

LETTERS

Can beaches and bathing environments represent a risk of spreading COVID-19? *Le spiagge e gli ambienti balneari possono rappresentare un rischio di diffusione di COVID-19?*

Dear Editor:

The emergence of new viruses with a high epidemic potential is often the result of complex dynamics involving humans, animals and environments (1). Coronaviruses belong to the *Coronaviridae* family, which includes viruses capable of infecting humans and causing a wide range of clinical symptoms, from the common cold to even lethal respiratory syndromes. In the past few years, we have dealt with the Severe Acute Respiratory Syndrome (SARS) and the Middle Eastern Respiratory Syndrome (MERS). On 11 March 2020, the World Health Organization (WHO) declared as Coronavirus Disease 2019 (COVID-19) – the new disease caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) that quickly spread throughout the world – a pandemic.

Some Authors have suggested that person-to-person transmission is a likely route for the spread of the new coronavirus infection (2, 3), primarily via direct contact or through Flügge droplets, sneezing, coughing from infected individuals. Transmission can also occur by indirect contact if objects and/or surfaces are contaminated by secretions from infected subjects or asymptomatic carriers (presenting no fever and only mild or no symptoms). In the latter case, the situation is even more critical, because there are no safe and scientifically documented techniques yet for quickly and effectively identifying asymptomatic people.

Several recent studies have shown that SARS-CoV-2 is present in the feces and urine of infected people, in the bioaerosol from washing toilets and can survive up to several days in an appropriate environment outside the human body (4-8). Therefore, the possibility that this virus can contaminate bodies of water (seas, surface and groundwater) represents a public health problem.

As countries have started lifting restrictions related to the COVID-19 pandemic, global attention has turned towards the approaching summer season, especially in areas along the sea where tourism is an important asset for local communities, also for its economic impact. Other important considerations are the long known beneficial effects of marine air and the sea on physical and mental health (9).

Italy is the European country with the largest number of bathing water sites (representing about one quarter of the total European bathing areas) and it has more than 50,000 maritime state concessions, 11,000 of which are for “*stabilimenti balneari*” (literally “bathing facilities” or “bathhouses”) privately run. Beach operators are seeking detailed information on how to organize their businesses for next summer to ensure their patrons’ health and safety and to manage the summer season with utmost security.

The purpose of this Letter is to provide some hygienic and sanitary indications for promoting and maintaining proper practices to reduce the risk of SARS-CoV-2 spread on beaches and in tourist venues frequented by bathers. The authors do not pretend to be exhaustive. Many aspects concerning the characteristics of SARS-CoV-2 have yet to be investigated, but we hope to make a modest contribution to sea-loving tourists, pending guidelines on this topic.

Indications for beach managers and operators

Access to tourist establishments and beach activities must be regulated, hand sanitizers made available at the entrances, facemasks always used and mandatory routes traced out for customers to reach their assigned positions.

In the case of particularly popular beaches with many patrons, accesses must be adequately planned to avoid close contacts between people belonging to different families.

Managers and operators must have a supply of facemasks and disinfectant solutions on hand that may be provided to bathers in case of need. Disinfectant dispensers must be available in adequate numbers and positions (at the entrances, near refreshment areas, toilets and showers, etc.).

Employees must receive proper training.

Physical distancing of at least 1 meter must always be guaranteed, especially in gathering places such as beach bars, showers and changing rooms.

Beach umbrellas must be at least five meters apart and deckchairs and sunbeds must be properly sanitized every time bathers leave the beach.

At the end of each day, dressing rooms, refreshment areas (including chairs, tables, counters, railings and handles) and beach umbrellas must be scrupulously treated with effective detergents and disinfectants (0.1% sodium hypochlorite solution or with 70% ethyl alcohol), depending on the surface to be treated.

In case of accidental spillage of sewage into the sea or on the coast due to a sewerage system failure, managers must put in place bathing bans, in accordance with the provisions of the local health authorities.

Signage reminding visitors of proper hygiene practices and social distancing requirements must be installed at the entrances and / or in strategic areas. Rules must be spelled out clearly and legibly (e.g. mandatory and proper handwashing), and printed not only in Italian and English, but also in the other languages most commonly used by the patrons.

Indications for bathers

Bathers must avoid going to the bathhouses and staying on the beach if their health condition is not optimal.

Wearing facemasks is mandatory on the beach when in the presence of people who are not family members.

Bathers must always comply with the social distancing requirement of at least 1 meter, especially in the more crowded areas. Parents are to always make sure children maintain safe behavior and avoid letting them in direct contact with the sand for long periods.

Children are to be taught not to put their hands in their mouth after playing with the sand (children are often asymptomatic subjects and can easily transmit the virus to other children or adults).

Once at home, all clothes and towels used on the beach must be washed, adding a disinfectant.

Consideration and Conclusions

The specific characteristics of bathhouses, as they accommodate a large number of people especially on weekends, as well as the multiplicity of activities that can be carried out on the beach (e.g. heliotherapy, bathing, recreational activities) pose particular critical issues regarding the containment of COVID-19.

The survival of human coronaviruses (SARS, MERS) or zoonotic coronaviruses (Transmissible Gastroenteritis Virus [TGEV], Mouse Hepatitis Virus [MHV] and Porcine Epidemic Diarrhea Virus [PEDV]) has been evaluated in water environments (10, 11), but how long and how much the SARS-

CoV-2 survives in the environment, as well as in seawater, is still unclear. By contrast, although the precise mechanisms through which SARS-CoV-2 interacts with the gastrointestinal tract remain unknown (12), its presence in stool and urine samples of infected patients has been demonstrated (8). Consequently, the virus can enter the water cycle through wastewaters and be discharged into rivers, lakes or the sea making their waters unsuitable for use, at least locally (13).

Some authors have experimentally demonstrated that SARS-CoV-2 can remain viable and infectious in aerosols for three hours and on surfaces up to days, depending on the material and the viral load (14). Moreover, the ability of the virus to survive decreases with increasing temperatures, because of denaturation of proteins and increased activity of extracellular enzymes (15, 16).

Since screening to identify asymptomatic subjects has not yet been fully validated and these unsuspected carriers can increase the risk of disease transmission, we have emphasized maintaining good hygiene practices, keeping proper physical distance, using facial masks in crowded areas, cleaning surfaces (tables, deck chairs, etc.) and sanitizing common areas (toilets, showers and dressing rooms).

Although marine microorganisms are subject to marine currents which dilute their density and microorganisms present on surfaces in bathing areas (including sand) are affected by high temperatures, SARS-CoV-2 transmission cannot be completely excluded. As a result, only a rigorous compliance with preventative hygienic and sanitary procedures and the common sense of the population will help prevent other COVID-19 outbreaks.

Following the above indications could increase expenses both for bathers and beach operators. If for some, profit margins may counter the economic losses, for others, compliance with the mandatory measures envisaged could constitute an unsustainable burden. It is also true that these obligations can represent an opportunity for promoting new jobs, with obvious social benefits and the possibility of tracing a model for a better management of the coastal territory.

The main problem will concern the public free beaches, which are generally not supervised and lack the most essential hygiene and safety services. Creating areas equipped with the necessary structures and facilities (sufficient to satisfy local demand), well distributed along the coast, may help cater to the needs of the more economically vulnerable members of society who cannot afford the benefits of the more serviced and privately managed beaches.

The considerations presented in this Letter by the Authors do not constitute guidelines but reports the current state of knowledge.

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