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## Complications of Covid-19: Developments for the unified health system [Complicações da Covid-19: Desdobramentos para o sistema único de saúde]

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# *Complications of Covid-19:* developments for the Unified Health System

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**Resumo:** Covid-19 is an infectious severe acute respiratory syndrome, caused by Coronavirus, which quickly reached pandemic levels. In July/2020, Brazil was the second country most affected by the disease, exceeding two million cases. Despite the increasing scientific literature on Covid-19, its containment is still compromised by the lack of understanding about its determinants and complications. This article presents a discussion on aspects related to Covid-19 complications and its effects on Unified Health System (SUS), aiming at planning new coping strategies. Additionally, it is pointed out that the overload of the health system does not result only from aspects associated with the assistance to Covid-19, but adds to the pre-existing health needs, whose care strategies were postponed and/or changed due to the actions transmission control. It is evident, then, the need to reinforce the action of Primary Health Care as the ordering of care in SUS, acting in the management of the reorganization of flows and in the improvement of the physical structures of the units. To this end, the end of measures to limit health resources is essential, since not only does the success of coping with Covid-19 depend on this, but also the future of SUS and Brazilian's health.

► **Keywords:** coronavirus infections; Covid-19; pandemics; Primary Health Care; Unified Health System.

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## Covid-19: definition and context in SUS

Covid-19 is an infectious severe acute respiratory syndrome (SRAG) caused by Coronavirus, being represented by the etiological agent SARS-Cov2 (WANG et al., 2020), which showed a particular speed and dissemination of new cases. The first official case of pneumonia with an unknown cause in Wuhan, with potential interest of health authorities, was registered at the office of the World Health Organization (WHO) in China, in December of 2020. In March of 2020, WHO declared Covid-19 a pandemic, affecting about 100 countries and surpassing the milestone of 100.000 confirmed cases, which triggered important control measures, from the planning of health services to the identification of containment strategies (WHO, 2020b et al., WANG et al., 2020; MEYER, 2020).

As of July 20, 2020, approximately 14 million confirmed cases were identified worldwide, and more than 600.000 deaths were associated with Covid-19 (WHO, 2020a). In Brazil, the first case was registered on February 26, 2020 and the first official death on March 17, 2020 (BRASIL, 2020a); and, in July 2020, the Brazilian Ministry of Health (MH) officially presented about two million confirmed cases and almost 80.000 deaths, with a mortality rate of 4%, being the second most affected country. It is noteworthy that this scenario is due to national adherence to the physical distancing protocol, recommended by WHO and adopted on March 12, 2020.

The Unified Health System (SUS) is the one responsible for fighting the pandemic in its different dimensions, from epidemiological surveillance, detection and tracing of cases, to the care of severe cases in intensive care units, the highest level of care complexity (CARVALHO; LIMA; COELI, 2020). In this context, the ignorance about the determinants of the disease's natural history and its complications can be considered as an element that compromises the decision-making process in the construction of clinical parameters – epidemiological factors that support the organization of care. These complications, whether temporary or permanent, represent a growing demand from health systems for clinical care, both in primary health care (PHC) and in medium complexity, which historically has relevant limits to patient access, overloading SUS even more.

Possible complications arising from Covid-19 could have a considerable impact in the population's quality of life. In addition, they will possibly generate an increase in the demand for care of medium and high complexity, which has an unequal

distribution of supplies nationwide (CASTRO et. al., 2020). Although SUS provides for the guarantee of universality and integrality of access to services, it is expected that there will be a greater occurrence of late diagnoses and limitations in the capacity of carrying out treatment and rehabilitation (EDITORIAL, 2020). In this sense, it is noteworthy the current reduction in public health quality services and the greater limitation of access, from the implementation of the Constitutional Amendment 95 (EC95), which was an important element in reducing health investments and resulted in SUS being underfinanced throughout years. The political scenario aggravated the health situation by reducing investment in social protection and promotion policies (CARVALHO; LIMA; COELI, 2020; PAES-SOUSA et al., 2019).

The impact of the economic recession generated by the control of infectious diseases of pandemic proportions, such as Covid-19, is strongly associated with the context, with the mapping of risk areas (epidemiological surveillance – VE), with the situation of vulnerability, and with the financing policy decision. Given the challenge imposed by Covid-19 on the health system and economic growth (SANDS et. al., 2016), the repeal of the spending ceiling can be seen as an important measure to face this scenario, in order to increase the resources needed to reinforce the health and social protection budget (DECCACHE et al., 2020).

Thus, this article seeks to consider aspects related to Covid-19 complications and their effects on SUS, to scale the planning of new strategies and policies to meet the demands generated in the context of the pandemic. The health system is not only due to aspects associated with assistance to Covid-19, but it adds to the pre-existing health needs of the pandemic, whose care strategies were postponed and/or changed, due to transmission control actions.

## Current and future problems: acute and chronic complications of Covid-19

Despite the great outpouring of evidence regarding Covid-19, little is known about its consequences. It is known that, regarding its pathogenesis, the majority of those infected – about 80% – will develop mild or asymptomatic symptoms, while the others will present more severe symptoms, with the possibility of hospitalization. From these, around 5% will need intensive care and mechanical ventilation (WHO, 2020b; WU; MCGOOGAN, 2020).

The average period of convalescence is of 19 days (2-5 days until symptoms appear and 14 days post-symptoms until recovery) (WHO, 2020b), but when undergoing intensive care, this period can take 3-6 weeks (WHO, 2020b). Thus, recognizing this high average length of stay in the hospital bed, due to the susceptibility of the population, it is estimated that the large number of patients affected will overload the health system, increasing the occupation of beds, the number of procedures performed, and the use of hospital equipment.

Regarding the complications of Covid-19, some risk factors for the development of the most severe form of the disease have already been recognized in the literature, which may have a role in the worsening of the clinical picture, such as: (a) advanced age (over 60 years old) and (b) presence of comorbidities (cardiovascular diseases, obesity, diabetes, hypertension, lung diseases, etc.) (KOLIFARHOOD et al., 2020).

Scientific production on this topic still shows strong expansion. With the exponential growth in the number of cases, new evidence may emerge, as issues such as cell tropism and pathogenic mechanisms still need to be better clarified (PANIZMONDOLFI et al., 2020; ZHOU et al., 2020). The available evidence already indicates that Covid-19 is a systemic disease with extensive dissemination in the human body, and not simply a respiratory disease, since the presence of pathogenic mechanisms and complications in vital organs have already been identified in studies (DIAO et al., 2021; SUN et al., 2020; ZHANG; SHI; WANG, 2020).

The recognition of the pathogenic mechanism may be of particular importance to elucidate the issue previously reported, since the receptor used by the virus to parasitize the host organism (angiotensin 2 converting enzyme receptor (ACE2)), is present in several organs and systems, not only in the respiratory tract (ZHANG; SHI; WANG, 2020). It is noteworthy that the tropism for the upper airways has already been recognized, as it is the entry point for this type of virus, but the infectious process is not over there (FELLET, 2020), thus developing clinical manifestations disseminated through the body (OXLEY et al., 2020).

To try to prove the dissemination of the virus through the human body, Wu and collaborators (2020) carried out studies on alterations, from a molecular perspective, to observe the disturbances in metabolism. The results showed metabolic changes in several organs and systems, appearing in a dispersed way throughout the body, suggesting a possible causal relationship to Covid-19. It is noteworthy that such metabolic changes, related to the process of endothelial deregulation already

recognized, due to the mediated inflammatory response, reduce the body's ability to perform the functions of homeostasis, essential for full functioning (OXLEY et al., 2020; PANIZ-MONDOLFI et al., 2020).

Thus, complications from Covid-19 infection will be presented, according to the organic systems, to better understand how this process can be treated (CHEN et al., 2020; HANLON et. al., 2020; MADJID et al., 2020; OXLEY et al., 2020; PANIZ-MONDOLFI et al., 2020). According to the currently available literature, the effects of Covid-19 in the body affect the following systems: a) respiratory; b) cardiovascular; c) urinary; d) central nervous system (CNS); e) sensory; f) digestive; g) male sire.

Concerning the respiratory system, there is a possibility of thrombi formation at the level of the pulmonary alveoli due to inflammatory mechanisms and deregulation of the coagulation cascade can lead to respiratory failure, specially from gas exchange abnormalities, caused as a consequence to fibrosis, which is an important respiratory complication of Covid-19 (GIANNIS; ZIOGAS; GIANNI, 2020; SERVICK; 2020; AM, 2020; YANG et al., 2020).

Complications related to the heart and vascular system can be: acute cardiac injury, heart failure, myocarditis, vascular inflammation, and cardiac arrhythmias (CHEN et. al., 2020; MADJID et al., 2020; YANG et al., 2020). The probability of occurrence of these events may be related to the inflammatory process mediated by the infection. It is also noteworthy that some evidence points to changes in the biochemical parameters of cardiac enzymes, which can cause heart problems that may be related to the combination of a significant systemic inflammatory response and vascular inflammation located at the level of the arterial plaque (CHEN et. al., 2020). This mediation of the inflammatory response provoked by the immune response to Covid-19 causes the formation of thrombi, disseminated throughout the body, causing a new inflammatory response and an injury where it is installed, triggering a multisystem dysfunction at the level of the organs which were affected (OXLEY et. al., 2020; WADMAN et al., 2020). Thus, it is noteworthy that such thrombotic changes identified in patients with Covid-19, thrombocytopenia, was noted to have five times more chances of developing the most severe form of the disease, increasing the risk of disseminated intravascular coagulation (GIANNIS; ZIOGAS; GIANNI, 2020; LIPPI; PLEBANI; HENRY, 2020; OXLEY et al., 2020; ZHOU et al., 2020).

Given the evidence regarding the urinary system, patients with Covid-19 may have renal failure due to the increase in serum creatinine and reduction in the glomerular filtration rate. Such infection can induce severe acute tubular necrosis and lymphocyte infiltration, causing further tubular damage by recruiting macrophages to infiltrate the interstitial tubule, which can be explained by the expression of ACE2 receptors in the renal tubules (DIAO et al., 2021; FAN et al., 2020a; YANG et al., 2020).

As for the nervous system, neurological complications are particularly important as they can trigger permanent sequelae, especially as reported in the literature for respiratory viral infections. Thus, two routes of entry into the CNS are already recognized: the hematogenous route, mediated by ACE2 receptors and the neuronal retrograde pathways, and consequent neuropathic virus-induced infection, which can result in a higher probability of causing a stroke and behavior change (PANIZMONDOLFI et al., 2020).

The sensory system, as a result of CNS infection, can be particularly affected due to its transitory anosmia in the period of clinical manifestation of the disease (PANIZMONDOLFI et al., 2020). Also on the sensory system, ophthalmological changes were identified as a result of Covid-19 infection, which may cause complications in the retina, such as retinitis and optic neuritis (MARINHO et al., 2020).

Concerning the digestive system, although intestinal problems have already been reported as a result of changes in the coagulation cascade mediated by the inflammatory process, one specific organ shows us greater importance: the liver, as it plays a very important role in the metabolic process. Thus, changes in liver enzymes become a particular issue, presenting results up to three times higher than the reference values. (YANG et al., 2020; ZHANG; SHI; WANG, 2020), which is more common among men (FAN et al., 2020b; SUN et al., 2020) and in more severe cases of the disease (SUN et al., 2020; YANG et al., 2020). Moderate microvascular steatosis and mild lobular activity were identified. It is also noteworthy that the changes identified in the liver may be related to polydrug treatment, common in patients hospitalized for this disease (FAN et al., 2020b; SUN et al., 2020; ZHANG; SHI; WANG, 2020). The identification of severe liver damage does not exclude the probability of developing chronic liver failure (CHEN et al., 2020; FAN et al., 2020b; SUN et al., 2020).

Finally, in the male reproductive system, as reported, the expression of ACE2 receptor in testicular cells was identified, which could be a potential mechanism of

infection. Data suggest that, given this mechanism of infection, there is a chance of development of orchitis as a complication of SARS-CoV-2 infection, altering the spermatogenesis process, which may cause effects on fertility, as well as in other viral infections (FAN et al., 2020a).

In addition to all the complications arising from the clinical manifestation of Covid-19 previously reported according to the systems, it is also worth mentioning some that are not directly related to any organic system, but which are particularly relevant since they are associated with multisystemic conditions, such as case report of children with symptoms similar to the ones of Kawasaki syndrome (TOUBIANA et al., 2020; WHITTAKER et al., 2020) and from the Guillain-Barré syndrome (ALBERTI et al., 2020; CAMDESSANCHE et al., 2020; NEEDHAM et al., 2020; TOSCANO et al., 2020).

Additionally, in parallel to the similarities between the clinical manifestations of Covid-19 and the acute respiratory distress syndrome - ARDS (HERRIDGE et al., 2011), developments such as severe heart disease are expected (SERVICK; 2020; AM, 2020) (heart attack and stroke) and “intensive care syndrome” - ICS (HERRIDGE et al., 2011; RAMSAY et al., 2016; RAWAL; YADAV; KUMAR, 2017; ROBINSON et al., 2018), the latter in particular, due to the need for hospitalization in intensive care for a long period.

This syndrome (ICS) stands out for a set of physical (muscle atrophy and weakness – 50%), cognitive (79%) and mental (28%) changes. Individuals with an average of 45 years old returned to work only one year after discharge from the Intensive Care Unit (ICU) (49%), with a reduction in gait speed (considered the sixth vital sign), which can last up for five years after discharge. This set of changes potentially reduces the quality of life of both the patient and their potential caregivers (HERRIDGE et al., 2011; ROBINSON et al., 2018).

Given the complications already reported by the system, which may also be related to such syndrome (ICS), it is worthy highlighting:

- a) cognitive impairment associated with hospitalization in the ICU, causing intense and prolonged delirium, as a result of coughing and anxiety attacks caused by the discomfort on the respiratory tube (HERRIDGE et al., 2011; RAMSAY et al., 2016; RAWAL; YADAV; KUMAR, 2017), which worsens in patients with Covid-19 due to the use of benzodiazepines (LONERGAN; LUXENBERG; AREOSA SASTRE, 2009; RAMSAY et al., 2016), acute



- brain dysfunction (stroke, alcoholism), hypoxia (ARDS, cardiac arrest), hypotension (severe sepsis, trauma), respiratory failure requiring prolonged mechanical ventilation, and use of renal replacement therapy (RAWAL; YADAV; KUMAR, 2017; ROBINSON et al., 2018);
- b) physical changes, such as neuromuscular weakness due to reduced functional status, in about 25% of patients, causing recurrent falls or tetraparesis (HERRIDGE et al., 2011; RAWAL; YADAV; KUMAR, 2017);
- c) mental changes, in about 60% (RAWAL; YADAV; KUMAR, 2017), including symptoms such as anxiety, depression, post-traumatic stress, which can be isolated or combined (HERRIDGE et al., 2011; RAWAL; YADAV; KUMAR, 2017; ROBINSON et al., 2018).

Additionally, as reported above, SARS-CoV-2, due to the potential formation of systemic clots (OXLEY et al., 2020; PANIZ-MONDOLFI et al., 2020) can reduce blood flow to the brain, causing neurological complications of the brain. CNS, such as seizures, loss of consciousness, loss of smell (5% to 10%), and “intense and prolonged delusion”, which can lead to long-term cognitive impairment, such as memory deficits (HERRIDGE et al., 2011; RAMSAY et al., 2016; RAWAL; YADAV; KUMAR, 2017; SERVICK; 2020; AM, 2020).

Thus, given the constant rising of evidence regarding knowledge of the natural history of the disease, it is not possible to exhaust all the possibilities of complications resulting from the clinical manifestations of Covid-19 that cured patients and the health system may still bear. Several measures are needed to improve the quality of life of patients discharged from the hospital after prolonged use of the ICU, such as: physiotherapy, nutritional care, and psychological support (RAWAL; YADAV; KUMAR, 2017). This factor reinforces the theses of increased demand (overload) of caregivers and the growth of costs associated with care in the convalescence of patients with Covid-19.

Therefore, the impact of severe acute diseases on the health system can be equated to that attributed to chronic diseases, due to the prolonged use of intensive care (HERRIDGE et al., 2011). In summary, it is estimated that, if the recommended preventive measures are not taken seriously by WHO, in addition to the significant increase in deaths in Brazil caused by Covid-19m it is expected that the costs associated with this process and the clinical sequelae will increase

In most of the recovered patients, demonstrating the great social, economic and health impact (WALKER et al., 2020).

## The impact of the pandemic on the health system and on the treatment of chronic diseases

### Confronting Covid-19 in Brazil

In Brazil, SUS, which was already facing serious challenges to meet the usual demand for health services, finds itself even more overloaded due to the volume of infections by Covid-19 and the need for resources available for treating this disease. At the beginning of the pandemic, it was expected that the most affected areas would have a rapid increase in the demand for health services, especially for hospital beds in the ICU, and for mechanical ventilatory support in cases of acute respiratory syndrome (RACHE et al., 2020).

A study from 2018, which used data from the National Register of Health Establishments (CNES), already indicated that the availability of ICU beds in SUS was below recommended and that it presented large regional differentials, with worse indicators in the Northern (0,65 beds per 10.000 inhabitants) and Northeastern (0,78 beds per 10.000 inhabitants) regions. In the private sphere the situation looks better, with around four ICU beds for every 10.000 inhabitants; however, only 30% of the Brazilian population has access to health plans (MEDEIROS, 2018).

A study on the supply and demand of beds during the current pandemic in Brazil points out that the contribution of private beds is not negligible, especially in the Southeastern region (NORONHA et al., 2020). The same study showed that first, the structure of health services would be able to meet the demand brought by the pandemic, but the situation depends on the speed of the spread of the disease. When specifically analyzing ICU beds, the problem is aggravated in several regions. Another study identified that 72% of the country's health regions already had the number of ICU beds below the minimum recommended for a usual demand (RACHE et al., 2020).

The situation is similar when analyzing the availability of mechanical ventilation devices. Although the problem is less severe than the ICUs one, the situation is also worrying (NORONHA et al., 2020). The Ministry of Health (2010) defined that there must be mechanical pulmonary ventilators in at least 50% of the ICU

beds, in addition to the reserve unit for every five beds. According to Rache and collaborators (2020), 216 (72%) health regions did not meet these requirements.

As a strategy to reduce the propagation of speed of Covid-19 and contain the burden of health systems, it was recommended worldwide adherence to measures such as isolation, quarantine, distancing, and community containment measures. The adoption of these measures impacts on postponing the peak of the epidemic (“flattening the curve”), reducing the number of cases, transmissions, and hospital demand (AQUINO et al., 2020). The last effect of the distancing measures is essential to avoid the collapse of the SUS, which already had problems even before it was hit by the pandemic. Although the determination of the first isolation measures in the country took place at a similar time to several countries, Brazil stands out negatively due to the position of the Head of State, who does not recognize their importance (AQUINO et al., 2020).

Another important recommendation to contain the spread of the disease is testing the population. In Brazil, it was initially expected to test all suspected cases and those who had contact with confirmed cases. Despite this, there were not a sufficient number of tests, making it necessary to prioritize testing only for severe cases. In addition, the MH started to guide the proper hand hygiene and use of face masks. However, there were not enough inputs for their distribution by the government, and citizens were asked to provide their own masks (BRASIL/SVS, 2020).

With the incipient number of ICUs, ventilators, tests, masks, and other essential supplies, the physical distance was the most viable option to contain the Covid-19. Despite this, even with the ascending curve in the number of cases, the flexibility of distancing measures was started, taking the country to the second position in number of cases worldwide until July 202 (WHO, 2020a).

### **Current scenario: SUS overload with delayed usual demand, Covid-19 and complications**

In the early stages of the Covid-19 pandemic, the focus was on containing the infection and identifying treatment strategies with a focus on controlling this communicable disease. However, it is important to mention that the long-term effect in individual with chronic non-communicable diseases (NCDs) is significant. Some NCDs seem to increase the severity of Covid-19 and its mortality risk. SARS-

CoV-2 infection in individuals with NCD can also affect the progression of their preexisting clinical conditions (PALMER et al., 2020).

Covid-19 control measures will have substantial short- and long-term consequences; distancing restrictions and quarantine will reduce physical activity and increase other harmful lifestyles, increasing risk factors for NCDs (smoking, alcoholism, physical inactivity, obesity) and aggravating clinical symptoms. Changes in the routine treatment of patients with NCD – for example, cancellation of non-urgent outpatient appointments – will have important implications for their treatment, diagnosis, adherence to treatment, and its progression (PALMER et al., 2020). The current pandemic directly affected health services. Overcrowding of contaminated patients, lack of beds and a low number of professionals, in addition to the demands for medical treatment of other illnesses are some of the main consequences observed.

Covid-19, as well as the measures to control the pandemic, can reach the most fragile individuals, worsening the return condition of patients with NCDs. One of the consequences of the pandemic was the delay in diagnosis and interruption of the treatment of cancer cases. Estimates indicate that 43% of cancer patients suffered the impact due to the pandemic (INSTITUTO ONCOGUIA, 2020). Among the main effects, there are the postponement of treatment, cancellation, and other effects on their outpatient routines. Thus, integrated strategies and actions are needed to mitigate the indirect and long-term effects of this pandemic.

It is also noteworthy that even after the end of the emergency phase of the pandemic, with the progressive reduction of cases and deaths, the challenge of dealing with the increased demand in SUS for diagnosis, treatment, and rehabilitation of recovered patients emerges, but still with complications, such as: (a) increased demand for rehabilitation services, due to respiratory complications; (b) consultations and psychotherapies for both “new” cases and for previous psychiatric cases that were aggravated due to the difficult access during the pandemic; (c) overload of cardiologists’ care due to the accumulation of postponed appointments in function of the control protocol, to avoid contamination and increased incidence of heart disease from Covid-19, with increased risk of stroke and heart attack; e (d) worsening of the scenario of drug therapy, medical appointments and elective surgeries for NCDs, due to the rescheduling of the appointments, without renewing prescriptions.

## **The role of epidemiological surveillance in planning health actions to fight the pandemic**

According to Duchiae (2020), it is necessary to assume that the virus is here to stay, and while there is no effective vaccine, it is assumed that the solution is to live with Covid-19. In this context, from the beginning, Brazil chose to focus resources on the treatment of critically ill patients and on adherence to measures of physical distance that would reduce the pressure on hospital services, slowing the demand for intensive care beds (the “flattening of the curve”)

Even so, it is possible to see different levels of the pandemic in the country: large centers with a slowdown in death curve and the “internalization” of the disease. This scenario was avoidable, as infectious diseases transmitted person-to-person are knowingly fought with epidemiological surveillance tools (ST).

In a simplified approach, concerning an action plan based on ST, the campaign to eliminate (suppress) the disease, when transmissible, has two phases (COSTA, 2020). The first is the attack phase, in which, indiscriminately, a vaccine or other means of control is used, such as physical isolation, which prevents illness and transmission to expressive portions of the population at risk. Thus, the transmission rate is reduced to levels that can be complemented more intelligently in the second phase – surveillance and control.

In the second phase, based on suspected cases notified by the PHC services, which are referred for diagnosis and treatment, the research is carried out with the polymerase chain reaction (PCR) diagnostic test, to check if among its contacts there are people transmitting the disease, despite having no symptoms. And concerning the situation of test application, three important directions stand out: (1) population surveys by sampling – such as in the national study EPICOVID (HALLAL et al., 2020), in which it was found that the number of cases can be up to 7-10 times higher than diagnosed (FREIRE, 2020); (2) continuous monitoring of health professionals; and (3) tracking of contact by ESF.

For this control action plan based on STs to be effective, according to Duchiae (2020), coordination between the different levels of health administration is essential. The MH is responsible for establishing guidelines for a national strategy, in addition to negotiating the purchase of inputs on the international market and signing agreements on patents and technology transfer, for example. The states and municipalities are tasked with articulating and making the different instances of SUS

work, from capitals and metropolitan regions to micro-regions and municipalities. In this sense, the accumulated experience of 30 of SUS constitutes an advantage that few countries have, with a capillary work network of PHC, hierarchical and the command of SUS.

Despite what has already been said about the Brazilian strategy controlling the pandemic, it is essential to discuss the place of PHC in the joint fight against it (SARTI et. al., 2020), since studies indicate that about 80% of the cases are mild and most of the moderates seek the basic network as the first access in the search for care (DUNLOP et al., 2020). Thus, considering the specificities of SUS, it is worth highlighting aspects related to the organization of the PHC and its role on facing the challenges imposed by Covid-19 in the country.

PHC must be considered as an important pillar when facing situations of emergency (DUNLOP et. al., 2020), such as the epidemics of dengue, zika, yellow fever, chikungunya, and, also, Covid-19. Betting on what is considered to be the soul of PHC (knowledge of territory, access, link between the user and the health team, comprehensive care, monitoring of vulnerable families, tracking and monitoring of suspected and mild cases) is a fundamental strategy for containment of the pandemic.

Thus, considering the current heated debate regarding the control measures used so far, it is necessary to have in mind that ST actions in the territory represent a structuring strategy, alongside with PHC, for the monitoring of Covid-19 infection (BRASIL, 2020b).

## The PHC experience in Brazil: strategy in the Covid-19 context

As a strategy to fight the pandemic/post-pandemic period, it was focused on the ensuring the proper action of the PHC in tracking and monitoring those infected and their contacts. Thus, both the Family Health Teams (FHT) and specifically the community of health agents (CHA), applying isolation strategies recommended by WHO, should follow the recommendations of the surveillance guide of the PHC secretariat – SAPS (BRASIL, 2020b; SAPS, 2020). Thus, within the scope of PHC in SUS (ENGSTROM et al., 2020), recommendations for the organization of Covid-19 care refer to the identification of suspected cases and household contacts and, if possible, community contacts in the last 14 days,

with guidance on home isolation for 14 days, in order to avoid the simultaneous generation of serious cases and overload of the SUS.

As it is widely disseminated, “only with strong PHC the system will be able to flatten the pandemic growth curve and guarantee sufficiency of ICU beds” (VITÓRIA; CAMPOS, 2020, p.1), thus being a possible way to guarantee the safety and efficiency of the system to face the pandemic. It is expected that the control of person-to-person transferability will allow the development of more effective strategies in terms of system resoluteness, making it possible to meet both the usual demand and the one that arises due to the pandemic.

Vitória & Campos (2020) defines, regarding the adequacy of PHC guidelines to fight the pandemic:

1. Guarantee the safe Access to the Basic Health Unit (BHU), with the adequate physical structure and online BHU (implementation of specific triage protocols, with effective separation on the entrance door exclusively for patients with Covid, or with the use of tents as physical structures for emergency care);
2. Guarantee of safety in immunizations (for example, with prior appointment);
3. Protection of health professionals (guarantee of availability and guidance for the current and rational use of personal protective equipment (PPE));
4. Guarantee of longitudinal care (strategies such as call centers, avoiding unnecessary displacements; as well as guaranteeing the maintenance of the SFt regarding the patient’s evolution, with low O<sub>2</sub> saturation and/or rapid worsening of their clinical condition);
5. Strengthening of the family approach (guidance by the CHAs to the families on the importance of maintaining the care of their patients regarding adequate food, hydration, medication, and indoor contamination);
6. Strengthening the community approach (responsibility of the BHU regarding the implementation of an isolation strategy for vulnerable families in their assigned territory, especially those with very high-density rates of inhabitants per room).

Consequently, specifically regarding the confrontation of Covid-19 by PHC in SUS, a special issue was published containing reports of local experiences that point to the reflection of the great health tragedy SUS is facing (EDITORIAL, 2020), exposing its strength and responsiveness. Even in an environment of difficulties

– which requires equipment, supplies, new protocols, knowledge/practices, as well as the political will to be overcome – the reports demonstrate the commitment of contagion and involving local communities in this effort.

In summary, PHC needs to play its role as an organizer of care in SUS, acting immediately in managing the reorganization of user flows in the services and, progressively, in improving the physical structure of the units. The centralization of PHC in the MH agenda is therefore urgent so that SUS won't be suffocated on constitutional amendments that limit its resources, since not only the success of confronting Covid-19 depends on this but also the future of SUS and the health of the Brazilian people. In this sense, it is worth mentioning that the weaknesses arising, for example, from the testing incapacity, reflect directly on the morbidity and mortality profile, providing an increase in the demand for more complex services. In this sense, it is essential to value the actions of epidemiological surveillance to guide strategies and policies in the fight against Covid-19, a *sine qua non* for achieving the best results for the health system, especially PHC, from the timely feasibility of the recognition, appreciation, and financing of SUS.<sup>1</sup>

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## Note

<sup>1</sup> F. G. Avelar, I. C. M. Emmerick, J. Muzy and M. R. Campos equally participated in the conception and design, writing of the article and critical review of the final content.

# Resumo

## *Complicações da Covid-19: desdobramentos para o Sistema Único de Saúde*

A Covid-19 é uma síndrome respiratória aguda grave, infecciosa, causada por coronavírus, que rapidamente alcançou níveis pandêmicos. Em julho 2020, o Brasil era o segundo país mais afetado pela doença, superando dois milhões de casos. Apesar da eclosão de literatura científica sobre Covid-19, o planejamento de ações para sua contenção ainda é comprometido pelo alto grau de desconhecimento sobre seus determinantes e complicações. Este artigo considera aspectos relativos às complicações associadas a Covid-19 e seus efeitos no Sistema Único de Saúde (SUS), visando ao planejamento de novas estratégias de enfrentamento. Adicionalmente, aponta-se que a sobrecarga do sistema de saúde não resulta apenas dos aspectos associados a assistência à Covid-19, mas se somam às necessidades de saúde preexistentes, cujas estratégias de cuidado foram postergadas e/ou alteradas devido às ações de controle da transmissão. Evidencia-se a necessidade de reforçar a ação da Atenção Primária à Saúde, enquanto ordenadora do cuidado no SUS, atuando na gerência da reorganização dos fluxos e na melhoria das estruturas físicas das unidades. Para tal, o fim de medidas de contingenciamento de recursos da saúde é imprescindível, visto que não só o sucesso do enfrentamento à Covid-19 depende disso, mas também o futuro do SUS e a saúde dos brasileiros.

► **Palavras-chave:** infecções por coronavírus; Covid-19; pandemias; Atenção Primária à Saúde; Sistema Único de Saúde.

