Coping with the COVID-19 Pandemic: Roles and Responsibilities for Preparedness

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34.1 Introduction

The novel coronavirus disease, COVID-19, was identified in China in December 2019. The responsible agent, SARS-COV2, was first isolated in China on January 9, 2020.

Since then, thanks to a globalized world, the absolute susceptibility of the world population to a new virus and an unprecedented situation, the infection has spread worldwide, infecting until now (May 16th 2020) 462,660,327 people in 188 countries and killing 311,363 individuals [1].

Skill sets such as patient safety management and quality of care are indispensable to battling the critical issues posed by the pandemic, as they

proactively and retroactively reveal weaknesses in the healthcare system. Unfortunately, in many regions where these valuable skills are present, they have not been directly applied in task forces for the management of the outbreak. Harm caused by a lack of knowledge of a new pathogen is unpredictable and in no way preventable. However, harm caused by foreseeable and preventable errors can be mitigated or avoided thanks to a systemic approach to risk management.

In this chapter, a clinical risk management perspective will be used to analyze how the world has coped with the crisis so far, highlighting measures that could have or should have been taken. The WHO pandemic plan will form the framework for the analysis. Since the pandemic is still ongoing, it should be noted that the analysis cannot be exhaustive and the solutions presented are preliminary.

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34.2 COVID-19 Summary

1. What is COVID-19?

COVID-19 stands for COronaVirus Disease 2019 and is a disease caused by a new betacoronavirus, the severe acute respiratory syndrome-associated coronavirus 2 (SARS-CoV-2).

2. What are the symptoms of COVID-19?

Fever, coughing, and shortness of breath are typical symptoms in patients with COVID-

19. In the most severe cases, the infection may cause pneumonia and acute respiratory failure, the latter being potentially life-threatening. The symptoms are similar to those of the common flu or cold and for this reason a diagnostic evaluation is needed to rule out COVID-19 in patients with flu-like symptoms.

3. How does COVID-19 spread out?

The SARS-CoV-2 is typically transmitted via liquid droplets exhaled during speech or aerosol particles produced with coughing, breathing, and sneezing. Also, transmission may occur through direct contact with contaminated surfaces, mainly of hands which then make contact with the face, in particular the eyes, nose, and mouth. SARS-CoV-2 can survive on various surfaces (i.e. plastic, stainless steel, copper, and cardboard) for 4–72 h. However, common multi-surface cleaners are able to remove the virus.

4. Who is at higher risk of COVID-19?

As the virus is new, limited knowledge is available. However, initial data from cohorts of patients in China showed that elderly people with multiple comorbidities, such as hypertension, diabetes, and malignancies, are likely to be at higher risk for severe and potentially life-threatening disease. Current data have shown that children are not infected very often, and, in the case of infection, the symptoms are mild and the outcome is overall good.

5. How do we treat COVID-19?

To date, no approved treatments for COVID-19 are available and the management is supportive. Prompt medical assistance is essential for early treatment of the disease. A mismatch between symptoms (e.g., shortness of breath) and clinical findings (severe hypoxia) has been commonly observed and leads patients to seek medical advice only when the disease is in an advanced stage.

34.3 Magnitude of COVID-19

The pandemic has affected 188 countries and the number of deaths and affected patients worldwide is very significant. The situation still varies greatly from country to country as across the

regions of Italy, probably due to the differing prevention strategies implemented.

34.4 Fundamental Aspects of the WHO Pandemic Plan

In 2005, following the outbreaks of avian influenza caused by the A/H5N1 virus, which was endemic in animals of the Far East and led to serious infections in humans, the WHO published the “WHO global influenza preparedness plan” [2] consisting of six phases, each of them including targets and specific actions that may be performed on a national or international level. The actions are divided in five different categories.

A global objective is identified for each phase. Governments are asked to adjust the plan to account for their own particular contexts and the state of the pandemic within their nation, and to provide precise recommendations for the indicated actions.

34.4.1 Phases

Interpandemic period

1. New influenza virus subtypes are detected only in animals and pose a low risk for humans.
2. New influenza virus subtypes pose a substantial risk for human disease localized to specific geographical regions.

Pandemic alert period

3. Human infection occurs with a new subtype, but human-to-human transmission is rare.
4. Small, highly localized clusters of infection form with limited human-to-human transmission. The virus is not well adapted to humans.
5. Large clusters of infection form with localized human-to-human transmission. The virus is adapted to humans and there is a real pandemic risk.

Pandemic period

6. Virus transmission in general population.

Postpandemic period

Return to Interpandemic period.

34.4.2 Framework

1. Planning and coordination.
2. Situation monitoring and assessment.
3. Prevention and containment (i.e. non-pharmaceutical public health interventions, vaccines, and antivirals).
4. Health system response.
5. Communication.

34.4.3 Overarching Goals

- **Interpandemic period, Phase 1**
 - Strengthen influenza pandemic preparedness at the global, regional, national, and sub-national levels.
- **Interpandemic period, Phase 2**
 - Minimize the risk of transmission to humans. Detect and report such transmission promptly if it occurs.
- **Pandemic alert period, Phase 3**
 - Ensure rapid characterization of the new virus subtype and early detection, notification, and response for additional cases.
- **Pandemic alert period, Phase 4**
 - Contain the new virus within limited foci or delay spread to gain time to implement preparedness measures, including vaccine development.
- **Pandemic alert period, Phase 5**
 - Maximize efforts to contain or delay spread to possibly avert a pandemic and to gain time to implement pandemic response measures.
- **Pandemic period, Phase 6**
 - Minimize the impact of the pandemic.

34.4.4 Key Actions

SURVEY	Improve virological and epidemiological surveillance
PREVENT	Implement infection prevention and control measures: <ul style="list-style-type: none"> • Public health interventions • Prophylaxis with antivirals • Vaccines
CURE	Coordinate patient care and assistance

KEEP	Develop plans to maintain health and essential services
TRAIN	Establish training programs
COMMUNICATE	Prepare communication strategies
CHECK	Continue monitoring <ul style="list-style-type: none"> • Planned actions by risk phase • Available resources • Additional resources needed • Effectiveness of interventions performed

Key actions require the implementation of specific intervention, for which actors and responsibilities must be identified.

34.5 Criticalities in the Application of the WHO Pandemic Approach During the COVID-19 Outbreak

34.5.1 Planning and Coordination

In order to adequately deal with a devastating emergency, such as the Covid-19 pandemic, it is fundamental to plan for the occurrence of similar situations even in unsuspected times.

Indeed, the pandemic plan requires WHO to coordinate member countries by taking on the role of a superior reference body [2]. A suspected underestimation of the current crisis, also by such superior reference body, had an impact mainly on the western world, which naively believed that it would be spared from what turned out to be a worldwide danger.

In particular, the most affected countries did not procure the necessary resources in the years between health crises. While countries had to develop effective mechanisms to stock up on “a global stockpile (e.g., antivirals, personal protective equipment, vaccines, laboratory diagnostics)” [2], in some countries, in particular Italy and Spain, the lack of personal protective equipment (PPE) among healthcare personnel has led to the spread of the infection in hospitals and care institutions.

During both Phase 1 and Phase 2, when the danger became more evident, effective strategies to protect health workers were not planned. In

Phases 3 and 4, strong emphasis should have been placed on ensuring proper coordination between the various actors involved in order to effectively engage the pandemic threat. The waves of the contagion could have been kept at bay by efficient identification and check of outbreaks, and the sharing of appropriate instructions, additional resources, and simple and immediate guidelines. Instead, the exchange of information between neighboring countries and the international coordination of emergency responses have happened too late. During Phase 5, which rapidly precipitated into Phase 6, attempts were made to remedy the mistakes made, learning from the most affected countries. It is precisely the lessons learnt which will allow us to prevent such a worldwide tragedy from happening again in the future.

34.5.2 Situation Monitoring and Assessment

Monitoring must be continuous and adopt a transversal approach, integrating and analyzing information systems data, in order to make an effective assessment.

The lack of information on the epidemiological and virological monitoring from China in the early stages of the disease and the subsequent delay in taking appropriate actions to assess the risk of a pandemic will certainly be analyzed worldwide at the end of the emergency. The various levels of responsibility, with subsequently difficult international solutions, will be also identified. The Western countries did not prepare themselves adequately because they did not have on hand, especially in the early stages, reliable and accurate information on the new viral strain and on the epidemiological trend of the disease. Yet the national and international objectives and actions of the aforementioned framework stated precisely what to do and how to do it. Unfortunately, the wasted time has resulted in tens of thousands of deaths. Thankfully, after a period of recovery, scientific communities across the globe have been quick to share data on new viral strains, develop a

diagnosis, experiment with new therapeutic protocols, and work towards the production of a vaccine.

34.5.3 Prevention and Containment

Prevention and containment measures include actions aimed to avoid or slow down the spreading of infection, such as non-pharmaceutical Public Health Measures (PHM), vaccines, and antivirals [2].

PHMs include individual protective measures for the target community [3], such as:

- Hand-hygiene.
- Face masks.
- Respiratory etiquette.
- Environmental measures.
- Surface and object disinfection.
- Travel restrictions such as border closure, tourism restrictions, entry and exit screening at airports and ports.
- Social distancing to reduce crowding and potential restrictions on nonessential activities; for example, in many workplaces and schools, “key-workers” may continue to work with extra precautions, while other employees should work from home wherever possible.
- Contact tracing, self-isolation of exposed individuals, and quarantine of those infected. The length of time suggested for quarantine and self-isolation will depend on the estimated period of infectivity of the pathogen.

These measures aim to delay and reduce the size of the “peak” of an infection trend and to slow transmission, so that the impact of the pandemic is mitigated and hospitals are not overwhelmed. Cultural, socioeconomic, regulatory, and political factors can affect or limit the application of PHMs with serious, preventable consequences for the entire population.

First of all, updated national guidance on PHMs should be available in the interpandemic period (Phases 1 and 2). Included interventions must be planned and shared with decision-makers from sectors other than healthcare (e.g., transpor-

tation) to avoid subsequent conflict that can delay implementation. Necessary resources and legal authority should be addressed in advance. Proposed interventions should be tested in simulations and improved. During the pandemic period (Phases 3–6), contingency measures should be assessed and improved in affected countries and prepared in those not yet affected [2].

During the Covid-19 pandemic, given the lack of effective vaccines or treatments [4] the only tool currently available to reduce SARS-CoV-2 transmission has been to identify and isolate contagious individuals.

Each country has implemented different strategies of prevention and control with varying results. For example, poorer nations have tended to introduce stricter measures than richer countries, relative to the severity of their outbreaks; their abundance of caution maybe be due to the fact that their healthcare systems are generally less developed. Europe, Sweden, the United Kingdom, and the Netherlands were relatively slow to take action. In the early stages of their epidemics, all three implemented “herd immunity” strategies, which involved few measures or relied on voluntary compliance. Later, however, the United Kingdom and the Netherlands switched to more aggressive responses, including country-wide lockdown. Meanwhile, Germany and Austria adopted aggressive control strategies early on, as compared to Italy, France, and Spain, which implemented similar measures, including lockdown, but later in their epidemics. So far, Germany and Austria have seen fewer deaths per capita attributed to COVID-19 than the other countries mentioned. A transmission model built on contact survey data for Wuhan and Shanghai before and during the outbreak and on contact tracing information from Hunan Province has allowed the impact of social distancing and school closure on transmission to be studied and has shown that social distancing alone, as implemented in China, is sufficient to control COVID-19. Meanwhile, proactive school closures can reduce peak incidence by 40–60% and delay the epidemic.

It is also becoming increasingly clear that testing is a relevant contributing factor in controlling the epidemic. At present, countries such as South

Korea and Singapore, and Italian regions like Veneto that have implemented aggressive contact tracing, broader case definitions, and/or intensive testing (i.e., case findings), in conjunction with isolation, have achieved better results [5]. Emerging evidence shows an inverse correlation between the number of tests per million inhabitants and rates of active infections, new cases, and deaths [6].

34.5.4 Healthcare System Response

This category includes interventions aimed to plan (interpandemic phase 1 and 2) and to deliver (pandemic phases 3–5) a timely, appropriate, safe, and coordinated response of healthcare facilities to pandemic. So, in the interpandemic phases 1 and 2, any healthcare organization should

- Provide itself with contingency plans with clear indications of authorities, responsibilities, and pathways.
- Set priorities and produce guidance about triage systems, surge capacity, specimen handling, diagnostic test deployment, human and material resource management.
- Share protocols or algorithm for case-finding, treatment and management, infection control guidelines.
- Increase awareness and skills of healthcare workers on pandemics.
- Assess pharmaceuticals and PPE inventory to secure supply [2].

Phases 3 and 4 include:

- The activation of emergency coordinating committees (at national, regional, and local levels).
- The start of a pre-established coordination between the healthcare sector and its partners for avoiding nosocomial transmission and laboratory infections, and ensuring biosafety.
- The review of contingency plans (especially surge capacity).
- The test of decision-making process and command chain [2].

Phases 5 and 6 focus is on the full implementation of contingency plans. The objective is to ensure that healthcare systems are able to scale up their response and implement changes in triage or treatment priorities for the efficient use of healthcare facilities. At the end of the pandemic or between waves, it must be ensured that healthcare staff have due rest, inventory is taken of supplies, plans are revised in anticipation of subsequent waves, and essential services are reinforced [2].

Apart from the inevitable issues arising from facing an unknown pathogen and the continuous acquisitions of knowledge determining continuous adjustments of strategies and protocols, the most common dysfunctions observed in terms of healthcare system responses during Covid-19 are listed below:

1. **Poorly coordinated application of the national pandemic plan and frequent derailing of systemic measures taken within a hierarchical decision-making process.** During the initial phase, patients tended to be treated in hospitals, disregarding primary care services. Later, in Italy, the best performing regions in mitigating the propagation of the pandemic were those with an early involvement and more robust organization of primary care services, such as Toscana and Veneto.
2. **Conflicting indications about essential issues.** The WHO's recommendation to "wear a mask if you are coughing or sneezing" [7] did not consider asymptomatic patients. Furthermore, if masks protect people besides the wearer, the prescription of wearing a mask should have been extended to everyone to ensure a more healthy environment. National authorities have followed the international policies to alleviate their responsibility and/or liability, but forgetting that global measures usually express minimum standards.
3. **Global shortage of Personal Protective Equipment (PPE).** If not adequately protected, healthcare workers representing the first line of defense against the virus can infect colleagues and patients and be quarantined, leading to the depletion of the healthcare workforce. The WHO has estimated that

nearly 89 million masks per month are required to face the Covid-19 pandemic, along with 76 million examination gloves and 1.6 million medical goggles. The supply of PPE, antivirals, and vaccines is an essential component of the healthcare system response to the pandemic. The determinants of the shortage seen include the off-shoring of PPE production to low-cost manufacturers, the abrupt disruption of production in the People's Republic of China, the first country hit by Covid-19, trade restrictions, and export bans [8].

4. **Global shortage of diagnostic test reagents.** This shortage is caused by the same reasons as the PPE shortage and it represents a serious problem in infection controls, considering the increasing value of intensive testing strategies. In any case, reagent production is not the only bottleneck: the lack of qualified technicians and labs running the tests has caused a cascade of dysfunctions, including laboratory congestion and staff overload, elevated need for specimen transportation, and manual order entry and reporting for outsourced tests leading to losses of information, identification errors, and delays in analyzing and communicating results. In addition, the diagnostic performance has been hampered by over-restrictive testing criteria and lack of swab technique standardization (increased number of false negative).
5. **Failure to learn from previous and current experiences.** There are several causes for this failure:
 - (a) Confirmation bias, the tendency to focus on information that confirms our preferred position or initial hypothesis. Threats such as pandemics that evolve in a nonlinear fashion (i.e., via exponential growth) are especially tricky to confront because of the challenge to rapidly interpret events occurring in real time. It is most effective to take strong action extremely early, when the threat appears to be small or potentially even before there are any confirmed cases. However, if the intervention actually works, those

same actions will likely be considered an overreaction in retrospect.

- (b) Over-reliance on “gut feeling” or the opinions of one’s inner circle. In a time of uncertainty, it is essential to resist this temptation and instead take the time to collect partial knowledge dispersed across different fields of expertise.
 - (c) Dependence on incomplete solutions instead of a systematic approach. An effective response to the virus needs to be orchestrated as a coherent system of actions taken simultaneously. The results of the approaches taken in China and South Korea underscore this point.
 - (d) Individualization and politicization of emergency management.
 - (e) Inadequate collection and dissemination of data.
 - (f) Sunk cost bias and premature closure, two cognitive biases that obstruct the revision of previously made decisions.
6. **Structural limitations of emergency departments and/or wards** have negatively affected safety, hindering the isolation of suspect cases.
 7. **Reduced staffing of public health units**, which have been responsible for the administration of vaccines for decades, has prevented aggressive contact tracing.
 8. **The lack of primary care resources** has initially compromised the home management of patients, before the forced reorganization.
 9. **Delayed or insufficient treatment of non-Covid-19 patients.** For example, during the week of the 12th of March when the maximum daily infection rate was reached in Italy, the number of admissions to hospitals for heart attacks was half that of the same week in 2019, while the mortality more than tripled. The two figures are not contradictory, but suggest that many people suffering from a heart attack did not go to the hospital and those who did arrived late in more critical condition. The time between the onset of symptoms and the angioplasty increased by over 39.2%, so that, in absolute terms, the number of deaths from heart failure almost doubled in hospitals

within the period considered, despite the fact that far fewer patients were treated [9].

34.5.5 Communication

Clear, consistent, and timely communication is crucial for managing disaster and emergency response efforts. Without proper communication, misinformation and misinterpretation can flourish and result in injury or fatalities. A communications manager should be identified and involved in the task force to support communications strategies at all levels, international, national, regional, and local. Proper communication management during a health pandemic must also include both operational messages addressed to health workers and public safety announcements. In any case, there are general criteria for effective communication regardless of the target audience.

34.5.5.1 Make the Message Clear

Information must be presented with simplicity and clarity so that everyone understands the context and the instructions to follow. The aim is to outline the situation, highlighting the necessary background information, as well as the actions that need to be taken or will be taken soon.

34.5.5.2 Keep the Message Consistent

As important as clarity, the consistency of a message helps ensure that everyone is on the same page. There may be more than one authority sharing information so all messages must be in agreement. When information is presented, it needs to be with one voice; this is particularly important for avoiding misinformation and miscommunication.

It can also help to repeat the same message so there is less room for confusion. People become disoriented during emergencies and may need to hear the same message multiple times before it sinks in.

34.5.5.3 Timeliness

Being open and sharing information as soon as possible are important communication techniques

during a pandemic to promote trust and reliability. The risk of miscommunication and incorrect assumptions increases when time goes by without any novel information or updates. Even when there is nothing new to report, reassure others with a repeating message as well as a rough timeline for when new information will be available.

Messages should be timely, consistent, and clear across all communication platforms. While these platforms often include TV and radio, there is another resource that is being used more and more for immediate information: social media.

34.5.5.4 Monitor Social Media

Social media has become a major information source for many people. According to the Global Digital Report released in 2019, the number of social media users worldwide had risen to nearly 3.5 billion in early 2019, with 288 million new users in the previous 12 months, bringing global usage to 45%.

Due to its widespread use and ability to update instantaneously, social media platforms need to be utilized and monitored. In an effort to keep the messages clear and consistent, communication managers must address any misinformation and provide the correct information before it gets out of control.

34.5.5.5 Select the Most Appropriate Method of Communication

The right methods of communication can reach all people affected by a crisis, and can be reliable even with limited accessibility. Integrated strategies with municipalities and voluntary associations must also be development so that messages are distributed as widely as possible.

Furthermore, it is necessary to clarify the roles and responsibilities of relevant parties when sharing purely operational messages related to diagnosis, treatment, etc. Situation awareness—that is, taking the right steps at the right times—should be integral to collaborative efforts.

During the current pandemic, on the other hand, we have witnessed a phenomenon of “overcommunication” in which the following critical issues were encountered: *ambiguous messages*, such as incomplete or distorted information regarding the use of PPE for both healthcare professionals and citizens; *inconsistent messages*, as a result of too

many experts expressing their own point of view; and *unclear messages*, such as recommendations that are called into question, retracted, and possibly reaffirmed in quick succession.

34.6 Improvement Actions Based on Lessons Learned

In the context of clinical risk management (CRM), the analysis of an incident report ends with recommendations in order to share the lessons learned with others and thereby avoid re-occurrence of the incident. Here, we present a series of suggestions that have been developed with reference to documents and papers published by Italian national institutions (such as Istituto Superiore di Sanità, I.S.S.) and international scientific societies and journals, based on reports and questions forwarded to the clinical risk managers of the Italian Network for Health Safety (INSH) from physicians working on the front line during the Covid-19 epidemic outbreak [10]. Recommendations are available in 5 languages at: <https://isqua.org/blog/covid-19/covid19-resources/patient-safety-recommendations-for-covid19-epidemic-outbreak.html>.

To ensure effective collaboration and communication, it is essential to promptly activate an emergency task force with a clear chain of command, roles, and responsibilities, equipped with reliable information-sharing tools. The task force should adopt a proactive approach, providing the front line with clear and continuously updated information, maintaining a streamlined reporting and learning system, and collecting and disseminating good practices. CRM units can play a relevant role in this setting. In addition, key human factors messages to help under pressure [11] should be implemented: (1) short but inclusive briefing and de-briefing, (2) open and inclusive leadership, (3) clarity of roles, (4) clear language protocols, (5) to ask questions—open questions—before acting, (6) to focus on what not on who, (7) to help staff unfamiliar with the work, (8) to use checklists, (9) to encourage staff to speak up and collect staff concern, (10) to take a pause before thinking what to do, (11) to recognize performance limiting factors each other, as anyone is not good at recognizing them him/herself.

Healthcare organizations should provide early and appropriate instructions for environment disinfection (e.g. regarding detergents, duration, and frequency) to prevent in-hospital infection spread, arrange germicide galenic preparations to avoid insufficient supply, and designate a hospital or building for infected patients rather than separate clean/dirty pathways in the same block. Hospital contamination can be further reduced by screening patients admitted for any reason (e.g. surgery, coronary angioplasty, labor and delivery), by restricting access and establishing mandatory precautionary measures for visitors (i.e. surgical masks and 1 m of separation between waiting room seats), and by limiting or suspending nonurgent hospital admissions, routine outpatient appointments, and postponable surgical procedures.

Early educational training and refresher courses are useful to enhance staff awareness and skills regarding infection transmission and management, medical and protective devices, and pandemic-related patient safety practices such as hand hygiene, the SEPSIS bundle, and the bundle for the prevention of ventilator-associated pneumonia or central venous catheter infections. A preliminary evaluation of surge capacity is highly recommended to aid in the creation of a competence-based strategy for staff re-allocation during the emergency. Expert doctors and nurses should be supported early-on by young colleagues or colleagues from other specialties, who should receive proper training in preparation of the event that they may be called upon to take over.

Shortages of PPE must be prevented by taking continual stock of supplies and establishing policies for limited reuse or extended use, for secure, centralized storage and distribution, and for distribution priorities. Every effort should be made to ensure that medical devices (i.e., haemogas-analyzers, pulsi-oximeter, mechanical ventilators, suction pumps, and oxygen therapy) are available in care areas and are well-functioning.

34.6.1 General Guidelines

The development of reliable clinical pathways to reduce preventable harm requires the identifica-

tion of high-risk steps in the diagnosis and treatment of infection, in care transitions (i.e., hospital discharge), and in special settings or categories of patients (e.g., surgery, obstetrics, pediatric care, oncologic or immunosuppressed patients). The following points should be addressed for safe diagnosis and treatment:

- With regard to diagnostic tests
 - Availability of diagnostic tests.
 - Reliability and timeliness of the diagnostic process.
 - Clear and updated criteria.
 - Standardization and quality validation.
 - Knowledge of uncommon presentations.
- With regard to treatment
 - Possible complications and prognostic factors.
 - Criteria for severity stratification for safe discharge or in-hospital allocation.
 - Parameters to monitor and to be alarmed for.
 - Criteria for setting upgrade.
 - Recall on drug-drug or drug-disease interactions.
 - Eventual not recommended drugs or other treatment precautions (i.e. in COVID-19 patients nebulizers are not recommended for the potential spread of virus; non-invasive ventilation is suggested only in selected patients for no more than 1–2 h in case of unresponsiveness).

During discharge, information transferred must be clear and structured: it is important to address follow-ups and social or work-related restrictions, such as whether the patient is cured or only clinically cured, whether the patient needs home isolation, and any precautions to be observed in case of home isolation.

34.6.2 Guidelines for Obstetrics and Pediatrics

In obstetrics, pandemic-related risk management is focused on the prevention of maternal and newborn contagion. To minimize the exposure of

the mother, prenatal care may be limited, cases screened, and quarantine protocols implemented. To protect the newborn, water birth may be avoided, extra precautions may be taken during breastfeeding (e.g. use of a breast pump), and the mother and newborn may be separated. It should be noted that Covid-19 is not a criterion for pre-term delivery or cesarean section.

To prevent unnecessary risks for children, changes in clinical presentation, laboratorial or instrumental examinations, and management must be highlighted for parents.

34.6.3 Guidelines for Caring for Immunocompromised Patients

For oncologic and other immunocompromised patients, good practices ensure the safety of required procedures and adequate infection prevention. To this end, the postponement of anti-neoplastic treatment should be evaluated on a case-by-case basis; in any case, immunosuppressant drugs must not be suspended, but dose increases should be postponed and a route of administration suitable for home treatment should be considered. Steroids can be continued with cautions. To minimize the risk of infection, individual protective measures must be thoroughly applied, and limitations should be put in place for visitation in therapy rooms or hospital wards.

34.6.4 Guidelines for Special Contexts

In special contexts such as surgery or autopsy, particular attention must be paid to the environment and operator safety to avoid infection spreading. Preventive measures may include the use of negative pressure environments, appropriate PPE, mindfulness of aerosol-generating procedures, granting access to the operating theater only to essential staff, and reliably reporting cases of infection.

34.6.5 Guidelines for General Practitioners

It is helpful to create special continuity units that visit people at home to prevent infection spreading and patient harm. In addition, general practitioners are strongly recommended to

- Educate patients about infection transmission and prevention.
- Inform patients about designated pathways for suspected/affected subjects.
- Reduce office contamination by avoiding overcrowding, preventing suspected patients access, appropriate cleaning, and utilizing PPE.
- Use tools for the early identification of cases and for the classification of the severity.
- Use checklists to avoid missing information and to ensure regulatory compliance.
- Strictly follow-up on home-managed cases.

34.6.6 Guidelines for Long-Term Care Facilities

In long-term care facilities and nursing homes, as well as in residential psychiatric facilities, risks can be reduced by

- Appropriate cleaning.
- The limitation of external visits and contact with the hospital.
- Restrictions on physical contact and careful, clinical monitoring of residents.
- Daily screening and measurement of body temperature for healthcare workers.
- Prompt isolation of suspected cases among residents or healthcare workers.
- Possible accommodation within the facility for healthcare workers.
- Provision of appropriate PPE.
- The creation of a filter area for new or returning residents.
- The creation of an isolation area for affected not requiring hospitalization.

34.6.7 Guidelines for Hemodialysis Patients

Recommended interventions include:

- Separate paths for affected/suspected cases.
- Screening and measurement of body temperature upon any access for patients and healthcare workers.
- Prompt referral to assessment and eventual isolation of suspected cases among patients and healthcare workers.
- Preference for home dialysis if feasible.
- Wide staggering of appointments and prohibition of carer access to waiting room.
- Use of private means of transportation or organization of individual medical transportation.
- Periodic screening with serologic tests or swabs of patients and healthcare workers according to local epidemiological trends.

Last, but not least, every effort must be made to ensure safe and appropriate care for noninfected patients. The rapid conversion of many hospitals to Covid-19 treatment centers should not hamper emergency care. Explicit priority criteria and dedicated, clean paths should be identified, taking into account pandemic status, hospital resources, and the need to avoid harmful delays in patient treatment, especially for oncologic patients.

34.7 Conclusions

Pandemic is a complex problem and the range of action must take into account the geographical area involved, international and national regulations, production autonomies and commercial exchanges, lifestyle, culture and ethical values of the affected population, available technology, characteristics of care facilities, organization of the doctor-patient unit, and safety of staff, patients, and uninfected citizens.

Only a careful “*a posteriori*” analysis will allow to understand if the suspected delayed

alarm by China and lack of awareness of the epidemic spread in other countries was due to lightness, incompetence, negligence, or guiltiness. The global involvement and the self-defense carried on by the countries involved will not help to fully clarify the responsibilities. However, we must learn from this tragedy that no event, albeit improbable, should be considered impossible.

China may have thought it have done everything possible to contain the contagion in a defined area, but forgot that probably the virus had already arrived in the rest of the world. The difference for other countries was the ability of national organizations to react in terms of resilience (Box 34.1) [12].

Box 34.1 The Four Essential Abilities of Resilience

- **The ability to respond.** Knowing what to do, or being able to respond to regular and irregular changes, disturbances, and opportunities by activating prepared actions or by adjusting current mode of functioning.
- **The ability to monitor.** Knowing what to look for, or being able to monitor that which is or could seriously affect the system’s performance in the near term—positively or negatively. The monitoring must cover the system’s own performance as well as what happens in the environment.
- **The ability to learn.** Knowing what has happened, or being able to learn from experience, in particular to learn the right lessons from the right experience.
- **The ability to anticipate.** Knowing what to expect, or being able to anticipate developments further into the future, such as potential disruptions, novel demands or constraints, new opportunities, or changing operating conditions.

All four abilities are necessary.

To **respond** to a critical event effectively, the organization **learn** what and how to do it, identifying who does it and with what resources.

Monitoring requires learning from experiences; thus, it will allow you to effectively **anticipate** dangerous situations [13].

Asia, Europe, Africa, the USA, Canada, South America, Australia, the entire planet has suffered an epochal arrest, paying a very high price in terms of life, economic recession, and political credibility. Yet everything was predictable, it was enough to think that it could happen.

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