

Epidemiology, public policies and Covid-19 pandemics in Brazil: what can we expect?

Epidemiologia, políticas públicas e pandemia de Covid-19: o que esperar no Brasil?

Epidemiologia, políticas públicas y la pandemia de Covid-19 en Brasil: que podemos esperar?

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ABSTRACT

Objective: to discuss experiences and contradictions in the control of the Covid-19 pandemic from the perspective of epidemiology and Brazilian public policies. **Content:** the discussion presented is divided into two sections: the first one present epidemiological parameters on the epidemic curve of SARS-CoV-2, as well as the international experiences for the control of this phenomenon. The second, anchored in the Brazilian public policies, presents a comparative analysis of national and international experiences, discussing the potential impacts on the pandemic, considering some specific social issues. **Conclusion:** in the face of impossibility of reducing susceptible people through vaccination strategies, the reduction of the speed of the epidemic curve needs to occur through actions of social distance. In addition, the construction of public policies aimed at protecting workers and expanding investment in the health sector are urgent measures.

Descriptors: Coronavirus; pandemics; uses of epidemiology; public policy.

RESUMO

Objetivo: discutir as experiências e contradições no controle da pandemia de Covid-19 sob a perspectiva da epidemiologia e das políticas públicas brasileiras. **Conteúdo:** o debate apresentado divide-se em duas seções: a primeira traça a reflexão dos parâmetros epidemiológicos sobre a curva epidêmica do SARS-CoV-2, bem como as experiências internacionais para o controle deste fenômeno. A segunda, ancorada nas políticas públicas brasileiras, apresenta uma análise comparada das experiências nacionais e internacionais, discutindo os potenciais reflexos sobre a pandemia, considerando algumas especificidades sociais. **Conclusão:** frente à impossibilidade de redução de pessoas susceptíveis por meio de estratégias vacinais, a redução da velocidade da curva epidêmica precisa ocorrer por meio de ações de isolamento físico social. Ademais, a construção de políticas públicas que visem a proteção ao trabalhador e a ampliação do investimento no setor saúde são medidas urgentes.

Descritores: Coronavírus; pandemias; aplicações da epidemiologia; política pública.

RESUMEN

Objetivo: discutir las experiencias y contradicciones en el control de la pandemia Covid-19 desde la perspectiva de la epidemiología brasileña y las políticas públicas. **Contenido:** el debate presentado se divide en dos secciones. El primero traza la reflexión de los parámetros epidemiológicos en la curva epidémica del SARS-CoV-2, así como las experiencias internacionales para el control de este fenómeno. El segunda secciona, anclada en las políticas públicas brasileñas, presenta un análisis comparativo de las experiencias nacionales e internacionales, discutiendo los posibles impactos en la pandemia, considerando algunas especificidades sociales brasileñas. **Conclusión:** dada la imposibilidad de reducir a las personas susceptibles a través de estrategias de vacunación, la reducción de la velocidad de la curva epidémica debe ocurrir a través de acciones de aislamiento social y físico. Además, la construcción de políticas públicas destinadas a proteger a los trabajadores y ampliar la inversión en el sector de la salud son medidas urgentes.

Descriptores: Coronavirus; pandemias; usos de la epidemiología; política pública.

INTRODUCTION

Since 1960, Coronavirus infections are known by the scientific community. Seven main types of Human Coronavirus are known to exist, four of which are responsible for 5 to 10% of mild acute respiratory affections. That is them: HCoV-OC43, HCoV-HKU1, HCoV-229E, and HCoV-NL63. Three other types are known for their ability to cause severe respiratory syndromes: the MERS-CoV (*Middle East Respiratory Syndrome*), the SARS-CoV and the SARS-CoV-2 (*Severe Acute Respiratory Syndrome*)¹.

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SARS-CoV, whose epidemic occurred between 2002 and 2004, starting in China, reached more than 20 countries and resulted in 754 deaths^{2,3}. While MERS-CoV, isolated in 2012 in Saudi Arabia, has reached 27 countries, causing 858 deaths⁴. Although the two agents have the unquestionable potential for epidemic production, it is important to consider that the clinical severity is quite distinct between them. While the SARS-CoV lethality rate is around 10%, this lethality is around 35% in MERS-CoV outbreaks, implying the need for ventilatory assistance in 50 to 80% of the cases^{1,3}.

Recently, the outbreak of the Covid-19 epidemic in Wuhan, China, led the international community to resume warnings about the risk of a pandemic, a fact declared by the World Health Organization in March 2020⁵. The disease, initially called 2019-nCoV or COVID-19 (Coronavirus Disease 2019) is now classified as SARS-CoV-2 by the International Committee on Taxonomy of Viruses¹.

With an erratic behavior and rapid spread throughout the world, the COVID-19 pandemic has become a public health emergency, being responsible so far for distributed 396,249 confirmed cases and 17,252 deaths. That is, 87.5% of the countries in the world have submitted at least one confirmed case (data capture: 12h 01m 27s of March 24, 2020)⁶. It should be noted that five countries account for 66.4% of confirmed cases, holding 263,106 cases, namely: China (20.59%), Italy (16.4%), United States (11.74%), Spain (10.01%), and Germany (7.91%). Regarding the lethality coefficient, we can observe that Italy (9.5%), China (4.0%) and Spain (6.8%) together account for more than 50% of all deaths, while the United States of America (1.3%) and Germany (0.42%) present totally different scenarios⁶.

This complex scenario poses additional challenges for epidemiological surveillance, international relations, and public policy planning, in particular through measures to reduce inequalities in access to health systems and structural conditions for self-care. Turning attention to the behavior of this pandemic in the different regions seems to be essential to update the strategies for dealing with this global emergency and its repercussions at the local level. In this sense, this article aims to discuss the experiences and contradictions in the control of the COVID-19 pandemic from the perspective of Brazilian epidemiology and public policies.

CONTENT

The epidemic curve and the experiences of control in the pandemic

The monitoring of epidemic curves is undoubtedly one of the main actions carried out by epidemiological surveillance services in the face of epidemic situations, such as that experienced today. This is because the graphic follow-up of the cases allows us to foresee the epidemiological scenario of the event and, therefore, to program public policies and assistance specific to its confrontation. The academic knowledge about this monitoring is longstanding, and it is based on a proven technique present in the literature, always with incidence measures being used (new cases of the event) for the speed estimation of the population infection⁷. An important measure to be considered in the estimation of this curve is the disease's ability of reproduction, which is given by estimating the number of secondary cases that can be generated from a single host⁸. The greater this ability to reproduce, the faster an epidemic will progress.

It is important to reflect that the number of susceptible individuals in the population and the social structure itself are capable of affecting this ability of the disease to reproduce and, consequently, the rate of the curve progression. No wonder the priority preventive measure in some epidemics is to reduce susceptible individuals by vaccination⁹. However, specifically on COVID-19, there is so far no proper immunobiological for the reduction of susceptible ones, leaving to us only the interventions in the social structure as a priority measure for its containment.

It draws attention that a review of articles based on the Chinese experience of COVID-19 points to a reproductive capacity of the disease between 1.5 and 6.49 people, with a mean of 3.28 and a median of 2.79 people¹⁰. In relation to the doubling time of the epidemic, we observe a variation between 5.2 and 7.4 days^{11,12}. It is important to consider that the slower the speed of progression of an epidemic – that is, the greater the number of days to double and the fewer the individuals who are infected by a host – the longer it will last. On the other hand, the responsiveness of the health services will also be greater. It is precisely for this reason that interventions in the social structure are essential and urgent measures to tackle epidemics with such potential, in this case, social isolation.

Based on international experience, it is possible to project that about 1% of those exposed to SARS-CoV-2 will be asymptomatic and 80.9% of those exposed will present mild clinical manifestations¹³. This group tends to present fever and/or non-productive cough, sore throat, nasal congestion, general malaise, headache, myalgia, requiring no hospitalization^{14,15}. On the edge, they are individuals who can be treated at home and who in 12.5 days, on average,

will be recovered¹⁴. However, we know that about 20.0% of the cases will require hospitalization, of which 5.0% will require intensive care unit admission and 2.3% mechanical ventilation^{15,16}. In this sense, we understand that the increase of the curve progression speed is directly proportional to the increase of intensive care unit admission needs in a short period.

For this reason, international experience has shown three major strategies for containing this curve and expanding the care capacity of positive cases. That is them: 1. expanding the testing of suspected cases with rapid delivery of results; 2. identifying communicators of the disease with subsequent and immediate isolation at home; 3. investments aimed at protecting health professionals; in addition to the displacement of professionals focused on assistance, monitoring and implementation of community control strategies¹⁷.

Against tradition – the contradiction: dialogues between international strategies and Brazilian public policies

In Brazil, the still initial situation of the epidemic already points to a rising and fast epidemic curve, rising from two confirmed non-native cases on March 2, 2020, to 2201 autochthonous cases on March 24, and already with the expectation of reaching 6981 cases (95% CI: 6243 – 7807) on the 29th day of this month¹⁸. It sounds fundamental to report that the observation of the initial periods of the epidemic curves in Brazil and Italy have similarities⁶.

On the other hand, a technical study that compared projections of the epidemic and the cases observed for the same period reflects an optimistic outlook for the COVID-19 behavior in the country, showing, in the medium term, a tendency to flatten the rise of the curve, i.e., to reduce the epidemic speed¹⁸. Corroborating this information, until March 16, 2020, when the first measure of physical social isolation was imposed in the country – specifically by the Government of Rio de Janeiro – the reproduction of the disease was estimated at between 2.4 and 4.6 individuals, falling to an estimation between 2.1 and 3.8 individuals on the 24th. The doubling time of the epidemic also showed a slight improvement when comparing the two periods: between 2.0 and 2.9 days and 2.9 and 3.3 days, respectively.

Even in the face of the apparent loss of speed in the epidemic curve in Brazil, at least three aspects still deserve reflection in this section. About the first aspect, it is important to reflect that the literature already has some theoretical-practical robustness on the recognition of the disease status and the prevention of new cases of the disease^{17,20}. This is justified by the possibility of early identification of positive cases, the adoption of home isolation and/or hospital care actions and, consequently, the reduction in the disease's reproduction indicators and increase in the time of duplication.

Until the current phase of the epidemic, Brazil still does not have enough tests for large-scale testing. The recommendations of the Ministry of Health have been directed towards the prioritization of tests only for severe cases in intensive care. The other cases are recommended to perform home self-isolation without necessarily notifying the health authorities²¹. Thing is, the option to increase sensitivity in diagnosis has potentially produced enlargement of suspect cases without the necessary documentation of confirmed cases that are in milder courses, and which represent the majority of COVID-19 cases. Thus, the Brazilian epidemic curve is likely to be undersized, weakening strategies to contain the epidemic.

If the extension of tests for COVID-19 is an urgent matter, the resumption of investments in the Brazilian Public Health System (Sistema Único de Saúde, SUS) seems to be on an equal footing, and this is the second aspect to be reflected on. A technical study conducted in Brazil projected the occupation rate for SARS-CoV-2 infection in adult beds of intensive care units in the SUS. Using the 2019 rate, a scenario was simulated in which 20% of the population would be infected, of which 5% would need intensive care admission for 5 days. The result shows that of the 436 health regions in the country 67.4% would exceed the 100% occupation rate. More than half of these regions would need twice as many beds per day to assist the serious cases. Furthermore, the study indicates that an infection rate of 9% of the population would be sufficient to occupy all intensive care beds in half of the health regions. A similar situation is observed for the existence of mechanical fans, even in large capitals such as Rio de Janeiro and São Paulo²².

A study that mapped intensive care unit beds in European countries showed significant differences in the ratio of bed per 100,000 inhabitants, an aspect that can be considered in this analysis. While Germany shows a result of 29.2, Italy and Spain have ratios of 12.5 and 9.7²³. The United States and China have ratios of 31,7 and 4,6 respectively²⁴. It is important to note that Germany, with the largest number of beds in Europe, has one of the lowest lethality rates in the region. A similar situation is observed in the United States of America, although these beds have the highest per capita cost in the entire globe (\$7,164).

It draws attention that the Chinese result precedes the record construction (in 10 days) of two hospitals to receive patients with COVID-19, an aspect that may have contributed to a lower lethality when compared to the performance

of Italy and Spain. This is not intended to attribute the lethality of the disease exclusively to the number of intensive care beds available, but this is certainly one of the elements needed to analyze the situation.

In any case, the last study carried out on the ratio of beds per inhabitant in the SUS shows values lower than part of the countries previously analyzed: 7.1 beds per 100.000 inhabitants²². It is important to consider that over the last few years the underfunding of the SUS has produced a sharp reduction in assistance beds. With the enactment of Constitutional Amendment 95 (Public Spending Ceiling) in 2016, the country set the budget for social policies for 20 years, including resources for health²⁵. In the face of public health emergencies, as in the case of this pandemic, investment needs to increase without medium and long-term budget monitoring.

The distribution of the workforce in countries is also a factor to be considered. Data from the World Health Organization's Global Health Observatory inform that the proportion of medical force is higher in European countries such as Italy (2017) and Spain (2016) – of 40.9 and 40.6 per 10,000 inhabitants, respectively – while in Brazil, the reported for the year 2018 was 21.4 and in China (2015) was 17.8 per 10,000 inhabitants. The proportional distribution of nursing workers in Italy and Spain in the same years is closer to that of doctors (58.6 and 55.3 for 10,000 inhabitants) and higher than in China, at 23.0/10,000 inhabitants. Data from Brazil inform a markedly higher proportion of nursing, 97.0/10,000, in 2018. However, unlike Spain and Italy, countries where direct health care is provided almost exclusively by graduate nurses, in Brazil, the largest number of professionals within the category are high-school graduate personnel, which makes it difficult to compare the scope and effectiveness of actions. It is also worth remembering that the concentration of professionals is traditionally higher in large Brazilian urban centers.

Additionally, it is important to reflect that, even with the volume of studies on the containment of the pandemic, the Brazilian Federal Government, in the figure of the President of the Republic, seems to disregard this production of knowledge. Thus, the third aspect under analysis is the discursive and practical formulation of political actors on the experience with the pandemic in Brazil. Systematic presidential pronouncements demonstrate resistance to the practice of home self-isolation and denial of the real gravity of the epidemic, producing antagonistic effects to the guidelines of the states' governors²⁷. We believe that these discursive actions blur the population's understanding of which guideline should be adopted, implying failures in social isolation and damage to the health barriers implemented. In times like these, in which there is evident confusion between a narrative that starts with an opinion and one that is based on evidence or observable events, the unrestricted dissemination of “fake news” contributes little to a collective and rational confrontation of the situation.

Reinforcing this problem, jobless rates (including unemployment) and informal employment were already high even before the beginning of the pandemic, with a precarious labor force in general, and women's in particular²⁸. The withdrawal of labor rights and guarantees, and the growing loss of the purchasing power of families in recent years, make it possible to think of a diffuse but significant increase in the vulnerability of the poorest populations to face the pandemic.

In the face of the need for families to survive and the already announced worsening of the economic crisis in the Brazilian state, it is reflected: how universal is the right to social isolation? Even aware of an underemployment mass in health, the Federal Government is committed to measures for the use of final year medical and nursing students²⁹. If much, it contradicts the very experiences of professional safety and exposes students still in the process of graduation in an already recognized scenario of professional contamination^{17,29}.

CONCLUSION

Faced with the impossibility of immediate control of the pandemic by reduction of susceptible ones through vaccination, the world experiences point to the need to control the rate of progression of the curve through measures of social self-isolation. This measure tends to reduce the need for ventilatory support and admission to intensive care units in a short period of time, adapting the need to the health system's care capacity. In contrast, social public policies need to be reconsidered in Brazil, especially those aimed at protecting workers, investing in the health system and ensuring professional protection.

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