considered important in solving this problem (1). In extraordinary situations such as war, political conflict and pandemic, the importance of the mentioned factors becomes more prominent.

In case of suspicion of abuse and neglect towards children, the notification of health professionals, teachers and everyone who knows is both mandatory in our country and also a necessity at the social level that we have reached. In cases of child sexual abuse, law enforcement takes the child to the nearest Child Monitoring Center (CMC) or University Child Protection Practice and Research Centers (CPC) upon the order of the child prosecutor. In these centers, a forensic medical interview and examination of the child is carried out. Emergency medical and legal measures are taken for the sexual abuse incident that the child is exposed to. At the same time, professional guidance is given to both the child and his family (2-4).

The new type of coronavirus (SARS-CoV-2), which emerged in Wuhan, China in December 2019 and rapidly caused pandemic disease (COVID-19) worldwide, has affected all areas, especially health, all over the world and in our country. Of course, as in all countries of the world, sanitation studies and the fight against viruses have been the main agenda items in our country. In addition to the precautions taken in the health system, starting from March 16, 2020, education was interrupted for a week in all schools and then distance education was initiated. Judicial proceedings have been postponed except for emergency ones. In addition, with the Circular issued by the Ministry of Internal Affairs on March 21, 2020, a curfew was introduced to children under the age of 20 ( $n = 23.5$  million) and people over the age of 65 ( $n = 7.6$  million) until April 31st. In addition, with the Circular, there were restrictions on social and working environments, and many sports and social facilities were closed. In this period, there were temporary layoffs as well as layoffs. Judicial proceedings have been postponed except for emergency ones. Although many non-governmental organizations and institutions carry out support programs for people who remain at home and unemployed, this situation will have acute and chronic effects in our country

as well as the whole world caught unprepared for the epidemic (5-8). These effects will mostly affect the fragile parts of the society, especially children. It is stated that the fight against epidemic requires a public responsibility, not just individual, and that the quarantine-isolation practice should be regulated according to basic public health principles and by considering basic human rights and children's rights (8).

In this period, there was a significant decrease in the number of children and adolescents reported to Antalya CMC due to sexual abuse. Is this decrease caused by the iceberg sinking to the bottom for the reasons listed above during this period? We think that especially children staying at home and being away from school will have short and long term effects. These are all kinds of exposure to domestic violence, cyber violence and various rights losses. For example, previous emergency experiences show that the longer the child takes a break from education, the lower the rate of back to school. UNICEF has described this as an unprecedented emergency and has begun working on alternative methods to ensure continuity of access to education. In this context, studies on preparing alternative learning programs to access education have been funded in approximately 145 countries (5,9).

Since this situation (limited period) reduces the level of social and physical contact, we believe that the reporting rates of violence and loss of rights will decrease relatively. In this study, arguments that will reveal the importance of determining the situation qualitatively and quantitatively in the pandemic period, as well as keeping the risk and protective factors in balance by the social environment in which the child lives, will be developed in order to prevent child abuse.

## Materials and Methods

A total of 309 cases evaluated in Antalya CMC due to sexual abuse in March-April 2019 and March - April 2020 were included in the study. It is a cross-sectional study. The cases that were applied to Antalya CMC in March-April in 2020 constituted the study group, and the cases that were applied to the center in March-April 2019 were added into the control group. The data were collected by examining the forensic interview reports, family interview forms, forensic and psychiatric examination reports in the central archive. Both groups were examined in terms of socio-demographic data and forensic medical evaluations, and the data were recorded in the SPSS database. Data outputs analyzed statistically were used in the writing phase of the study.

The data headings evaluated are as follows: year, month, the person reporting, social environment,

disability in the victim, multiple perpetrators, age-gender of the exposed person, perpetrator identity-age, sexual abuse type, pregnancy status, procedures in the center, cooperation with stakeholder institutions, sexual commerce, accommodation in the center.

Statistical analysis was performed using SPSS 22.0 package program using chi-square test and Fisher's Exact test. P values below 0.05 were considered statistically significant.

## Results

211 cases (68.3%) were evaluated in March-April 2019 and 98 (31.7%) cases were evaluated in March-April 2020 in Antalya CMC. The age range of all cases varied between 1-18, and the average age was 12.95 ± 3.24. 257 (83.2%) of the children and adolescents were girls and 52 (16.8%) were boys. There were no disabled children and adolescents. After the forensic interview and examination at the center, definite sexual abuse findings were detected in 225 (72.8%) cases, suspicious findings were found in 38 (12.3%) cases and in 46 (14.9%) cases definite sexual abuse findings were not detected. 12 (3.9%) cases were reflected in the statistics as an additional statement or a second application. Sexual trade was not detected in any cases. Temporary accommodation and physical requirements of all cases applied to the center were provided, and the first directions after abuse were made by the center.

It was found that the children in the study group were asked short questions about the way of life recently by the forensic interviewer before the forensic interview. It was understood that children who were interviewed were living at home (88.8%) or in a dormitory (11.2%) during the pandemic period and living a limited life (away from schoolmates, watching the school program via television or internet from home, where the pandemic was spoken at home, and sports and social activities were limited).

Considering the individuals reporting child sexual abuse in the study group; the parents in 34 (34.7%) incidents, the teachers in 32 (32.7%) incidents, the children themselves in 10 (10.2%) incidents, the police in 10 (10.2%) incidents (police detection), the health personnel in 8 (8.2%) incidents, relatives-neighbors in 4 (4.1%) incidents were determined as the reporters. In the control group, the rates were found as: teachers in 83 (39.3%) incidents, parents in 79 (37.4%) incidents, children in 18 (8.5%) incidents, law enforcement in 12 (5.7%) incidents (police detection), relatives-neighbors in 10 (4.7%) incidents, health personnels in 9 (4.3%) incidents ( $p = 0.419$ ) (Table 1).

**Table 1. The distribution of individuals reporting child sexual abuse in control and working groups.**

Individuals reporting	Groups (Year)			
	Control group (2019)		Study group (2020)	
	n	%	n	%
Teacher	83	39.3	32	32.7
Parent	79	37.4	34	34.7
Child	18	8.5	10	10.2
Law enforcement	12	5.7	10	10.2
Relatives - neighbors	10	4.7	4	4.1
Health personnel	9	4.3	8	8.2
Total	211	100	98	100

After the forensic medical evaluation in the center, the study group and the control group were compared in terms of the rates of detection of definitive sexual abuse findings in children, and a statistically significant difference was found between them ( $p = 0.015$ ). In the study group, definitive sexual abuse findings were found in 64 (65.3%) cases, definite sexual abuse findings were not detected in 23 (23.5%) cases, and suspicious findings were found in 11 (11.2%) cases. In the control group, 161 (76.3%) cases had definitive sexual abuse findings, suspicious findings were found in 27 (12.8%) cases, and 23 (10.9%) cases had no definite sexual abuse findings.

One perpetrator was detected in 282 (91.3%) incidents, and more than one perpetrator was detected in 27 (8.7%) incidents. The study group and the control group were compared in terms of the number of perpetrators or suspects in the same event, and there was no statistically significant difference between them ( $p = 0.336$ ).

When the identity of the perpetrator was analyzed in all cases included in the study; in both groups, it was determined that friend-lover was in the first frequency and familiar people were in the second frequency. The study group and the control group were compared in terms of the identity of the perpetrator, and there was no statistically significant difference between them ( $p = 0.128$ ). However, when an analysis was performed by comparing the group one with which the perpetrator was friend or flirt (Group 1) and the group with other perpetrators (group 2), a statistically significant difference was found between the study group and the control group ( $p = 0.007$ ). While the ratio of the offender to be friend or flirt in the control group was 40.3%, this ratio decreased to 24.5% in the study group (during the pandemic period) (Table 2). In all cases, the age of perpetrators ranged between 18-73, and 1/3 of them were found to be in the 18-20 age group.

**Table 2. The distribution of the control group and the study group in terms of the identity of the perpetrator (friend or flirt and others\*).**

GROUP	Identity of the perpetrator				TOTAL	
	1st group (friend or flirt)		2nd group (others*)		n	%
	n	%	n	%		
Control group	85	40.3	126	59.7	211	100
Study group	24	24.5	74	75.5	98	100
Total	109	35.3	200	64.7	309	100

(\*): Familiar, foreign, own father, own brother, stepfather, half-brother, formal-informal spouse (forced child marriage), 2nd degree relatives, those serving the child, mother, stepmother

The study group and the control group were compared in terms of the age of the perpetrator, and there was no statistically significant difference between them ( $p = 0.098$ ). In 145 (68.7%) cases sexual abuse without penetration, in 43 (20.4%) cases sexual abuse with penetration, in 19 (9%) cases abuse in the form of other non-touch sexual abuse, in 4 (1.9%) cases sexual abuse between underage peers has been identified in the control group. In the study group, 61 (62.2%) cases had sexual abuse in the form of non-penetration touch, 27 (27.6%) cases of sexual abuse with penetration were detected, 7 (7.1%) cases of other non-touch sexual abuse were detected, in 2 (2%) cases sexual abuse was detected as early marriage, in 1 (1%) case, sexual abuse was found in the form of a relationship between underage peers ( $p = 0.145$ ).

Pregnancy was not detected in 288 (93.2%) cases, pregnancy was still continuing in 12 (3.9%) cases, suspicious pregnancy was detected in 5 (1.6%) cases, and 4 (1.3%) cases were found to have given birth due to abuse. The control group and the study group were compared in terms of pregnancy, and there was no statistically significant difference between them ( $p = 0.278$ ).

All cases underwent forensic medical examination by the responsible physicians (Forensic Medicine Specialist) at the center. The rate of genital examination in all cases is 20.4% (n: 63). In the study group, 79 (80.6%) cases did not have genital examination, and 19 (19.4%) cases were performed. In the control group, 167 (79.1%) cases did not have genital examination, and 44 (20.9%) cases were performed. No statistically significant difference was found between the two groups in terms of the number of cases undergoing genital examination ( $p = 0.446$ ).

In addition to 235 (76.1%) cases, pediatric psychiatry consultation was requested, and 5 (1.6%) cases were requested for gynecology clinic consultation in terms of possible gestational week and sexually transmitted

disease. In 69 (22.3%) cases, no consultation was requested. The study group and the control group were compared in terms of the number of consultations and forensic examinations requested, and no statistically significant difference was detected ( $p = 0.319$ ).

Apart from the routine forensic examinations and evaluations conducted in CMC no additional procedures were made in 55 (56.1%) incidents in the study group, only the prosecution claim file was prepared. In addition, in 28 (28.6%) incidents, a detailed social examination was requested, 10 (10.2%) cases were under institutional care and a decision was made for continuing, and 5 (5.1%) cases were taken into institutional care for the first time. In 140 (66.4%) incidents in the control group, no procedures were performed other than routine forensic examinations and evaluations in CMC, in 55 (26.1%) incidents detailed social examination was requested, 14 (6.6%) cases were taken into institutional care for the first time and a decision was taken for the continuation of institutional care for 2 (1%) cases. It was determined that. The study group and the control group were compared in terms of transactions with stakeholder institutions, and a strong statistically significant difference was found between them ( $p = 0.001$ ). This difference was found to be due to the increase in the application of children in institutional care during the pandemic period compared to the control group.

## Discussion

In this study, although the risk factors of child sexual abuse increased in our country during the pandemic period, it was also determined that the rate of reporting decreased and protective factors were largely disabled. In the literature, in the etiology of child abuse and neglect, there are biopsychosocial interacting factors that can be expressed at four levels: individual factors, parental characteristics, familial factors, social and communal factors (1,10-15.).

We can state that the effects of familial, social and communal factors increased from these factors during the pandemic period. Past epidemics and economic crises have shown that informal workers and people without social security protection are more affected by these crises (16). Social protection networks weakened by the crisis pushed states to take more intrusive steps, and these steps limiting the state's intervention in social and economic life after the COVID-19 outbreak are expected to decline (5).

In our study, it was found that all children who were evaluated in the center during the pandemic period stayed at home and dormitory due to social and physical

limitations and lacked many supports and social environments that they had access to before. These can be listed as limited day care or constant home parents, absence or limited relationship with friends as they do not go to school, lack of access to social facilities, less physical activity, decreased neighborly relationships, stressful and same event (pandemic) focused society and media, sudden drop in family income level.

In this study, very few of the individual factors of child sexual abuse were examined. Data on a limited number of parameters such as age, gender, and disability of children and adolescents exposed to sexual abuse were obtained from the files. It was determined that the exposed individuals were concentrated between the ages of 12-16, 257 (83.2%) were female and 52 (16.8%) were male. No apparent physically and mentally disabled children were detected. Studies show that the majority of child sexual abuse cases are girls and girls are at higher risk (2-5 times) than boys (17-18). Based on international studies, WHO reports that 18% of girls and 8% of boys are exposed to sexual abuse, 23% of all children are physically abused and many children are exposed to emotional abuse and neglect (1). In this study, in accordance with the literature, the rate of reporting of girls was 5 times higher than that of boys.

In the study although the concentration of the case age range between 12-16 years which is especially related with adolescence was remarkable for this period, no difference was found between the study group and the control group. Although the reactions of children and adolescents against traumatic experiences are generally similar, initiatives in extraordinary periods such as pandemics should be planned by considering the developmental characteristics of children and additional measures should be taken against risks (19). It is also necessary to pay attention to the negative effects of individual or mass stigma especially on adolescents.

In the study, not all of the risky parental characteristics (alcohol and substance addiction, chronic disease, domestic violence, fragmented family, etc.) could be observed, it was only possible to check whether the parents were in the informing position and whether the child lived with the family (1,10-15.). Considering the individuals reporting sexual abuse in the child; in the study group, parents were in the first place with a number of 34 (34.7%), while in the control group, teachers were in the first place with a number of 83 (39.3%) and parents were in the second place with 79 (37.4%) (Table 1). 88.8% of the cases live with their family. In this period, parental surveillance seems to be at the forefront as a protective factor. In the literature, family support or measures taken by the

mother for her child are shown as one of the most important protective factors (1). Since the parental factors that may increase the risk in etiology could not be observed, a definite assessment could not be made in this regard. However, it can be stated that children may have been subjected to other situations such as witnessing domestic violence in this period when they have limited social relations and cannot go to school. However, according to the 19th article of the Convention on the Rights of the Child; those responsible for the upbringing of the child cannot exercise their rights in a way that harms the child. The state is responsible for protecting the child from all forms of ill-treatment of the parent or other persons responsible for the child's care, to prevent child abuse and to prepare social programs aimed at the treatment of children exposed to such behavior (20). "Restriction" is already taking away many rights of the child. It is a situation that can open doors to all kinds of abuse and neglect. The quarantine-isolation practice should be organized according to basic public health principles and by considering basic human rights and children's rights. The quarantine process itself should be prevented from turning into a traumatic factor, and conditions enabling the individual to live his life well in this process should be provided (8).

In this period, the family, the related institutions or the state should fulfill their most basic responsibilities towards the child in order to avoid negligence and abuse (21). In fact, even if there is no pandemic, millions of children are struggling to survive with "limited" opportunities in war, prison and political conflict environments. In these cases, it is stated that many children are losing their parents, relatives, friends, they are physically, emotionally or sexually abused, and they are deprived of their school and other social support structures (19).

In this study, when the rates of people reporting sexual abuse both in the study group and the control group were evaluated separately as March and April, teacher reporting rates were very close between March (46.1%) and April (28.9%) 2019 and March 2020 (38%), it was found to have decreased significantly in April 2020 (10.5%). This month, unlike the others, is the month where we can clearly see the effects of distance education. It can be predicted that some possible cases remain confidential without notice for the above environmental reasons, and the possibility of teachers and others noticing is eliminated. Qualified education and counseling is important in preventing child abuse and neglect. Educational institutions and educators have important roles in the diagnosis and prevention of child abuse (22). In accordance with the literature, the role of teachers in reporting abuse was clearly demonstrated in this study. When schools are

opened (June 2020 and later), notification rates are expected to increase compared to the same period of the previous year. Many new approaches such as WEB Based Education, Distance Education and E-Learning, which were suddenly implemented as a search for a new paradigm in education, has been the subject of debate today (23). After pandemic, these forms of education will enter our lives more. Studies on child abuse and neglect should be identified through questionnaires and scales on the internet, and efforts should be made to raise the awareness of children on digital media in this regard.

We think that many factors such as social segregation, stress (unemployment, flexible working, home working system, isolation), domestic violence, adult male living without biological relationship at home, lack of social support are important factors in this period (1,6,11-14). However, the study group and the control group were compared in terms of the identity of the perpetrator, and there was no statistically significant difference between them ( $p = 0.128$ ). When the identity of the perpetrator was analyzed in all cases included in the study; in both groups, it was determined that friend-lover was in the first frequency and familiar people were in the second frequency ( $p = 0.128$ ). It was determined that 1/3 of the perpetrators in both groups gathered in the 18-20 age group. Likewise, in two studies held in Turkey, it was determined that girls are most often sexually abused by their male friends (24, 25). In many publications, violence occurring in a dating relationship may have consequences ranging from pregnancy and sexually transmitted diseases, fractures, soft tissue traumas, head traumas or post-traumatic stress disorder and depression. Therefore, it is stated that this violence should be handled as a multi-faceted public health problem (26,27).

Especially in the pandemic period, while the incidence of abuse in the form of intercourse is expected to increase, no finding in this direction has been obtained in this study (Table 2). It is a known fact that incest victims do not talk about this situation because of shame, guilt and fear, and families hide this situation (28). We believe that the relationship between pandemic and incest cannot be evaluated with the data of this study and that a comprehensive and separate study should be planned.

To look at the identity of the perpetrator from a different perspective, an analysis was performed by comparing the group one with which the perpetrator was friend or flirt (Group 1) and the group with other perpetrators (group 2), a statistically significant difference was found between the study group and the control group ( $p = 0.007$ ). While the ratio of the offender to be friend or flirt in the control group was 40.3%, this ratio decreased to 24.5% in

the study group (during the pandemic period). This is of course an expected result due to social isolation.

In the literature, if there is a suspicion that the child has sexual and physical symptoms in the story, or if the incident occurred within the last 72 hours, it is recommended to inform the forensic medicine specialist and conduct a forensic examination (29). However, general body examination is routine in our center and in such centers and genital examination is performed in case of doubt and when necessary. Because of this routine, all cases included in the study underwent forensic medical examination by the responsible physicians at the center. The genital examination rate of all cases was 20.4% ( $n: 63$ ). When the study group and the control group were compared in terms of genital examination rates, there was no statistically significant difference between them. This result shows that the operation at the center continues with a professional approach and unnecessary examinations are avoided. In addition, it should be kept in mind that children have the right to refuse the examination and this should not be insisted on. Turkey is seen as changing the approach to victims of sexual violence. However, it is known that the approaches that abuse the victims of abuse for the second time continue (30).

In children exposed to sexual abuse, it is often stated that physical examination findings are less dramatic or not at all (10,31). It is stated that even if there are significant physical injuries, children often encounter physicians long after the incident, most wounds will heal and semen and other materials will be washed away in time (10,31). In the center, after the forensic medical examination, in terms of definitive sexual abuse findings in children, the study group and the control group were compared, and a statistically significant difference was found between them ( $p = 0.015$ ). In the pandemic period, the rate of detection of a definitive or suspicious finding of sexual abuse decreased from 89.1% to 75.5%. On the other hand, the rate of sexual abuse finding detection including penetration during genital examination increased from 20.4% in the control group to 27.6% in the study group during the pandemic period. There was no significant difference between the two groups in terms of pregnancy rates. In the pandemic period, the findings related to the delayed application of children were deleted, but in cases where sexual examination was performed, the rate of penetration detection was higher than that of the control group.

The sexual exploitation of the child by an adult in a way that provides in kind or cash response to the child or third parties is explained by the concept of "commercial sexual exploitation" (14,30). This situation is reported to

increase in extraordinary periods, especially in war and political conflict environments (19). In our cases, sexual trafficking was not detected in either the control group or the study group.

Emphasis is given to the negative physical and social effects of chaotic environments on children, and these children are also reported to suffer from psychological problems such as intense fear and helplessness (19). These fears are said to be related to repetition, injury or death, being alone and defenseless, being punished or accused of their mistakes (19,32). Although they are not directly exposed, children who receive the message that the world is an insecure and abusive place may experience similar fears due to such news in various media organs such as radio and television (20,33). In the study, the number of notifications may have decreased for all these reasons. However, considering that there are hidden cases and no medical aid, professionals should be careful in the post-pandemic period in terms of short and long term medical, mental health and social sequelae.

It is stated that the clinical features and effects of sexual abuse, which is our subject, on the child may change depending on the relationship of the child with the abuser, the form of abuse, duration, the use of violence, the presence of physical harm, the child's age and developmental stage, psychiatric characteristics, and pre-traumatic spiritual development (14 ,18). The intensity of trauma is also associated with the response of the social environment in which the person lives to trauma, and it is mentioned that family and friend support will play a very important role in the victim's coping with the situation (1,34). Some children appear to be more comfortable due to protective factors or early interventions (1).

If child abuse and neglect is identified, the first thing to do is to ensure that the child is protected from recurrent abuse. For this, it is recommended that the family should be handled socially, monitored, benefited from social supports, if the success cannot be achieved, the child should be removed from the family quickly and included in the appropriate social support program (10). In the study, the rate of not performing any additional procedures (social examination, protection measure, etc.) in the control group, except for the forensic examinations and evaluations carried out in CMC, was 66.4%, while this rate decreased to 56.1% in the study group ( $p = 0.001$ ). This is a misleading meaning. The rates of asking for detailed social examination about the child and the family and the rates of taking the child for the first time in institutional care are very similar in both groups. It was found that this difference was due to the increase in the application of children in institutional care during the pandemic

period compared to the control group. The increase in the reporting of children in institutional care in this period is a separate research topic.

**As a conclusion;** no approach such as avoiding additional action and taking precautions was detected in medical and legal practitioners during the pandemic period, and it was determined that the professional multi-disciplinary approach was also shown in this period. Considering the importance of the role of teachers in the awareness and diagnosis of sexual abuse, it is thought that studies should be carried out to adapt these roles to the distance education system, and risk groups should be identified and supported.

### Limitations of the Study

The study is planned to determine the reflections of the pandemic primarily to CMC and indirectly to child abuse cases. Due to the period we are in, the single-center planning and execution is one of the limited sides of the study. On the other hand, psychiatric diagnostic scales could not be used on the cases due to the retrospective file scanning. Considering that child sexual abuse cases that remain hidden in this period may come to light in the future, a complementary study is also needed.

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Review

## Domestic violence during the COVID-19 pandemic

### COVID-19 Salgınında Ev İçi Şiddet

Akça Toprak Ergöner\*, Emin Biçen, Gökhan Ersoy

**Abstract:** **Objective:** Major outbreaks cause alterations in the dynamics of society. One of the leading is the change in crime trends. Although a significant decrease is observed in the total number of crimes, the frequency of some types of crime decreases while others increase, such as domestic violence. Although the number of systematic studies is not enough, data are showing that increased cases of violence against women during the COVID-19 outbreak in Turkey. Compared to the previous year, in March 2020, physical violence, psychological violence, and shelter demand increased by 80%, 93%, and 78%, respectively. Another survey-like study reported that there was a 27.8% increase in violence against women in the pandemic process. However, the number of child abuse cases decreased during this period. The difficulty of the detection of such cases due to social restriction may lead to this effect. These restrictions and the fear environment may also increase the risk of elder abuse and neglect. It's important to take necessary measures to reduce the negative effects of long-term restraint in the quarantine period.

In this review, we discussed the increase of domestic violence during the COVID-19 pandemic by presenting the available data. We also aimed to discuss the possible reasons for the increase in violence and the recommendations made by international and national organizations in solving the problem.

**Keywords:** Violence against women, Child abuse, Elder abuse, Pandemic, COVID-19

**Öz:** **Amaç:** Büyük salgınların toplumun sosyal yapısı ve döngüsünde çeşitli değişimlere yol açtığı bilinmektedir. Başta gelen değişimlerden biri de suç oranlarında ve türlerinde görülen değişimdir. Gerçekte, toplam suç sayılarında belirgin bir düşme görülmesine karşın, bazı suç türlerinin sıklığı azalırken bazılarının artmaktadır. Artış gösteren suç tiplerinden biri de ev içi şiddet olgularıdır.

Yeterli sayıda sistematik çalışmalar bulunmasa da, Türkiye'de COVID-19 salgını süresince kadına yönelik şiddet olgularının arttığını gösteren veriler vardır. Bir önceki yıla kıyasla 2020 yılı Mart ayında fiziksel şiddet %80, psikolojik şiddet %93, sığınma evi talebi %78 oranında artmıştır. Anket niteliğindeki bir başka çalışma ise pandemi sürecinde kadına yönelik şiddet olaylarında %27.8 oranında artış olduğunu bildirmiştir. Ancak, bu dönemde çocuk istismarı olgularının sayısının azaldığı görülmüştür. Bu durumun sosyal kısıtlamalar nedeniyle olguların saptanmasının zorlaşmasından kaynaklandığı bildirilmektedir. Bu sosyal kısıtlamalar ile pandemini oluşturduğu korku ortamının yaşlı istismarı ve ihmali riskini de arttırabileceği belirtilmiştir.

COVID-19 salgınına karşı alınan önlemlerden başta geleni olan karantina uygulamasında evde uzun zaman kısıtlı kalmanın olumsuz etkilerinin azaltılabilmesi için gerekli önlemlerin alınması önemlidir. Bu zorlu süreçte, toplumun her bireyi, birey ve toplum sağlığının korunmasındaki rolünün farkında olarak üzerine düşen sorumluluğu yerine getirmelidir.

Bu derlemede, mevdut veriyi de sunarak, COVID-19 salgını süresince ev içi şiddetin kadınlara, çocuklara, LGBTİ ve yaşlı bireylere yönelik olarak artışı irdeledik. Türkiye'deki ve dünyadaki durumu özetledikten sonra, artışın nedenlerini, sorunun çözümünde uluslararası ve ulusal kuruluşların yaptıkları önerileri ortaya koymayı amaçladık.

**Anahtar Kelimeler:** Kadına yönelik şiddet, Çocuk istismarı, Yaşlı İstismar, Pandemi, COVID-19

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## Introduction

Great epidemics (or pandemics) have some effects on the structure and dynamics of societies, as known by historical examples (1,2). Intensity and diversity of these effects vary by the economic capability of the country, the extent of preventive measures, and the viewpoint of population. Changes in crime trends present early in the list. For example, burglary had increased during the plague epidemics at the middle ages, whereas the ratio of total crimes showed a decrease in influenza epidemics of the 20th century (3). It seems a similar change is valid in the COVID-19 period.

It's started to publish data about declines in the numbers of criminal events during pandemic (4). Media reports point decreasing crime rates across many continents and countries: Murder rates drop sharply in Peru, El Salvador, Republic of South Africa (5). Likewise, in the United States (USA), a reduction of nearly 15% for Los Angeles and 40% for San Francisco has been reported for all crimes (6,7). Public order crimes dropped by 14% in Turkey, according to released news (8). This periodic decrease has been linked to factors such as constrained home environment and its preventing anti-theft effect, frequent police patrols during this period, etc (9).

Although there is a significant decrease in total numbers of crime, the frequency of some varieties is increasing. The decrease in the house- theft may lead to a shift towards other crimes such as auto theft and robbery (4). Cybercrime related to fraud may rise with heightened internet use (10,11). An increasing trend is expected in internet-based false news, information production, and digital sabotage events (10).

Anxiety factors, unemployment, economic limitation, and limited access to the health system increase in catastrophic conditions. Considering the difficulty in moving away from the abuser due to the social isolation policy and the lack of social support systems, all these are among the risk factors of domestic violence (12-13). In terms of its effects on social life, there is an increase in domestic violence cases after similar natural disasters, although there is not much effect on other violent crimes (12-14). After volcanic activity in Washington state and Katrina hurricanes in Mississippi, domestic violence reports increased by 46% and 36%, respectively (15,16). Similar increases can be seen after events that massively affect social life such as earthquakes, tsunamis and big fires (17).

Likewise, the number of domestic violence cases during the COVID-19 outbreak also increased (18). For example, in Indianapolis, between 1 January and 23 March 2020, the number of crimes in the form of vandalism and

domestic violence increased (ready for publication, unpublished data) (18). In reports from many countries, the number of domestic violence incidents increases, at least do not fall (7). The United Nations has announced that reports and searches for domestic violence have risen in Germany, the USA, Argentina, United Kingdom, France, Canada, Cyprus, and Singapore (19,20). With the start of the quarantine practice in Wuhan, China, where the epidemic first started, the reporting of domestic violence cases increased three times compared to the previous year. This increase is 30-36% in France, 40-50% in Brazil, 25% in Argentina, 33% in Singapore, and 10-35% in different states of the United States. It has been stated that applications to domestic violence support lines increased by 20% in Spain, 30% in Cyprus and 25% in the UK. Some hotels in France and Italy are used as shelters for victims of domestic violence. It has been reported that the expression of domestic violence has increased by 75% in searches performed on the Google search engine. During this period, at least 8 domestic violence related murders were committed in the UK (21-30).

While staying at home decreases the rate of home theft, it increases domestic violence with the same and different mechanisms. As seen in the Ebola and Zika outbreaks, it is pointed out that economic, social, age and gender-related inequalities would increase even more during the epidemic periods (20). As it is known, the increasing trend in domestic violence reports, which increased after natural disasters, may last up to one year after the end of the catastrophic event (31).

In this review, we aim to reveal the increase in domestic violence against women, children, LGBTI and elderly individuals during the COVID-19 epidemic process and the reasons for this increase. For this purpose, by explaining the situation in the world and in Turkey, the issue will be discussed along with suggested solutions proposed by the international and national organizations.

## Violence Against Women

Violence against spouses is the most common form of domestic violence, and if gay marriages are excluded, the victim is generally women (32,33). It is known that one out of every three women in the world experiences physical and / or sexual violence by the men they know. The issue is a common human rights violation worldwide and remains a threat to women's health. Domestic violence against women causes sexually transmitted diseases, various injuries including HIV and unplanned pregnancies, and negative effects on physical, mental, sexual and reproductive health. For these reasons, it is accepted as a serious public health problem all over the world (34,35).

In a study conducted by the Directorate General for the Status of Women in 2014, the rate of women who stated that they were exposed to physical and psychological violence in any period of their lives throughout the country was 36% and 44%, respectively. 48.5% of women did not tell anyone about the violence they experienced, one out of 10 women were exposed to physical violence during pregnancy and 25% of women had to receive medical treatment as a result of physical violence (36). Although academic studies have as yet not present, there are data showing that the increase in violence against women during COVID-19 epidemic in Turkey. Compared to 2019, physical violence, psychological violence and demand for shelter in March 2020 increased by 80%, 93% and 78%, respectively, according to the statement of the Women's Federation of Associations of Turkey (37). Socio-Political Field Research Center conducted a survey between 3-8 April 2020 with the participation of 1873 women living in 28 cities. According to this study, violence against women increased by 27.8% in the pandemic process (38). The number of women suffering from domestic violence, who applied to the Dokuz Eylül University Faculty of Medicine Emergency Department in March and April of 2020, has increased 3 times compared to the same period of 2019.

In the World Health Organization's publication titled COVID-19 and Violence Against Women dated April 7, 2020, it was emphasized that there is an increased risk of violence against women in outbreaks. There are additional risks especially for particularly vulnerable groups such as elderly, disabled, immigrant and refugee women (39). Increased time to stay at home, unemployment, economic problems, stress, decreased communication with family and friends, restricted access to helplines, legal aid, and protection services are underlined as the reasons to increase violence against women in COVID-19 days.

Similar to the World Health Organization, the Council of Europe issued a statement on the implementation of the Istanbul Convention (European Council Convention on preventing and combating violence against women and domestic violence) during the COVID-19 outbreak on April 20, 2020. The Council of Europe also noted that domestic violence against women and girls tends to increase during times of crisis, and the resulting data show an alarming increase in the number of cases worldwide and in many European Council members. Council made proposals to the States parties on preventing violence, protecting individuals from violence and processes in the investigation phase (40).

Domestic violence against women is a special form of violence that victims hesitate to come to health

institutions, even in times other than an epidemic, unless there are serious injuries. There is a recurring cycle of violence due to its nature; the woman is experiencing more and more serious health problems and is injured and / or killed. The health of women who are exposed psychological, economic and sexual violence besides physical violence is at risk throughout their lives and their years of healthy living are decreasing. Women who are constantly under fear and threats also have somatization disorders. It should also be kept in mind that there may be an underlying domestic violence in patients who come with non-specific complaints such as chronic headache, abdominal pain, sleep problems, and depressive mood. Healthcare professionals should be aware of the risks and health consequences of violence against women. They should listen to the woman who is exposed to violence with empathizing and without judging. They should ask questions about their needs and concerns, take measures to increase their safety, request the necessary consultations and provide treatment services (34-36).

Health workers, mostly women in many places, may also be at risk of violence at home and / or work. Healthcare managers should have plans to ensure the safety of healthcare professionals. Psychosocial support, non-performance incentives, additional transportation allowance and childcare support should be provided. It is stated that healthcare professionals interested in COVID-19 may encounter situations such as stigma, isolation and social exclusion. Turkish press had released news in this context. (39,40).

Although the COVID-19 outbreak puts a huge burden on health systems and healthcare workers, there are things to do to help alleviate the effects of violence on women and children (39,40);

Decision-making bodies should identify ways to make physical removal measures accessible in their plans to combat the COVID-19 outbreak; taking into account domestic violence against women. Local services (helplines, shelters, sexual assault crisis centers, counseling, etc.) and appropriate health institutions should be identified by working hours and contact information; They also should be made accessible. Information should be given as to whether services can be accessed remotely.

Coordination mechanisms between institutions should be maintained in developing and implementing policies to reduce violence against women during the epidemic. The needs of victims should be assessed through multi-stakeholder processes, including NGOs and women's rights organizations. Capacity of service providers should be strengthened and measures should be taken for shelter needs of women infected with COVID-19.

Non-governmental organizations working in this field should be supported and strengthened.

Non-governmental organizations should provide services for women exposed to violence and their children, collect and record data on reported cases of violence against women, and ensure that they can be used by relevant parties.

The Council of Europe states that States parties to the Istanbul Convention should take measures such as press releases, television, radio or social media campaigns aimed at informing the public of the increased risk of violence. These parties should ensure during pandemic that as much information is available as possible about the possible ways victims can receive help (40). In Spain, if women request "Mask 19" from officials in pharmacies, pharmacy employees can report to the police secretly domestic violence case (41).

It is important for women exposed to violence to establish a safety plan that can be implemented in the events of increased violence. The woman can predict a neighbor, friend, relative or shelter for both her and her children, when they need to leave home immediately. It must keep the requirements such as identity cards, money, personal clothes, medicines in a certain place. He should plan how he can leave home and get help (34,36).

Information should be provided on how women can access helplines, social workers, child protection, the nearest police station, accessible shelters and support services (37). Local administrations have been exemplary practices in İzmir and Ankara. The measures taken after the meetings with local administrators and non-governmental organizations were shared on the web page and information was provided on ways to access support services (37,42).

States take some precautions about increasing domestic violence in the COVID-19 outbreak. The French government has announced that it will place victims of domestic violence in hotel rooms and will finance pop-up counseling centers in markets. In addition to hosting victims and their children in hotels, the Spanish government has launched a new campaign that encourages women to seek helplines. It also keeps all services open to assist victims of domestic violence during quarantine. The South African government keeps courts open for emergency protection decisions as well as providing access to shelters and social services. In addition, there is an active messaging line where victims can get help (43).

## Violence Against LGBTI

The United Nations High Commissioner for Human Rights has issued a statement reminiscent of the rights

of LGBTI (lesbian, gay, bisexual, trans and intersex) individuals and states' responsibilities in combating the COVID-19 outbreak. The paper draws attention to a number of problems related to the COVID-19 outbreak. Accordingly, LGBTI individuals may face restrictions on access to health rights. They may experience problems such as stigma, discrimination, hate speech and attacks, domestic violence. They are often faced with access to work and livelihoods. In this declaration of the United Nations, it is emphasized that the measures to be taken for the socio-economic effects of the epidemic should take into account the problems of LGBTIs, including the elderly and homeless. The state can take many steps by acting with stakeholders. It has been proposed to produce discourse against stigma and hate speech, to take measures to prevent discrimination in access to health and other services, and to provide support services to those exposed to gender-based violence (44).

## Child Abuse and Neglect

Although there is not enough systematic study yet, the increase of domestic violence attracts the attention of the society. Child abuse often coexists with violence between partners. Children witnessing this violence visually or audibly can cause post-traumatic stress disorder and some behavioral disorders in children (45-47). Because studies have shown that children living in homes where domestic violence is seen are at 60 times higher risk of abuse and neglect than the normal population (48). During this period, children spend more time at home than normal, as schools and libraries are closed (49). Since children are obliged to stay at home as part of the curfew, there is a risk of neglect in children of working parents and physical, verbal and psychological abuse in children of those who do not work (or in home-office style workers). This process can end with death, especially children under 12 months (47). In this period, it is possible that the intruder in the house, who wants to increase his control over the households, will target the children in the house (49). In the United States, the severity of the hazard is evident given the fact that one out of every eight children, including a significant number of recurrences, is being abused even before a pandemic (47,50,51). It is stated that between 1 and 2.3 million children in England are exposed to similar risks in this period (52, 53). United Nations Educational, Scientific and Cultural Organization estimates that 1.38 billion children in the world do not have access to social areas such as school, group activities and team sports (54).

In this process, low income, crowded families are especially at risk. In addition to the prolonged time spent at

home due to restrictions, other factors such as stress, fear, and exacerbation of the economic reflections of the crisis decrease the tolerance and long-term thinking ability of family members and increase the possibility of child abuse and neglect (54).

It is reported that the measures taken to prevent pandemic may cause a secondary hidden pandemic in the form of an increased frequency of child abuse and neglect (52,55).

It has been reported that calls to some child support lines have increased even in just a week after the closure of schools in Ireland (52,56). On the other hand, although the reports of domestic violence have increased in the United States, some organizations dealing with children's rights have been announced a reduction for reported cases of child abuse and neglect (49). Many factors, such as failure to be monitored by healthcare workers due to postponing routine health screenings of children and the lack of access to teachers and social workers after school and curfews reduces our chances of detecting child neglect and abuse (47,52, 57,58). Therefore, it is difficult to fully reveal the extent of damage caused by child neglect and abuse until the beginning of the school season. In particular, a scenario where the training season does not start until next autumn will increase the likelihood and severity of abuse of children at risk. In addition, formal and informal organizations that serve victims of child abuse will be faced with too many cases that they cannot provide the desired standards of service.

At this point, it is recommended that the relevant institutions organize activities such as summer camps, club activities and youth sports leagues that will enable children to be integrated into the social system as soon as possible by establishing partnerships. Thus, it will be possible to create potential opportunities to detect child abuse or neglect in the summer without waiting for the children to return to school in autumn (49). These strategies should be put forward by the highest authority, with similar determination and stability, as far as the health of adults is concerned. Financial support for non-governmental organizations, health institutions and projects in this context is important for the protection of our children in order to ensure that the works are effective and continuous (47,52).

National / international organizations and non-governmental organizations should support the dissemination of good parenting practices, do research and inform the society in different ways. During the COVID-19 outbreak, certain studies are driven by some associations and supporting official organizations (such as WHO, UNICEF, Global Partnership to End Violence Against Children, the

U.S. International Development Agency, the U.S. Centers for Disease Control and Prevention, the UK Global Issues Research Fund, etc.). Controlled studies of these groups aim at good parenting practices such as coping with stress during the crisis and building positive relationships with children, in low-middle income countries and are shared free of charge in 55 different languages (14, 54, 59-61).

During the COVID-19 epidemic, it is important to establish emergency hotlines and application centers for children and women in case of possible abuse and neglect. Extending the use of online methods as much as possible will increase the impact. These approaches are likely to make it possible to reach groups at risk and to have the chance of early diagnosis and intervention (14, 62). It is important to prepare informative documents and make announcements through social media, mainstream media, and health centers so that risk groups can benefit from the measures to be taken (21).

During the examination at health institutions or on virtual telephone/videocall visits possible signs of abuse or neglect should be investigated, the follow-up frequency of families at risk for domestic violence needs to be increased and parents should be advised about good parenting behaviors (47).

## Elder Abuse and Neglect

Elderly abuse is considered as a growing public health problem all over the world today. The elderly can be abused or neglected by healthcare professionals, caregivers and household members (63). While the rate of the elderly population in the total population has been increasing in recent years, the number of victims of the abuse victims applying to the emergency services has also increased (64). Elder abuse is defined as any harmful behavior that is done consciously or unconsciously by the household members who care for the elderly and those with a trust relationship between them. Elder abuse can manifest itself in the form of physical, psychological, economic and neglect (63,64).

In addition to the COVID-19 threat, the elderly also have an increased risk of abuse and neglect due to their social isolation, fear of death and increased dependence on caregivers (66,67). Although other forms of elder abuse have not yet been investigated due to pandemic constraints, the United States Federal Trade Commission and the American Bar Association report a massive increase in the economic exploitation of the elderly group (68,69).

In this period when calls to stay at home increased worldwide, the abuser was generally relatives of the elderly (70). Older cases and those with diseases such as

dementia are at risk of neglect. Elderly people living in nursing homes are more isolated due to reduced family visits, and this increases the risk of caregivers' abuse and neglect (71). In addition, in elderly people living with their children at home, the risk of abuse increases with the increase in the time they spend with other members of the family (66). In this period, one of the leading elements of elder abuse is discrimination and aggression to a certain age group due to their age defined as ageism by the World Health Organization. All of the following factors are some form of elder abuse and harm the elderly (66,72):

- a. Displaying COVID-19 as an elderly disease since the beginning of the outbreak,
- b. Persistent targeting of the elderly about the curfew,
- c. Selective emphasis on the proportion of the elderly in official statements made about the deceased,
- d. Verbal and physical attacks against the elderly population in the society reflected in the language and media used.

It is recommended that governments make arrangements such as hourly grocery shopping permits for the elderly to reduce the dependency of the elderly population, provide virtual telephone visits, and develop discourses and disseminate through social and mainstream media in order to end the ageism trend (66).

Due to restrictions, the inability of the elderly people to reach their families and friends' homes has increased the importance of shelters where victims can feel safer and receive legal and access to health and legal support more easily (73). During this period, it is important to develop shelters due to possible emergency needs, to create them if they do not exist, and to create safe shelter options for all individuals who are exposed to abuse, abuse and violence.

## Conclusion

The social change created by a pandemic in this dimension manifests itself in all examples of violence. Death, as the primary form of violence, may increase not only due to the disease but also due to personal destruction. According to the first calculations, it has been suggested that there will be an increase in suicide numbers up to 50000 people (74).

It is pointed out that the approach focusing on COVID-19 in health services may have already increased the casualties due to other diseases (75). Apart from mortality, morbidity is also expected to show a rising line. This will have a more pronounced effect on vulnerable groups. It has been argued that the stress caused by the isolation increases the risk of alcohol and substance use,

especially the possibility of relapse (76,77). The reduced chance of asylum-seekers and migrants to access support makes these groups very fragile (78). Depending on the psychosocial results caused by COVID-19, an average of 0.2 years of total life-year loss per person is envisaged. Moreover, it has been estimated that this loss will reach 9.8 years for 2% of the population (79).

Domestic violence has visibly increased. The dominant patriarchal order and gender inequality are pointed out as the main reason for this increase (6,80). Factors such as the time spent together, increase in the level of alcohol use, etc., can heighten the risk concomitant with the restrictions (80). As a result of the restrictions, potential aggressors and victims exist in a certain socio-geographic area for a long time. As a result of the restrictions, potential aggressors and victims exist in a certain socio-geographic area for a long time. In this context, the home environment sets grounds for violence and creates situation-specific forms of violence, such as the threat of virus transmission (82).

Social impacts such as domestic violence continue long after natural disasters. Moreover, with a possible COVID-19 peak that may occur after social isolation, the risk may extend over a longer period of time. Considering the factors that delay the diagnosis of domestic violence, the measures to be taken should be considered to be long-term, highly inclusive and capable. The number of qualified personnel, especially psychological support units, should be increased, and the necessary budget should be planned in advance (14,44,83).

In this process; The workload of working women can increase even more: Women start housework and maintenance after finishing work at the workplace. Due to the children staying at home and online education, all kinds of care, education and training of children, meeting their emotional needs, planning games and activities are expected from women. Since there is no help for services, more chores such as food, cleaning, etc., and even quarantine management of families and parents are mostly carried out on women (84,85).

Although COVID-19 mortality rates are reported to be higher in men, the risk of domestic violence is also known to be higher in women. With the precautions taken to cope with this challenging COVID-19 outbreak, home security should be considered for women and children, while safety measures should be considered (84-86).

While fighting a serious health problem like the COVID-19 outbreak, it is very valuable that all segments of the society are in unity, solidarity and harmony. While fighting this war, equality must be ensured in the distribution of housework among individuals. Necessary

precautions should be taken to minimize the negative effects of long-term restraint at home, and every individual of the society should fulfill its responsibility, being aware of its role in the protection of individual and community health.

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Review

## COVID-19 Pandemic and Prisoners

### COVID-19 Pandemisi ve Alıkonulanlar

İsmail Özgür Can\*, Hediye Aslı Davas, Ümit Biçer

**Abstract:** **Objective:** It is estimated that around 11 million people in the world are detained in prisons. Prisons, detention centers are areas with possible high prevalence of infection due to closed environment with crowded and unsanitary conditions. The problems experienced due to the COVID 19 pandemic in the health examinations and the living conditions of the detainees and convicts will be discussed and ethical approach suggestions published by the Turkish Medical Association will be presented.

**Keywords:** Prisoners, detainees, COVID-19, ethics.

**Öz:** **Amaç:** Dünyada yaklaşık 11 milyon civarında kişinin hapishanelerde alıkonulduğu düşünüldüğünde, COVID 19 pandemisinin etkileri yönünden riskin ağırlığı dikkat çekmektedir. Bu derlemede alıkonulanların sağlık kontrolü muayenelerinde COVID-19 pandemisi nedeniyle yaşanan sorunlar, tutuklu ve hükümlülerin durumları ele alınarak tartışılmış, çözüm önerileri geliştirilmesi amaçlanmıştır. Ayrıca bu konuda Türk Tabipleri Birliği'nin ortaya koyduğu öneri ve etik yaklaşım önerileri de sunulacaktır.

**Anahtar kelimeler:** alıkonulan, COVID 19, tutuklu, hükümlü, etik.

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#### Ethical Declaration

Our study was written in accordance with the Helsinki Declaration, and the ethics committee approval was not obtained because of the review study.

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## Introduction

Prisons, detention centers, are areas with possible high prevalence of infection due to crowded and unsanitary conditions. The risk is high for convicts and employees due to these unhealthy conditions, insufficient ventilation, poor hygiene and lack of timely health care. (1-2).

As it is known that prisoners and detainees tend to have worse living and health conditions than general population, COVID 19 also carries a life-threatening risk for them in the absence of effective prophylaxis and treatment.

The hazardous physical environment where individuals who are deprived of their liberty are detained / closed, insufficient number and quality of the staff working in these places, the former health of prisoners (detainees and convicts) and their access to health care services pose serious health risks.

The average number of prisoners living in wards, quality of ventilation and lightening of wards, number of prisoners using per toilet and bathroom, availability of clean sanitary facilities or means for personal hygiene, the provision of safe, adequate nutritional food in cafeterias and canteens and existence of violence are the main determinants of health in prisons. Prison environments carry serious risks in terms of infectious diseases due to these adverse conditions, increasing and the risk of transmission through air, droplets, water and nutrients. The rates of tuberculosis, HIV hepatitis are already known to be more frequent than the general population

As mentioned in the Prison and Health report of WHO (2014), it is difficult to control the communicable disease in prisons due to continuous exchange with outside communities. Globally, nearly one third of the prison population change every year.

All these determinants of health aforementioned above is not promising in case of Turkey. In a report published by HRFT, the negative notifications of inmates about the physical environment and living conditions of prisons in Turkey worsened between 2015 and 2019. Also referral of inmates with communicable diseases between prisons in the absence of control measures were reported.

Health authorities and professional organizations, especially WHO, draw attention to the protection of social isolation and personal hygiene for COVID 19 disease The risk of transmission is not only high within prisons also a remarkable risk factor for the society through interactions between prisoners, staff and visitors during visits, prison transfers and staff assignments (1,2).

The available information suggests that prisons are among the areas that are likely to have a high infection

prevalence due to the Covid-19 pandemic, and increase the risk for prisoners and prison staff.

## Human Rights in Places of Detention and Closure Under Pandemic Conditions

It is thought that approximately 11 million people in the world are detained in prisons, at least 124 prisons are detained well above their capacity (4-5 times) (3). The presence of a crowded and active population in prisons (correctional, prison, prison); is shown to exacerbate the effects of negative shelter conditions, accessing to safe, adequate and quality food and water to provide personal and environmental hygiene, making necessary immunizations and periodic health screenings for the prevention of diseases, and reaching appropriate, timely accessible emergency and therapeutic services.

On March 25, 2020, United Nations (UN) High Commissioner for Human Rights, Michelle Bachelet, stressed that the crowds in prisons should be diminished by inviting governments to protect the health and safety of prisons and other confined spaces in order to take control of the COVID-19 pandemic. He emphasized the increasing prevalence of COVID-19 in prisons and (immigration) removal centers as well as nursing homes and psychiatric and called for an urgent action to governments to reduce the number of population living in prisons and “(4). The UN Human Rights Commissioner has suggested that prisoners with special needs should be released due to the pandemic. In relation to the condition of the political prisoners, he pointed out to use that pretrial proceedings and other alternatives order not to face unlawful practices (5,6). He made similar requests regarding children at UNICEF (7).

Following pandemic, steps have been taken to release prisoners in many countries, taking into account the existing capacities and risks of prisons. 85 thousand people in Iran, 10 thousand people in France and 6 thousand people in Italy were released. In United Kingdom; since the population of prisons 107% of its current capacities, 4000 prisoners were released (3). However, the numbers announced are not sufficient to minimize contamination risk and facilitate process management in the COVID-19 pandemic.

To host the very top of the human population of the current capacity of prisons in Turkey leads to worsening physical conditions, on the other hand, the prison population of arrest and to be in a constant mobility due to release and which contains serious risks in terms of health, prisoners are vulnerable to infectious diseases. According to the statement made by Ministry of Justice on September 14, 2019 the total capacity of prisons was

220.230 while the number of prisoners held in prisons has been reported to be 294 thousand in January 2020 in Turkey (8, 9). Despite the increased capacity in prisons, it is understood that the population in prisons are above 29% of its current capacity. Through the pandemic period Turkey entered into force on executions with a new law which is released from prison and is still believed that the number of prisoners held not disclosed, while 40 thousand prisoners freed on certain conditions (3). Even this shows that the problem is not solved in terms of prisons and the risk continues.

## COVID-19 in Prisons

Especially in the fight against COVID-19, precautions and steps to be taken in prisons or other places of closure (closed psychiatric clinics etc.) are important. The acceptance of health as a right and the existence of social determinants necessitate that people detained from their liberty should be kept in conditions where they can maintain their dignity and fulfill their care needs. Adequate accommodation, healthy physical conditions, clean clothes and sheets, food and drink and exercise opportunities are required for adequate and balanced nutrition.

The number of prisoners, the number and quality of wards, toilets and bathrooms, the provision of safe, adequate nutritional food in cafeterias and canteens, etc. Prison environments carry serious risks in terms of infectious diseases due to their negativity, and increase the transmission and transmission of diseases transmitted through air, droplets, water and nutrients (10). Professor Richard Coker drew attention to the risks of high rate of virus spread in institutions that are locked as a place of closure and called the process "cluster amplification" (11).

Burki (3) reported that the rate of infection in prison is 10% in New York City, and 2000 positive cases were reported from a prison with a capacity of 2,500 prisoners in Ohio (USA) (3). The first COVID 19 positive cases in the UK prison were reported in Manchester on 18.03.2020, 13 prisoners were taken into isolation as a precaution, according to the statement of the British Ministry of Justice (12). It was stated that at least 806 COVID-19 positive cases were detected in 5 prisons in three regions in China and 4 of the infected people were critical. Approximately 1/3 of those infected are in Wuhan Women's Prison (13). An amnesty was requested for prisoners due to overcrowding in Italy. Iran has released tens of thousands of prisoners in order to prevent the spread of COVID-19 in prisons (<https://www.usnews.com/news/world-report/articles/2020-03-09/iran-to-release-70-000-prisoners-to-prevent-coronavirus-spread>). The priority was given

to the release of prisoners with chronic diseases. This measure is considered to be purely preventive since no COVID-19 cases have been reported in prisons to date.

The situation is similar in terms of prison staff. The information regarding two physicians where they were COVID-19 positive working in Şakran Prison in Izmir were shared with the public after hospitalization (<https://www.izgazete.net/genel/izmirde-covid-19-teshisi-konularak-cezaevinden-tahliye-edilen-oldu-h46168.html>).

In epidemic conditions, prisoners and their relatives need more information and news about the pandemic and the measures taken, by the government. The absence of independent audit mechanisms and the fact that government officials do not provide accurate and clear information about the pandemic, increase doubts, raise fear and anxiety among prisoners. This anxiety increased after the Izmir Chief Public Prosecutor's Office's announcement of a prisoner's positive test result at Buca Prison and indicating that there were signs of disease in 62 prisoners (<https://www.evrensel.net/haber/404059/11-kurumdan-acil-cagri-risk-altindaki-mahpuslar-serbest-birakilsin>).

55 prisoners and convicts in Konya E-type prison were reported to be transferred to the hospital with a suspicion that they had been infected with Covid-19 virus. According to the statements of the Ministry of Justice dated April 13, 2020, 3 prisoners lost their lives due to the corona virus, 17 prisoners and 79 personnel working in open prisons were positive, and in April 28 120 prisoners were stated to diagnosed with COVID-19 ([http://cisst.org.tr/basin\\_duyurulari/hasta-mahpuslar-icin-korona-virus-salginina-karsi-yapilmasi-gerekenler/](http://cisst.org.tr/basin_duyurulari/hasta-mahpuslar-icin-korona-virus-salginina-karsi-yapilmasi-gerekenler/)).

Another important issue is the situation experienced at the detention centers operating in connection with illegal immigration. According to the records of the Directorate General of Migration Management, there are 20 thousand people in 28 units. these persons carry similar risks with those detained in prisons (14).

Information shared during the COVID pandemic at other closures is limited. In late February, more than 3,150 confirmed COVID-19 positive cases and 101 patients in the Daenam psychiatric ward in South Korea were reported. The ward has been isolated in order to limit the spread of the virus, but this measure has been a punishment for patients rather than preventing the virus from spreading (15).

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. It should be taken into account that any problem that will lead to deterioration of mental and social

well-being will negatively affect the health and immune system of the person.

### Status of Prisoners with Special Needs

Closure itself and properties of closure spaces accelerate the emergence and the spread of infectious diseases. Not only the pre-existing health problems, but any situation that prevents the person from maintaining his / her own needs and hygiene, with the obstacles to access health services would accelerate severity of the health problems and be life threatening WHO, health authorities and professional chambers emphasize that people having a chronic medical condition or an old age are at an increased risk for severe disease or death in the COVID pandemic, and it is vital for these people to take personal protective measures, strengthen the immune system and be in an environment where they can protect their health.

Keeping the groups with special needs, especially “severely ill, elderly, disabled, pregnant and children” in the closure places is an unacceptable risk considering the transmission rate and mortality risks of the COVID-19 and it would be violation of the right to life According to the data published by HRA in 2019 a total of 1333 patients, 457 of whom had severe illness, identified in Turkish Prisons (9). It can be estimated that the real number is much higher than this. Considering the fact that seriously ill prisoners couldn’t survive alone and protect their personal hygiene, their health would worsen and they would have more difficulties accessing to healthcare due to the COVID pandemic, and, which would lead to serious human rights violations.

Although there is a provision in the Law No. 6411, that the sentences of prisoners “*who are unable to sustain their lives alone under the conditions of the penal institution due to a serious illness or disability they are exposed to and that they are not considered to pose a threat to social security*”, are still very limited. On the other hand, the obligation to carry an identity card which the crime decision is written leading to stigmatization and usage of reverse clamp, torture, other ill-treatment and degrading practices during transfers would be another significant obstacle to access healthcare.

In the article 16 of the Penal Execution Law, “*the execution of the persons who are deemed to be postponed, according to the report prepared by the Forensic Medicine Institution or approved by the Forensic Medicine Institution, which is determined by the Forensic Medicine Institution, that the disease of the convict poses a definite danger for his life*”. In practice, this provision does not ensure that the execution of sick prisoners would be postponed for health reasons, such as the length of time for approval

of transfer, the lack of standard health criteria for postponement because of the fact that decisions cannot be made from another institution other than CFM (Council of Forensic Medicine).

In the pandemic process, human rights and health professionals’ organizations requested the removal of Council of Forensic Medicine (CFM) approval in the reports issued by the full-fledged or university hospitals determined by the Ministry of Justice. The new enforcement law based on the requirements of pandemic does not include the most vulnerable people with life risks and is against the principle of equality of the Constitution.

According to the statements of the Ministry of Justice, as of January 2020, there are 3,100 child prisoners and also 780 more were staying with their mothers in prisons. Pandemic would have detrimental effects on children’s development and health especially in certain age groups via because of suppression of the immune system due to personal hygiene and insufficient nutrition and care caused by worsened prison conditions.

### Legal Framework for Seriously Ill Prisoners

The European Committee for the Prevention of Torture states that physicians are obliged to report the “people who are not eligible for permanent imprisonment and “those with a fatal course or prisoners with severe illness or severely handicapped or elderly” who would not be tolerable to continue to be held in prison to the relevant authority. In addition, the Committee underlines that there should be no discrimination ensuring the right to health and that decisions should be made with a clinical approach and based on medical principles only (16).

In the European Prison Rules (art. 43.3), the physician is obliged to report the situation to the prison director if the physical or mental health of a prisoner is at serious risk due to imprisonment conditions, including imprisonment or cell arrest.

In the Recommendation No. 98 (April 8, 1998) of the Committee of Ministers of the Council of Europe on the structural and ethical aspects of treatments in the prison setting (paragraph 50, 51), it was mentioned that “*Prisoners with serious physical handicaps and those of advanced age should be accommodated in such a way as to allow as normal a life as possible and should not be segregated from the general prison population. Structural alterations should be effected to assist the wheelchair-bound and handicapped on lines similar to those in the outside environment.*”

The rules regulate their transfer to outside hospital units related to patients who may have a fatal outcome in

a short time, but in such a case, the possibility of forgiveness or early release for medical reasons related to these people will be reviewed on a medical basis.

The Council of Europe Parliamentary Assembly said that, “*in the Recommendation No. 1418 (1999) of 25 June 1999 on the Protection of Human Rights and the Comfort of Persons Who Have Suffered from Death*”, the State should encourage to take measures to protect all aspects of the dignity of those who suffer from permanent illness or deadly disease. These measures shall provide all kinds of treatment options by taking the necessary precautions to make and protect the rights of those who suffer from permanent illness and fatal disease, and ensure the conditions of benefiting from the appropriate treatment facilities for all the measures should also encourage families and friends to be with people who are constantly ill and lethal, and to provide professional support to patients. If there is an opportunity for outpatient treatment, it should be organized by specialized mobile teams and networks in order to carry out the treatment of those who are constantly ill and deadly.

In ECtHR judgments; it has been underlined that the state is obliged to ensure that “prisoners are not subjected to distress and strength beyond the level that is unavoidable in the conditions of detention, providing the necessary medical support and maintaining their health and well-being”. The ECtHR warned the States about their duty of not to cause any delay or failure failure to provide healthcare services to the prisoner in an emergency situation which would lead incomplete treatment of the person. Because in complete treatment would harm the dignity of prisoner provoking to feel humiliated and pain that could decrease his physical and moral resistance. It states that it is a violation of the third article that regulates the prohibition of torture and ill-treatment, and determines that the right to life is violated if the necessary health service is not provided and death occurs (17). The ECtHR accepted the condition that the prisoner whose execution was postponed, had to send back to prison despite the fact that there was no change in his permanent illness as a violation of Article 3. (18).

### Custody Health Examinations

Forensic medical evaluations made in the detention processes of persons detained for liberty should also be made in accordance with professional ethical rules and medical standards, requesting necessary examinations and consultations, collecting biological material that may be of medical evidence and forming a forensic medical opinion (reporting).

During the COVID-19 pandemic, it is difficult to take precautions to minimize the risk of infection transmission in detention entrance and exit examinations in hospitals. There were problems in the provision of adequate protective equipment and materials to physicians, law enforcement and patients. It was observed that law enforcement officers and patients applying to the emergency clinics of hospitals for suspected COVID-19 are posing a risk, but effective measures could not be taken.

Physicians encountered problems while completing the medical examination procedures performed at the detention entrance, exit or displacement within the Health Control Section of the Turkish Criminal Procedure Code (CPC) and the Regulation on Arrest, Detention and Expression, It was observed that they had problems with implementation.

These examinations have been difficult to perform for similar reasons in other units in hospitals. In some provinces, examinations were tried to be carried out in areas established within the police departments and physicians were invited to these areas.

If the physicians are forced out of the medical examination or their demands are not taken into consideration, actions to be taken were shared by the Forensic Medicine Association, TMA (Turkish Medical Association) and THRF (Turkish Human Rights Foundation);

- “If the examination does not take place in a healthcare setting, the assessment should include medical and legal drawbacks.
- If physicians are invited to perform a medical evaluation or forensic report outside of the health institutions; they should inform the healthcare facility and the Medical Chamber they are affiliated with.
- Despite all this, in cases where the physician is forced to carry out an examination under pressure and threats to his own security, etc.” it:
  - Consent of the person to be interviewed and examined should be taken under all circumstances. If the person does not give consent, the examination cannot be performed. In all similar cases, the physician should record the reason for not giving consent.
  - If the person gives consent; he is obligated to state, the conditions of the interview and examination environment and the identification of the person
  - The physician should inform the professional organization about all the difficulties and the oppressions / she has experienced during the medical evaluation processes”.

Considering the effects of the COVID-19 pandemic process, especially in terms of ease of transmission,

forensic medical evaluations of patients exposed to trauma / violence and forensic reporting should be completed under the principles of the UN Istanbul Protocol, which is the guide for effective investigation, examination and documentation of torture and ill-treatment. act according to the rules (19-23).

In case the person is closed / detained; as soon as they enter the places of closure, their medical evaluations should be made, their control for infectious diseases should be carried out, the diagnosis and treatment processes required by the health condition should be carried out without delay. To prevent the transmission to, other people who are detained / closed measures should be taken.

### In terms of international standards

The main document on practices for prisoners is the United Nations Minimum Standard Rules for the Treatment of Prisoners, dated 1955. The rules were revised by the United Nations General Assembly on 17 December 2015 to reflect the changing needs and developments in the fields of human rights and prison administration and were approved by member states as “Mandela Rules”.

The universal values of humanity and social conscience require that prisoners and convicts to be protected from unnecessary pain and victimization and that they have right to access to health services on an equal basis. One of the main tasks of the social state is to ensure “*the provision of health services in an equal, qualified and accessible manner*”. International Economic, Social and Cultural Rights Convention (Article 12) it stipulates that everyone including the prisoners has the right to reach the highest level of physical and mental health. The right to health, including prisoners and convicts defined UN Minimum Standards to be Applied to “*prisoners in 1955; the UN Medical Ethical Principles in 1982; the UN Principles for the Protection of Persons Detained or Imprisoned in 1988; the Basic Principles for the Improvement of Prisoners and United Nations Rules for the Protection of Children Deprived of Their Freedom in 1990*”.

From the moment when the state effectively takes control of people, in order to protect human rights in all places of detention, “*examinations of detainees and convicts, like other patients, are respected in terms of practicing the art of medicine; disregard of patients’ race, language, religion, sect, gender, political thought, philosophical belief, economic and social status and similar differences; performing all kinds of medical intervention by respecting the privacy of the patient* ” is stated as the basic rule. States

must ensure not only medical care but also the well-being of prisoners.

To provide “*equal, qualified and accessible*” healthcare services is the duty of a social state which requires that health services in prison be organized in close relation with the general social health system, integrated and in harmony with the national health system. Health services should be sufficient for the diagnosis and treatment of physical or mental illnesses that prisoners may face. Prisoners should have the opportunity to benefit from all health services in the country without discrimination due to their legal status and should equally access and benefit from all medical, surgical and psychiatric facilities available in the general health system. States are always and promptly obliged to provide protective and preventive health services as well as therapeutic ones in order to guarantee the well-being of prisoners

The right to health of all detainees has been assessed under the UN Civil and Political Rights Convention by the UN Human Rights Committee (art. 6) and the prohibition of torture (art. 7) and the inhuman and degrading obligation to provide adequate and adequate medical care to prisoners and convicts It has been demonstrated to be covered by the prohibition of treatment (art. 10) (24).

In addition to *its purpose of treating healthcare*, it should be evaluated with *its protective / preventive quality*. Health standards, statements and opinions of WHO and the World Medical Association also accepted to take preventive measures for the protection of infectious diseases as necessity (25,26). The state is obliged to detain the people kept in prisons under healthy conditions and to take care of them if they become ill due to the conditions they are detained.

Public officials are under the obligation to take necessary protective measures to protect the lives of those under protection, as well as to avoid deliberate killing. It is a State obligation to protect prisoners with special needs in prisons, particularly elderly and / or prisoners with serious health problems, by providing appropriate and adequate health care (27). The European Court of Human Rights ruled that States are under an obligation to *provide preventive health care in terms of the physical integrity and health of prisoners and not to take practical preventive measures to prevent the spread of infectious diseases for detainees will be considered under Article 3 (28,29)*.

In order to protect the people held in places of detention and closure against human rights violations, especially torture and other ill-treatment, independent boards and mechanisms have been established and monitoring and auditing activities have been adopted. In all conventions and declarations, especially the United Nations

Universal Declaration of Human Rights, “Living, freedom and personal security are everyone’s right, no one can be tortured, cruel, inhuman, degrading, punishment or behaved discriminating, no one can be arbitrarily discriminated against. The common emphasis was that he could not be arrested, detained and banished, and had the right to open and fair trial”.

### Conclusions and recommendations

- In world, the COVID-19 pandemic should not be considered as an excuse for prisoners to be exposed to the risk of serious illness due to poor physical conditions of the places of closure or inadequate care. Despite the enforcement law, the number of prisoners remaining in prisons is still far above the capacity. Measures should be taken to reduce the number of prisoners taking into account the rate of new admissions through the year
- Accommodation conditions of prisoners are an important determinant for both physical and mental health. As stated in the Minimum Standard Rules for the Correction of Prisoners of the United Nations and the Mandela Rules, the adequacy of the windows that will allow the use of space per person, the amount of air, cooling and heating in accordance with the climatic conditions, lighting and daylight, it must have a bed of its own, a locker where it can safely put personal belongings and a use area. Arrangements should be made so that the common use and social areas are not overcrowded, the number of bathrooms and toilets required should be arranged according to the number of people.
- In the case of infectious diseases, measures such as early treatment of the patient, hospitalization during the period of infectiousness to prevent contact, determination of the contacts in the environment and immunization, chemoprophylaxis should be taken and special nutrition should be provided for these patients.
- Anyone suspected of being infected with COVID-19 virus should be able to access health care without delay, including emergency and specialist health care. Retention centers should develop close relationships and cooperation with general health services and other health care providers.
- Those released should be screened for medical care and measures should be taken to ensure the care and follow-up of those infected.
- Special attention should be given to the special health needs of the elderly and those with health problems, such as children held by their mothers, pregnant women and people with disabilities.
- While providing health care services, attention should always be paid to meeting gender-specific needs.
- Persons deprived of their liberty should be informed about preventive health measures and every effort to ensure the continuity and improvement of hygiene and cleanliness in the grip should be supported. Such measures should be sensitive to gender and age.
- In this context, it should not be forgotten that one of the guarantees of the effective implementation of preventive health measures is the training and information of the staff working in the institutions.
- Isolation or quarantine measures in all detention facilities, including detention centers, should be legal, proportionate and necessary, should be applied for a period of time and supervision, and the prisoner should not actually be placed in solitary confinement. The quarantine measures should have a time limit and should only be applied if an alternative preventive measure cannot be taken by the authorities to prevent or respond to the spread of the infection.
- It should be remembered that overcrowding of prisons also causes security problems. The environment should also include security measures to prevent physical or mental attacks by prisoner’s prison staff or other prisoners.

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# The Bulletin of Legal Medicine

Adli Tıp Bülteni

COVID-19 Pandemic and Forensic Medicine- Special Section

## Statement of the Ethics Committee of Turkish Medical Association on Disease Outbreaks

Salgınlara Yönelik Türk Tabipleri Birliği Etik Kurulu Görüşü

TMA Ethics Committee, 04/04/2020, Ankara

### Introduction

Communicable diseases and outbreaks have led to mass human morbidity and mortality throughout the history. Preventive health services are of essential importance in combating communicable diseases. Human intervention to the nature is causing even larger-scale destruction and outbreaks by disturbing natural life, ecological balance and ecosystems and existing inequalities. The most recent example is the on-going COVID-19 outbreak now defined as pandemic.

Global outbreaks bring along radical changes ranging from daily life habits to political, economic and cultural structure of societies. These changes have their most adverse effects on disadvantaged groups. It is clear that such outcomes can be prevented through democratic and scientific interventions upholding the interests of people.

### OUTBREAK MANAGEMENT

Communicable diseases differ from other diseases for risks they pose to others besides their processes of emergence as a result of social determinants of health. An effective combat against the outbreak entails the following: Protection through measures that are adopted at both individual and community levels; identification of active cases through widespread application of screening tests; diagnosis treatment and isolation of suspected cases; and tracing and tracing and quarantine of contacts.. This integrated process requires a public health approach guided by the science of epidemiology which brings together the accumulated knowledge of different branches of expertise. In outbreak management there is actually a race against time and therefore relevant decisions have to be taken without delay and measures have to be applied uniformly without any distinction.

In cases of outbreak, the maintenance and enhancement of relations of trust which is the basis of the relationship between the society and all components of medicine

gains further importance. It is clear that in building relations of trust the government has its primary responsibility with the Ministry of Health in the first place. It is of vital importance that the Ministry of Health gives sound and timely information to the public concerning the real dimension of the disease, ways of transmission, diagnosis, treatment and methods of protection. By observing the privacy of patients, the public must be enlightened with updated information about the characteristics of the epidemic in terms of time and space. Authorities must inform persons living in communities such as schools, factories, dormitories, prisons, military posts, etc. about the state of the epidemic and share required protective measures with their rationale.

Outbreak management requires communicating correct information about the seriousness of the situation without creating any panic environment. It is important to identify cases and to expose the true dimension of the epidemic. Scientific and predictable criteria must be developed for tests and methods of diagnosis and they must be applied to all without any distinction.

Preventing disease outbreaks, maintaining social order during crisis and maintenance of individual's trust in society all require community participation. In this context it is important that decision makers are all inclusive and ready to review their decisions with due account of alternative approaches. It must be kept in mind that, as the fundamental principle of public health ethics, solidarity and scientific methods and knowledge are keys to the solution of problems that are of interest to society.

Epidemics denote periods when routine health measures fall short of safeguarding public health. In combating epidemics, it may be necessary to restrict the autonomy and freedom of individuals regardless of whether they are ill or healthy as well as options in diagnosis and treatment. These restrictions must be applied in a way not to hurt human dignity and not to lead to the "otherization" and stigmatization of sick persons. The justification

for restrictions must be explained and decisions must be made by considering their financial and social consequences. Guaranteeing humane conditions in and fair application of restrictions, communication and transparency are all needed for community participation. All measures must be taken in line with scientific assessments. The application of these measures should not mean excessive restriction of fundamental rights and freedoms. It must be known well that human rights related obligations of the state do not cease to exist, but it is only some compulsory measures to combat the disease that lead to restrictions to rights and freedoms. It is therefore categorically unacceptable, on the pretext of the epidemic, to adopt sanctions which are not related to the disease. All restrictive measures must have their basis in law and be absolutely necessary, proportional, time-bound and respectful to human dignity.

In cases like staying home where personal freedom is restricted, public resources must be mobilized to respond to medical, economic and social needs of people staying home, material losses that may be incurred as a result of measures must be compensated for in line with the principles of social state, and practices of social solidarity must be developed. It is also important to prevent such tendencies as stockpiling and black marketing that intend to make profit out of crisis.

The measures for protecting from the outbreak must be strictly and carefully applied, nobody must be excluded, and the responsibility in adopting protective measures must not be left to individuals. All expenses in protection measures and treatment must be covered by public funds.

### **Confidentiality of personal information**

Sharing personal health information with others without the consent of the person concerned is violation of the right to respect to privacy. The underlying principles in the “TMA Declaration on the Protection of the Right to Privacy” are valid also in outbreak environments. To protect the patient from possible negative effect of restriction to privacy, necessary information is supplied proportionally to the existing threat and to persons who are capable of preventing any damage that could occur if this information is not supplied. The underlying principle in this regard is that the harm emerging from the disclosure of patient information is smaller than the harm expected in case it is not disclosed. The fulfilment by the state of the duty to inform the public rapidly, fully and correctly is one of the basic conditions of protecting the privacy of patients and confidentiality of their information.

### **Discrimination and stigma**

Epidemics may lead to stigmatization of specific communities or individuals. Discrimination and stigmatization in communities may also emerge on the basis of racism against specific communities or individuals. In the context of communicable diseases and particularly during disease outbreaks some people may be associated with the disease and made subject to discriminatory and degrading attitudes. Sick people, those who exhibit indications of disease, elderly people, refugees, etc. may be targets of discrimination and stigmatization and these people may choose not to apply for treatment with the fear of being stigmatized. Combat against epidemics must proceed together with combat against discrimination.

### **Disadvantaged population groups**

The duties of the state also include the following: Ensuring that disadvantaged groups including the elderly, persons with disabilities, refugees, people staying in institutions, etc. have their access to health services, enjoy fair share from resources, live in safe environments, protected against discrimination and stigma, receive health services and information in their native languages and saved from disproportionate burden of the disease. As required by the principle of upholding public interest, it is important to support persons and groups facing excessive burden and risk. Any approach that may lead to discrimination must be avoided given that sex and gender differences may bring along gaps in susceptibility to infection, levels of health services received, and the course and consequences of the disease.

The measures introduced by the state to combat and control disease outbreaks must be applied equally to all without any distinction. This includes measures adopted in places of isolation to prevent further damages of the outbreak. Principles enshrined in Turkish Medical Association (TMA) Declarations on “Medicine and Human Rights” and “Individuals Deprived of their Freedom” must be observed during epidemics as well. The concept of equality requires the State to introduce additional measures through positive discrimination for disadvantaged groups.

### **Obligations of managers of health facilities**

Besides policies formulated at macro-level, also important are the duties of managers in local health facilities to be prepared, to introduce the appropriate plan at the right time, to support health workers and ensure their safety and security. There must be institutional policies on how health workers will serve under what conditions,

measures for their protection, and their rights and responsibilities; their participation to the process must be ensured and policies developed must be shared transparently with health workers.

In outbreak management, it is important to identify the rights and responsibilities of associations of professional specialization including medical specialties, labour and professional organizations as well as local governments and to translate into life the principles of coordinated work at all stages by adopting a dynamic approach taking due account of changing circumstances.

### International cooperation

Given that it is the duty of the state to ensure the realization of the right to health, it is the ethical obligation of governments to make sure that systems necessary to prevent any outbreak and intervene when it occurs are effective, of desired quality and inclusive. The obligation mentioned must be taken to encompass international community as well beyond individual nations. The first step in realizing this is immediate and transparent notification of international community. Information sharing at international level is important in stopping the pandemic and safeguarding the right to health and life. All individuals and units engaged in these efforts must cooperate by timely sharing of relevant and correct information.

At this point it is important to consider the general comment of the UN Committee on Economic, Social and Cultural Rights which states, “(...) given that some diseases are easily transmissible beyond the frontiers of a State, the international community has a collective responsibility to address this problem. The economically developed States parties have a special responsibility and interest to assist the poorer developing States in this regard.”

### Surveillance

The presence of an active surveillance system that is reliable and of required quality is essential to keep the epidemic under control. The active surveillance must encompass the identification of cases, control of contacts and keeping of records that will allow for the analysis of data through studies on the origin of the disease and contacted persons. In every case, however, there must be full protection of rights and freedoms and privacy of persons and transparency as to who will collect information and use it for which purposes.

### Role of the media

The media too has the responsibility, in line with ethical principles, to question the accuracy of information

supplied and to supply correct information to the public in case earlier information has its flaws and loopholes. With a quite important role in combating the disease, it is very important for the media to avoid short-cut and populist approaches, discourses that may lead to panic, and to adhere to ethics and responsible conduct. It must not be forgotten that letting excessive worries emerge or belittling the epidemic will eventually weaken combat against communicable diseases. The media cannot be a culprit to concealment of information concerning the disease with the exception of patient privacy.

Social media offers wide possibilities for information dissemination in our present day world. In order to prevent the dissemination of misinformation in social media it is important that the Ministry of Health, labour and professional organizations, universities and health organizations keep informing the public with update, evidence-based and correct information. Each individual, particular the physician have their ethic responsibility to avoid disseminating information not yet confirmed.

## HEALTH SERVICES

Health services must continue in epidemics in environments that pay utmost attention to patient safety and in line with professional medical standards. When the case is communicable diseases caused by a newly identified agent, it is the duty of the state to train health workers together with their professional organizations and ensure their professional development. The delivery of quality and accessible health services to all gains further importance at times when communicable diseases are more frequent and common. Individuals who are suggested medical intervention for the diagnosis, treatment and prevention of an infectious pathogen must be informed about risks, benefits and alternatives as is the case with other medical interventions. It must be kept in mind that the ultimate decision about which medical interventions are to be accepted in the process rests with the patient. However this condition related to the consent of the patient may be overlooked when there are strong indicators that there may be serious public health risks and no other way is possible to eliminate these risks and protect public health including the isolation of the patient.

It is also among the duties of the state to keep delivering other health services during the outbreak, to ensure the quality and accessibility of these services to all and to plan for fair allocation of health services and resources.

As one of the most crucial points in delivering health services, personal protective equipment (PPE) must be regularly provided to health workers in sufficient quantities. Any shortage in this respect is unacceptable and

failure in providing PPE is a risk factor in itself. Scarcity of resources cannot be an excuse for shortage of protective equipment. Further, it is also unacceptable to go to prioritization in the provision of protective equipment to health workers on the pretext of limited resources.

An effective combat against a disease outbreak largely depends upon dedicated contributions of health workers. Health workers take significant personal risks in this process. Some health workers may be from the most disadvantaged groups in the society and may have little control over duties they are assigned to perform. These health workers deserve special protection since the risks they face is higher. The obligations of the state to health workers during outbreaks include, regardless of whether the health worker has a pre-determined duty involving higher risks, the minimization of existing risks, priority in access to treatment, psychosocial support, improvement in social rights and benefits, assistance in post-outbreak participation to society, support to family members and transparent information. In cases where sufficient protection is not provided, health workers have their right and responsibility to take necessary initiatives for the correction of the situation as soon as possible.

### **Limits to service delivery obligation**

The TMA Declaration on the Rights of Physicians clearly defines the rights of the physician vis-à-vis patients and society. As in other health issues, the physician must approach persons in need of healthcare by sticking to the principle “First, do no harm.” In epidemics, all health workers are under the risks of getting infected. Consequently, the state has its positive duty to protect health workers, their family members and those who may get infected from them. While performing this duty the state must organize working conditions in a way not to force the physician to make a choice between his life and others’ and supply health facilities necessary materials and equipment including PPE sufficient to respond to the needs of all health workers. Having regular health controls including diagnostic tests of health workers working under high risk is one of the important tools in performing this duty. Transmission to health workers as a result of their professional practice must be defined as work accident and occupational disease and all rights of physicians in this context must be safeguarded.

The ethical responsibilities of health workers include demanding protective and preventive measures to curb the further spread of infection and practice these measures and also report the case when they are infected and temporarily stay away from work until full recovery. In

this respect, there must absolutely be written applications about any missing health and safety measures.

The right of health workers to work in safe and secure environments is defined in the TMA Declaration on the Health and Safety of Workers and the Rights of Physicians. It must be known that when infected or there is vital risk to their health, the service obligation of health workers cannot be without limits. In such cases, health workers cannot be forced to work unless necessary health and safety measures are taken.

### **Allocation of resources**

In the face of such emergencies as disaster and epidemics, health systems may fall short of some facilities like medicine or intensive care beds. In such cases, the state is expected to introduce arrangements to keep up with changing circumstances. Triage may be necessary in deciding about resource allocation. Triage protocols aim to ensure rule-based, fair and transparent allocation of scarce resources and to maximize chances of survival for common good.

When triage becomes necessary, necessary measures must be taken to protect the rights of patients to life and treatment. Triage is carried out by applying the criteria of exclusion, assessment of mortality risk and the progress that the patient makes. The ethics in triage focus on the principles of fairness, benefit and equality.

The responsibility for triage must not be left solely to the physician taking care of the patient. A National Board of Ethics on Triage must be established with the participation of relevant parties to define the principles of triage, justification and triage protocols. Principles and protocols laid down by this board must be updated as circumstances change. Physicians must implement principles and protocols determined by the national board of triage ethics. In case there is any hesitation in implementing principles and protocols, the national board must develop an opinion either upon request or ex officio.

### **Pressures on health workers**

During outbreaks there may be political pressures on health workers. Further, chaotic environments caused by outbreaks may trigger violence against health workers. Timely and correct information to the public by health authorities and a transparent flow of information is the key to prevent any confrontation between patients and health workers.

In environments of epidemic, the state must perform its duties of providing physicians conditions for their scientific work complying with codes of ethic, protecting their professional autonomy and clinical independence

and preventing any act of violence targeting health workers and introduce necessary arrangements to ensure all of these.

## RELATIONS AMONG HEALTH WORKERS

Epidemics may lead to fear and concerns among health workers. Prolongation of crisis, increased risks and colleagues falling ill may bring along even higher concerns, frustration and exhaustion. In such chaotic periods health workers will have higher chances of performing their duties in solidarity if health authorities manage the process well with clear job definitions, algorithms related to the maintenance of health services, availability of sufficient PPE and reasonable working conditions. Professionalism and solidarity in the light of scientific facts must be the foundation of relations among health workers.

## SCIENTIFIC RESEARCH

During an epidemic, some studies may be planned in advance to keep the science updated and fresh in both combating the on-going epidemic and preventing similar ones in the future. It is important to ensure that these studies are sensitive to relevant ethics and in conformity with the Helsinki Declaration. In such studies, public health and appropriate clinic care must not be jeopardized, they must be planned with appropriate scientific methodology, harm/benefit balance must be observed, volunteer selection must be fair, and scientific findings obtained must be quickly shared. The society as a whole and individuals must have free and equal access to the outcomes of scientific studies. Ethical concerns must be observed in the transfer of biological specimen collected during the study to other countries and confidentiality of personal data must be protected.

### Practices yet at research stage

In the context of the epidemic, the immediate use of a practice whose scientific merit is yet not proven may be ethically acceptable in case the following criteria specified by the WHO are met and on the condition that outcomes are documented and shared with a wider medical and scientific community:

1. Absence of any proven effective treatment.
2. Data providing ex-ante support to the effectiveness and safety of the practice must have been obtained from laboratory work or work on animals and the use of the practice out of clinic research must be suggested on the basis of risk-benefit balance by a scientific board established upon the outbreak.
3. Approval from a duly qualified board of ethics.
4. Sufficient conditions for minimizing possible risks.
5. Informed consent from the patient.

## AFTERWORD

The pandemic we are experiencing today has made it clear that neoliberal policies describing the world as a “global village” and the associated healthcare system are in collapse and that public sector based health policies are no luxury but a fundamental human right. Approaches such as “let the stronger live” deriving from higher mortality among elderly people and those with chronic diseases must be categorically rejected. Also unacceptable are tendencies and practices trying to dig for opportunities in crisis like stock piling, black marketing, mass layoffs, increasing work burden in home-based work, pulling wages down, ethnic discrimination, xenophobia, etc.

In the face of outbreaks, we must stick to fulfilling our responsibilities and keep struggling on the common denominator of humanity by addressing all adversities in a holistic manner and without giving up science and our citizenship rights. The conditions we are going through at present show once more the importance of being prepared for emergencies, developing policies for extraordinary situations and completion of service planning and infrastructural preparations.

Since public health has a meaning beyond the sum total of the health status of individuals, it must be noted that there is need for social solidarity and collective struggle to achieve common good.

**Ethics Committee of Turkish Medical Association,**  
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