

Epidemiological Report

Covid-19 vaccination

Historic Series 2010 – 2021

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THE PANDEMIC AND THE COVID-19 VACCINATION CAMPAIGN

The São Paulo State Health Department (SHD-SP) is carrying out gradually, in line with the Ministry of Health (MS), the Vaccination Campaign against Covid-19, since January 2021. Covid-19 is the largest pandemic in recent human history, caused by the new coronavirus (SARS-CoV-2). It is an acute, potentially serious, globally distributed respiratory infection that is highly transmissible between people through respiratory droplets or contact with contaminated objects and surfaces.

According to the World Health Organization (WHO), about 80 percent of people with Covid-19 recover from the disease without needing hospital treatment. However, one in six people infected with SARS-CoV-2 develops severe forms of the disease. Elderly people and/or people with morbidities, such as people with heart and lung problems, diabetes, or cancer, among others, have a higher risk of developing severe forms of the disease. It is known that the non-pharmacological measures to contain the transmission of the new coronavirus, although they have been fundamental until now, have a high social and economic cost, making it indispensable to have a vaccine against the disease.

By December 31, 2021, confirmed cases of Covid-19 totaled 4,456,469 in the state of São Paulo (SSP), with 155,213 deaths, while worldwide there had been 281,808,270 cases and 5,411,759 deaths. These data are published on the Epidemiological Surveillance Center electronic address, from the Disease Control Coordination of the São Paulo State Health Department (ESC/DCC/SHD-SP), on January 1st, 2022, available at: <http://saude.sp.gov.br/cve-centro-de-vigilancia-epidemiologica-prof.-alexandre-vranjac/>.

According to the WHO overview, there are approximately 265 Covid-19 vaccines under study, with 172 in preclinical studies, 43 in Phase I clinical studies, 20 in Phase II clinical studies, and 20 in Phase III clinical studies. There are four vaccines against Covid-19 authorized for use in Brazil by the Agência Nacional de Vigilância Sanitária - ANVISA (National Health Surveillance Agency): two with emergency use authorization (Sinovac/Butantan and Janssen) and two with definitive registration (AstraZeneca/Fiocruz and Pfizer/Wyeth).

Since it is a worldwide search for technology, production, and acquisition of the immunobiological, the availability of the vaccine is initially limited.

Considering the limited availability of vaccine doses, it is necessary to define priority groups for vaccination. In this scenario, the groups at highest risk for aggravation and death were prioritized. In addition, in the pandemic context experienced in the years 2020 and 2021, the vast majority of the population was still highly susceptible to virus infection, and the maintenance of the health care workforce and essential services was also a priority.

With the campaign's progress and the acquisition of more vaccine doses, it is being possible to immunize people according to their age and the defined schedule, and also beyond the priority groups that were originally established. It is emphasized that up to the present moment, as the Covid-19 pandemic continues in the world, the vaccination strategy in the SSP, as well as in Brazil, remains implemented.

Moreover, it is important to reinforce that all technical recommendations for the operationalization of the vaccination campaign in the state have been given through the "Documento Técnico da Campanha de Vacinação contra a Covid-19" (Technical Document of the Vaccination Campaign against Covid-19) in the SSP, which by December 2021 was already in its 31st update, available on the ESC/DCC/SHD-SP website.

AVAILABLE VACCINES

The National Immunization Program (NIP) has made available the Covid-19 vaccines from the pharmaceutical companies Sinovac/Butantan and AstraZeneca/Oxford University/Fundação Oswaldo Cruz (Fiocruz)/Serum India - Covid-19 (recombinant) from the beginning of the campaign until April 2021, available in all municipalities of the SSP.

Beginning in May 2021, Covid-19 vaccines were introduced from the pharmaceutical company Pfizer/Wyeth (messenger RNA), which were initially distributed only to the capital cities, due to the conditions required for proper transport and storage, as established by the PNI/MS. After receiving a larger quantity of the Pfizer vaccine and changes in the conservation conditions, the doses were distributed to all the municipalities in the state. In June of the same year, the SSP received doses from Janssen-Cilag Farmacêutica Ltda. (recombinant Covid-19 vaccine), which were also distributed to all cities.

Thus, during the year 2021, with the effective accomplishment of the vaccination campaign against Covid-19, Brazil and the SSP counted on the availability of Sinovac/Butantan vaccines, the so-called Coronavac, besides the Astrazeneca and Pfizer vaccines, which have as primary vaccination scheme the accomplishment of two doses according to the recommended interval (Chart 1), and the Janssen vaccine, which has as primary scheme the application of a single dose.

Chart 1. Recommended time interval between doses of Covid-19 vaccines with a two-dose primary vaccination schedule, 2021.

Immunobiological	Covid-19 (inactivated) adsorbed vaccine Sinovac/Butantan	Covid-19 (recombinant) vaccine AstraZeneca	The Covid-19 Vaccine (Messenger RNA) Pfizer	
Age group	People aged 18 and older	People aged 18 and older	People aged 18 and older	Persons aged 12 to 17 years, 11 months, and 29 days
Interval between doses in weeks	4 weeks	8 weeks	3 weeks	8 weeks
Interval between doses in days	From 14 to 28 days*	56 days	21 days	56 days
Observations	Not recommended for people between 12 and 17 years, 11 months, and 29 days; contra-indications - see Technical Document	Not recommended for people between 12 and 17 years, 11 months, and 29 days; pregnant and post-partum women; contra-indications - see Technical Document	Contra-indications - see Technical Paper	

Source: Technical Document of the Vaccination Campaign against Covid-19, 31st update. *Preferably 28 days.

It should be noted that the vaccination campaign against Covid-19, besides having been initiated in a staggered manner, with the prioritization of immunization of people in groups at higher risk of morbidity and mortality, used the vaccines initially approved for adult use, i.e., for people aged 18 years or older. With the campaign's progression and the advances in vaccine research and technology, this scenario has undergone changes, which are noticeable to this day.

Considering the analyzed period in this bulletin, between March 2020 and December 2021, it is possible to infer that there was the expansion of the Pfizer vaccine (purple cap) use to people over 12 years old, upon authorization by Anvisa on June 11, 2021, after analysis of the request made by the manufacturer. Thus, after the incorporation by the PNI, the SSP started the vaccination of the public between 12 and 17 years of age in a staggered way.

Moreover, as the months went by, the results of the studies carried out with temporal updates of the vaccine effectiveness analyses identified a progressive drop in protection in the most recent months, initially among the elderly, so that, in the period analyzed, this is still the part of the population with the highest incidence and lethality rates, highlighting their high vulnerability even after vaccination. In addition to the elderly, another group that has received attention worldwide is those with a high degree of immunosuppression, as immunogenicity data on vaccinated individuals have shown lower rates of seroconversion and neutralizing antibody titration against Covid-19, varying with different degrees of immunosuppression.

In this perspective, clinical trials have been conducted in immunosuppressed individuals and in the general population with the administration of three doses of the Covid-19 vaccine and, in general, a significant amplification of the immune response - both cellular and humoral - has been observed after the administration of an additional dose in these individuals. Thus, the strategy of additional/reinforced doses for the population was started, prioritizing the elderly, people with a high degree of immunosuppression, and health care workers (Chart 2).

Chart 2. Interval to perform the additional/reinforced dose for eligible public, 2021.

VACCINE	NUMBER OF DOSES	GROUP	INTERVAL BETWEEN DOSES
The vaccine available in the network*	1 additional dose	People aged 60 and older	6 months from the vaccination schedule completion date
The vaccine available in the network*	1 additional dose	Health Care Workers	6 months from the vaccination schedule completion date
The vaccine available in the network*	1 additional dose	Immunosuppressed**	28 days from the vaccination schedule completion date

Source: Technical Document of the Vaccination Campaign against Covid-19, 31st update.

*Cities must consider the quantity of doses intended for the additional dose strategy and the immunobiological intended for this purpose.

**For the purposes of vaccination with additional dose, individuals with a high degree of immunosuppression are considered (see Technical Document).

We point out that, with the progression of the vaccination campaign, given its dynamics, the recommendations of the number of doses for the additional doses/booster scheme, as well as the interval between these doses, and even in the primary scheme, have changed. To see the new recommendations, access the Technical Document in its latest update, available on ESC's website.

TARGET AUDIENCE AND THE VACCINATION SCHEDULE IN SSP

According to the Plano Nacional de Operacionalização da Vacinação contra a Covid-19 - PNO (National Plan for the Operationalization of Vaccination against Covid-19) and the Programa Estadual de Imunização contra a Covid-19 - PEI (State Program for Immunization against Covid-19), the following target groups for the campaign were initially defined:

- o People aged 60 and older who are institutionalized.
- o Indigenous people living in ratified and non-rootified Indigenous Lands.
- o Health care workers.
- o People aged 18 and older with institutionalized disabilities.
- o Traditional riverside peoples and communities.
- o Traditional Quilombola peoples and communities.
- o People aged 60 and older
- o People with severe permanent disabilities between the ages of 18 and 59.
- o People with morbidities from 18 to 59 years old.
- o Pregnant and postpartum women between the ages of 18 and 59.
- o Prisoners and employees of the prison system.
- o People who are homeless.
- o Education workers (daycare, pre-school, elementary school, high school, higher education, vocational education, and Youth and Adult Education).
- o Security and rescue forces.
- o Military Forces.
- o Truckers.
- o Port workers.
- o Industrial workers.
- o Workers in public transport by subway, rail, waterway, air, and road (road transport is the transport on roads, highways, streets, and other paved or unpaved roads, with the intention of moving people from one point to another).
- o Workers in urban cleaning and solid waste management.

Considering the vaccine's limited availability, these groups were prioritized according to the criteria of exposure to infection and higher risks for worsening and death from the disease, as well as the essentiality of the service they provide. The scheduling of these groups for vaccination was done according to vaccine availability.

In view of the CIB Deliberation nº 64, 10-06-2021, by means of which the Comissão Intergestores Bipartite do Estado de São Paulo - CIB/SP (Bipartite Interagency Commission of the State of São Paulo), on 06/09/2021, approves *ad referendum* the adoption of the immediate strategy of vaccinating the general population, in descending order, for the age group 59 to 18 years old, and registering the doses applied immediately in the official information system VaciVida, used in the SSP, within 24 hours between the application and the registration of the referred vaccine. Thus, at that time, for Covid-19 vaccination in the state, there were groups incorporated and/or planned according to age groups, as follows:

- o People aged 50 to 59 - starting June 16, 2021.
- o Persons aged 43 to 49 - starting June 23, 2021.
- o People aged 40 to 42 - starting June 30, 2021.
- o Persons aged 37 to 39 - starting July 8, 2021.
- o People 35 to 36 years old - starting July 15, 2021.
- o People 30 to 34 years old - starting July 19, 2021.
- o Persons aged 28 to 29 - starting July 30, 2021.
- o People 25 to 27 years old - starting August 5, 2021.
- o People aged 18 to 24 - starting August 10, 2021.
- o People between 16 and 17 years old with disabilities, comorbidities, pregnant and postpartum women - starting August 18, 2021.
- o People between 12 and 15 years old with disabilities, comorbidities, pregnant and postpartum women - starting August 26, 2021.
- o People from 15 to 17 years old - starting August 30, 2021.
- o People from 12 to 14 years old - starting September 6, 2021.

It is worth noting that the São Paulo State Health Department (SHD-SP) has sent and is sending doses regularly to all cities in the state for the execution of the campaign phases in progress. At each new shipment received from the Ministry of Health, the SSP schedules the grids and distributes them based on the target public remaining to be vaccinated, monitoring the supply and demand for the continuation of the campaign.

In this perspective, it should be noted the guidance that even those who are under state guardianship, with their freedom deprived, must be vaccinated, i.e., the prisoners who fit the list

of priority public for vaccination against Covid-19 in the SSP follow the same vaccination schedule of the general population. This group is accounted for by IBGE (Brazilian Institute of Geography and Statistics) as the resident population in the host cities.

Given the complete vaccination schedule, in accordance with the recommendation of additional dose in the elderly and immunosuppressed populations, the vaccination campaign against Covid-19 progressed to the additional dose, so that at that moment people aged 60 years or more, healthcare workers, and immunosuppressed people were eligible for this vaccination, and the vaccination of these groups started according to the following schedule, considering the completion date of the primary vaccination schedule and the appropriate interval for the additional dose:

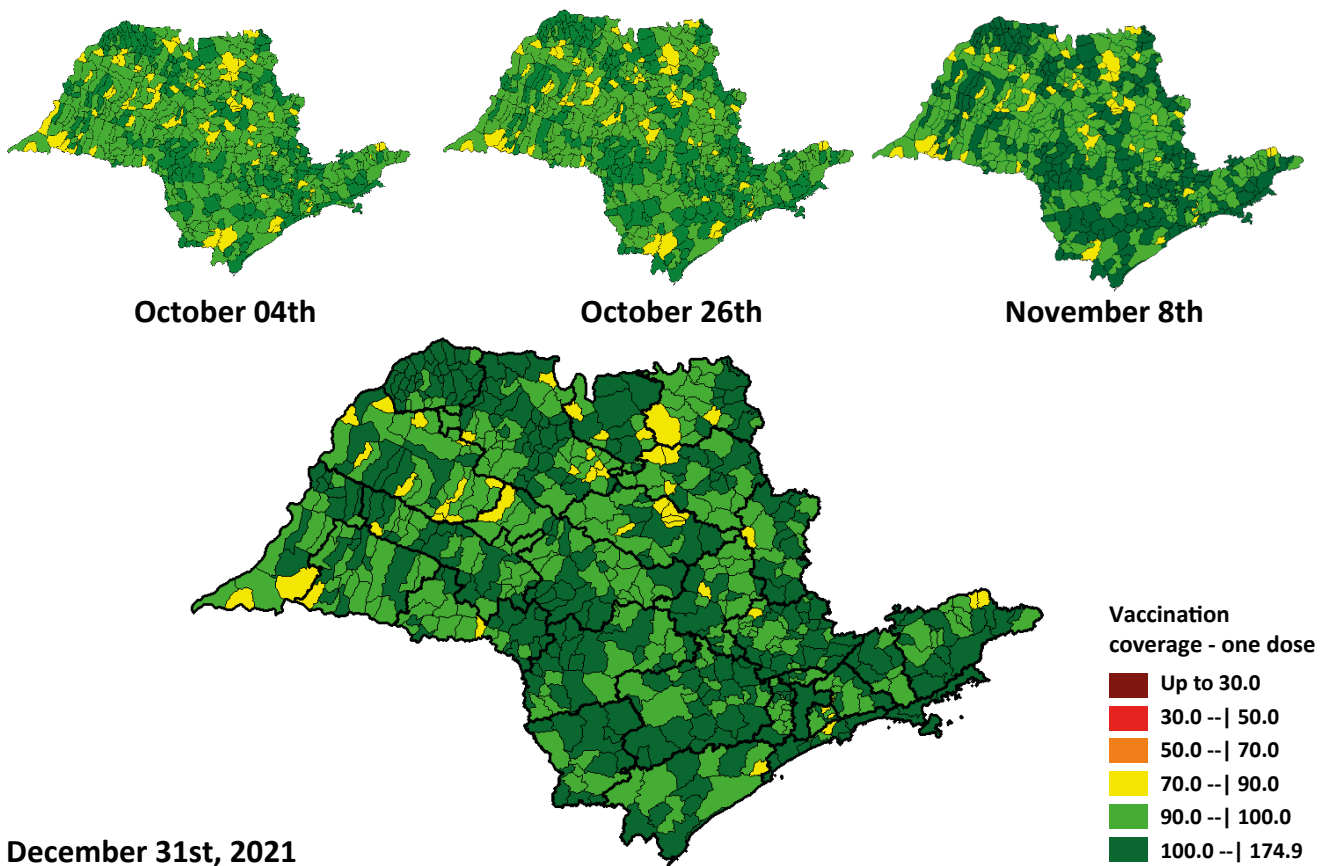
- o People aged 90 and older - starting September 6, 2021.
- o People aged 85 to 89 - starting September 13, 2021.
- o People aged 80 to 84 - starting September 20, 2021.
- o People with a high degree of immunosuppression who are 18 years or older - starting September 20, 2021.
- o People aged 70 to 79 - starting September 27, 2021.
- o People aged 60 to 69 years - starting October 4, 2021.
- o Health workers - starting October 4, 2021.

We emphasize that some of the definitions contained in the Technical Document, which guides the operationalization of the Covid-19 vaccination campaign, are dynamic, and are conditional on the vaccines' characteristics and availability for use and may be adjusted.

VACCINATION COVERAGE

As the vaccination campaign against Covid-19 has advanced throughout São Paulo, it is possible to observe the increase in the vaccination coverage of people with at least one dose (either the first dose of the vaccination scheme - D1 or a single dose - DU), i.e., it is noticeable that the amount of first doses applied in the population has grown over time, and by December 31, 2021 the vaccination coverage reached 102.92% of the target population (people aged 12 years or older) vaccinated with at least one dose. This allows us to conclude that, for the first dose, the campaign goal, which corresponded to 90%, was reached. However, when the goal per city is observed, of the 645 cities in São Paulo, although 601 had reached the goal for the first dose, 44 had not reached it until then ([Figure 1](#)).

Figure 1. Spatial distribution of Covid-19 vaccination coverage of persons aged 12 years and older with at least one dose of the vaccine regimen, by city, SSP, 2021.

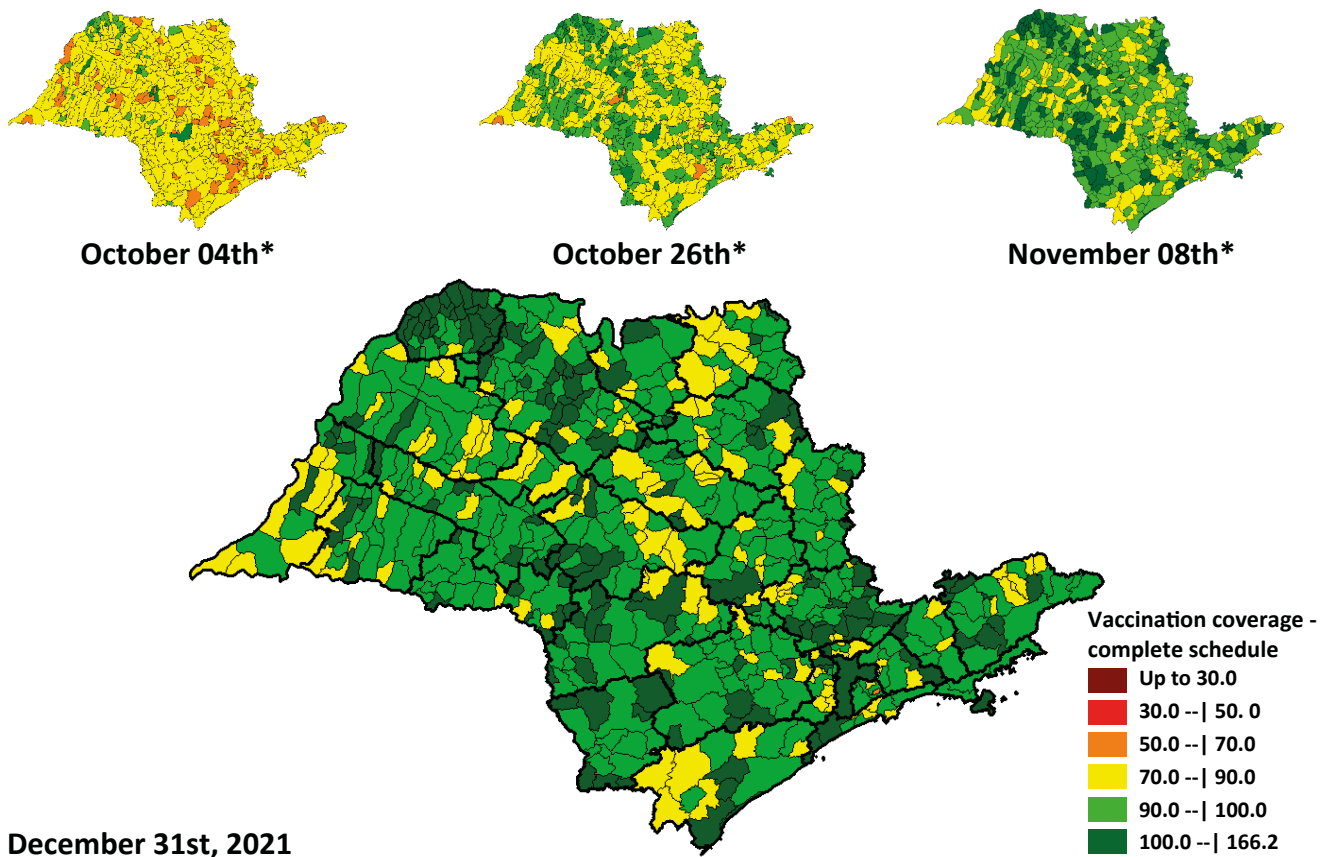


Source: VacíVida. Data extracted on January 05, 2022.

From this perspective, we can conclude that the vaccination coverage of people with complete vaccination schedule (second dose - D2 or single dose - D1) has also progressed over time, and this is also influenced by the recommended interval between doses to enable the completion of the vaccination schedule. On December 31, 2021, we observed 95.81% vaccination coverage for this same population, within the target recommended by the Ministry of Health.

When looking at the city scenario, it is possible to conclude that 499 cities had already achieved full vaccination coverage for the population aged 12 or older, while 146 cities had not yet reached the recommended 90% coverage ([Figure 2](#)).

Figure 2. Spatial distribution of Covid-19 vaccination coverage of persons aged 12 years and older with complete vaccination schedule, by city, SSP, 2021.



Source: Vacivida. *After December 2021, the calculations changed to people aged 12 years and older, instead of 18 years and older.
Data extracted on January 05, 2022.

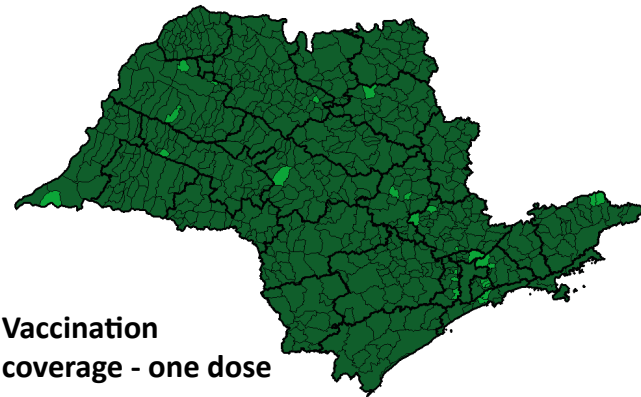
In this sense, it is important to observe the progression of the vaccination campaign according to the age groups, as, although vaccination has started with priority groups, targeting the groups at higher risk of morbidity and mortality, given the scarcity of immunobiologicals in the world scenario, it is known that the great advance of the campaign was driven by the vaccination of the general population, oriented according to age group, occurring in a decreasing manner.

Considering, at that time, three major groups (population aged 60 years or more, population aged 18 to 59 years, and population aged 12 to 17 years), we have that for at least one dose, all were above the recommended target, being respectively 100.8%, 101.7%, and 108.9%. However, when the goal for the complete vaccination schedule was analyzed, as expected, the group of people from 12 to 17 years of age had not yet reached satisfactory vaccination coverage, because part of this population was not yet within the interval for receiving the second dose of the vaccination schedule, thus showing coverage of 80.6% for this group, 94.9% for people aged 18 to 59, and 106.6% for

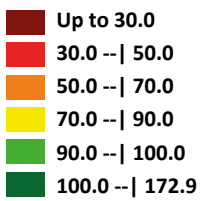
people aged 60 years or older (Figures 3, 4, and 5). So, as expected, the vaccination coverage with the first dose was in more satisfactory percentages than the complete vaccination schedule, especially when analyzed by age group.

Figure 3. Spatial distribution of Covid-19 vaccination coverage of persons aged 60 years and older with at least one dose and complete Covid-19 vaccination schedule, by city, SSP, 2021.

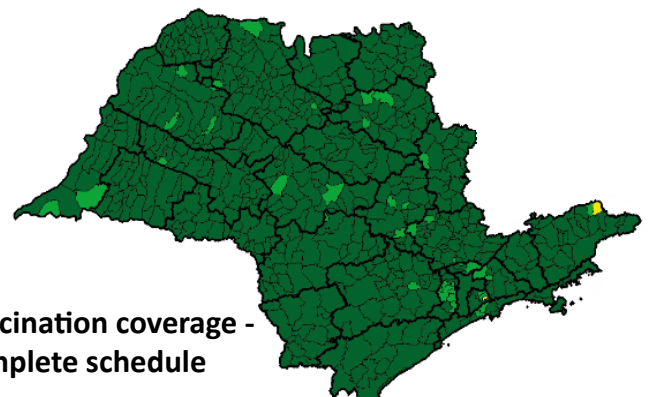
A) At least one dose



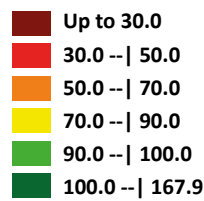
Vaccination coverage - one dose



B) Complete vaccination schedule



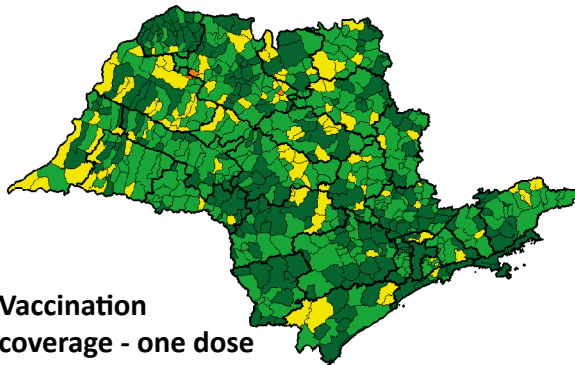
Vaccination coverage - complete schedule



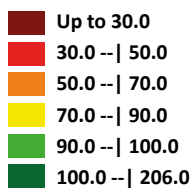
Source: Vacivida. Data extracted on January 05, 2022.

Figure 4. Spatial distribution of Covid-19 vaccination coverage of persons aged 18 to 59 years with at least one dose and complete Covid-19 vaccination schedule, by city, SSP, 2021.

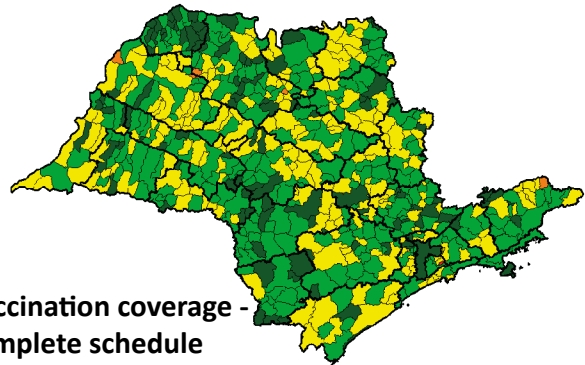
A) At least one dose



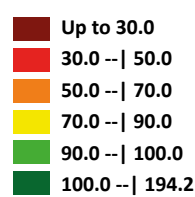
Vaccination coverage - one dose



B) Complete vaccination schedule



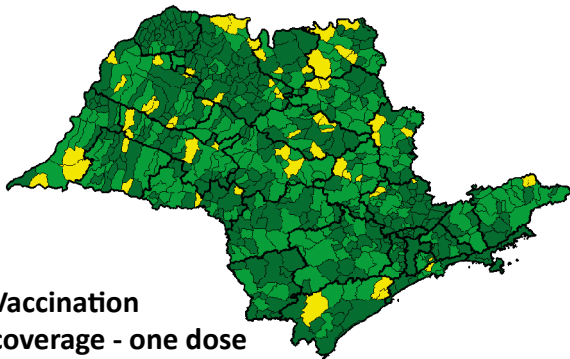
Vaccination coverage - complete schedule



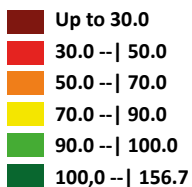
Source: VaciVida. Data extracted on January 05, 2022.

Figure 5. Spatial distribution of Covid-19 vaccination coverage of persons aged 12 to 17 years with at least one dose and complete Covid-19 vaccination schedule, by city, ESP, 2021.

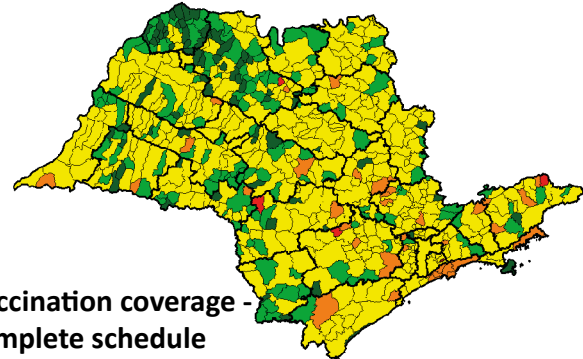
A) At least one dose



Vaccination coverage - one dose



B) Complete vaccination schedule



Vaccination coverage - complete schedule



Data extracted on January 05, 2022. Source: VaciVida.

Given this scenario, it is evident that by December 31, 2021, the SSP had vaccination coverage for people with at least one dose above the recommended target for all age groups in the population starting at age 12, while for the complete vaccination schedule the target was reached in the age groups starting at age 35, as well as for the population aged 25 to 29 (Table 1).

Table 1. Vaccination coverage of Covid-19 vaccine by age group, SSP, 2021.

Age Group	Target Population	People with first or single dose	Persons with complete vaccination schedule	Vaccination coverage of people with at least one dose	Vaccination coverage of people with complete vaccination schedule
90 OR MORE	205,952	207,821	199,888	100.91%	97.06%
85-89 YEARS	309,125	349,527	339,587	113.07%	109.85%
80-84 YEARS	562,367	601,230	584,212	106.91%	103.88%
75-79 YEARS	850,465	933,450	916,231	109.76%	107.73%
70-74 YEARS	1,297,671	1,387,513	1,366,555	106.92%	105.31%
65-69 YEARS	1,780,635	1,894,428	1,856,773	106.39%	104.28%
60-64 YEARS	2,266,765	2,329,207	2,274,973	102.75%	100.36%
55-59 YEARS	2,632,224	2,730,875	2,639,597	103.75%	100.28%
50-54 YEARS	2,904,703	2,937,072	2,829,687	101.11%	97.42%
45-49 YEARS	3,141,667	3,242,828	3,109,106	103.22%	98.96%
40-44 YEARS	3,548,754	3,708,339	3,531,379	104.50%	99.51%
35-39 YEARS	3,854,180	3,830,717	3,615,762	99.39%	93.81%
30-34 YEARS	3,809,963	3,655,865	3,403,441	95.96%	89.33%
25-29 YEARS	3,511,090	3,563,208	3,228,822	101.48%	91.96%
20-24 YEARS	3,448,513	3,462,092	3,039,911	100.39%	88.15%
12-19 YEARS	4,473,753	4,493,020	3,673,500	100.43%	82.11%

Source: VaciVida. Data extracted on January 05, 2022.

As for the additional doses, because the vaccination strategy is based on the completion date of the primary vaccination schedule and because of the short period of time between the beginning of the primary vaccination schedule and the analysis period of this report, it is not appropriate to analyze them in terms of vaccination coverage, but rather in relation to the doses applied. Thus, by December 31, 2021, 10,481,980 additional doses (booster) had been applied and registered in the SSP.

Regarding vaccination and distribution of immunobiologicals, the population estimation calculations for vaccination are based on the IBGE 2020 estimate by the Ministry of Health. Thus, it has been reported by São Paulo's cities that the population estimate is underestimated, requiring supplementation of the number of doses sent per city, a factor that directly impacts the verified

vaccination coverage. Thus, when we analyze the vaccination coverage, we observe that for a large part of the groups the coverage exceeds 100%, that is, the estimated population.

Still on the vaccination process, it is expected and observed that vaccination coverage will increase as the vaccination campaign progresses, with an increase in the number of doses being applied. Therefore, it is possible to infer that the numbers observed are directly dependent on the nominal registration of the doses applied in the information system indicated for the dose registration: VacíVida, the official system for registering doses applied in the vaccination campaign against Covid-19 in the SSP.

HOMOGENEITY OF VACCINATION COVERAGE

When the vaccination coverage per city is analyzed according to the age groups, their progression becomes more evident at the expense of the dates recommended for the opening of each group, considering that the vaccination campaign against Covid-19 has a cumulative character for vaccination. In addition to the analysis of vaccination coverage, another important indicator is the homogeneity of vaccination coverage.

Homogeneity of vaccination coverage is understood as the percentage of cities in the SSP that managed to reach the 90% vaccination goal established for this vaccination campaign, being 70% the goal of homogeneity of vaccination coverage, i.e., it is desirable that at least 70% of the cities in São Paulo reach the 90% vaccination coverage goal.

Thus, when we observe the vaccination coverage for the target population with at least one dose and with a complete vaccination schedule, based on the results achieved in each city, on December 31, 2021, in the SSP there was a homogeneity of 93.2% with at least one dose and 77.4% with a complete vaccination schedule.

From this perspective, just as the stratified analysis by age group was performed on vaccination coverage, we will do the same for homogeneity. In SSP, satisfactory homogeneity of vaccination coverage was found on December 31, 2021, for people vaccinated with at least one dose from 12 to 17 years (90.5%), people from 18 to 59 years (82.0%), and people who were 60 years or older (100%), as well as for people aged 60 years or older who had a complete vaccination schedule (99.8%) ([Table 2](#)).

Table 2. Homogeneity of Covid-19 vaccine vaccination coverage by age group, SSP, 2021.

	12 to 17 years old		18 to 59 years old		60 years or older	
	At least one dose	Complete vaccination schedule	At least one dose	Complete vaccination schedule	At least one dose	Complete vaccination schedule
Cities with at least 90% vaccination coverage (n)	584	213	529	407	645	644
Vaccination coverage coverage no SSP (%)	90.5%	33.0%	82.0%	63.1%	100.0%	99.8%

Source: VacíVida. Data extracted on January 06, 2022.

Thus, it is understood that, at that time, it was necessary to increase the homogeneity of the vaccination coverage for the 18 to 59 year old age group when referring to the complete vaccination schedule, since the equivalent of 63.1% was verified at that time; for the 12 to 17 year old population, it was expected that, as the recommended interval time between doses for the primary vaccination schedule was reached, the homogeneity of the vaccination coverage would improve, as, by December 2021, it was 33%. It is known that for this population, in addition to the issues inherent to the interval between doses according to what is recommended, there was still the low adherence of the population to the second dose, which drove the cities to proceed with an active search for those considered absent, as well as increased the opportunity to record the administered doses in the VacíVida system, as recommended in Resolution SS-59 of 04/12/2021.

OPPORTUNITY FOR REGISTRATION OF APPLIED DOSE

The performance evaluation of the vaccination campaign involves the observation of the factors that contribute to the vaccination coverage, as well as the factors that may contribute to not reaching it in a more opportune time. In this sense, we emphasize that the SSP Government has spared no efforts to optimize the logistics in order to make the vaccination process more effective, as well as the qualification of all technical processes for monitoring the campaign, providing the necessary support to cities, whether through the central level of SHD-SP, through the ESC/DCC, or at the regional level, with its Epidemiological Surveillance Group - ESG.

The vaccination campaign against Covid-19 has been monitored systematically and continuously, so that the data obtained through VacíVida and all the rumors and information that come to the

attention of the State Government are used as benchmarks for decision making, besides being the main tool for the correct observance of the indicators established for the monitoring the vaccination process.

Thus, it is essential to emphasize that such monitoring is only feasible if the vaccinees' data are correctly and timely recorded, i.e., if the dose applied is registered nominally in VaciVida. Only with this record, which must be kept in each vaccination room in the cities, will be possible to analyze the situation of the vaccination campaign in a way that is closer to the reality experienced in the territory. According to Resolution SS-59, from 04/12/2021, the registration must occur within 24 hours after the administration of the dose.

Based on the immunization process of routine vaccines and other campaigns, there may have been an operational delay in the registration of the doses applied in the system by the cities, which may have directly interfered in the analysis of the number of doses that had not been registered. In this perspective, it is observed that on December 31, 2021, there was a number of doses available in the system, which could constitute part of the municipal stock not yet used or part of doses administered and not yet registered.

THOSE FAILING FOR THE SECOND DOSE OF THE PRIMARY SCHEME

Anyone who has not received the second dose of Covid-19 vaccine on the scheduled day is considered a defaulter. We emphasize that the opportunity to register may be one of the factors that impact the number of absentees for the second dose observed per city, i.e., the total number of absentees observed may not correspond to the reality of the city if it does not have a good opportunity to register the doses applied.

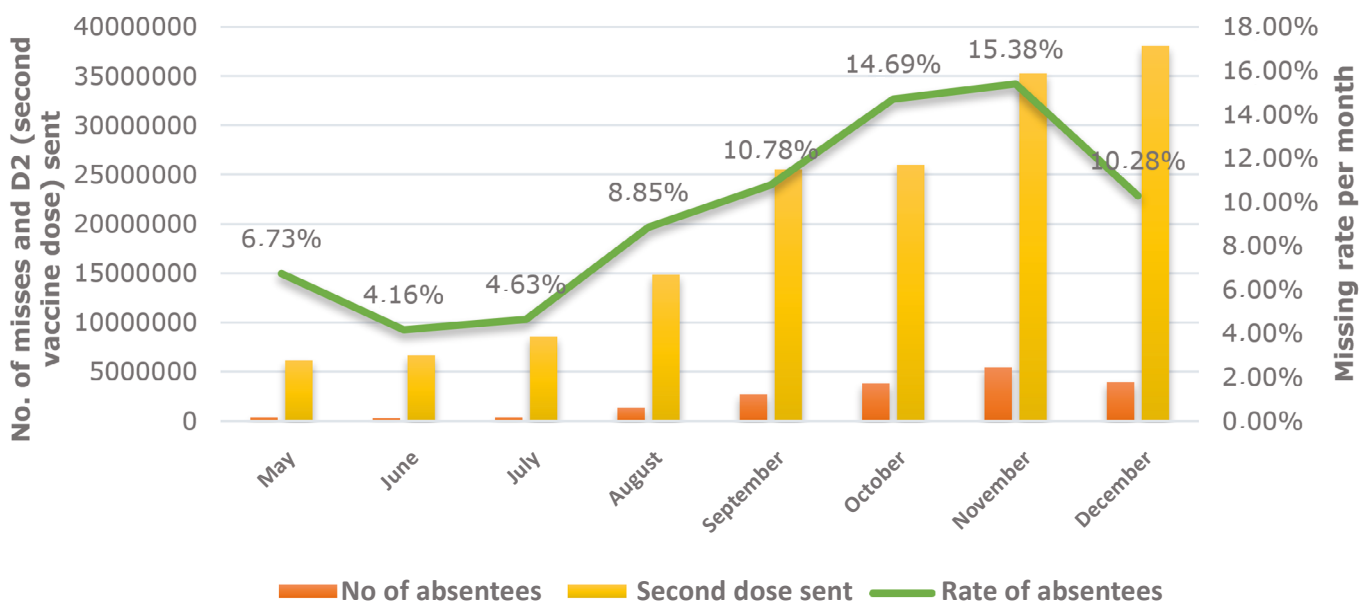
Despite this, even though there may be operational problems involved which contribute to the perception of the number of absentees, it is known that the occurrence of people refusing to take the second dose can also directly impact the final number observed. Because of this, we reinforce that it is essential for the cities to actively search people who still need to receive the second dose, making the correct record, including the reasons why this person did not take the second dose on the due date, in order to qualify the analysis on this issue.

Even taking into account the scenario described above, it should be noted that the total volume of absentees perceived in the SSP had a progressive increase over the months, and although the time period for the second dose of Pfizer immunobiologicals was changed from 12 to 8 weeks, and then to 21 days for adults, this is not the factor that influenced the observation of the increasing number of absentees in the state of São Paulo. Furthermore, it is worth noting that weeks before the interval

between doses was anticipated, an increase in the number of absentees was noticed, which was more significant for the Pfizer vaccine, since it was the most widely distributed in the state.

It is noteworthy that, in the last months of this analysis period, there was an abrupt increase in the number of absentees in relation to the total number of second doses distributed to the cities for application, resulting in a rate of 14.69% in October and 15.38% in November, and a decrease in this rate can be seen in December (10.28%) for those who missed the second dose in the SSP.

Graph 1. Missing rate for the second dose in SSP, May to October 2021.



Source: Vacivida. Data extracted on January 05, 2022.

When the regional reality is observed, it is possible to affirm that there was no reduction rate in the number of absentees per ESG, which reflects the situation observed by the Regional Health Department (RHD), so that three RHD have rates higher than the rate verified for the state: Baixada Santista; Greater São Paulo; Sorocaba.

It is noteworthy that, in the process of monitoring and following up on all indicators and in the work processes related to vaccination against Covid-19, the ESGs have weekly followed up and given technical support to the cities, aiming at the discussion of these indicators, as well as discussions in the Regional InterManagerial Commissions, aiming at minimizing the currently perceived rates of absentees, with the concern also with the demand for the additional/replacement dose, thus contributing to the improvement of vaccination coverage and consequent protection of the population of São Paulo.

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