

RECOGNITION OF COVID-19 AS AN OCCUPATIONAL DISEASE IN POLAND – DEFINITION, CRITERIA AND RECOMMENDATIONS

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ABSTRACT

A major challenge over the pandemic period was to establish the criteria for recognizing COVID-19 as an occupational disease. The European Center for Disease Prevention and Control has attempted to estimate the incidence of COVID-19 in individual occupational groups and economy sectors in the European Union and the United Kingdom, and to identify possible factors increasing the transmission of the virus at workplaces. Legal regulations of various countries in the world allow COVID-19 to be recognized as an accident at work and/or an occupational disease. In Poland, an occupational disease is defined as a disease caused by harmful factors occurring in the work environment or connected with performing a given job, included in the official list of occupational diseases. When assessing occupational exposure in the healthcare sector, it should be considered that healthcare workers include all persons in contact with patients or their biological material, as well as employees who are not medical professionals but who share a common space with patients due to the nature of their work. The latter group includes administrative and technical employees, control and rescue service workers, people supporting medical staff, and employees of nursing homes. In the case of non-medical occupations, the decision to recognize COVID-19 as an occupational disease should be made on an individual basis, after confirming a significant risk of contracting a SARS-CoV-2 virus infection at the workplace and in the absence of evidence of a non-occupational source of infection. An assessment of occupational exposure should always include evaluating the possibility of SARS-CoV-2 transmission. *Med Pr Work Health Saf.* 2023;74(5):435–42.

Key words: occupational exposure, occupational disease, employees, infectious disease, SARS-CoV-2 virus, COVID-19 pandemic

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INTRODUCTION

The epidemiological and medical criteria for diagnosing COVID-19 were effectively implemented and were similar in most countries. However, a major challenge over the pandemic period was to establish the criteria for recognizing COVID-19 as an occupational disease, considering the rapid spread of SARS-CoV-2 in both occupational and non-occupational settings.

For the purpose of epidemiological supervision in Poland, several conditions had to be met to diagnose COVID-19. One of them concerned the clinical criteria, i.e., symptoms such as cough, fever, shortness of breath, abrupt onset, loss of smell, sudden onset, and loss or disturbance of taste. Nonetheless, some SARS-CoV-2 infections were asymptomatic or mildly symptomatic (27–40% of all cases), resulting in difficulties in managing virus transmission between workers [1].

According to the Polish epidemiological criteria (published by the Chief Sanitary Inspector on October 31, 2020), a COVID-19 case was defined as any person who met

at least one of the following criteria within 14 days before the onset of symptoms:

- 1) close contact with a person diagnosed with a SARS-CoV-2 infection (contact with a confirmed or probable case),
- 2) staying (as a resident) or working in a care/long-term care facility where COVID-19 transmission was confirmed.

The Chief Sanitary Inspector also provided a classification of individual cases and definitions of possible, probable and confirmed COVID-19 cases [2].

The aim of the paper is to present the recommendations developed in Poland for the recognition of COVID-19 as an occupational disease.

METHODS

The authors undertook a variety of approaches to achieve the assumed objective. First, they performed a systematic bibliographic search covering the period of 2019–2023 through the library services available in

PubMed and Google Scholar databases to identify relevant information on the COVID-19 occupational recognition criteria and the risk of contracting COVID-19 in occupational settings. The synthesis of searching terms was as follows: “COVID-19” and “occupational exposure,” “COVID-19 in the workplace,” and “occupational COVID-19 recognition criteria.” Studies focusing on occupational exposure to COVID-19 and its recognition criteria were included. The exclusion criterion was no occupational risk of COVID-19.

Second, the authors surveyed the current practice of recognizing COVID-19 as an occupational disease among members of the Occupational Medicine Section of the European Union of Medical Specialists.

Third, a short questionnaire was performed, followed by face-to-face discussions among regional consultants and executive committee members of the Polish Society of Occupational Medicine.

Additionally, the analysis of the existing Polish and EU regulations referring to the recognition of COVID-19 as an occupational disease was performed. A final consensus was reached through discussions involving key experts from the Nofer Institute of Occupational Medicine in Łódź and the Polish Society of Occupational Medicine.

RESULTS

Epidemiology

According to WHO data (as of July 26, 2023), 768 237 788 cases (cumulatively) were recorded since the beginning of the pandemic, of which 6 951 677 people (cumulatively) died. The course of the pandemic is wave-like, with peaks of new cases occurring in the autumn-winter season and in the spring [3]. An important indicator characterizing the transmissibility of infectious diseases is the virus reproduction rate (RO), defined as the expected number of secondary cases caused by a confirmed primary case in a completely susceptible population. This parameter is used to determine the disease's ability to spread in a given population. For COVID-19, the virus reproduction rate varies from country to country. According to the WHO, its value ranges 1.4-2.4, and in Poland it is estimated at about 1.55 [4].

The infectious period precedes the onset of clinical symptoms of COVID-19 by about 3 days, which is of key importance in the spread of the epidemic. Importantly, during the incubation period, the person infected with SARS-CoV-2 does not know that he/she may be the source of infection for the others [5]. The management of this risk was crucial in eliminating

the transmission of SARS-CoV-2 in the workplace environment. The following risk factors influence the occurrence of an infection [6]:

- exposure, which may include:
 - exposure to aerosols containing infectious material, especially in people performing “essential” work,
 - lack of an appropriate personal protective equipment,
 - work in human clusters,
 - lack of ventilation,
 - prolonged face-to-face or physical contact/situation where social distancing cannot be maintained;
- vulnerability, which consists of:
 - demographic factors (older age, male gender),
 - comorbidities (hypertension, diabetes, ischemic heart disease, chronic obstructive pulmonary disease, kidney diseases, cerebrovascular diseases, immunosuppression),
 - smoking,
 - living in areas with high air pollution,
 - limited access to healthy food,
 - lack of physical activity.

Occupational exposure

The European Center for Disease Prevention and Control has attempted to estimate the incidence of COVID-19 in individual occupational groups and economy sectors in the European Union and the United Kingdom, and to identify possible factors increasing the transmission of the virus at workplaces. The cases covered various professional groups that are not only healthcare and social care workers but also uniformed services, office workers, and employees of the education and industrial sectors. Most outbreaks occurred in healthcare and social care workplaces, followed by food processing workplaces, mines and factories/manufacturing facilities [7].

Healthcare workers are the group significantly exposed to a variety of biological agents, especially infectious pathogens, including *Mycobacterium tuberculosis*, influenza viruses, SARS, and measles [8]. Among healthcare professionals, the following factors may contribute to the transmission of these pathogens:

- close/direct contact with sick people and/or their biological material,
- lack, insufficient or improper use of personal protective equipment,

- work in closed rooms with no/insufficient ventilation of the rooms,
- sharing a common social space with other co-workers (e.g., canteen, doctor's room, sanitary facilities),
- shared accommodation, transport and/or non-professional activities.

In occupational groups other than healthcare professionals, other factors that may increase the risk of contracting a SARS CoV-2 infection are identified:

- sharing the same office space, social rooms (e.g., canteens), sanitary facilities, working on the same production line or within the same workspace,
- maintaining social contacts with each other, also outside the workplace,
- working in tight or confined spaces with no social distancing,
- shared transport,
- shared locker rooms,
- lack of the possibility to wash hands,
- staff meetings and training [8].

Diagnosics of SARS-CoV-2 virus infections

Diagnostic methods and laboratory tests enabling the diagnosis of SARS-CoV-2 infections include:

- 1) molecular tests detecting the genetic material of the virus or antigen tests in the biological material obtained from a patient. The most common molecular test is the real-time reverse-transcription polymerase chain reaction (RT-PCR) test. The material for testing includes aspirates taken from the lower respiratory tract, i.e., the bronchial alveolar lavage and spontaneous sputum. The most common method, however, is to collect material from the upper respiratory tract - the nasopharynx or from both the nose and throat mucosa [9]. To improve access to diagnostic tests and reduce diagnostic costs, antigen tests have been introduced to detect SARS-CoV-2 infections. They allow for quick (15-30 min) SARS-CoV-2 diagnostics and thus quick identification of infected people (their use remains limited to the initial infection period) [10];
- 2) serological tests detecting human antibodies (class IgA, IgM, IgG) directed against specific antigens of the virus. The research material in this case is the patient's blood (plasma or serum), and the test technique uses mainly immunoenzymatic methods (usually the ELISA method). This test cannot be used to detect infections at an early stage, due to a delayed process of producing antibodies by the immune system. The serological tests are used to monitor the immune status of people with COVID-19

(IgM seroconversion to IgG and immunity), and in population studies to assess the prevalence of contact with the virus and to identify convalescents with acquired immunity [10].

Recognizing COVID-19 as an occupational disease

In Poland, the definition of an occupational disease is regulated by the Act of June 26, 1974 - the Labor Code. An occupational disease is defined as a disease caused (without any doubt or with high probability) by harmful factors occurring in the work environment or connected with performing a given job, included in the official list of occupational diseases [11].

According to the recommendations of the Nofer Institute of Occupational Medicine and the Polish Society of Occupational Medicine, COVID-19 as an occupational disease can be recognized in the case of:

- confirmation of a the SARS-CoV-2 virus infection based on:
 - a positive result of a molecular test performed by the nucleic acid amplification test method, which is, e.g., an RT-PCR test confirming the presence of genetic material of the SARS-CoV-2 virus in a swab collected from the respiratory tract,
 - or
 - a positive result of an antigen test (detecting the presence of protein antigens of the SARS-CoV-2 virus in a swab collected from the respiratory tract using antigen tests),
 - or
 - a positive result of a serological test (detecting the presence of anti-SARS-CoV-2 antibodies in a venous blood sample),
 - and
 - documented symptoms of the disease, i.e., recorded in the medical documentation. An asymptomatic infection, which was used for epidemiological evidence, is not sufficient to diagnose the disease. A long-term presence of SARS CoV-2 in biological material in the absence of clinical symptoms should be considered as a carrier status, which is consistent with generally accepted principles of diagnostic procedures of infectious diseases.
- In the case of healthcare workers, in the absence of clear evidence of a non-professional source of infection, the diagnosis of an occupational disease is possible after demonstrating permanent work in direct contact with patients, and not only those who have been confirmed to be infected with the SARS-CoV-2 virus [12].

The guidelines published in Poland in 2021 indicated that the period in which the symptoms of the disease occurred should not exceed 14 days from occupational exposure [5,12]. The above specification, which concerns the period after the cessation of occupational exposure, in which the diagnosis of an occupational disease is still justified, is not valid in the context of “post-COVID” or “long-COVID” cases. The post-COVID-19 syndrome is defined as complaints and symptoms that develop during or after COVID-19 and last >12 weeks, and are not due to another diagnosis and may also be considered as the result of occupational exposure [13,14].

When assessing occupational exposure, it should be considered that healthcare workers include all persons in contact with patients or their biological material, as well as employees who are not medical professionals, but who share a common space with patients, due to the nature of their work. The latter group includes administrative and technical employees, control and rescue service workers, people supporting medical staff, and employees of nursing homes.

The guidelines do not specify the minimum duration of occupational exposure due to the mode of transmission of COVID-19 although it should be assessed in each case individually.

It is worth mentioning that the provision of appropriate personal protective equipment by the employer, and the subsequent supervision of its use, minimizes the risk of contracting an infection but does not reduce it completely. Therefore, providing an employee with personal protective equipment and disinfectants at the workplace does not exclude the possibility of recognizing COVID-19 as an occupational disease.

Infectious and parasitic diseases have been the most frequently diagnosed occupational diseases in Poland for years. According to data published by the Central Register of Occupational Diseases, maintained at the Nofer Institute of Occupational Medicine, in 2022, a total of 2637 cases of occupational diseases were registered in Poland – the most frequently registered ones

were infectious or parasitic diseases or their consequences – 1412 cases, i.e., 53.5% of all occupational diseases. In this group, COVID-19 accounted for the vast majority (1053 cases, 39.9%) and was mainly recognized among healthcare workers (Table 1) [15].

COVID-19 AMONG NON-MEDICAL PROFESSIONS

In the case of healthcare workers, the causal relationship between exposure and the disease is usually unquestionable, as described above. However, it is tough to confirm an occupational etiology in cases where the SARS-CoV-2 virus is not a typical workplace exposure. The pandemic situation and the spread of infections in the general population increased the non-occupational risk of environmental exposure.

According to recommendations from other countries, as well as opinions expressed by Polish experts, in the case of non-medical occupations, the decision to recognize COVID-19 as an occupational disease should be made on an individual basis, after confirming a significant risk of a SARS-CoV-2 virus infection at the workplace (e.g., after evidencing long-term and close contact with people diagnosed with COVID-19), and in the absence of evidence of a non-occupational source of the infection [12]. In the course of assessing occupational exposure, it is necessary to consider the possibility of SARS-CoV-2 transmission [16–19].

The evaluation of occupational exposure to biological agents, such as the SARS-CoV-2 virus, includes the possibility of bioaerosol spreading in the workplace air. In the context of research on the SARS-CoV-2 virus, aerosol particles include droplets or droplet nuclei (dried droplet residues) in the ambient air, which may contain infectious agents (pathogens). The size of the SARS-CoV-2 virus is 0.1 µm and it is transmitted by air-droplet, airborne and contact transmission [20,21]. Importantly, high virus emission values have been found in asymptomatic individuals with SARS-CoV-2, both under light exertion of speaking (i.e., slow walking)

Table 1. Occupational disease cases recorded during the pandemic period (2020–2022) in Poland, including infectious or parasitic diseases, or their sequels, published by the Central Register of Occupational Diseases [15]

Year	Occupational diseases cases [n]		
	total	infectious	COVID-19
2020	1850	505	38
2021	2543	1384	968
2022	2637	1412	1053

and under heavy exertion with mouth breathing, while symptomatic patients at rest usually display low particle/droplet emissions [22]. Some studies have shown that the SARS-CoV-2 virus was present in the bioaerosol for at least 3 h, and in patient isolation rooms, it was present in the bioaerosol collected at distances exceeding 2 m. Droplets are formed more often at high temperatures and low humidity but they can be transported over distances up to 3 times greater in low temperatures and high humidity [16,19,22,23].

In summary, the most important factors determining the risk of contracting a SARS-CoV-2 infection include:

- active virus content in the aerosol particle/drop (the so-called viral load),
- exposure time,
- size, diameter and shape of the aerosol particles,
- ambient temperature and humidity,
- number of people in the room,
- ventilation level.

Due to the wide spread of the SARS-CoV-2 virus outside workplace settings, it may prove challenging to determine undisputedly or with high probability (according to the definition of an occupational disease) that the COVID-19 disease was caused by factors harmful to human health occurring in the work environment.

While establishing the criteria in Poland, it was noted that an occupational exposure assessment is crucial for determining the risk for individual occupations. According to the WHO recommendations, the authors of this article identified and divided occupations depending on the risk of transmission of the SARS-CoV-2 virus [24]:

- Occupations with a very high risk of transmission of the SARS-CoV-2 virus, with a high potential for exposure to known or suspected sources of COVID-19 during certain medical, post-mortem or laboratory procedures:
 - healthcare professionals (e.g., doctors, nurses, dentists, paramedics) performing aerosol generating procedures (e.g., intubation, cough induction, bronchoscopy, certain dental procedures or invasive biopsy) on patients with suspected or confirmed COVID-19;
 - medical or laboratory personnel collecting biological material or working with material from patients with suspected or confirmed COVID-19 (e.g., swabs, cultures);
 - *post-mortem* (dissecting) facility staff performing autopsies, which typically involve aerosol-generating

erating procedures, on the bodies of individuals with suspected or confirmed COVID-19.

- Professions with a high risk of SARS-CoV-2 virus transmission:
 - medical and support staff (e.g., doctors, nurses and other hospital staff who need to enter patient rooms) exposed to suspected or confirmed COVID-19. Importantly, when workers in this risk group perform aerosol generating procedures, their exposure level becomes very high;
 - medical transport workers (e.g., ambulance drivers) transporting patients with suspected or confirmed COVID-19;
 - employees of dissection rooms and other post-mortem facilities dealing with the preparation, e.g., for burial or cremation, of the bodies of people known to have had COVID-19 or suspected of having it at the time of their death.
- Professions with an average risk of SARS-CoV-2 virus transmission, requiring frequent and/or close contact with people who may be infected with SARS-CoV-2, but have no suspicion or confirmation of COVID-19:
 - close contact means contact within 2 m;
 - in areas where there is currently no population/community transmission, workers at risk may be in frequent contact with travelers who may be returning from areas where COVID-19 transmission is common; in areas where there is current population/community transmission, workers at risk may come into contact with the general public (e.g., schools, work environments with a large concentration of people).
- Occupations with a low risk of SARS-CoV-2 transmission, not requiring contact with persons known or suspected to be infected with SARS-CoV-2, and not having frequent or close contact with the general public: workers in this category have minimal professional contact with the public and other colleagues.

According to Polish recommendations, in the case of professions not related to healthcare, the occupational etiology of COVID-19 can be considered in employees performing professions with a moderate risk of SARS-CoV-2 virus transmission only in the absence of epidemiological evidence of a non-professional infection (i.e., no contact with a person infected with SARS-CoV-2 was recorded in the sanitary and epidemiological proceedings; the patient has not previously been in quarantine due to such contact) [25].

COVID-19 as an accident at work or an occupational disease

Currently, legal regulations of various countries in the world allow COVID-19 to be recognized as an accident at work and/or an occupational disease. These data can be obtained from national statistics on accidents at work or occupational diseases, respectively, in the case of European countries – the European Statistics on Accidents at Work and the European Statistics on Occupational Diseases [26]. Member states of the European Union declare that COVID-19 should be recognized as an occupational disease in the health, social and home care sectors [25].

In different European countries, there are different criteria for linking COVID-19 with work, most often depending on the type of work-related activities, and the perspective of occupational health and safety. A case of COVID-19 in an employee can be considered [26]:

- only as an accident at work (Spain, Slovenia and Italy);
- only as an occupational disease (Bulgaria, Cyprus, Croatia, Czech Republic, Estonia, France, Hungary, Latvia, Lithuania, Luxembourg, Malta, Norway, the Netherlands, Poland, Portugal, Romania, Slovakia, Switzerland and Sweden);
- as an accident at work or an occupational disease (Austria, Belgium, Denmark, Germany and Finland).

Prevention of COVID-19 due to workplace exposure

Recommendations regarding preventive measures and protection against SARS-CoV-2 virus infections were consulted by the Nofer Institute of Occupational Medicine and published by the Ministry of Health in March 2020 [27]. The most important instructions concern [27]:

- limiting the number of employees staying at the workplace at the same time by delegating as many people as possible to remote work or by introducing a rotation or shift working time system;
- conducting administrative activities, conferences and training via the Internet;
- introducing restrictions on business trips and foreign trips (employees might refuse to go on such trips if the transmission of the SARS-CoV-2 coronavirus has been confirmed at the destination);
- performing daily disinfection procedures of frequently touched surfaces in the workplace, such as door handles, desks, keyboards, worktops at workstations, sinks, toilets, soap dispensers and others;

- providing employees with general access to skin disinfectants at the entrance to the workplace and in toilets, in packaging not requiring touching with fingers (activated automatically, possibly with the elbow or the forearm), as well as, if possible, sprays or disposable wipes soaked in disinfectants, which employees could use it independently before and after work;
- reminding employees (e.g., via e-mails or posters displayed in visible places) about the need to maintain a social distance of ≥ 2 m from other co-workers, to observe proper hygiene rules when sneezing, grunting, coughing, yawning into a tissue, to avoid touching one's eyes, mouth and nose, as well as the rules of proper hand washing with soap and water for at least 20 s and the use of disinfectants that should be thoroughly spread on the dried skin of the hands, including in the spaces between the fingers, and left for at least 20 s;
- informing employees (via e-mails, intra/web platform, etc.) about the need to stay at home in the case of displaying any respiratory infection symptoms, especially cough, shortness of breath and fever (i.e., body temperature measured in the armpit, forehead, temple or neck, reaching $>38^{\circ}\text{C}$) until these symptoms disappear completely (spontaneously, not under the influence of drugs).

The most effective method of preventing the transmission of infections and disease complications is specific prophylaxis, i.e., protective vaccinations. Specific immunization protects employees against a severe course of the disease, thus reducing the risk of permanent negative health consequences and sickness absence. Vaccinations against the SARS-CoV-2 virus causing COVID-19 were mandatory for healthcare workers with the requirements of the Ministry of Health Regulation [28–30]. At present, it is not obligatory in Poland, but it is recommended especially for employees from high and very high risk groups of contracting virus infections at work, and for employees with comorbidities and elderly people. These vaccinations should be carried out in cooperation with the occupational medicine service, possibly also in the workplace.

KEY INFORMATION REGARDING THE DIAGNOSIS OF AN OCCUPATIONAL DISEASE

- The COVID-19 occupational disease can be diagnosed definitely or with high probability among healthcare workers and other employees who have a direct contact with patients or their biological material, or who work in places where patients are present.

- In the case of non-medical professions requiring contact with other people (with a moderate risk of contracting a SARS CoV-2 infection), it is necessary to confirm work-related contact with a sick person and exclude any possible environmental infection through sanitary and epidemiological procedures.
- Distinguishing between asymptomatic SARS-CoV-2 infections and the COVID-19 disease is crucial. For the diagnosis of COVID-19, documentation of the symptoms of the disease is needed. An asymptomatic infection is not sufficient for diagnosing COVID-19 as an occupational disease.
- Short occupational exposures (<15 min to 1 person) do not pose a significant risk of contracting the infection in the workplace.

Author contributions

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