

ENGLISH VERSION



Istituto Superiore di Sanità

Rapporto ISS COVID-19 • n. 5/2020 Rev. 2

Interim provisions to prevent and manage the indoor environment in relation to the transmission of the infection by SARS-CoV-2 virus

ISS Working group Environment and *Indoor* Air Quality

Version of May 25, 2020

Interim provisions to prevent and manage the indoor environment in relation to the transmission of the infection by SARS-CoV-2 virus

Version of May 25, 2020

ISS Working group Environment and *Indoor* Air quality

Gaetano Settimo, Italian National Institute of Health (ISS), Roma

Luigi Bertinato, Italian National Institute of Health (ISS), Roma

Lucia Bonadonna, Italian National Institute of Health (ISS), Roma

Paolo D'Ancona, Italian National Institute of Health (ISS), Roma

Anna Santarsiero, Italian National Institute of Health (ISS), Roma

Translation by Julie Sawitzke.

Istituto Superiore di Sanità

Interim provisions to prevent and manage the indoor environment in relation to the transmission of the infection by SARS-CoV-2 virus. Version of May 25, 2020.

ISS Working group Environment and Indoor Air Quality

2020, ii, 13 p. Rapporto ISS COVID-19 n. 5/2020 Rev. 2 – English version

To stop the outbreak of SARS-CoV-2 virus, it is fundamental to guarantee a good standard for indoor air quality to protect citizens' and workers' health. This report gives some recommendations to adopt both at home and at work in order to maintain a good level of indoor air quality and contrast the risk of contagion by COVID-19.

The original Italian version of ISS COVID-19 Reports are available from: <https://www.iss.it/rapporti-COVID-19>

The reports translated in English are available from: <https://www.iss.it/rapporti-iss-COVID-19-in-english>

For information: gaetano.settimo@iss.it

Cite this document as follows:

ISS Working group Environment and Indoor Air Quality. *Interim provisions to prevent and manage the indoor environment in relation to the transmission of the infection by SARS-CoV-2 virus. Version of May 25, 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 2/2020 Rev. 2- English version).

The responsibility for scientific and technical data lies with the authors, who declare that they do not have any conflict of interest.

Editing and graphics: ISS Scientific Communication Unit (Sandra Salinetti and Paola De Castro)

© Istituto Superiore di Sanità 2020
viale Regina Elena, 299 – 00161 Roma



Table of contents

Target of the report	ii
Update	ii
Acronyms	ii
Introduction	1
General measures for domestic environments	4
General measures for work environments	8
Appendix	13

Target of the report

The main recipients of this document are citizens, workers, employers, Protection and Prevention Services (PPS), property managers, and health authorities of the NHS Prevention Departments, each committed to their role in the adoption and observance of the new prevention and protection procedures envisaged in the “new phase 2” to respond to the needs of protection and prevention of the health of personnel and the community in the current context.

Update

Compared to the previous version of April 21, 2020:

- The advice and recommendations provided are intended to facilitate the reprogramming and management of the various spaces and work environments following the issuance of the National Guidelines for the main sectors of activity which contain operational indications and the different organizational measures to be implemented
- The new procedures to be put in place to ensure good air exchange in various environments are specified on the basis of the number of workers (indication of natural exchange, mechanical ventilation systems and the frequency of cleaning if filters supplied to the terminal devices).

Acronyms

AHU	Air Handling Unit
CMV	Controlled Mechanical Ventilation
ISS-SG-IP	Study Group “Indoor Pollution” of the Istituto Superiore di Sanità
NHS	National Health Service
PM	Particulate Matter
PPS	Protection and Prevention Services
VOCs	Volatile Organic Compounds

Introduction

The DPCM of 17 May 2020 Implementing provisions of Decree-Law No. 19 of 25 March 2020, containing urgent measures to deal with the epidemiological emergency from COVID-19, and of decree-law of 16 May 2020, n. 33, containing additional urgent measures to deal with the epidemiological emergency from COVID-19, replace those of the DPCM of 26 April 2020 and will be valid until 14 June 2020, reports the long-awaited indications for the start-up and implementation of the “new phase 2”, which will bring significant practical changes in all sectors of work with the gradual resumption of different national production activities. The DPCM contains the technical data sheets relating to the main sectors of activity with operational guidance of the measures to be implemented and adapted, in order to guarantee the health and safety of citizens and workers and to counter the spread of contagion in the heterogeneous national production context.

The recent update and integration document on the Guidelines for the reopening of Economic and Productive Activities, published by the Conference of Regions and Autonomous Provinces (22 May 2020) is in continuity with the guidance at national level, in particular with the protocol shared between the social partners approved by the decree of the President of the Council of Ministers of 26 April 2020, as well as with the general guiding criteria referred to in the technical documents produced by the Italian National Institute of Health (INAIL) with the main objective of reducing the risk of contagion for individuals and the community in all production and economic sectors.

It is understood that, on the basis of the evolution of the epidemiological scenario, the indicated measures may be remodulated, and even in a more restrictive sense.

The priority of these measures remains the protection of citizens and workers, in particular persons with vulnerabilities.

It should be noted, however, that the return to work of staff or those already working cannot ignore the “new social perception in the workplace” which must quickly and unambiguously respond to measures to contain the risk of transmission and contagion from the SARS-CoV-2 virus. Therefore, prevention and protection procedures, which are easy to implement in the field of health, must be adopted as appropriate beyond what has been done to date which neglected the improvement of *indoor air quality*.

For this reason, it is necessary to pay special “attention” to the indoor air quality characteristics that come to be determined in the different environments, workstations and working spaces, considering the influence of several factors:

- Air exchange (natural, mechanical, centralized and otherwise), reshaping the frequencies and methods of maintenance according to the current health risks.
- Microclimatic parameters closely related to health (high temperatures and high relative humidity values of the air).
- Use of products and equipment used in cleaning, sanitizing and disinfection activities.
- Workloads, redetermined with the aim of ensuring and maximizing the health protection of citizens, visitors, customers and workers in all conditions, and ensuring the reduction of the risk of transmission.

However, it should be considered how the “revision of organizational methods in the workplace”, adopted in line with preventive measures, can present inevitable problems in the “additional” anti-contagion daily operations, with an aggravation of inconvenience for staff and citizens.

In particular with reference to:

- activities with restricted and no longer free access of staff, booking of access, minimization of staff present in the working time slots, requirement and management of social distancing within the workplace.
- review of training and information procedures to strengthen, for example, knowledge on prevention devices (e.g., masks and gloves), explain the role of hand hygiene, signs, paths and accesses, behaviours and measures to be adopted in case of positivity, etc.
- adaptation of protocols and operating conditions, increase in ventilation rates and air changes, remodelling of cleaning and maintenance activities of technological ventilation systems in indoor environments.

In particular, in order to better address the various problems in indoor environments it should be emphasized that the correct application of the “anti-contagion protocol” remains one of the central points for the protection and prevention of the risk of transmission and contagion from the SARS-CoV-2 virus, as provided for in the various documents of remodulation of the contagion content measures elaborated by the government that take into account the essential measures of containment and combating the spread of the epidemic.

Today we know that the quality of our indoor environment affects our state of health and that preserving the quality of our environment is an integral part of public health plans and programs.

Although the effect of summer weather conditions (high temperatures, strong solar radiation, and relative humidity can affect the vitality of the virus) that the country is encountering can favour a reduction in the incidence of COVID-19, it is still negligible compared to the application of measures and strategies for prevention and protection of the health of citizens and workers identified by the Government.

In this document two different types of indoor environments are considered according to this scheme:

- *Domestic environments*
such as homes in which only family units interact on a daily basis, where work and distance learning activities will continue to be carried out through digital technologies.
- *Work environments*
designed with standards dedicated to specific purposes such as offices, supermarkets, pharmacies, para-pharmacies, offices and bank and post office branches, airports, stations and public transport where employees, customers, visitors, operators of external companies, suppliers and travelers interact for different needs.

This report updates and deepens the precautionary and good practice indications published by the Istituto Superiore di Sanità (ISS, the National Institute of Health in Italy) in the poster “New coronavirus: advice for indoor environments” available at the ISS official website among the infographics of the New coronavirus section (<http://www.iss.it/infografiche>) which made use of the experience of the national Study Group “Indoor Pollution” of the ISS (hereinafter ISS-SG-IP). The poster is attached to the document.

For some time, the ISS-SG-IP has published a series of reference documents in Italian on indoor pollution, in order to implement harmonized actions at the national level to reduce and mitigate indoor pollution exposure and health effects, to improve and control risks in indoor workplaces, to raise awareness of behaviour and make the population aware of this priority issue for our country. Below is the list:

- *Rapporti ISTISAN 13/4*
Monitoring strategies for Volatile Organic Compounds (VOCs) in indoor environments;

- *Rapporti ISTISAN 13/37*
Monitoring strategies of biological air pollution in *indoor* environment;
- *Rapporti ISTISAN 13/39*
Workshop. Issues related to *indoor air pollution*: current situation in Italy. Istituto Superiore di Sanità. Rome, June 25, 2012. Proceedings;
- *Rapporti ISTISAN 15/4*
Workshop. Indoor air quality: current national and European situation. The expertise of the National Working Group on indoor air. Istituto Superiore di Sanità. Rome, May 28, 2014. Proceedings;
- *Rapporti ISTISAN 15/5*
Monitoring strategies to assess the concentration of airborne asbestos and man-made vitreous fibres in the *indoor* environment;
- *Rapporti ISTISAN 15/25*
Microclimate parameters and indoor air pollution;
- *Rapporti ISTISAN 16/15*
Presence of CO₂ and H₂S in indoor environments: current knowledge and scientific field literature;
- *Rapporti ISTISAN 16/16*
Monitoring strategies to PM₁₀ and PM_{2.5} in indoor environments: characterization of inorganic and organic micropollutants;
- *Rapporti ISTISAN 19/17*
Indoor air quality in healthcare environments: strategies for monitoring chemical and biological pollutants;
- *Rapporti ISTISAN 20/3*
Indoor air quality in schools: strategies for monitoring chemical and biological pollutants;
- *Booklet on indoor air quality*
"The air in our home".

General measures for domestic environments

Even during this “new phase 2” the houses represent environments in which a good part of families spends more time during the day and where it is possible to invite and meet friends and relatives.

In recent months, all the integrated actions and functional approaches to improve indoor air quality, made necessary by the spread of COVID-19, have constituted a further element of strengthening and combatting, as much as possible, the spread of the SARS-CoV-2 virus.

For this reason, but also for the fact that high summer temperatures (and at times high relative humidity) and possible heat waves are encountered, it is necessary to implement a series of interventions that take into account the various levels of the population from the most vulnerable, with diversified disabilities, such as non-self-sufficient people, infants, children, pregnant women, the elderly and the sick (e.g., those with chronic obstructive bronchopathy, COPD, diabetes, hypertension, etc.) whose body compensates for heat stress and temperature changes with greater difficulty.

Specifically, on the operational level, below are some tips and recommendations that in this “new phase 2” can help prevent and limit indoor air pollution and the spread of the epidemic.

Preliminarily, it should be remembered that the transmission of SARS-CoV-2 occurs mainly through person and person contact, through the inhalation of droplets, with a size $\geq 5 \mu\text{m}$ in diameter generated by coughing or sneezing and by the acts of the speaking and breathing. Such droplets generally spread over short distances. There is currently no evidence of airborne transmission of SARS-CoV-2, through particles smaller than $5 \mu\text{m}$ (“droplet nuclei”, resulting from the drying of larger droplets) or particles of particulate matter containing the infectious agent, although several studies are underway to ascertain this assumption. These particles, unlike droplets, can remain in the air for long periods of time and travel several meters, transported by turbulent motions. In this regard, at the present state of knowledge, airborne transmission is not recognized for SARS-CoV-2, even if some procedures performed in a healthcare setting can actually generate aerosols (execution of nasopharyngeal swab, tracheal intubation, bronchial aspiration, bronchoscopy, sputum induction, cardiopulmonary resuscitation). Furthermore, although it is not currently proven that the transmission of the virus derives directly from contact with commonly used objects on which it is deposited, there is evidence that viruses belonging to the same group (coronavirus, the SARS virus and the MERS virus) can persist on inanimate surfaces for up to 9 days depending on the material on which they are found, the quantity of biological fluid, the initial viral concentration, the air temperature (e.g., at a temperature higher than 30°C the persistence is lower) and relative humidity, even if to date their infectious capacity has not been demonstrated.

More recent data relating to the SARS-CoV-2 virus confirm that on plastic and stainless steel, under experimental conditions, the virus has similar ability to persist compared to the SARS virus (SARS-CoV-1), showing however an exponential decay of the viral titer over time (half of the viral particles were no longer infectious after just over an hour). Under controlled laboratory conditions (e.g., with a relative humidity of 65%), the virus appears to be detected for periods of less than 3 hours on paper (for printing and handkerchiefs), up to one day on wood and fabrics, two days on glass, and for longer periods (4 days) on smooth surfaces such as steel and plastic, persisting up to 7 days on the outer fabric of surgical masks.

In this context, the document lists a series of measures and advice to be adopted, organically on a daily basis, during the period of stay at home:

- **Ensure good air exchange in all home environments**, naturally, opening windows and balconies more frequently, as a precautionary measure to increase the level of “fresh air” as some environments have turned into “new” workstations and study stations. The increase in manual air

exchange, although not controllable, helps to dilute any contamination of specific pollutants in the air by reducing the concentration and risk of exposure of those staying in indoor environments.

This measure would improve uncomfortable conditions that can occur in poorly ventilated homes, where symptoms may be reported, such as simple discomfort, malaise, headache, eye and throat irritation, respiratory tract fatigue, asthma, allergies, cardiovascular problems, decreased cognitive performance, decreased productivity.

The natural ventilation of the rooms depends on numerous factors, such as meteorological parameters (e.g., outdoor air temperature, wind direction and speed), physical parameters such as open surface of windows and balconies and duration of opening. The external air operates a replacement/renewal with a dilution/reduction of the concentrations of specific pollutants (e.g., Volatile Organic Compounds-VOCs, PM₁₀, just to name a few), CO₂, odours, humidity and biological aerosol present in homes. In general, poor air exchanges favour exposure to pollutants and can facilitate the transmission of pathogens.

- It is advisable to **open windows and balconies overlooking the less busy streets and during periods of less traffic**, especially when the house is located in a busy area or leave them open all night (on very hot days or of heat waves). Opening times must be optimized according to the number of people in the household and the activities carried out in the room / environment to avoid conditions of discomfort (hot or cold drafts directly on people). **It is preferable to open for a few minutes several times a day than once for a long time**. Since it is again possible to meet people in the house, it is recommended to do so during air exchange when the windows are open, to keep the room door closed to further limit the possibility of spreading the virus in other rooms.

In environments/rooms without windows (e.g., closets, bathrooms, etc.), but equipped with fans extractors, these must be kept running at least for the entire time people stay in the area to reduce the concentrations of pollutants in the air keeping the doors closed as much as possible.

In the event that some rooms of the house are equipped with autonomous fixed heating/cooling systems (for example, air conditioners or split heat pumps are quite common, consisting of an indoor unit and an outdoor unit, generally the indoor unit is wall mounted, or air-to-water air conditioners with fan coil type indoor unit) or portable air conditioners connected with a flexible air exhaust pipe to the outside (they operate similar to stationary systems), which do not supply new air but recirculate the same air for heating/cooling, it is advisable during their use to **open windows and balconies for a few minutes several times a day**, to replace/renew and dilution/reduction of concentrations of specific pollutants (e.g., VOCs, PM₁₀, CO₂, odours, relative humidity and biological aerosols). In general, poor air exchanges favour, in indoor environments, exposure to chemical and biological pollutants that can facilitate the transmission of pathogens. Given their capacity, mainly linked to the size of the room, it is advisable to position portable air conditioners appropriately (e.g., they should not be placed near the corners or walls of the room or close to sofas).

During the use of the systems:

- Avoid too dry air that can generate, in addition to “discomfort”, dryness of the nasal mucous membranes increasing the risk of contracting respiratory infections in the elderly.
- Do not forget to keep suitable microclimatic conditions in the environment (e.g., the ideal temperature for physiological well-being is between 24 and 26°C with a relative degree of humidity of 50%, to date this rate is recommended where the vitality of the virus is negligible). The use of portable dehumidifiers could be useful (although their scope often depends on the models and operating modes and is limited to individual rooms in the dwelling. However, it is recommended before and after the use of dehumidifiers to carry out hand cleaning and careful and regular cleaning of the

different components of the appliances (following the manufacturer's indications according to the type of model). Pay attention to relative excessive humidity levels of more than 70% because in such a situation the growth of contaminants of a microbial nature can be fostered (bacteria, viruses, parasites, filamentous fungi [moulds]).

- Clean regularly (we recommend once a month), according to the manufacturer's instructions and with the system stopped, the recirculating air filters supplied with the system/air conditioner to maintain adequate filtration/removal levels (they are generally in plastic material e.g., polyethylene PE, polyester PL, polyamide or *nylon* PA, etc.). Some brands already use very high efficiency filters called High Efficiency Particulate Air filter (HEPA) or Ultra Low Penetration Air (ULPA) (UNI EN 1822). The dust captured by the filters represents a favourable environment for the proliferation of bacteria and fungi, and in any case of biological agents. Avoid using and spraying cleaning products detergents/disinfectants spray directly on the filter in order not to inhale pollutants (e.g., VOCs), during operation.
- It is important to regularly open the balconies and windows to increase air turnover, favour the dilution of pollutants, biological aerosol, CO₂ and reduce odours and relative humidity accumulated in the recirculated air. It is not recommended to carry out these cleaning operations in the presence of other people.
- Regularly clean the vents and ventilation grilles with microfiber cloths moistened with water and common soaps, or with a solution of ethyl alcohol with a minimum percentage of 70% v/v drying later. The cleaning of the grilles contributes to the good general maintenance of air in the environment.
- The same attention must be paid to the positioning of personal portable mini air conditioners, to cleaning the filters and the water container.

In the event that some rooms in the house are equipped with ceiling fans or portable floor or table fans that involve significant air movement, it is advisable to pay attention in the presence of non-household subjects. In the event that this equipment is used (e.g., during high temperatures and heatwaves) by people from the same household they are not a problem. **In any case, remember to place the fans at a certain distance from people (they should not be pointed directly at people).** In the event that the equipment is used in the presence of several people not belonging to the household, greater caution is recommended, closing the room door and keeping the windows of the room open.

Before using any product, **it is advisable to carefully read the labels, the instructions of use, respecting the quantities recommended by the manufacturers** (e.g., using the dosing cap present on all packages of the products). Incorrect use or dilution of a product can reduce the effectiveness of cleaning or lead to unexpected final results. The effectiveness of disinfectants (e.g., ethyl alcohol, sodium hypochlorite) is related to the need to remove dust and dirt in advance. In addition, the excessive and repeated use of cleaning products can cause irritation of the respiratory tract and dermatitis making it more vulnerable to bacteria and viruses (control of danger symbols on labels). **Choose, if possible, products without fragrances and without allergens keeping in mind that clean does not have a scent.** Any fragrances of detergents contain VOCs that degrade indoor air quality and should not be used in the presence of asthmatic subjects.

Do not mix cleaning products, in particular those containing sodium hypochlorite, such as bleach, with ammonia, or other acidic substances, e.g., vinegar, and do not add ammonia for descaling. **All products should be used with extreme caution**, always wearing gloves. Many of the common products used for cleaning the house if used correctly can inactivate the SARS-CoV-2 virus.

For daily cleaning of homes, particular attention should be paid to the most frequently touched surfaces (e.g., doors, door handles, windows, tables, light switches, toilets, taps, sinks, desks, chairs, mobile phones,

keyboard, remote controls and printers). Use microfiber cloths moistened with water and common soap and/or ethyl alcohol with a minimum content of 70% v/v or with a solution of sodium hypochlorite diluted to 0.1% active chlorine for all surfaces to be cleaned, taking into account compatibility with the material to be cleaned and sanitized, use and environment. Chlorine-based detergents are not usable on all materials; below are the materials compatible with their use: polyvinylchloride (PVC), polyethylene (PE), polypropylene (PP), polyacetal, polyoxymethylene (POM), Buna-Nitrile gum, bisphenolic polyester, fiberglass (GFRP), polytetrafluoroethylene (teflon®), silicone (SI), Butadiene Styrene acrylonitrile (ABS), polycarbonate (PC), polysulphon, stainless steel, titanium, while low-alloy steel, polyurethane, iron and metals are generally not compatible.

In all cases:

- Use gloves when cleaning.
- Be very careful when using (e.g., sodium hypochlorite) to avoid the production of splashes during cleaning.
- When materials or furnishings cannot be washed (e.g., carpets, carpets and mattresses), use steam appliances for cleaning.
- Air out rooms both during and after the use of cleaning products, especially if intensive use of disinfectant/detergent products that have danger symbols on the label.
- Make sure that all cleaning products are kept out of the reach of children, teenagers and pets. Store all products in a safe place.
- It also useful to remember that it is advisable to avoid or limit the use of incense sticks, essential oils, diffusers and smokers in indoor environments as they emit polluting chemicals (VOCs, PM₁₀ and PM_{2.5}). In fact, despite the fragrance, it unnecessarily adds pollutants and degrades indoor air quality.

General measures for work environments

In this emergency context indoor air quality in the working environment of small and large administrations and companies has an important influence on the health, performance and psycho-physical well-being of workers (e.g., decrease/loss of productivity, concentration, reaction times, level of motivation and satisfaction, professional skills, days of absence, stress, increase in health and care costs borne by the worker, the NHS, etc.). Therefore, administrations and companies must strengthen and intensify their commitment to face this delicate “new phase 2”.

At the operational level with the application of the specific “anti-contagion protocols”, new organic actions have been implemented to respond to the needs of safeguarding the health of personnel and the community that take into account the essential measures to contain and combat the spread of the epidemic, which can be summarized as follows:

- adaptation of spaces, areas and offices, staff quotas, avoiding where possible the return of workers with diversified susceptibility and disabilities, with respiratory diseases, alteration of the immune system, differentiating and staggering working hours, distancing, limiting and/or defining specific paths (e.g. differentiated entrances and exits), limiting the areas to avoid close contacts and gatherings, supporting the dissemination of billboards describing health prevention and protection measures (especially distancing and frequent washing of hands with soap and water or the use of disinfectants when soap and water is unavailable), training on the main risks, increasing and changing the frequency of cleaning of plant filters, remodulation or modification of sanitization interventions, the use of masks or other protective devices that do not replace physical distancing, the dissemination of procedures and technical measures of personal prevention and protection.

Below are some general tips, actions and recommendations to be implemented daily under the emergency conditions of this “new phase 2” to limit the spread of the SARS-CoV-2 virus that must be part of an integrated precautionary and risk mitigation approach (not individual actions in its own right) for the maintenance of good *indoor air quality* in the workplace, such as:

- **Ensure a good air exchange (by mechanical or natural means)** in all environments where workstations and personnel are present, improving the controlled supply of primary air and favouring more frequently the opening of the windows and balconies. The principle is to increase the amount of *outdoor air* flowing inside the work environments, cleaner fresher air and, at the same time, reduce/dilute concentrations of specific pollutants (e.g., VOCs, PM₁₀, etc.), CO₂, odours, moisture and bioaerosols which can carry bacteria, viruses, allergens, filamentous fungi (moulds) and, consequently, the risk of exposure to building staff and users.
- In particular, poor air exchange promotes exposure to pollutants indoors and can facilitate the transmission of pathogens among workers.
- The natural ventilation of rooms depends on a number of factors, such as meteorological parameters (e.g., outdoor air temperature, wind direction and speed), physical parameters such as window surface and opening duration, just to name a few.
- Air exchange must take into account the number of workers present, the type of activity carried out and the length of stay in the workplace. During natural air exchange it is advisable to avoid the creation of uncomfortable/discomfort conditions (drafts or excessive cold/heat) for the staff. It is advisable where possible to improve the layout of workstations to ensure that personnel are not directly exposed to drafts.

- In buildings without specific ventilation systems, it may be preferable to open windows and balconies that overlook the less trafficked streets and during periods of minor passage of vehicles, especially when the building is in a busy area. In general, it is recommended to avoid opening windows and balconies during peak traffic hours or to leave them open at night (an option that is valid during days of high summer temperatures or during periods of heatwaves). It is preferable to open for a few minutes several times a day rather than once for a long time.
- In buildings equipped with specific ventilation systems (Air Handling Unit-AHU, or Controlled Mechanical Ventilation Unit-CMV), properly designed, which move *outdoor air* through engines/fans and distribute it through ducts and grids/diffusers positioned on the ceiling, walls or floor and allow the exchange of air with the outside, these systems, where thermal loads allow, must keep the entry and extraction of air active 24/7 (possibly with a decrease in ventilation rates at night when the building is not used or through the remodulation of the on/off hours, e.g. two hours before the workers enter and continue for another two hours after the closure/non-use of the building). **The advice is to continue at this stage maintaining the same level of protection; eliminating**, where possible, **the function of recirculation** of air to avoid the possible transport of pathogens in the air (bacteria, viruses, etc.). At this stage it is more important to try to ensure the reduction of contamination from the SARS-CoV-2 virus and to protect workers, customers, visitors and users, rather than ensuring thermal comfort. It is now known that many systems have been designed to recirculate the air (a measure exclusively linked to the reduction of the energy consumption of the structure); in this emergency context it is clearly **necessary to increase the primary air in a controlled manner in all conditions**. It is recommended, **where it is not possible to deactivate this recirculation**, to operate the system by correctly adapting and **remodulating** the amount of **primary** air necessary for **such purposes and reducing the recirculation air altitude**. If it does not cause safety problems, it is advisable to open the windows and balconies during the working day for a few minutes several times a day to further increase the level of air exchange. The decision to do so is generally the responsibility of the head of the structure in agreement with the employer.
- It is worth remembering that **no ventilation system can eliminate all risks**, however, if properly designed, combining both energy efficiency concepts and air changes, in addition to the main WHO references and those indicated by the ISS SG-IP (too often forgotten at the design stage) and maintained in efficient operation, such ventilation systems can certainly help reduce the risks of exposure and contamination from the virus. In several European documents (e.g., QUALICHeCK) shows the performance gap between what is planned and what is measured (e.g., stagnation of spoiled air, high concentrations of VOCs, CO₂, relative humidity, etc.).
- Acquire all the information on the correct functioning of the AHU or CMV system (e.g., control of operating efficiency, load losses, verification of the conduction register, air recirculation quota, maintenance expiration times, type of filtering package installed, scheduled interventions, etc.). If you are close to the replacement times of the filtering package (for high load losses, or a few weeks after the scheduled maintenance, etc.), in order to improve the filtration of the incoming air, it is advisable, where possible and compatible with the functionality of the system, to replace with more efficient filter packages (e.g., UNI EN ISO 16890:2017: F7-F9). Once replacement has been made, make sure that the air tightness is maintained.
- In buildings equipped with heating/cooling systems with local terminal equipment (e.g., internal units such as fancoil) whose operation and speed regulation can be centralized or governed by workers occupying the environment, it is recommended, following the “anti-contagion” reorganization, to **keep the system in continuous operation** (possibly with a decrease in the level of ventilation at night or non-use of the building or through the remodulation of the power/off times, shutdown, e.g., two hours before the workers open or enter, and continue for another two hours after the closure/non-use of

the building) regardless of the number of workers present in each room, **keeping the entrances (doors) closed**. It is recommended to check that in the vicinity of the sockets and ventilation grilles of the terminals that there are no curtains, objects and plants, which may interfere with the proper functioning. To this end, it is advisable to schedule a periodic cleaning every four weeks, according to the indications provided by the stationary manufacturer, of the fancoil recirculation air filters to maintain the appropriate filtration/removal levels. Filter cleaning, heat exchange battery control, and condensate collection basins can help make buildings safer by reducing disease transmission, including the SARS-CoV-2 virus.

- **Avoid using and spraying cleaning products detergents/spray disinfectants directly on the filter so as not to inhale pollutants (e.g., VOCs), during operation. Pay special attention to the use of such sprays in the case of personnel with respiratory problems, e.g., asthmatic subjects.** Spray cleaning/disinfectant products must be approved in advance by the PPS.
- Clean the ventilation sockets and grilles with clean microfiber cloths moistened with water and common soaps, or with a solution of ethyl alcohol with a minimum percentage of 70% v/v by drying later.
- Where possible **in these environments it would be necessary to regularly open windows and balconies to increase the turnover and dilution of specific pollutants (e.g., VOCs, PM10, etc.), CO₂, odours, humidity and bioaerosol that can carry bacteria, viruses, allergens, filamentous fungi (moulds) accumulated in the air recirculated by the structure.** It is preferable to open for a few minutes several times a day, rather than once for a long time. When opening windows, keep the doors closed.
- In the event that some individual rooms or work rooms are equipped with small autonomous fixed heating/cooling systems (e.g. *split heat pump* air conditioners or air-water air conditioning) or portable air conditioning systems connected with a flexible hot air exhaust pipe supported or connected to the outside where the air that is heated/cooled is always the same (they have a similar operation to fixed systems and depends on the type of model and potential), a regular cleaning of the recirculation air filter supplied to the system/air conditioner must be carried out to maintain adequate filtration/removal levels (e.g., the filters are made of plastic material: PE polyethylene, pl polyester, polyamide or PA nylon, etc.). Some air conditioners already use very high efficiency recirculation air filters called High Efficiency Particulate Air filter (HEPA) or Ultra Low Penetration Air (ULPA) (UNI EN 1822).

The cleaning must be carried out according to the indications provided by the manufacturer and stationary system. It is recommended to schedule a periodic cleaning of the filters that takes into account the real operation of the air conditioner, the climatic and microclimatic conditions and the activity carried out in the room and the number of people present; cleaning can be recommended every four weeks. The dust caught by the filters represents an environment conducive to the proliferation of bacteria and fungi, and in any case of biological agents. Avoid performing these cleaning operations in the presence of other people. **Pay special attention to the use of such sprays in the case of personnel with respiratory problems, e.g., asthmatic subjects.** Spray cleaning/disinfectant products must be approved in advance by the PPS.

- In the event that some people want to equip the environment with portable air purification systems (e.g., with High Efficiency Particulate Air filter (HEPA) or Ultra Low Penetration Air (ULPA) filters), the optimal choice of the system must take into account the wide variability of the performance offered by the different systems: the volume of the environment, the layout, the type of activity carried out, the number of people.

In the event that some rooms are equipped with ceiling fans or portable floor or table fans that involve significant air movement, it is recommended to pay great attention to their use in the presence of more people. **In any case it is advisable to place the fans at a certain distance, and never point directly on people.** It is not recommended to use this equipment in the case of environments with the presence of more than one worker. It is therefore appropriate to:

- Ensure a good air exchange even in the environments /spaces where there are vending machines for hot drinks, water and food. In these environments, periodic cleaning/sanitization (by professional cleaning workers) and daily cleaning/sanitization (by vending machine workers) of the vending machine keyboards with special detergents compatible with the types of materials must be ensured.
- In the case of windowless rooms (e.g., archives, changing rooms, toilets, etc.), but equipped with fans/extractors these must be kept in operation throughout working hours in order to reduce concentrations in the air. Fans should be turned on again early in the morning.
- Public transport must be cleaned and disinfected before leaving the terminal. Disinfect interiors, such as steering wheel, gear lever and seat belt when the driver of the vehicle is changed. Clean and disinfect at least once a day the spaces and surfaces most touched by passengers. Lock the front doors near the driver. Air conditioning systems in public transport and commercial rental vehicles must be kept active and, in order to increase the level of air exchange/dilution/removal, the recirculation function must be completely eliminated in order to avoid the possible transport of biological contaminants (bacteria, viruses, etc.) into the air. Careful attention must be paid to the maintenance of the filters supplied to the vehicles (e.g., cockpit or anti-pollen filters). At this stage, if weather conditions allow, it may also be useful to open all the windows and hatches of the roof to further increase the level of air exchange by favouring the inflow of external air.
- Whenever workers enter or leave the vehicle, it is advisable to cleanse hands with a hydro-alcoholic gel.
- Professional workers/operators who carry out daily cleaning of environments and/or places (wet dusting and sweeping or with dust-catching cloths, washing, disinfection, etc.) must correctly follow the procedures, protocols and methods starting cleaning from the cleanest areas to the dirtiest areas, and adopt the use of Personal Protective Equipment (PPE) (e.g., referring to the provisions present in the operational document conveyed for each environment, integrated with the latest government measures). **Avoid performing these cleaning/disinfection operations in the presence of employees or other people.**
- Daily cleaning* of rooms/areas must cover the most frequently touched surfaces (e.g., doors, handles, windows, glass, tables, light switches, toilets, taps, sinks, desks, chairs, trolley and shopping basket handles, passenger handles, controls, steering wheel, seat belts, door handles, keys and door openers, keyboards, remote controls, printers). Use cloths, different for each type of object/surface, in microfiber moistened with soap and water. The risk can be further reduced by using a solution of ethyl alcohol with a minimum percentage of 70% v/v immediately after cleaning with soap and water or with a solution of sodium hypochlorite diluted to 0.1% active chlorine for toilets

* Daily cleaning/sanitization is defined as the set of procedures and operations designed to make a certain environment healthy through cleaning, cleansing and/or subsequent disinfection activities. Reference UNI 10585:1993: cleaning/sanitization and disinfection can be carried out separately or can be carried out with a single process using products that have dual action; it is important to remove dirt or dirt residues that can help make the whole process ineffective. Decree No 254 of 7 July 1997: a regulation implementing Articles 1 and 4 of Law No 82 of 25 January 1994 on the regulation of cleaning, disinfection, disinfestation, rodent control and sanitization activities.

and other surfaces taking into account the type of material (e.g., such as bleach that is generally found on the market at a percentage close to 5% of chlorine content, or other equivalent professional detergents (sanitization: cleansing and disinfection), paying attention to the correct use for each surface to be cleaned (refer to the “Indications for the implementation of measures containing contagion from SARS-CoV-2 through procedures for sanitizing non-sanitary structures (surfaces, indoor environments) and clothing” of the Ministry of Health n.0017644-22/05/2020-DGPRE-MDS-P).

- Air out rooms both during and after the use of cleaning products, especially if potentially toxic disinfectant/detergent products are used (check danger symbols on labels), temporarily increasing the ventilation rates of AHU/CMV systems or opening windows and balconies. Avoid or limit the use of scented detergents, as, despite fragrance, they add pollutants and degrade indoor air quality. **Choose, if possible, products without fragrance/fragrances and without allergens keeping in mind that the clean does not smell.**

nuovo coronavirus

Consigli per gli ambienti chiusi

Ricambio dell'aria

- Garantire un buon ricambio d'aria in tutti gli ambienti: casa, uffici, strutture sanitarie, farmacie, parafarmacie, banche, poste, supermercati, mezzi di trasporto.
- Aprire regolarmente le finestre scegliendo quelle più distanti dalle strade trafficate.
- Non aprire le finestre durante le ore di punta del traffico e non lasciarle aperte la notte
- Ottimizzare l'apertura in funzione delle attività svolte.

Pulizia

- Prima di utilizzare i prodotti per la pulizia leggi attentamente le istruzioni e rispetta i dosaggi d'uso raccomandati sulle confezioni (vedi simboli di pericolo sulle etichette).
- Pulire i diversi ambienti, materiali e arredi utilizzando acqua e sapone e/o alcol etilico 75% e/o ipoclorito di sodio 0,5%. In tutti i casi le pulizie devono essere eseguite con guanti e/o dispositivi di protezione individuale.
- Non miscelare i prodotti di pulizia, in particolare quelli contenenti candeggina o ammoniacca con altri prodotti.
- Sia durante che dopo l'uso dei prodotti per la pulizia e la sanificazione, arieggiare gli ambienti.

Impianti di ventilazione

A casa

- Pulire regolarmente le prese e le griglie di ventilazione dell'aria dei condizionatori con un panno inumidito con acqua e sapone oppure con alcol etilico 75%.

Negli uffici e nei luoghi pubblici

- Gli impianti di ventilazione meccanica controllata (VMC) devono essere tenuti accesi e in buono stato di funzionamento. Tenere sotto controllo i parametri microclimatici (es. temperatura, umidità relativa, CO₂).
- Negli impianti di ventilazione meccanica controllata (VMC) eliminare totalmente il ricircolo dell'aria.
- Pulire regolarmente i filtri e acquisire informazioni sul tipo di pacco filtrante installato sull'impianto di condizionamento ed eventualmente sostituirlo con un pacco filtrante più efficiente.

A cura del Gruppo ISS "Comunicazione Nuovo Coronavirus"
Fonte ISS • 12 marzo 2020

Rapporti ISS COVID-19 (ISS COVID-19 Reports)

ISS COVID-19 Reports are mainly addressed to healthcare professionals to cope with different aspects of the COVID pandemic. They provide essential and urgent directions for emergency management and are subject to updates. All reports have an English abstract.

The complete list is available at <https://www.iss.it/rapporti-COVID-19>.

Some reports (highlighted below) are also translated in English and are available at <https://www.iss.it/rapporti-iss-COVID-19-in-english>

1. Gruppo di lavoro ISS Prevenzione e controllo delle Infezioni. *Indicazioni ad interim per l'effettuazione dell'isolamento e della assistenza sanitaria domiciliare nell'attuale contesto COVID-19*. Versione del 24 luglio 2020. Roma: Istituto Superiore di Sanità; 2020 (Rapporto ISS COVID-19, n. 1/2020 Rev.)
2. Gruppo di lavoro ISS Prevenzione e controllo delle Infezioni. *Indicazioni ad interim per un utilizzo razionale delle protezioni per infezione da SARS-CoV-2 nelle attività sanitarie e sociosanitarie (assistenza a soggetti affetti da COVID-19) nell'attuale scenario emergenziale SARS-CoV-2*. Versione del 10 maggio 2020. Roma: Istituto Superiore di Sanità; 2020 (Rapporto ISS COVID-19, n. 2/2020 Rev. 2)
3. Gruppo di lavoro ISS Ambiente e Gestione dei Rifiuti. *Indicazioni ad interim per la gestione dei rifiuti urbani in relazione alla trasmissione dell'infezione da virus SARS-CoV-2*. Versione del 31 maggio 2020. Roma: Istituto Superiore di Sanità; 2020 (Rapporto ISS COVID-19, n. 3/2020 Rev. 2)
4. Gruppo di lavoro ISS Prevenzione e controllo delle Infezioni. *Indicazioni ad interim per la prevenzione e il controllo dell'infezione da SARS-CoV-2 in strutture residenziali sociosanitarie*. Versione del 17 aprile 2020. Roma: Istituto Superiore di Sanità; 2020 (Rapporto ISS COVID-19, n. 4/2020 Rev.) Available also in English.
5. Gruppo di lavoro ISS Ambiente e Qualità dell'aria indoor. *Indicazioni ad per la prevenzione e gestione degli ambienti indoor in relazione alla trasmissione dell'infezione da virus SARS-CoV-2*. Versione del 25 maggio 2020. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 5/2020 Rev. 2). Available also in English.
6. Gruppo di lavoro ISS Cause di morte COVID-19. *Procedura per l'esecuzione di riscontri diagnostici in pazienti deceduti con infezione da SARS-CoV-2*. Versione del 23 marzo 2020. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 6/2020).
7. Gruppo di lavoro ISS Biocidi COVID-19 e Gruppo di lavoro ISS Ambiente e Rifiuti COVID-19. *Raccomandazioni per la disinfezione di ambienti esterni e superfici stradali per la prevenzione della trasmissione dell'infezione da SARS-CoV-2*. Versione del 29 marzo 2020. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 7/2020).
8. Osservatorio Nazionale Autismo ISS. *Indicazioni ad interim per un appropriato sostegno delle persone nello spettro autistico nell'attuale scenario emergenziale SARS-CoV-2*. Versione del 30 aprile 2020. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 8/2020 Rev.).
9. Gruppo di Lavoro ISS Ambiente – Rifiuti COVID-19. *Indicazioni ad interim sulla gestione dei fanghi di depurazione per la prevenzione della diffusione del virus SARS-CoV-2*. Versione del 3 aprile 2020. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 9/2020).
10. Gruppo di Lavoro ISS Ambiente-Rifiuti COVID-19. *Indicazioni ad interim su acqua e servizi igienici in relazione alla diffusione del virus SARS-CoV-2* Versione del 7 aprile 2020. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 10/2020).
11. Gruppo di Lavoro ISS Diagnostica e sorveglianza microbiologica COVID-19: aspetti di analisi molecolare e sierologica *Raccomandazioni per il corretto prelievo, conservazione e analisi sul tampone oro/rino-faringeo per la diagnosi di COVID-19*. Versione del 17 aprile 2020. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 11/2020).

12. Gabrielli F, Bertinato L, De Filippis G, Bonomini M, Cipolla M. *Indicazioni ad interim per servizi assistenziali di telemedicina durante l'emergenza sanitaria COVID-19. Versione del 13 aprile 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 12/2020). Available also in English.
13. Gruppo di lavoro ISS Ricerca traslazionale COVID-19. *Raccomandazioni per raccolta, trasporto e conservazione di campioni biologici COVID-19. Versione del 15 aprile 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 13/2020). Available also in English.
14. Gruppo di lavoro ISS Malattie Rare COVID-19. *Indicazioni ad interim per un appropriato sostegno delle persone con enzimopenia G6PD (favismo) nell'attuale scenario emergenziale SARS-CoV-2. Versione del 14 aprile 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 14/2020). Available also in English.
15. Gruppo di lavoro ISS Farmaci COVID-19. *Indicazioni relative ai rischi di acquisto online di farmaci per la prevenzione e terapia dell'infezione COVID-19 e alla diffusione sui social network di informazioni false sulle terapie. Versione del 16 aprile 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 15/2020). Available also in English.
16. Gruppo di lavoro ISS Sanità Pubblica Veterinaria e Sicurezza Alimentare COVID-19. *Animali da compagnia e SARS-CoV-2: cosa occorre sapere, come occorre comportarsi. Versione del 19 aprile 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 16/2020). Available also in English.
17. Gruppo di lavoro ISS Sanità Pubblica Veterinaria e Sicurezza Alimentare COVID-19. *Indicazioni ad interim sull'igiene degli alimenti durante l'epidemia da virus SARS-CoV-2. Versione del 19 aprile 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 17/2020). Available also in English.
18. Gruppo di lavoro ISS Ricerca traslazionale COVID-19. *Raccomandazioni per la raccolta e analisi dei dati disaggregati per sesso relativi a incidenza, manifestazioni, risposta alle terapie e outcome dei pazienti COVID-19. Versione del 26 aprile 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 18/2020). Available also in English.
19. Gruppo di lavoro ISS Biocidi COVID-19. *Raccomandazioni ad interim sui disinfettanti nell'attuale emergenza COVID-19: presidi medico-chirurgici e biocidi. Versione del 25 aprile 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 19/2020).
20. Gruppo di Lavoro ISS Prevenzione e Controllo delle Infezioni. *Indicazioni ad interim per la sanificazione degli ambienti interni nel contesto sanitario e assistenziale per prevenire la trasmissione di SARS-CoV 2. Versione del 14 maggio 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 20/2020 Rev.).
21. Ricci ML, Rota MC, Scaturro M, Veschetti E, Lucentini L, Bonadonna L, La Mura S. *Guida per la prevenzione della contaminazione da Legionella negli impianti idrici di strutture turistico recettive e altri edifici ad uso civile e industriale, non utilizzati durante la pandemia COVID-19. Versione del 3 maggio 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 21/2020).
22. Gruppo di lavoro ISS Salute mentale ed emergenza COVID-19 *Indicazioni ad interim per un appropriato supporto degli operatori sanitari e sociosanitari durante lo scenario emergenziale SARS-CoV-2. Versione del 28 maggio*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 22/2020 Rev.) Available also in English.
23. Gruppo di lavoro ISS Salute mentale ed emergenza COVID-19 *Indicazioni di un programma di intervento dei Dipartimenti di Salute Mentale per la gestione dell'impatto dell'epidemia COVID-19 sulla salute mentale. Versione del 6 maggio 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 23/2020).
24. Gruppo di lavoro ISS Malattie Rare COVID-19. *Indicazioni ad interim per una appropriata gestione dell'iposurrenalismo in età pediatrica nell'attuale scenario emergenziale da infezione da SARS-CoV-2. Versione del 10 maggio 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 24/2020). Available also in English.
25. Gruppo di Lavoro ISS Biocidi COVID-19. *Raccomandazioni ad interim sulla sanificazione di strutture non sanitarie nell'attuale emergenza COVID-19: superfici, ambienti interni e abbigliamento. Versione del 15 maggio 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 25/2020)

26. Gruppo di Lavoro ISS Ambiente e Rifiuti. *Indicazioni ad interim sulla gestione e smaltimento di mascherine e guanti monouso provenienti da utilizzo domestico e non domestico. Versione del 18 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 26/2020)
27. Ricci ML, Rota MC, Scaturro M, Nardone M, Veschetti E, Lucentini L, Bonadonna L, La Mura S. *Indicazioni per la prevenzione del rischio Legionella nei riuniti odontoiatrici durante la pandemia da COVID-19. Versione del 17 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 27/2020).
28. Gruppo di Lavoro ISS Test Diagnostici COVID-19 e Gruppo di Lavoro ISS Dispositivi Medici COVID-19. *Dispositivi diagnostici in vitro per COVID-19. Parte 1: normativa e tipologie. Versione del 18 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 28/2020)
29. Gruppo di lavoro ISS Malattie Rare COVID-19. *Indicazioni ad interim su malattia di Kawasaki e sindrome infiammatoria acuta multisistemica in età pediatrica e adolescenziale nell'attuale scenario emergenziale da infezione da SARS-CoV-2. Versione 21 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 29/2020). Available also in English.
30. Gruppo di lavoro Salute mentale ed emergenza COVID-19. *Indicazioni sull'intervento telefonico di primo livello per l'informazione personalizzata e l'attivazione dell'empowerment della popolazione nell'emergenza COVID-19. Versione del 14 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 30/2020)
31. Gruppo di lavoro Salute mentale ed emergenza COVID-19. *Indicazioni ad interim per il supporto psicologico telefonico di secondo livello in ambito sanitario nello scenario emergenziale COVID-19. Versione del 26 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 31/2020)
32. Gruppo di lavoro ISS Sanità Pubblica Veterinaria e Sicurezza Alimentare COVID-19. *Indicazioni ad interim sul contenimento del contagio da SARS-CoV-2 e sull'igiene degli alimenti nell'ambito della ristorazione e somministrazione di alimenti. Versione del 27 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 32/2020).
33. Gruppo di Lavoro ISS Ambiente-Rifiuti COVID-19. *Indicazioni sugli impianti di ventilazione/climatizzazione in strutture comunitarie non sanitarie e in ambienti domestici in relazione alla diffusione del virus SARS-CoV-2. Versione del 25 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 33/2020).
34. Gruppo di Lavoro Bioetica COVID-19. *Sorveglianza territoriale e tutela della salute pubblica: alcuni aspetti etico-giuridici. Versione del 25 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 34/2020). Available also in English.
35. Gruppo di Lavoro Bioetica COVID-19. *Il Medico di Medicina Generale e la pandemia di COVID-19: alcuni aspetti di etica e di organizzazione. Versione del 25 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 35/2020)
36. Gruppo di Lavoro ISS Ambiente-Rifiuti COVID-19. *Indicazioni sulle attività di balneazione, in relazione alla diffusione del virus SARS-CoV-2. Versione del 31 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 36/2020).
37. Gruppo di Lavoro ISS Ambiente-Rifiuti COVID-19. *Indicazioni per le piscine, di cui all'Accordo 16/1/2003 tra il Ministro della salute, le Regioni e le Province Autonome di Trento e Bolzano, in relazione alla diffusione del virus SARS-CoV-2. Versione del 31 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 37/2020).
38. Silano M, Bertinato L, Boirivant M, Pocchiari M, Taruscio D, Corazza GR, Troncone R *Indicazioni ad interim per un'adeguata gestione delle persone affette da celiachia nell'attuale scenario emergenziale SARS-CoV-2. Versione del 29 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 38/2020).
39. Gruppo di lavoro ISS Malattie Rare COVID-19 *Censimento dei bisogni (23 marzo - 5 aprile 2020) delle persone con malattie rare in corso di pandemia da SARS-CoV-2. Versione del 30 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 39/2020).
40. Gruppo di Lavoro Bioetica COVID-19. *Comunicazione in emergenza nei reparti COVID-19. Aspetti di etica. Versione del 25 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 40/2020).

41. Gruppo di lavoro ISS Salute mentale ed emergenza COVID-19. *Indicazioni per prendersi cura delle difficoltà e dei bisogni dei familiari di pazienti ricoverati in reparti ospedalieri COVID-19. Versione del 29 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 41/2020).
42. Gruppo di Lavoro ISS Bioetica COVID-19. *Protezione dei dati personali nell'emergenza COVID-19. Versione del 28 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 42/2020).
43. Gruppo di lavoro ISS Salute mentale ed emergenza COVID-19. *Indicazioni ad interim per un appropriato sostegno della salute mentale nei minori di età durante la pandemia COVID-19. Versione del 31 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 43/2020)
44. Gruppo di lavoro ISS Salute mentale ed emergenza COVID-19. *Indicazioni di un programma di intervento per la gestione dell'ansia e della depressione perinatale nell'emergenza e post emergenza COVID-19. Versione del 31 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 44/2020)
45. Giusti A, Zambri F, Marchetti F, Sampaolo L, Taruscio D, Salerno P, Chiantera A, Colacurci N, Davanzo R, Mosca F, Petrini F, Ramenghi L, Vicario M, Villani A, Viora E, Zanetto F, Donati S. *Indicazioni ad interim per gravidanza, parto, allattamento e cura dei piccolissimi 0-2 anni in risposta all'emergenza COVID-19. Versione 31 maggio 2020.* Roma: Istituto Suprire di Sanità; 2020 (Rapporto ISS COVID-19 n. 45/2020)
46. Gruppo di Lavoro ISS Test Diagnostici COVID-19 e Gruppo di Lavoro ISS Dispositivi Medici COVID-19. *Dispositivi diagnostici in vitro per COVID-19. Parte 2: evoluzione del mercato e informazioni per gli stakeholder. Versione del 23 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 46/2020)
47. Gruppo di Lavoro ISS Bioetica COVID-19. *Etica della ricerca durante la pandemia di COVID-19: studi osservazionali e in particolare epidemiologici. Versione del 29 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 47/2020), Available also in English.
48. Gruppo di Lavoro Immunologia COVID-19. *Strategie immunologiche ad interim per la terapia e prevenzione della COVID-19. Versione del 4 giugno 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 48/2020).
49. Gruppo di Lavoro ISS Cause di morte COVID-19, Gruppo di lavoro Sovrintendenza sanitaria centrale – INAIL, ISTAT. *COVID-19: rapporto ad interim su definizione, certificazione e classificazione delle cause di morte. Versione dell'8 giugno 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 49/2020)
50. Perilli R, Grigioni M, Porta M, Cruciani F, Bandello F, Mastropasqua L. *S Contributo dell'innovazione tecnologica alla sicurezza del paziente diabetico da sottoporre ad esame del fondo oculare in tempi di COVID-19. Versione del 31 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 50/2020).
51. Gruppo di Lavoro ISS Farmaci COVID-19. *Integratori alimentari o farmaci? Regolamentazione e raccomandazioni per un uso consapevole in tempo di COVID-19. Versione del 31 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 51/2020)
52. Gruppo di lavoro SISVet-ISS. *Protocollo di gestione dell'emergenza epidemiologica da SARS-CoV-2 nelle strutture veterinarie universitarie. Versione dell'11 giugno 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 52/2020)
53. Filia A, Urdiales AM, Rota MC. *Guida per la ricerca e gestione dei contatti (contact tracing) dei casi di COVID-19. Versione del 25 giugno 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 53/2020).
54. Giansanti D, D'Avenio G, Rossi M, Spurio A, Bertinato L, Grigioni M. *Tecnologie a supporto del rilevamento della prossimità: riflessioni per il cittadino, i professionisti e gli stakeholder in era COVID-19. Versione del 31 maggio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 54/2020).
55. Cisbani E, Dini V, Grande S, Palma A, Rosi A, Tabocchini MA, Gasparrini F, Oracchio A. *Stato dell'arte sull'impiego della diagnostica per immagini per COVID-19. Versione del 7 luglio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 55/2020)
56. Gruppo di lavoro ISS-INAIL. *Focus on: utilizzo professionale dell'ozono anche in riferimento al COVID-19. Versione del 21 luglio 2020.* Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 56/2020). Available also in English.

57. Gruppo di lavoro ISS Formazione COVID-19. *Formazione per la preparedness nell'emergenza COVID-19: il case report dell'Istituto Superiore di Sanità. Versione del 31 maggio 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 57/2020). Available also in English.
58. Gruppo di Lavoro ISS, Ministero della Salute, Ministero dell'Istruzione, INAIL, Fondazione Bruno Kessler, Regione Emilia-Romagna, Regione Veneto, R. *Indicazioni operative per la gestione di casi e focolai di SARS-CoV-2 nelle scuole e nei servizi educativi dell'infanzia. Versione del 28 agosto 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 58/2020 Rev.). Available also in English.
59. Gruppo di lavoro ISS Bioetica COVID-19. *Supporto digitale al tracciamento dei contatti (contact tracing) in pandemia: considerazioni di etica e di governance. Versione del 17 settembre 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 59/2020). Available also in English.
60. Gabbrielli F, Capello F, Tozzi AE, Rabbone I, Caruso M, Garioni M, Taruscio D, Bertinato L, Scarpa M. *Indicazioni ad interim per servizi sanitari di telemedicina in pediatria durante e oltre la pandemia COVID-19. Versione del 10 ottobre 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19 n. 60/2020).
61. Tavolo per il monitoraggio e implementazione del Piano Nazionale delle Demenze. *Indicazioni ad interim per un appropriato sostegno alle persone con demenza nell'attuale scenario della pandemia di COVID-19. Versione del 23 ottobre 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 61/2020).
62. D'Ancona F, Isonne C, Lia L, Urdiales AM, Onder G, Vanacore N, Bellentani MD, Caraglia A, D'Alisera A, Iera J, Sabbatucci M, Spizzichino M, Benini F, Pizzuto M, Scaccabarozzi G, Pucciarelli G. *Indicazioni per la prevenzione delle infezioni da SARS-CoV-2 negli hospice e nelle cure palliative domiciliari. Versione del 15 dicembre 2020*. Roma: Istituto Superiore di Sanità; 2020. (Rapporto ISS COVID-19, n. 62/2020). Available also in English.