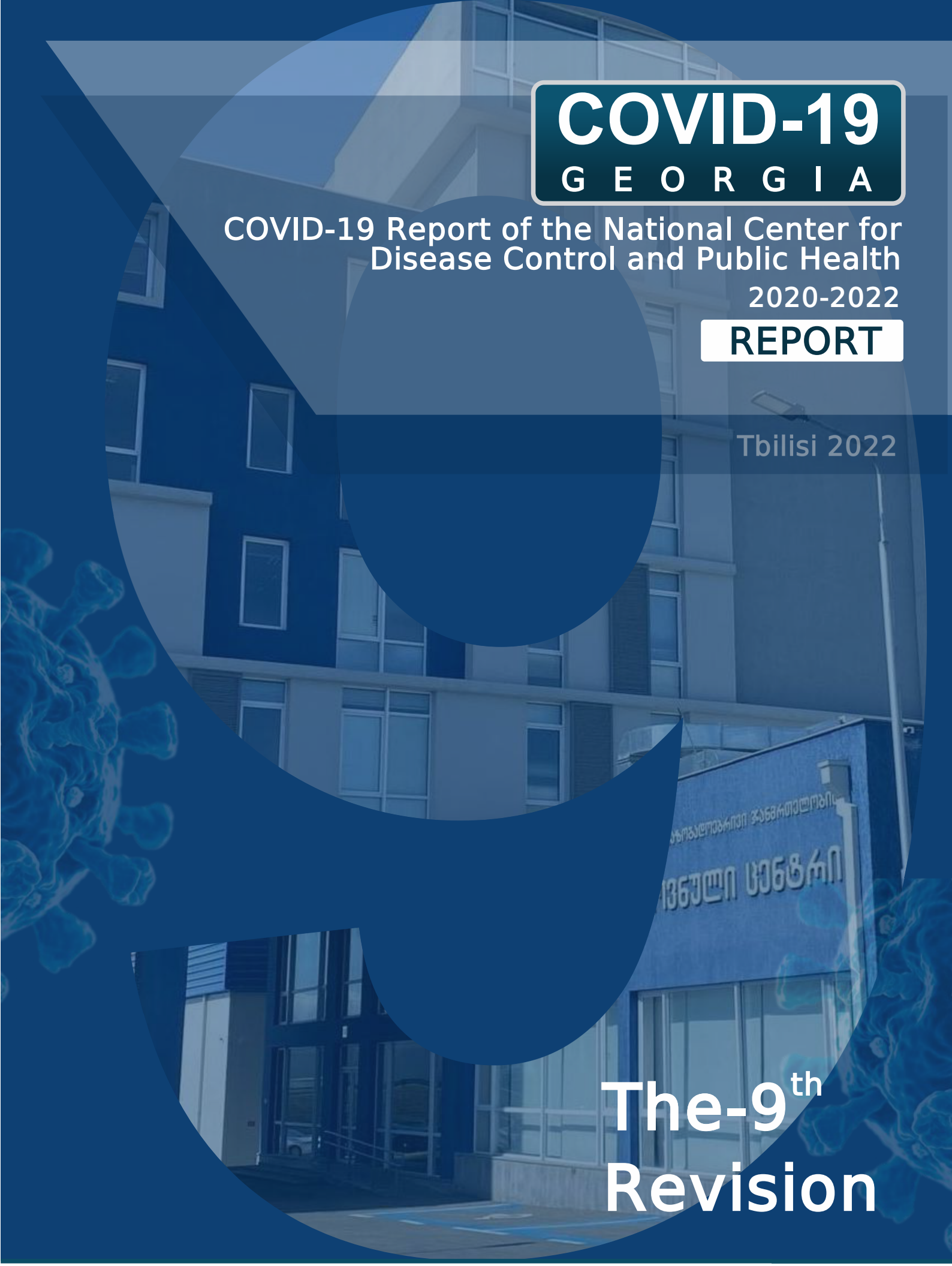
COVID-19
G E O R G I A

COVID-19 Report of the National Center for Disease Control and Public Health

2020-2022

REPORT

Tbilisi 2022



The-9th Revision

საქართველოს ოკუპირებული ტერიტორიებიდან დევნილთა, შრომის, ჯანმრთელობისა და სოციალური დაცვის სამინისტრო

დაავადებათა კონტროლისა და საზოგადოებრივი ჯანმრთელობის ეროვნული ცენტრი

GEORGIAN NATIONAL CENTER FOR DISEASE CONTROL AND PUBLIC HEALTH

Introduction

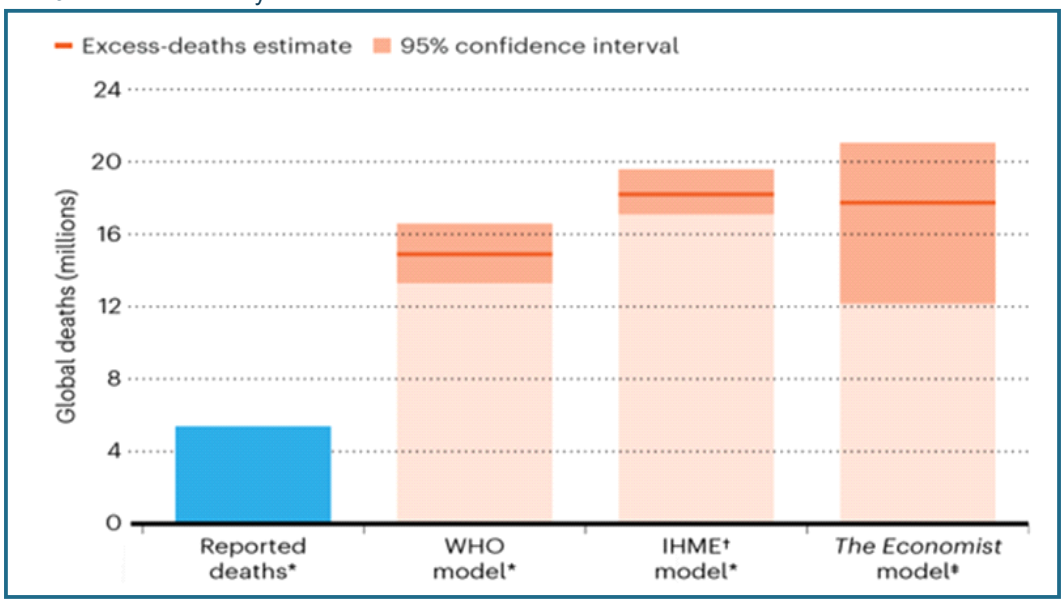
Following detection of the novel coronavirus (SARS-CoV-2) at the end of 2019, the virus spread rapidly around the world, it was assessed as a pandemic by experts, and for almost three years now, the challenges related to it have been emerging both at global and national levels. Dealing with COVID-19 has become a major priority for all countries and has had a significant impact on the operational and strategic agendas of healthcare and the other sectors1. During this period, many important steps were taken to defeat the pandemic on a global scale, but the negative impact of the virus, despite its weakening, still remains, challenging and damaging not only healthcare and the other systems, but also the global economy and, therefore, the world's population.

In 2020 the pandemic reduced global economic growth and trade by 3,2% and 5,3% respectively. The same year, loss in total working hours equaled 9%, representing 225 million full-time jobs. From 88 to 115 million people found themselves below the extreme poverty2. An unprecedented 5,8% inflation for the past 25 years was recorded in OECD countries3. The global economic growth rate will continue to slow down in the future as well. According to experts, globally, the risks caused by the pandemic will create many problems in the following years.

The damage caused by the pandemic to people's health has been quite significant. According to official statistics as of July 1, 2022, since the beginning of the pandemic, more than 561 980 million people got infected, and over 6 368 million died from COVID-19 or associated complications.

According to the estimates of various authoritative organizations, the actual number of infected and deceased people is at least 3,5 times higher than the official statistics, based on the WHO data4 (Figure1).

Figure 1. COVID-19 -Induced Mortality Estimates



[1] *Coronavirus disease (COVID-19) pandemic, https://www.who.int/emergencies/diseases/novel-coronavirus-2019 2* [2]*World Bank Blog. 2020 Year in Review: The impact of COVID-19 in 12 charts, https://blogs.worldbank.org/voices/2020-year-review-impact-COVID-19-12-charts*

[3] *https://www.oecd.org/newsroom/consumer-prices-oecd-updated-11-january-2022.htm?utm_medium=email&utm_source=CampaignMonitor_Editorial&utm_campaign=LNCH%20%2020220111%20%20House%20Ads%20%20SM+CID_83f978aac799f5a3f6cd575ad8c89902*

[4] *https://www.who.int/news/item/05-05-2022-14,9-million-excess-deaths-were-associated-with-the-COVID-19-pandemic-in- 2020-and-2021*

In order to improve the management of the pandemic and to plan further response measures, it is quite important to have potential scenarios. Many international organizations have been working in this regard, however, the most significant and close-to-reality forecasts have been regularly offered by the Institute for Health Metrics and Evaluation, University of Washington (IHME) supported by the Bill and Melinda Gates Foundation. In addition, the WHO strategic plan deserves attention, which was updated three times during the pandemic and included possible development scenarios and recommended strategic directions for improving response and preparation. The *Strategic Preparedness, Readiness and Response Plan to End the Global COVID-19 Emergency in 20225* document describes several possible scenarios of the pandemic in the future:

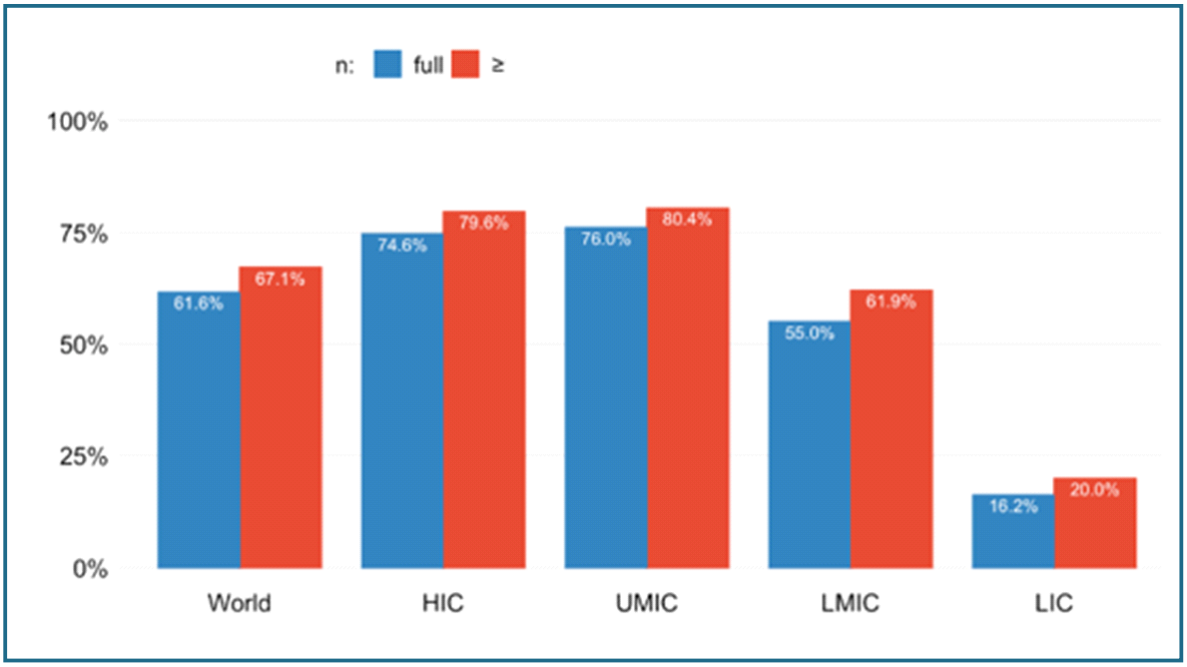
- Basic - the virus continues to circulate. The severity of the disease course weakens over time, as the immunity after infection and vaccination increases. Since immunity weakens over time, there will be periodic increases in incidence and associated deaths, indicating at the need for booster administration, particularly in vulnerable and high-risk population groups.
- Optimistic - further mutated variants are less severe, reducing the need for a booster and a new variant-specific vaccine.
- Pessimistic - further mutated variants are more acute and highly contagious, and existing natural and artificial immunity is ineffective in preventing severe disease and death.

Regardless of the possible scenarios, viruses will continue to circulate in the future, including other variants with pandemic potential, and in the event of the next pandemic, the number of infected and deceased people could be equal or higher than in case of SARS-CoV-2. A clear example of such threats is declaration by the WHO Director-General of escalating global monkeypox outbreak as a Public Health Emergency of International Concern (PHEIC) on July 23. Therefore, continuous improvement of health sector response and implementation of modern approaches is important, especially to end the acute phase of the COVID-19 pandemic. This requires maintaining proven approaches over the past two years, including public-private collaboration and multi-sector partnerships, as well as further strengthening public health response capacity, improving and integrating sentinel and genomic surveillance into epidemiologic surveillance, continuous implementation of innovations, and coordinated work from emergency response for transition to long-term management of respiratory disease.

During the pandemic, information and evidence about the new virus are being gradually collected, and the population learns to live with the virus. Strict restrictive measures, which were adopted at the initial stage of the pandemic, have been replaced by relatively mild, local, targeted ones, which, along with efficiency, put less burden on the economy and the functioning of other sectors. Scientists developed a vaccine against COVID-19 after one year from the start of the epidemic. Currently, the main line of defense against the virus is vaccination against it, the benefits of which far outweigh the possible risks. Recent modeling by WHO experts estimated that 20 million lives were saved in the first year of vaccination alone, and in total, 34,5 million additional people would have died if the vaccine were not introduced6. According to global data, by July 15, 2022, 156 doses of the vaccine against COVID-19 have been administered for every 100 people in the world7. It is important that all countries are able to vaccinate at least 70% of their population in order to move the management of the pandemic to a new level and gradually treat it as endemic. It is noteworthy that the vaccination rate is unevenly distributed among high-, middle-, and low-income countries8 and a large share of vaccinations is consumed at the expense of the population of high-income states (Figure 2).

[5] WHO, Strategic Preparedness, Readiness and Response Plan to End the Global COVID-19 Emergency in 2022, https://www.who.int/publications/m/item/strategic-preparedness-readiness-and-response-plan-to-end-the-global-COVID-19-emergency-in-2022

Figure 2. Population Fully Vaccinated against SARS-CoV-2 by Income of the Country of residence, 15,07,2022



Source: World Bank Group, New estimates of global vaccination progress, https: / /pandem-ic.com /new-estimates-of-global-vaccination-progress/

With the unprecedented collaboration and mobilization of resources, existing scientific knowledge was combined and specific medicines for the treatment of COVID-19 were created. At the end of 2021, the US Food and Drug Administration granted emergency use authorization to two drugs Paxlovid and Molnupiravir for the treatment of COVID-19, created by the pharmaceutical companies Pfizer and Merck, Sharp and Dohme, which, according to studies, significantly reduced the risk of hospitalization and death in infected people9.

Along with preventive and treatment measures, testing, detection, surveillance, tracing and contact monitoring are important in the fight against COVID-19. Adherence to non-pharmaceutical interventions and individual behavioral characteristics, based on the use of masks, reduced mobility, distancing and personal hygiene are nonetheless important.

Pandemic in Georgia

In order to reduce the potential damage related to COVID-19 and ensure stability for all sectors, the Government of Georgia started taking appropriate measures at the early stages of the pandemic. On

[6] *https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(22)00320-6/fulltext?utm_source=STAT+Newsletters&utm_campaign=9d288cd089-MR_COPY_01&utm_medium=email&utm_term=0_8cab1d7961-9d288cd089-134140705*

[7] *Financial Times vaccination statistics dashboard https://ig.ft.com/coronavirus-vaccine-tracker/?areas=gbr&areas=isr&areas=usa&areas=eue&areas=are&areas=chn&areas=chl&cumulative=1&doses=total&popul ationAdjusted=1*

[8] *Our World in Data https://ourworldindata.org/COVID-vaccinations*

[9] *US Food and Drug Administration https://www.fda.gov/news-events/press announcements/coronavirus-COVID-19-update-fda-authorizes-first-oral-antiviral-treatment-COVID-19#:~:text=Today%2C%20the%20U.S.%20Food%20and,of%20age%20and%20older%20weighing*

January 6, 2020, L. Sakvarelidze National Center for Disease Control and Public Health informed the Ministry of Health about the unusual pneumonia outbreak in China, which was followed by the introduction of a number of control measures by the state. On January 13, an operational center for responding to public health threats was created and equipped in the NCDC for coordinated response. On January 31, based on a risk assessment, the definition of a new coronavirus (COVID-19) infection case was approved, an algorithm for the management and tracking of COVID-19 cases and contacts was prepared, and the country switched to active surveillance. Starting from February 4, Richard Lugar's laboratory was able to test COVID-19 cases and retrospectively analyze all adequate samples collected since the beginning of 2020. From February 6 through February 12, various methodical recommendations and protocols related to COVID-19 were developed and approved step by step, video lectures and circulation of educational materials commenced and risk communication was activated throughout the country. During the initial wave of the pandemic, under the initiative of the Ministry of Health, Healthcare Sector Capacity Building and Emergency Preparedness for the Next Waves of COVID-19. Healthcare Sector Action Plan 2020-2021 was prepared and approved under the Ministerial Decree 01-153 /o. ", which was updated this year and represents a framework-guide for managing the current epidemic.

The first confirmed case of COVID-19 in Georgia was recorded on February 26, 2020. On January 28, 2020, the highest responsible body for crisis response was established at the national level - the Interagency Coordination Council10, the plan was approved under the Decree N164 (2020) of the Government of Georgia and, along with other important measures, the list of various state agencies was determined. Each participating ministry and government agency was tasked with clearly defined roles and responsibilities. The National Center for Disease Control and Public Health is a permanent member of the said Council.

At the initial stage of the epidemic, the virus was spreading at a slow pace in the country, which was due to timely taken preventive measures among the population. From March 18, 2020, border traffic was gradually stopped and reduced to a minimum, cafes, bars, restaurants, fitness clubs, swimming pools and shops were closed (except for those selling essential products and pharmacies). On March 21, the state of emergency was declared in the country based on the decision of the National Security Council of Georgia. In addition, intercity passenger transportation by minibuses and buses and passenger traffic by minibuses in the territory of the self-governing city and municipality were suspended. Due to the worsening of the epidemiological situation, on March 31, a general quarantine was announced, and on April 14, the state of emergency was extended until May 22 in order to improve the current epidemiological situation in the country. From the end of April, the capacity of laboratory molecular diagnostics was expanded, and 7 additional laboratories (total of 12 at this time) got involved in molecular diagnostics of COVID-19. In the spring of 2020, the mentioned laboratories were already carrying out an average of 250-300 PCR tests per day. By May 2020, the average workload increased to 1 200-1 300 tests per day. At the same time, the country was gradually decentralizing the laboratory service and improving geographical access. In addition, the service got diversified to increase accessibility in this direction. As of November 12, 2020, antigen-based testing with Ag-RDTs test systems started in the country within the framework of the state program for confirming COVID-19 cases. As the scale of the pandemic grew and the virus evolved, the policy of the national testing approach at some extent changed, and the availability of services improved. A list of priority groups for routine testing was developed for the maximum detection of cases of infection during the pandemic, which were tested within the framework of the state program. During the years 2020-2022, the list of priority groups for routine testing was updated and filled several times, including after the

[10] Decree N[164] of the Government of Georgia On Approving the Measures to Prevent the Possible Spread of New Coronavirus in Georgia and the Operational Response Plan against Disease Cases caused by New Coronavirus

winter wave of 2022, caused by the Omicron variant. Both the list of groups and the testing regime were revised, which was determined by the Decree No. 01 -110 /o of the Minister of Internally Displaced Persons from the Occupied Territories, Labor, Health and Social Affairs. By 2022, 713 medical institutions or independent laboratories of the country had the opportunity to participate in the testing program, if necessary, where it was possible to produce both molecular, antigen-based and serological tests for different groups. In addition, both individual and pool testing were introduced in the country, and the possibility of conducting daily testing (PCR, antigen) reached 100 000. It is important that on April 24, 2020, the Prime Minister's Office presented a six-stage economic anti-crisis plan, and the first stage of the anti-crisis plan was launched across Georgia, which included the resumption of transportation by light vehicles, the restoration of taxi services, as well as of online shopping and delivery services. Outdoor agricultural markets were opened with observance of the relevant standards. Starting from May, the country gradually lifted strict quarantine regime in a number of municipalities, to get ready for the summer season, inter alia for hosting foreign tourists. The country joined the Covax platform established with the support of WHO, UNICEF, GAVI and CEPI. The negotiations held in the fall ended with the signing a cooperation agreement to receive doses for vaccinating 20% of population.

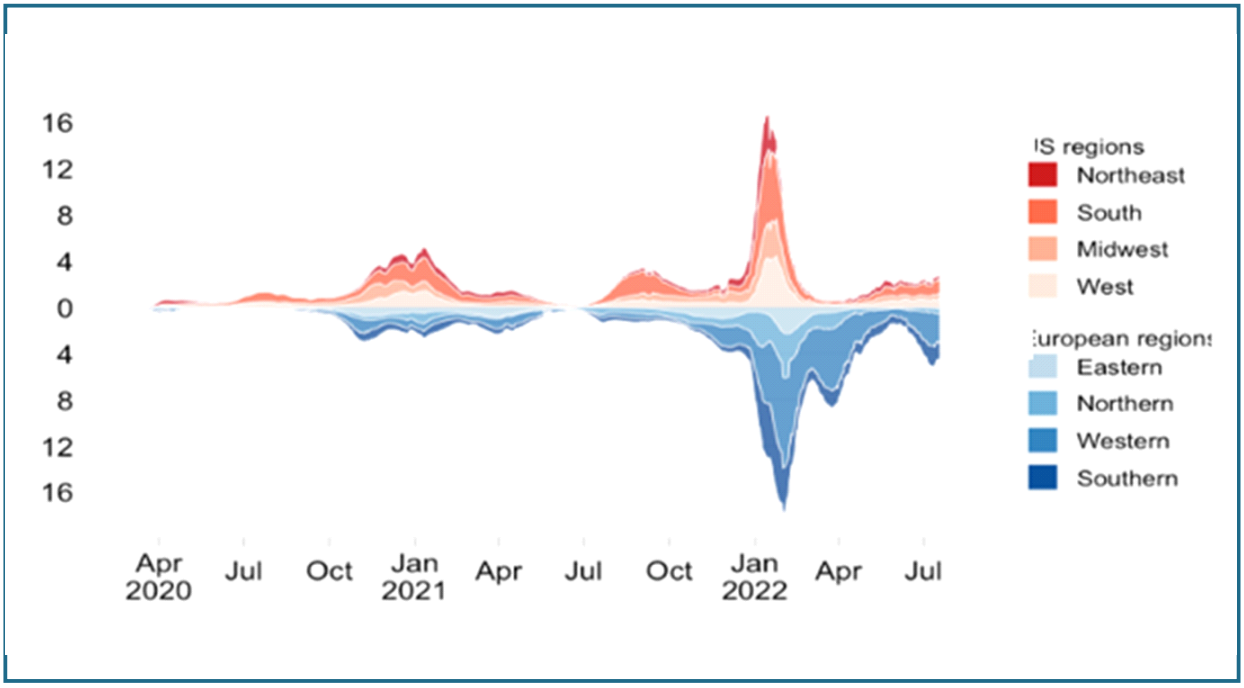
Despite the current positive dynamics, in the summer of 2020, with the lifting of restrictions and the arrival of the tourist season, the wave of infections gradually began to increase against the background of growing mobility. From the fall of 2020, under the influence of various factors (a local epidemic outbreak in a region with high tourism activities, political processes, a trend in the neighborhood and the European region), the number of new coronavirus cases in Georgia began to rise intensively, which led to a massive spread of the epidemic throughout the country. In November 2020, the country reached the red alert level in all parameters, after which the government made it mandatory to follow certain measures for prevention and stabilization. Since then, there have been several waves of new cases rising and falling in the country, with the most recent rise resulting from the spread of a mutated variant, Omicron. An important stage for managing the pandemic at the national level was the preparation for the start of vaccination against COVID-19 and the development of the national program. In the fall of 2020, the Inter-agency Coordination Committee, chaired by the Minister of Internally Displaced Persons from the Occupied Territories, Labor, Health and Social Affairs, with the involvement of experts and multi-sector cooperation, developed the Plan for the Introduction of COVID-19 Vaccination in Georgia, which was approved in February 2021. This year, the mentioned plan was updated and the targets were revised in accordance with the current reality. On March 15, 2021, the Oxford-AstraZeneca anti-Covid- 19 vaccine was imported to the country and vaccination of all people employed in the health sector began. On March 25, vaccination of the 65-year-old and older population began. On March 30, 2021, the Pfizer-BioNTech vaccine was imported to the country and the process was expanded. Vaccination of citizens aged 55 and over, dialysis patients and organ transplant patients began on April 1. From the end of April, in parallel with the vaccination process, research of the vaccine effectiveness against COVID- 19 began at the national level. From May 4th, Sinopharm vaccine became available in the country, and from May 24th, the Sinovac vaccine. As part of the national vaccination program, the COVID-19 vaccination website https://-vaccines.ncdc.ge/ was launched on June 2, and the plan for organizing mass vaccination centers was approved on June 15. Since July, after the arrival of 500 000 doses donated by Pfizer-BioNTech USA and a million doses purchased by the state through direct negotiations with the company, as well as a million doses from Sinopharm and Sinovac, mass vaccination of the population started in Georgia.

Georgia, like the other countries, is taking consolidated measures to end the acute phase of the pandemic and to improve the endemic management of the virus, one of the important components for which is to strengthen the possibility of molecular testing and accompanying genetic sequencing, gradually being improved at the national level. Since the beginning of the pandemic, whole genomes of SARS-COV-2 variants have been continuously sequenced using next-generation sequencing technology. The purpose of sequencing is genetic characterization of virus variants common in Georgia, their phylogenetic analysis and monitoring of new mutations. Sequencing is carried out in two directions - routine and targeted (targeted) to reveal the phenotypic characteristics and evolutionary features of the variant circulating and prevalent in the country's population. The country uploads the results of the sequencing to the international GISAID database. As of July 15, 2022, more than 2 000 sequencing results have been uploaded to the international database. The measures implemented in Georgia since the beginning of the pandemic are presented in detail in Appendix 1.

As of July 15, 2022, 1 673 160 cases were officially confirmed in Georgia. 14-day cumulative incidence was 3251 per 100 000 of population. The reproduction index was 1,6. The 7-day mortality rate was 0,3 per of 1 000 000 population and the lethality during the entire period of the pandemic was 1%. The 7-day test positive rate was 9,9%. Vaccination in Georgia started on March 15, 2021. The rate of the last 7 days was 14 doses per 100 000 inhabitants. By July 15, 2022, a total of 2 909 700 doses of vaccination were administered. 1 272 787 persons were fully vaccinated. 48,5% of the adult population received at least one dose of the vaccine, and 45% of the adult population was fully vaccinated. A single booster dose was administered in 9,2% of adult population.

Experience gained from the spread of different variants of COVID-19 showed that mutated variants of the virus had the potential to radically change the course of the pandemic. During the wave caused by the highly virulent delta variant in Georgia in August 2021, at its peak, the 14-day cumulative incidence reached 1 798 per 100 000 of population. Due to high virulent nature of the variant the rate of complications and hospitalization was also high (>15%), which entailed overloading of the healthcare system, in particular the hospital sector. At the end of 2021, virus B.1,1,529, a new variant of the SARS-CoV-2 appeared in the world, which was named Omicron. It was first detected in a sample taken in South Africa. New variant was reported to the WHO on November 24, after which the variant was assigned a Status of Concern (VOC). The Omicron variant was characterized by high transmissibility, resulting in a much faster spread among the population than its predecessor variants11. In Georgia, the Omicron option was first reported on December 20, 2021. Since January 2022, the variant has been dominant in the country, and the daily number of new cases during the winter peak reached a record of 26 320 (the daily cases detected on 01,02,2022). However, compared to the Delta variant, the rate of hospitalization was reduced and on average it was within the range of 5 - 10%. Since the spring, the circulation of Omicron sub-variants - BA.4 and BA.5, having even higher transmission capacity, has started globally and in Georgia as well. After the spring period of 2022, the increase in the number of Covid cases in the epidemic parameters - incidence, reproduction index, and positive test rate- was noted in the European region, including Georgia (Figure 3).

Figure 3. Cases of SARS-CoV-2 in the European and the USA; Weekly Number of Confirmed Cases per 1 000 Population, 15,07,2022



Source: World Bank Group, Data insight, COVID waves: Europe and US compared, https: / /pandem-ic.com /COVID-waves-europe-and-us-compared /

Despite the increase, the death rate remained more or less stable globally. The main driver of the increase was the increase in the circulation of BA.4 and BA.5 variants. It is worth noting that, despite the relatively mild course, with a rapid increase in new cases, depending on its scale, there may be a significant increase in pressure on the health care system, especially on the laboratory sector and primary health care, which requires the mobilization of resources and the rapid implementation of response actions.

The 12th meeting of the WHO International Health Regulations (IHR) Emergency Committee was held on July 8 of this year to discuss the situation of the pandemic. According to the post-session statement of the committee members, COVID-19 was still alarming and the current pandemic remained a special public health situation of international importance12. On July 12, WHO Director General Dr. Tedros Adhanom Ghebreyesus called on national governments to continue implementing appropriate preventive measures, stressing that despite the approach of many countries to essentially lift all restrictions against COVID-19, the virus was still circulating intensively, and the protective measures were still important to reduce transmission and protect the population. According to the Director-General and the IHR Emergency Committee, regardless the uncertainty and unpredictability associated with the pandemic and the spread of new, noteworthy mutated variants and the daily increase in the incidence of COVID-19 globally, the latest studies and data from countries confirmed that vaccination was the most important tool to manage the pandemic together with the authorized therapeutic drugs, which collectively played the greatest positive role in reducing hospitalization and mortality. The IHR Emergency Committee also highlighted the reduced availability of testing worldwide, which greatly complicated epidemic surveillance and integration of home antigen test results into national surveillance data. Accordingly, the Director General recommended that a number of preventive measures were implemented and the countries resumed the testing regime with updated approaches, and promoted vaccination and booster administration to strengthen immunity

[11] WHO. Enhancing Response to Omicron. Technical brief and priority actions for Member States. Update #[5]: January [7], 2022

as much as possible. Based on the statement (July 19) of Hans Kluge, WHO Regional Director for Europe13 it is important that countries continue taking number of response measures, such as vaccination and booster administration, wearing a mask, avoiding further overloading of the health system and etc. Strengthening the surveillance system for COVID-19 and the other respiratory viruses is an important component of national public health systems, and evidence-based knowledge is the key instrument in the fight against the virus that needs to be taken into account.

Coronaviruses include a large family of viruses that generally cause mild illness, which is unpleasant to most people, but is self-healing and not life-threatening. However, in some cases, illness can be severe or complicated by bacterial infections such as bronchitis, pneumonia, and etc. Children, the elderly and people with various chronic diseases are at particular risk of developing complications.

Infection caused by seasonally circulating coronaviruses is mainly prevalent during the fall-winter period, although single sporadic cases can be reported throughout the year. Infection is transmitted from person to person through drip and contact.

The emergence of two new coronavirus serotypes in recent decades - SARS-CoV (beta coronavirus, which causes severe acute respiratory syndrome or SARS) and MERS-CoV (beta coronavirus, which causes Middle East respiratory syndrome, or MERS) caused two outbreaks.

SARS is caused by the SARS-CoV coronavirus. It was first discovered in Asia in February 2003, but a retrospective study found that the first case of the disease was reported back in November 2002 in Guangdong Province, China. In total, 8 098 cases were registered in 26 countries, including 774 (9,55%) lethal ones.

Middle East Respiratory Syndrome (MERS) is a respiratory disease caused by the MERS-CoV coronavirus. It was first identified in 2012 in Saudi Arabia and spread to the Arabian Peninsula and neighboring countries.

Overall MERS-CoV coronavirus was detected in 27 countries, infecting 2 583 people during the period from 2012 to the end of December 2021, including 888 deaths due to infection and related complications, with a lethality rate of 34,4%.

Coronavirus 2, also known as SARS-CoV-2, originally referred to as 2019-nCoV by the World Health Organization (WHO), emerged in December 2019 in Wuhan, Hubei Province, China, and was later officially named as COVID -19. It spread fairly quickly outside China's borders. WHO assessed the situation on January 30, 2020, as the Public Health Emergency International Concern and on March 11 as a pandemic.

This has been the third coronavirus outbreak of the XXI century when human-to-human transmission of the infection and the emergence of a global health problem occurred. COVID -19 is characterized by a high frequency of transmission, in which cases the course of the disease varies considerably in severity - from asymptomatic to fatal. Various factors including age, sex, concomitant chronic diseases are considered with the current characteristics of COVID-19.

[12] *https://www.who.int/news/item/12-07-2022-statement-on-the-twelfth-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-coronavirus-disease-(COVID-19)-pandemic*
[13] *https://www.who.int/europe/news/item/19-07-2022-rapidly-escalating-COVID-19-cases-amid-reduced-virus-surveillance-forecasts-a-challenging-autumn-and-winter-in-the-who-european-region*

Since the outbreak of the COVID -19 pandemic, countries have launched intensive efforts to combat it, including preparedness and response measures, real-time surveillance, management of new coronavirus laboratory diagnostics, monitoring compliance with standards, epidemiological surveillance over existing and suspicious cases, tracking, recommendations and monitoring for quarantine and isolation and etc.

The main purpose of COVID -19 monitoring is to reduce its transmission and associated morbidity and mortality. The objectives of epidemiological surveillance are:

Testing and rapid detection of cases;

Monitoring COVID -19 -induced lethality trends;

Contact identification, follow-up control and quarantine;

Detecting and limiting clusters and outbreaks, especially in vulnerable population;

Manage the implementation and adjustment of targeted control measures to enable safe resumption of social and economic activities;

Assessing the impact of the pandemic on the health care system and society;

Monitoring long-term epidemiological trends and evolution of SARS-CoV-2 virus;

Determination of co-circulation of SARS-CoV-2, influenza and the other respiratory viruses and pathogens.

Comprehensive COVID -19 oversight includes the following key actions:

Using, adapting and strengthening existing oversight systems;

Expanding and improving laboratory and testing capacities;

Introduction of a contact tracking system;

Using, adapting, and enhancing public health human resources for case investigation, contact tracking, and testing;

Inclusion of COVID -19 in the list of diseases subject to mandatory notification;

Immediate reporting.

It is important to maintain routine syndromic / sentinel surveillance for other infectious diseases, especially those caused by respiratory pathogens such as influenza and respiratory syncytial virus, influenza-like illness (ILI), severe acute respiratory infection (SARI), atypical pneumonia, and unexplained fever, which includes taking samples and laboratory examination of all cases and case subgroups.

The Georgian health care system, since the confirmation of the first case of COVID-19, was monitoring COVID -19 in accordance with the established activities, including contact tracking, laboratory testing and preventive measures to contain subsequent transmission when cases are detected and confirmed.

In conditions of SARS-CoV-2 detection and the subsequent spread of COVID-19 across the world, the readiness of the Georgian surveillance system was determined by existing systems of epidemiological and laboratory surveillance of respiratory diseases, the creation and strengthening of which was initially based on the need to monitor influenza viruses.

Until 2006 population-based epidemiological surveillance of flue and upper respiratory tract infections was being carried out in Georgia. From 2006 to 2012, two types of epidemic surveillance were used in parallel mode: population-based and support-based (pre-selected medical facilities). Within the framework of population – based surveillance, information was collected from medical institutions in a monthly aggregated format on cases of influenza, influenza-like disease hospitalization cases and upper respiratory tract infections, while for support surveillance the data was being collected on severe acute respiratory (SARI) and influenza-like diseases (ILI). Epidemiological and clinical data collection and virological monitoring were carried out within the scope of support surveillance. In order to monitor influenza and the other respiratory viruses (including zoonotic agents), virological monitoring bases were additionally established, mainly focused on zoonotic agents and unusual events. The Center started surveillance over respiratory pathogens other than influenza and their laboratory diagnostics within SARI support surveillance since 2015. The same diagnostic approach was used within the ILI base starting from the autumn-winter season of 2021-2022 (from the 40th calendar week of 2021).

Since 2012, country-wide epidemic surveillance (virological monitoring) was carried out only through reference bases on SARI and ILI, and since 2020, the monitoring of COVID-19 has been integrated into the sentinel surveillance system.

Support bases are located in different cities of Georgia (Tbilisi, Kutaisi, Akhaltsikhe, Batumi, Zugdidi) for the purpose of monitoring the epidemic at the national level. Data is being collected weekly and analysis is performed according to the season in a weekly or bi-weekly mode. The results of the surveillance are regularly published on the website of the Center, which allows interested parties to learn about the spectrum of pathogens circulating in a given period.

In addition to the national support surveillance, the spread of SARI and ILI is continuously monitored during the autumn-winter season by local public health centers at the municipal level.

The Center's Influenza and Respiratory Pathogens Laboratory, established in 2006, had been accredited by the World Health Organization since 2009. Before the start of the COVID-19 pandemic, the laboratory had adequate capacity and was testing for 23 different respiratory pathogens, including SARS, MERS, seasonal coronaviruses 229E, NL63, OC43, HKU1.

The multi-year dynamics of laboratory surveillance reveals that seasonal coronaviruses are common pathogens in Georgia, and the burden associated with them may become the subject of additional study.

During the spread of COVID-19 in the country, a case-oriented notification rule was established, for which the Electronic Integrated Disease Surveillance System (EIDSS) was used to report at the initial stage of the pandemic (February-September 2020). Since September 2020, in parallel with the wide spread of cases, increased diagnostic capacity and the involvement of various structures in the response mechanism, the use of EIDSS for the purpose of notification / reporting became inconvenient and was replaced by the LabCov module, in which the results of testing for SARS-CoV-2 are still registered along with key variables (Figure 4).

Figure 4. Circulating Respiratory Pathogens, 2021 – 2022, Autumn - Winter season, according to calendar weeks

ჯამის კალენდარული კვირა	40	41	42	43	44	45	46	47	48	49	50	51	52	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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Influenza A/H3									√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Influenza B											√																						
Rhinovirus	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√
Coronavirus NL63/229E /OC43/HKU1	√	√	√	√	√	√	√	√	√					√			√	√	√	√			√				√	√	√	√	√	√	√
Parainfluenza 1, 2, 3, 4,	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		√	√		√	√		√		√	√	√	√
Human metapneumovirus A/B							√	√		√						√		√				√	√	√		√	√	√	√	√	√	√	√
Bocavirus	√		√	√	√		√	√	√	√	√		√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√
Respiratory syncytial virus A/B	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Adenovirus	√	√	√	√	√	√	√	√	√	√	√	√		√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
Entero virus	√	√	√	√				√	√		√	√	√	√	√		√	√					√	√		√	√	√	√	√	√	√	√
Covid – 19	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

Due to the fact that COVID-19 and other acute respiratory infections have similar symptoms and case definitions, in Georgia, as well as in other countries, the surveillance system for COVID-19 was integrated into the surveillance systems for the other acute respiratory infections. The mentioned integrated system is of particular importance during the period of pandemic and flu season coincidence.

From December 14, 2021 to January 30, 2022, the national surveillance system identified 1 689 laboratory-confirmed cases of infection with the Omicron variant of COVID-19.

According to mathematical modeling starting from January 2022, >95% of positive cases were caused by different variants of Omicron.

Of the 1 689 laboratory-confirmed cases, 1 184 cases were traced by the epidemiologist team, 1 083 of whom were contacted by telephone and interviewed using a structured questionnaire. Primary information on 101 cases was sought through the laboratory module and, where available, by means of the immunization module.

According to the analysis of the data obtained as a result of the epidemiological investigation of the detected cases, 89,27% were citizens of Georgia (1, 057 / 1 184).

60,3% of detected cases (1, 184) come from Tbilisi (714), 19% from Imereti (226), 6,75% from Adjara (80), 4% from Kvemo Kartli (48), 1,3% from Samegrelo (16) and 1% from Samtskhe-Javakheti (12).

In 14,2% of studied cases, past infection with SARS-COV-2 virus was confirmed.

49,8% (590) of the cases (1, 151) were fully vaccinated, and 36,1% (415) did not receive a single dose of vaccine for the period of infection. 1 booster dose was administered in 59 cases, and 2 booster doses in 5 cases.

Most cases were mild, and symptoms included 37,5oC - 38,5oC temperature, sore throat, cough, severe headache and muscle and joint pain. In confirmed cases, the share of hospitalization among those infected with Omicron-variant was 3,76%.

In the first 6 months of 2022, 3 273 suspicious samples were submitted for research from the support bases (10 support bases - multi-specialty medical facilities). 2 495 of them were positive for various respiratory pathogens. In 19,2% of positive samples for respiratory pathogens, COVID-19 was confirmed.

Since February 7, 2022, one Covid Clinic was added to the surveillance of the support bases, where overall 2 382 patients were hospitalized by July 1. Surveillance was established over 475 patients (19,9%), of which 337 were positive for SARS-CoV-2 (300 Omicrons, including BA.2 – 69,1%, BA.1 – 17,4%, BA.4 /5 -13,5%). Of the patients under surveillance who tested positive (475) at the base, 78,7% recovered, 7,8% died.

TESTING

Coverage of the population through testing is one of the main criteria for assessing the prevalence of COVID -19 and pandemic trends in the country. Specific testing for COVID -19 in Georgia began on February 4, 2020, with the first case reported on February 26.

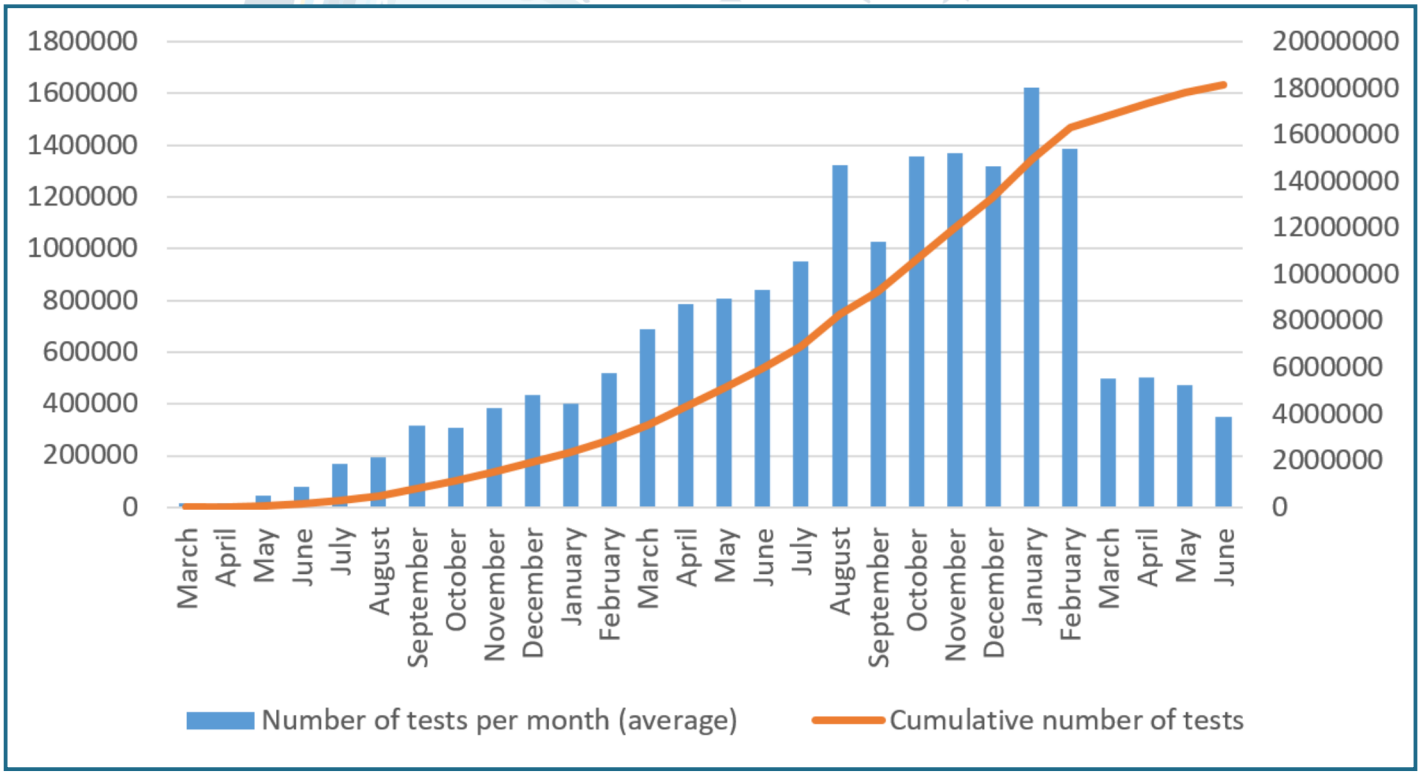
Until April 2020, testing was performed using only the PCR method14, which was considered the gold standard in the COVID -19 diagnostics. It has a high sensitivity and specificity, which minimizes the risk of a false positive (as well as a false negative) result. It can be used only in the presence of high-tech laboratory space and highly qualified staff.

For PCR testing, a nasopharyngeal smear or sputum, bronchoalveolar lavage or respiratory biopsy material is taken, although other materials such as feces/ blood / urine / corpse (lung tissue) may be used for PCR testing with special indications.

Since May 2020, together with the PCR testing, the country began antigen and antibody-based testing in certain groups, although case confirmation was only possible through PCR testing. Antigen-based testing with Ag-RDTs test systems, certified by the World Health Organization as having the highest hypersensitivity and specificity, with minimal risk of false-positive or negative results, began nationwide in November 2020 to confirm COVID -19 cases.

As of July 1, 2022, the total number of tests performed in the country was 18 161 408 (, including PCR – 7 251 308 and antigen – 10 910 100 tests.

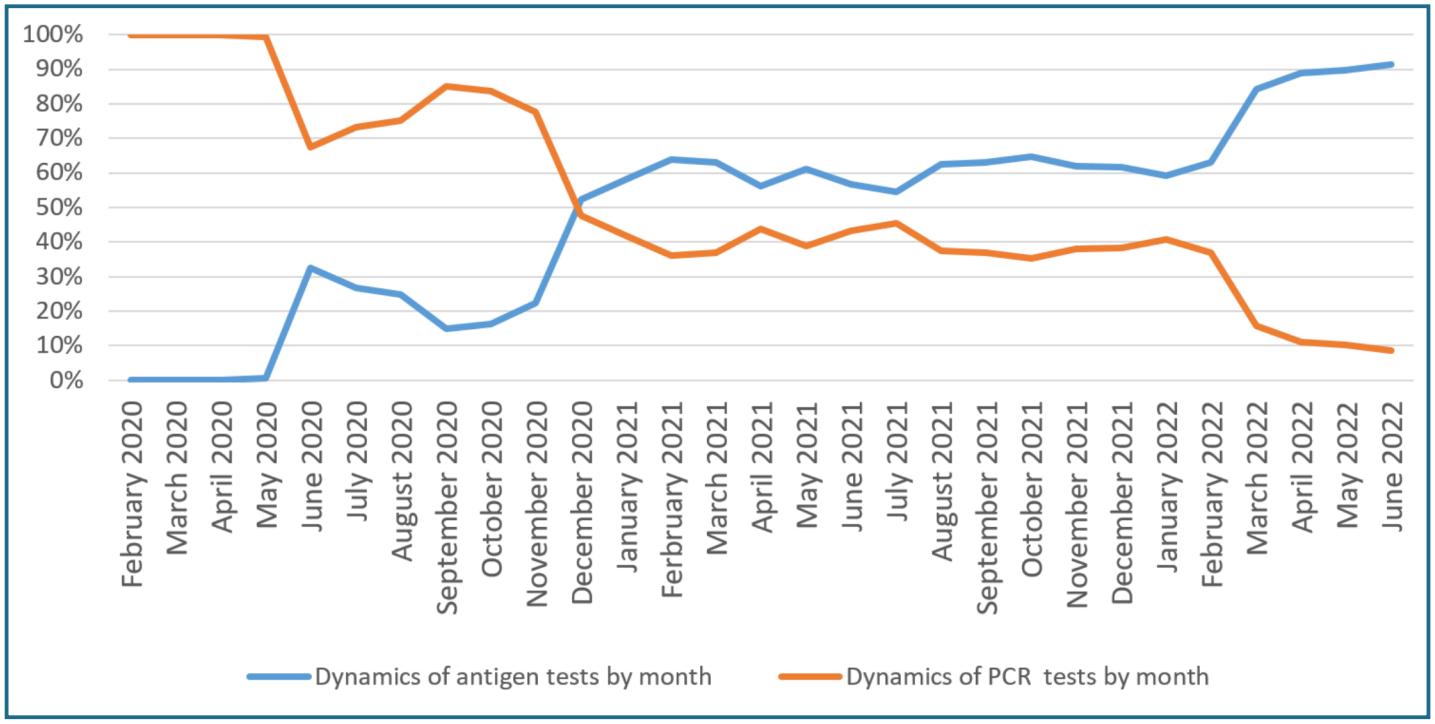
Figure 5. Total and monthly average number of tests performed on COVID -19 (PCR and antigen-based), Georgia (as of July 1, 2022)



[14] *Real-time reverse transcript polymerase chain reaction/ RT-PCR*

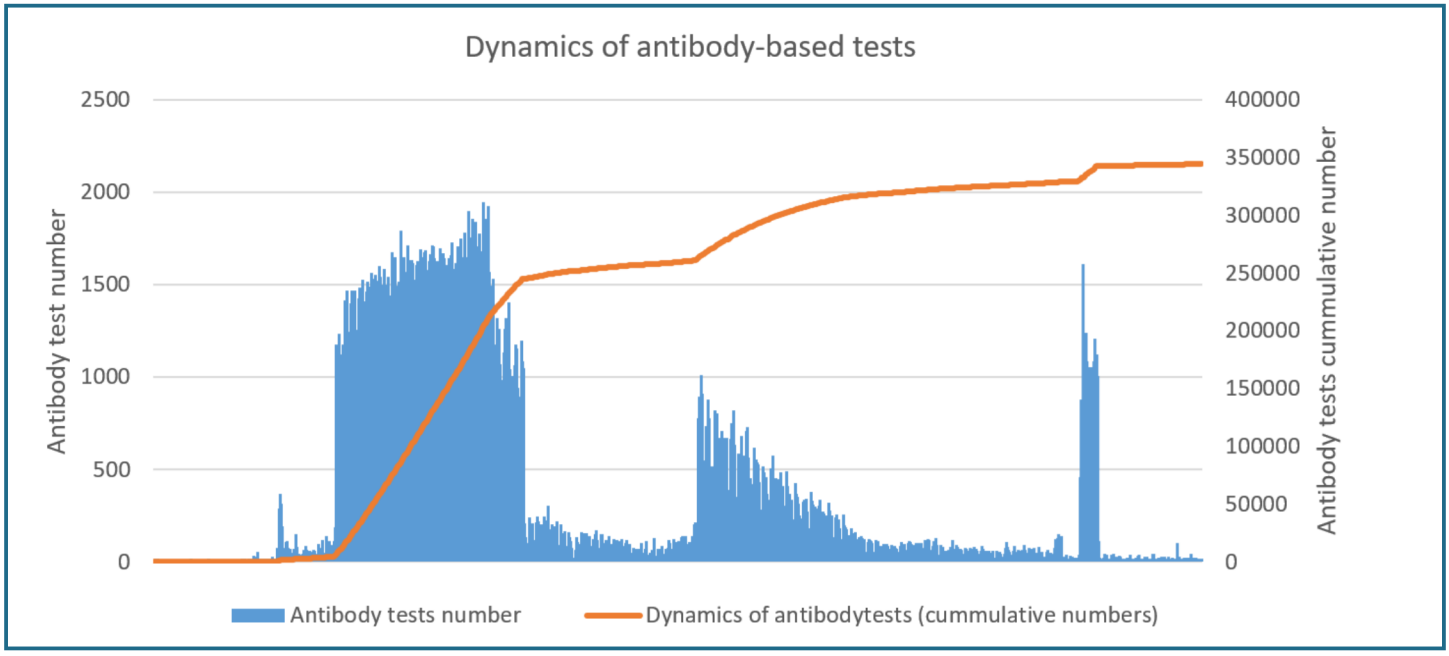
During the period from 2020 through June 2022, the maximum number of tests was recorded in January 2022. Since March 2022, the pace of testing has slowed down due to a significant improvement in epidemic situation.

Figure 6. Monthly Share of PCR and Antigen-based tests performed for COVID -19 in Georgia (as of July 1, 2022)



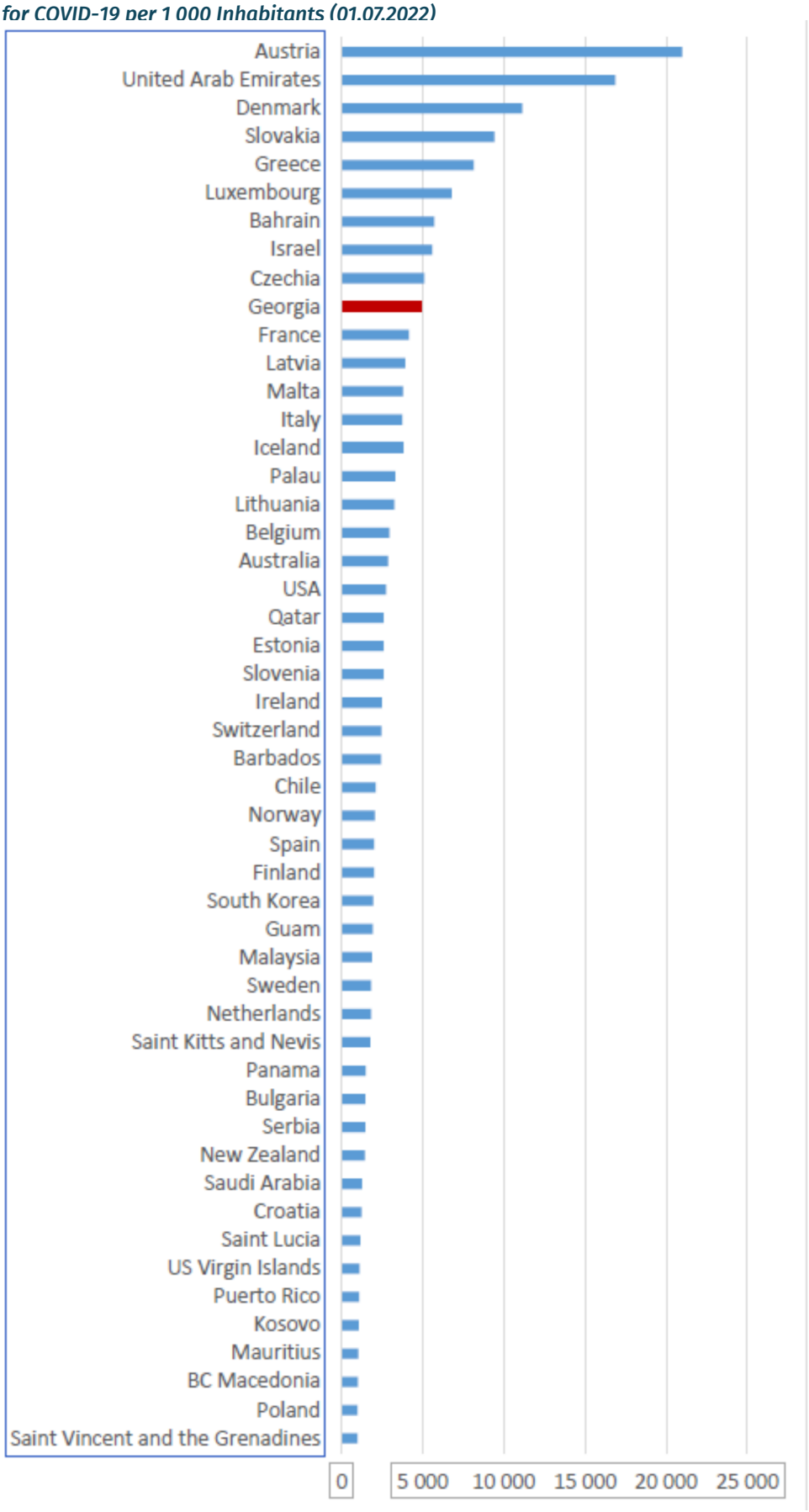
Share of PCR tests was dominant in total testing through November 2020. From December 2020 to the end of 2021, the share of antigen-based tests was 60-70%, and from March 2022, antigen-based testing significantly exceeded PCR testing. In June, the ratio between antigen and PCR reached ~9:1.

As of July 1, 2022, overall 344 658 antibody-based rapid tests were performed in the country. The number of antibody-based tests peaked in October 2020, and the minimum number was recorded in June 2022.



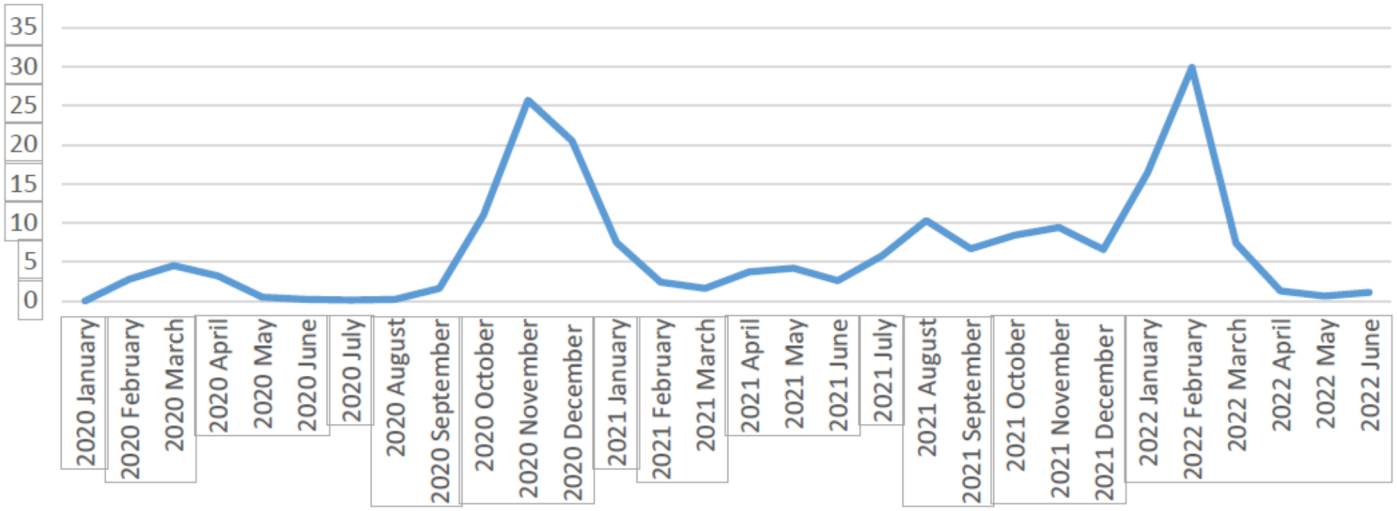
The testing figure (PCR+antigen) as of July 1, 2022 was 4 897 per 1 000 inhabitants (including PCR testing - 1 955, antigen-based testing - 2 942). Georgia ranks 10th among the world's 50 countries with the highest testing rates.

Figure 8. Testing Rate for COVID-19 per 1 000 Inhabitants (01.07.2022)



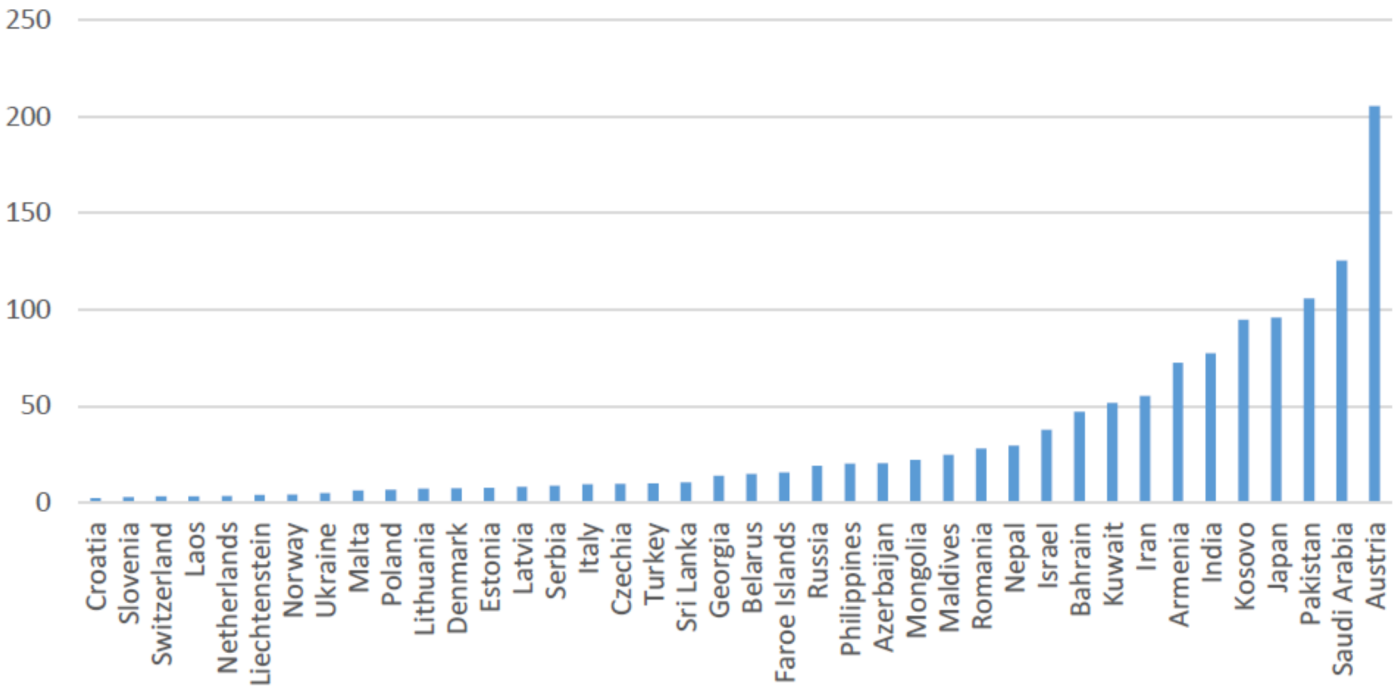
Test positivity rate in Georgia during the period from 2020 through July 1, 2022 was 9.4%. The maximum values of the positivity rate were recorded in November 2020 (25.2%), August 2021 (9.9%) and February 2022 - (29.9%).

Figure 9. COVID-19 Positive Rate (%), Georgia, 2020 – 2022



In addition, the optimal number of performed tests is also assessed by the ratio of the number of tests to the number of confirmed cases, that is, how many tests are performed to detect one case of COVID-19 in the country. According to WHO recommendations, an adequate testing rate is about 10-30 tests per confirmed case. The ratio of the number of tests conducted in Georgia to the number of confirmed cases is 14 and is within the recommended standard.

Figure 10. Ratio of Testing for COVID-19 to the number of cases, European and Asian countries (01.01.2022)



Source : https: / /ourworldindata.org /coronavirus

COVID - 19 RELATED MORBIDITY

As of July 1, 2022, the cumulative number of confirmed COVID-19 cases in Georgia was 1,661,920, including 228,410 cases registered in 2020 (incidence per 100,000 population - 6,135.6), 708,434 cases registered in 2021 - (incidence per 100,000 population - 19,000), and 725,076 (incidence per 100,000 population - 19,551.2) during the period from January 1 to July 1, 2022. As a result of relatively strict regulations and restrictive measures introduced in Georgia, the situation remained calm until mid-September 2020, with a minimum number of confirmed cases and deaths.

Against the background of lifting restrictions, increased mobility during the summer holiday season and non-compliance with regulations, the number of cases in all regions of Georgia peaked in November. Disease at that time with high probability was caused by the primary variant of SARS-CoV-2.

Large-scale restrictive measures were introduced at the end of November 2020, and a declining trend began in January 2021. Although the Alpha variant got spread since February 2021, low morbidity rates have been maintained in the country amid restrictive measures. The Delta variant appeared in the country at the end of May 2021 and kept dominant position from August through December 2021. From the end of December 2021, the Omicron variant began to spread, which in January 2022 replaced the Delta variant completely. In February 2022, the number of cases reached the peak, which was due to the high contagiousness of the Omicron variant. Since March 2022, a significant decrease in cases has been recorded, which, along with the real decline in the number of cases was determined by a change in the testing format.

As in 2020 and 2021, a high cumulative incidence of COVID-19 (higher than the national incidence) was observed in Adjara, Imereti and Tbilisi in the first 6 months of 2022.

Figure 11. Incidence of COVID-19 per 100,000 inhabitants in Georgia and some regions (Adjara, Imereti, Tbilisi) Georgia, as of July 1, 2022

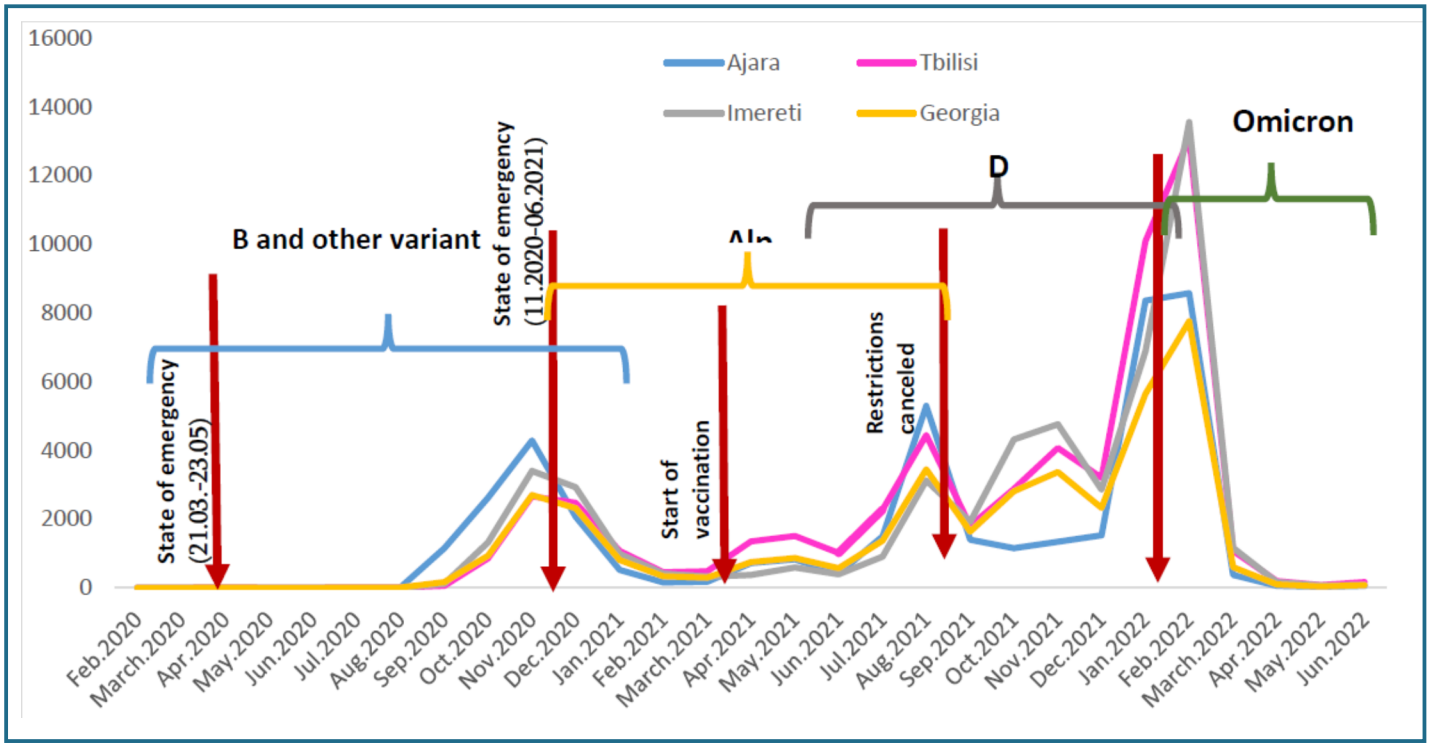


Figure 11. Incidence of COVID-19 per 100,000 inhabitants in Georgia and some regions (Adjara, Imereti, Tbilisi) Georgia, as of July 1, 2022

Figure 12. Cases of COVID-19 by Gender, Georgia, as of July 1, 2022

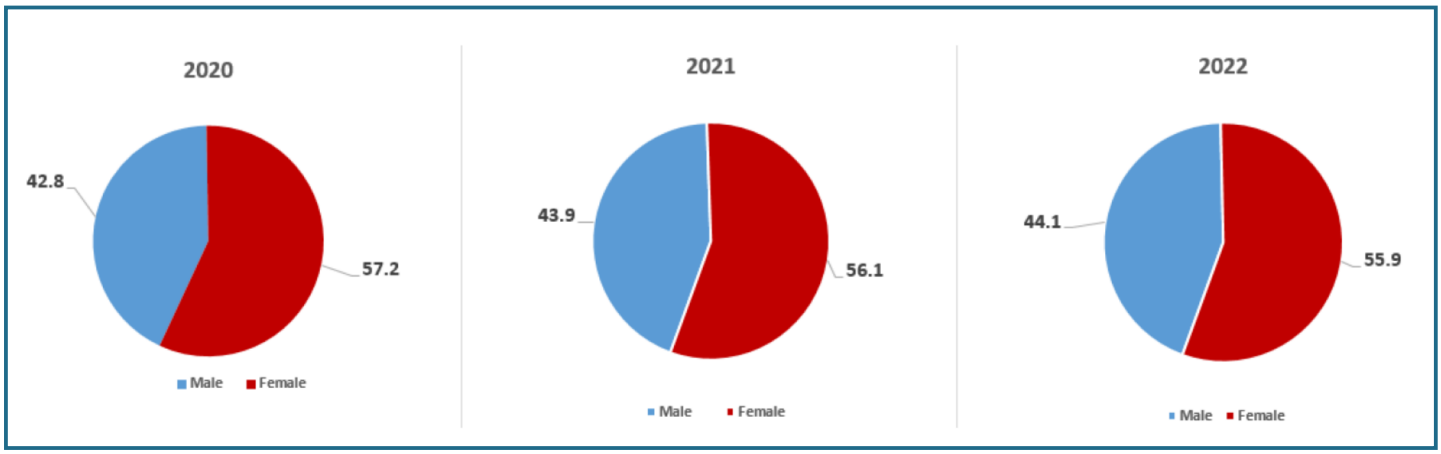


Figure 13. Incidence of COVID-19 per 100,000 Inhabitants by Gender, Georgia, as of July 1, 2022

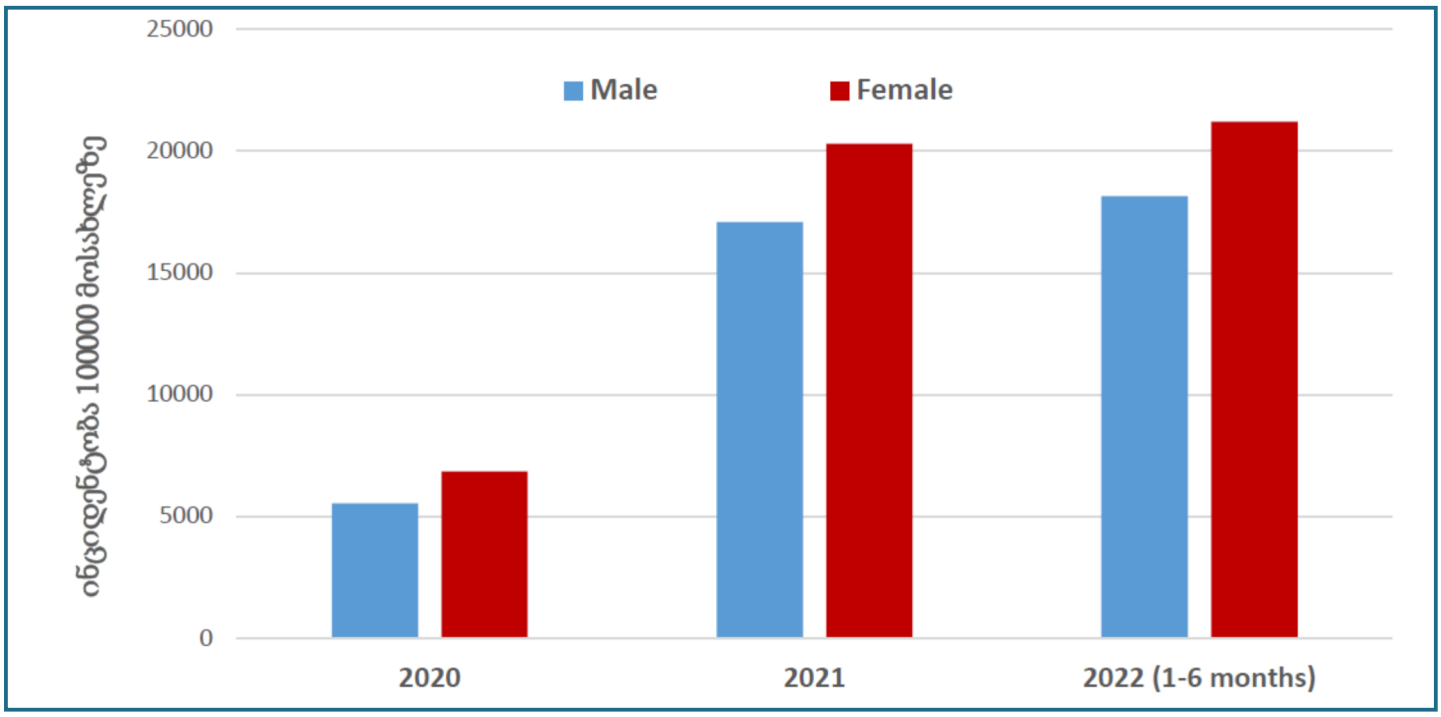


Figure 14. Age-specific COVID-19 Incidence per 100,000 of population, Georgia, as of July 1, 2022

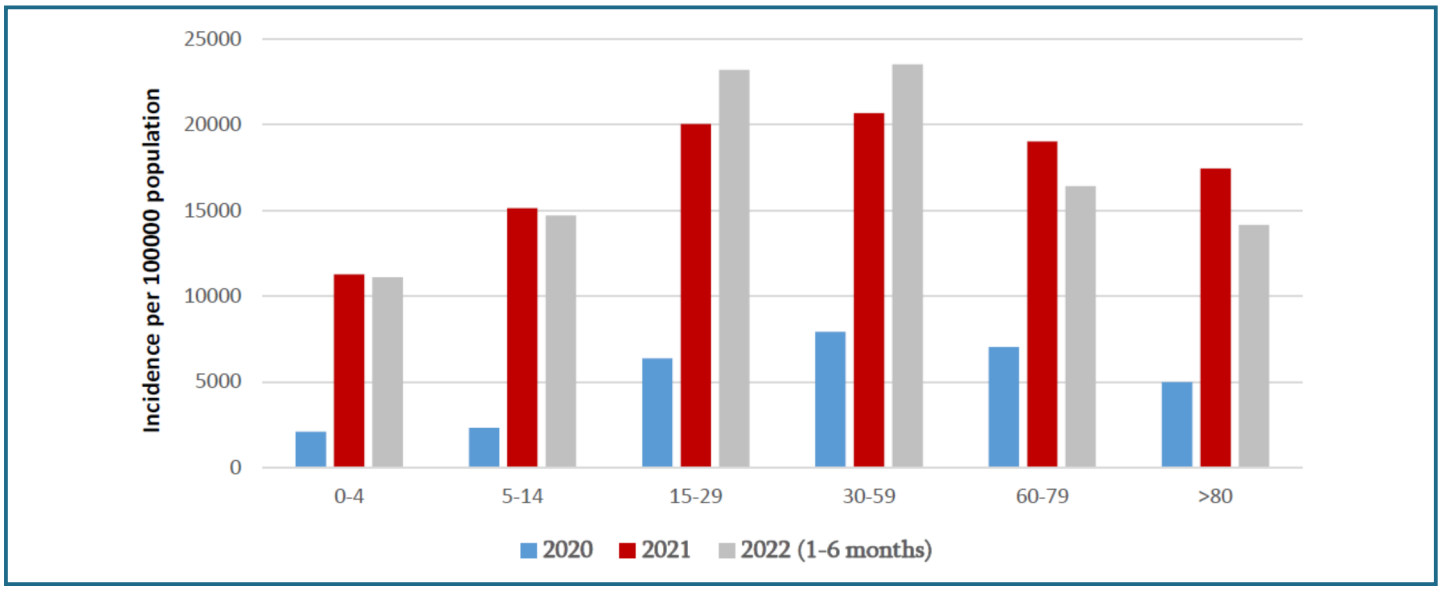


Figure 15. Age-specific COVID-19 Incidence of per 100,000 of population, Georgia, January-June 2021 - January-June 2022

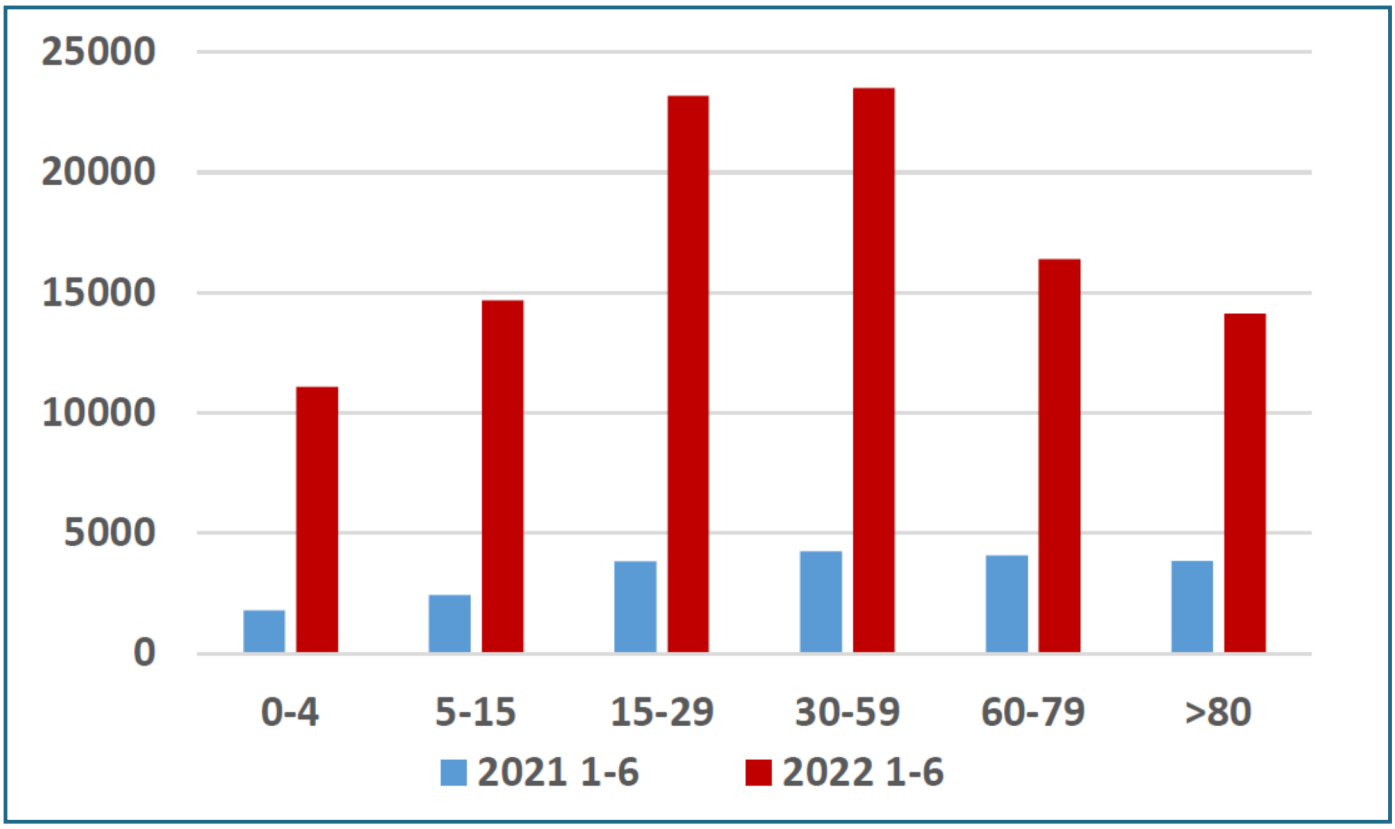


Figure 16. Lethality due to COVID-19 and COVID-19 Incidence, Georgia, as of July 1, 2022

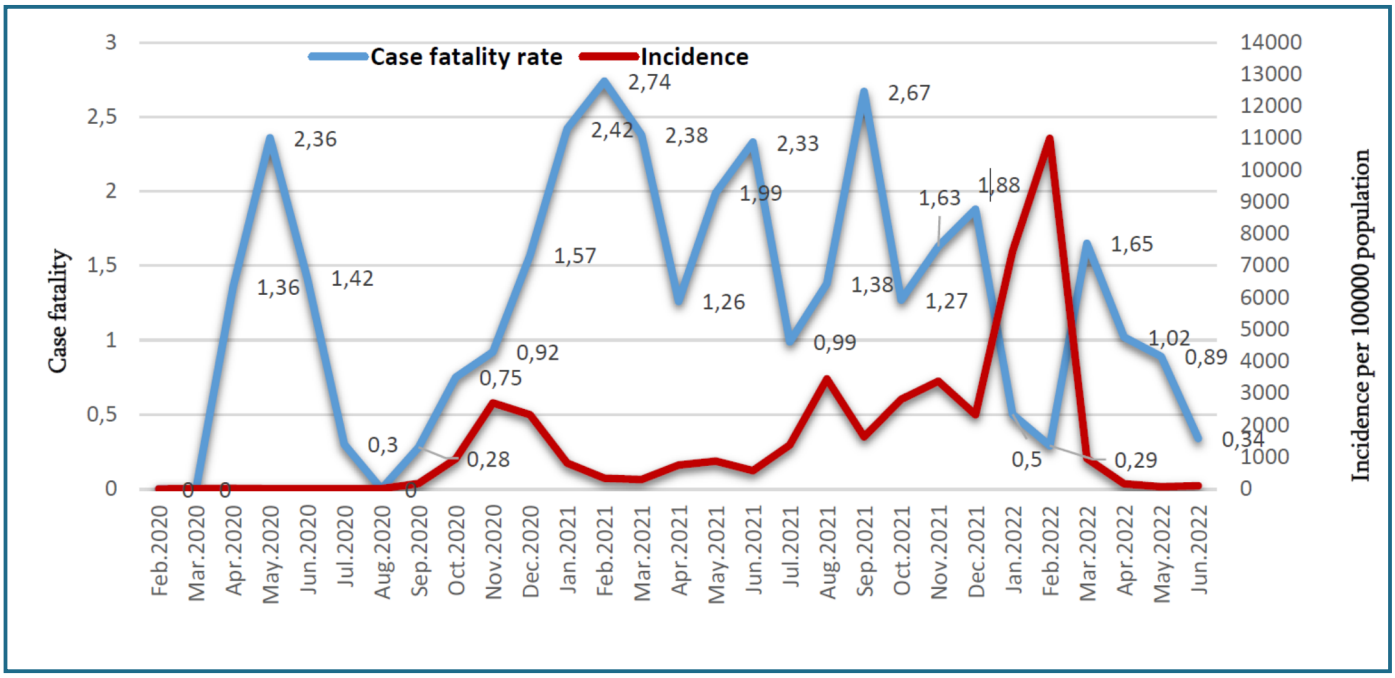
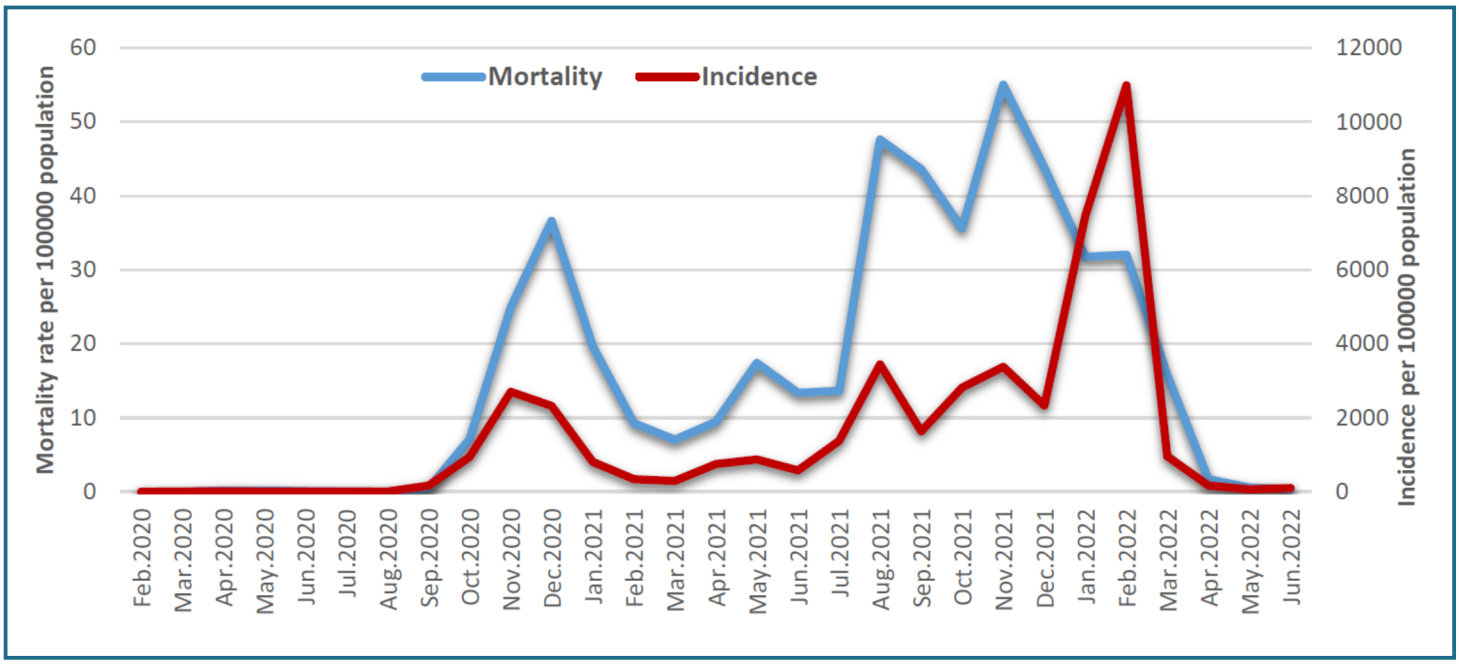


Figure 17. Mortality due to COVID-19 per 100,000 of population and COVID-19 Incidence, Georgia, as of July 1, 2022

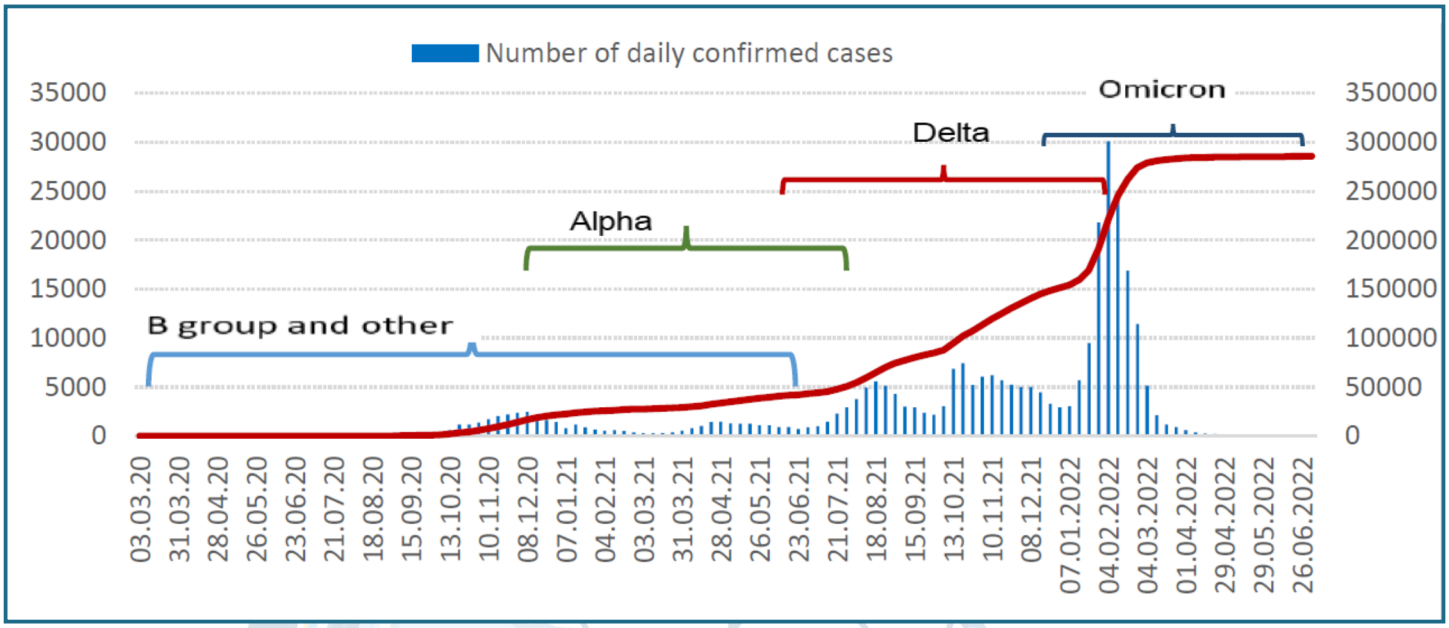


THE COVID-19 MORBIDITY IN CHILDREN AND ADOLESCENTS (0 –18-YEAR-OLD)

The first case of COVID-19 in Georgia in the 0-18 year - age category was confirmed on March 10, 2020. As of July 1, 2022, the number of confirmed cases in the 0-18-year age group amounted to 294,649 and accounted for 17.7% of all confirmed cases:

- 2020 (10 months) – 23,554
- 2021 – 136,423
- 2022 (6 months) – 134,672

Figure 18. Cumulative and Daily Number of Confirmed COVID-19 Cases among Children and Adolescents aged 0-18, Georgia (as of July 1, 2022)



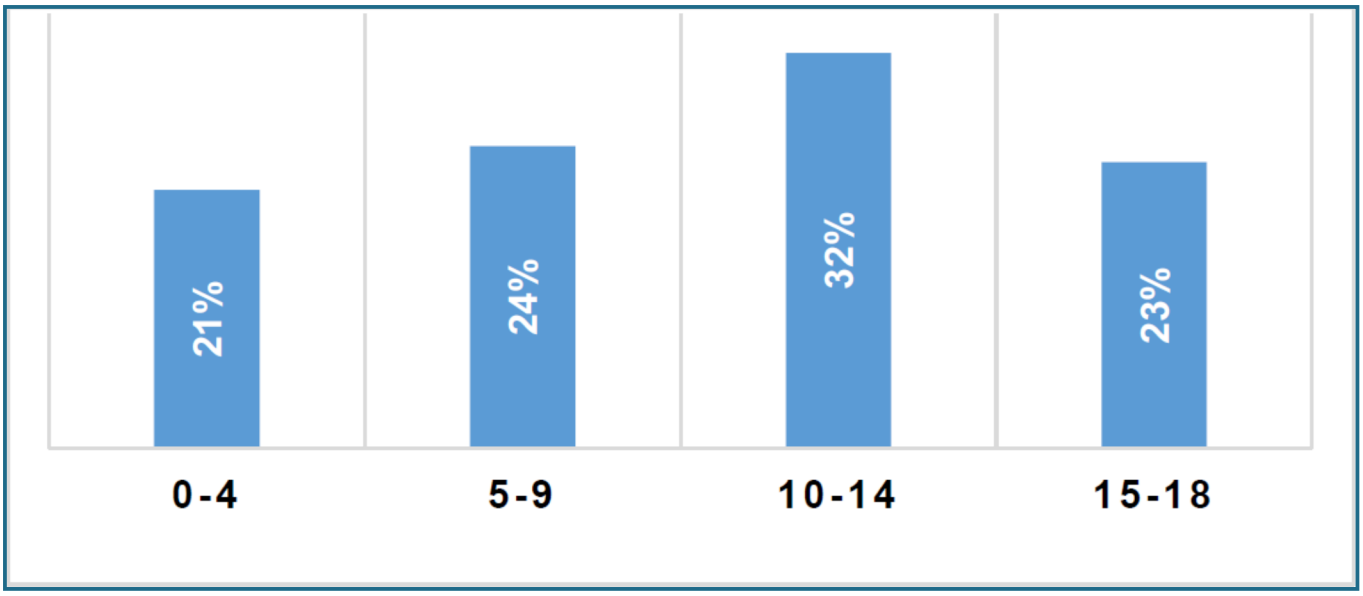
Increasing trend of confirmed cases in the 0-18- years age group was noted in 2020-2021. The number of infected children declined in December 2021, while it increased in January-February 2022 and then started to decrease again from April. The 6-month cumulative incidence rate was 1,448.3 per 100,000 children. The incidence rate reached its maximum in February 2022.

Table 1. COVID-19 Morbidity Rates in Children and Adolescents Aged 0-18 years

	2020		2021		2022	
	Number of the infected	Rate per 10,000 children	Number of the infected	Rate per 10,000 children	Number of the infected	Rate per 10,000 children
January	0	0	3 892	41.9	51,763	556.7
February	0	0	2 110	22.7	73,966	795.5
March	11	0	1 706	18.4	6,948	74.7
April	45	0.4	5 186	55.9	1,077	11.6
May	44	0.5	5 661	61.0	417	4.5

June	7	0.2	3 935	42.4	501	5.4
July	34	0.4	9 272	99.9		
August	52	0.6	23 161	249.5		
September	927	9.8	12 195	131.4		
October	4 275	46	25 191	271.4		
November	9 305	100.1	26 224	282.5		
December	8 854	95.8	17 890	192.7		
Total	**23 554**	**253.7**	**136 423**	**1469.7**	134 672	**1448.3**

Figure 19. Distribution Percentage of COVID-19 Confirmed Cases in Children by Age Group, Georgia (as of July 1, 2022)



Among confirmed COVID-19 cases 49% were girls and 51% boys.

Figure 20. COVID-19 Confirmed Cases among Children and Adolescents by Gender (as of July 1, 2022)

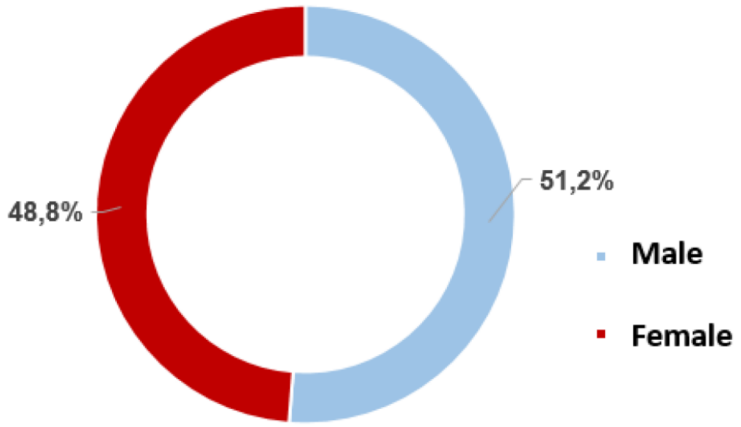


Table 2. Confirmed COVID-19 Cases among Children and Adolescents by Region of Residence (as of July 1, 2022)

Region	Quantity
Tbilisi	115 137
Guria	8 749
Adjara	26 237
Shida Kartli	16 758
Kakheti	18 792
Samtskhe-Javakheti	4 521
Imereti	42 960
Samegrelo and Zemo Svaneti	20 198
Racha-Lechkhumi and Kvemo Svaneti	10 042
Mtskheta-Mtianeti	6 135
Kvemo Kartli	17 341
Other	7 779
Total	**294 649**

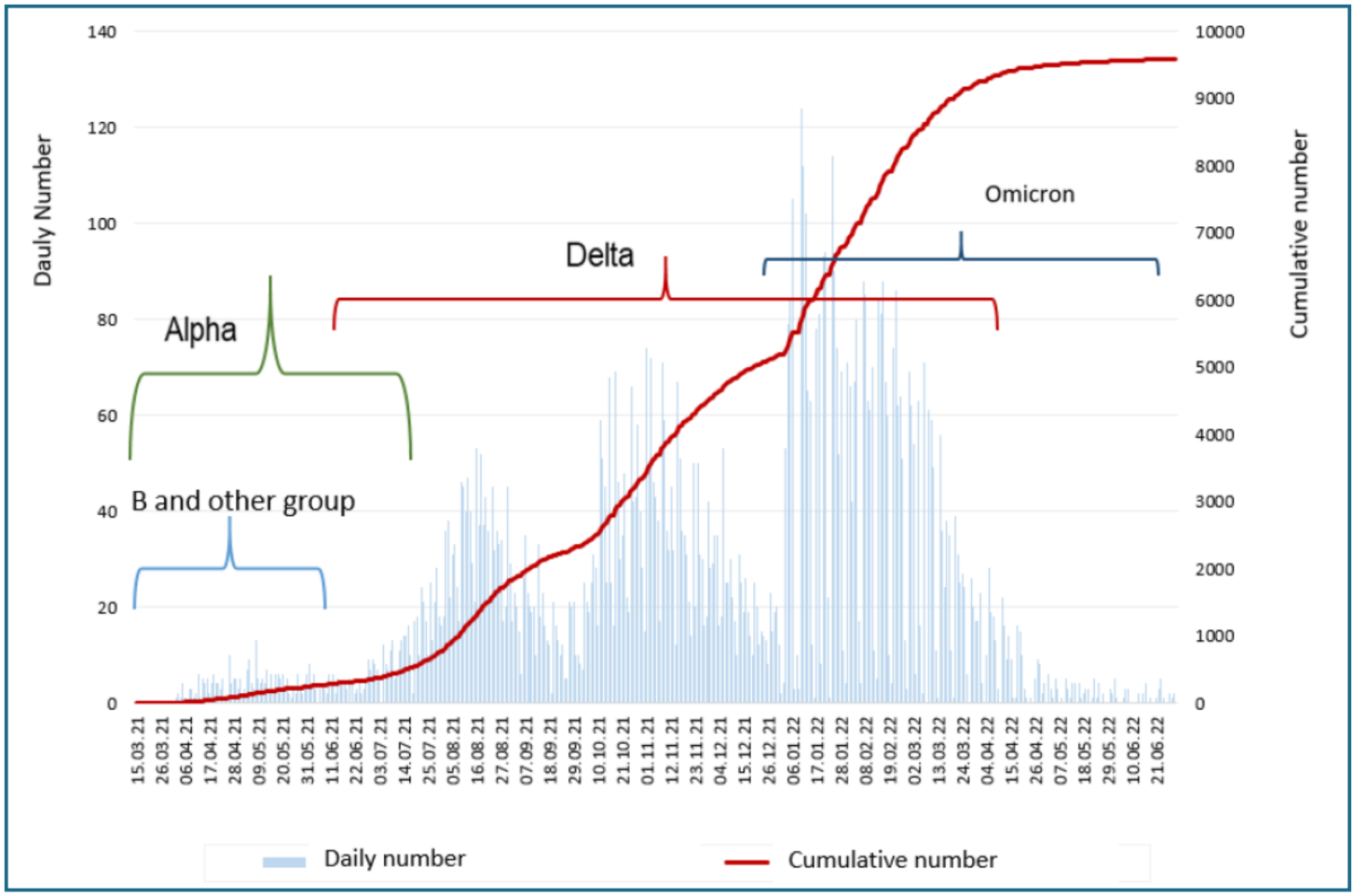
BURDEN OF DISEASE WITH COVID-19 IN PREGNANT WOMEN

From the beginning of the COVID-19 pandemic to July 1, 2022, 159,836 pregnant women were registered for antenatal care in Georgia:

- In 2020 - 66, 359
- In 2021 - 62, 982
- In 2022 - 30, 495

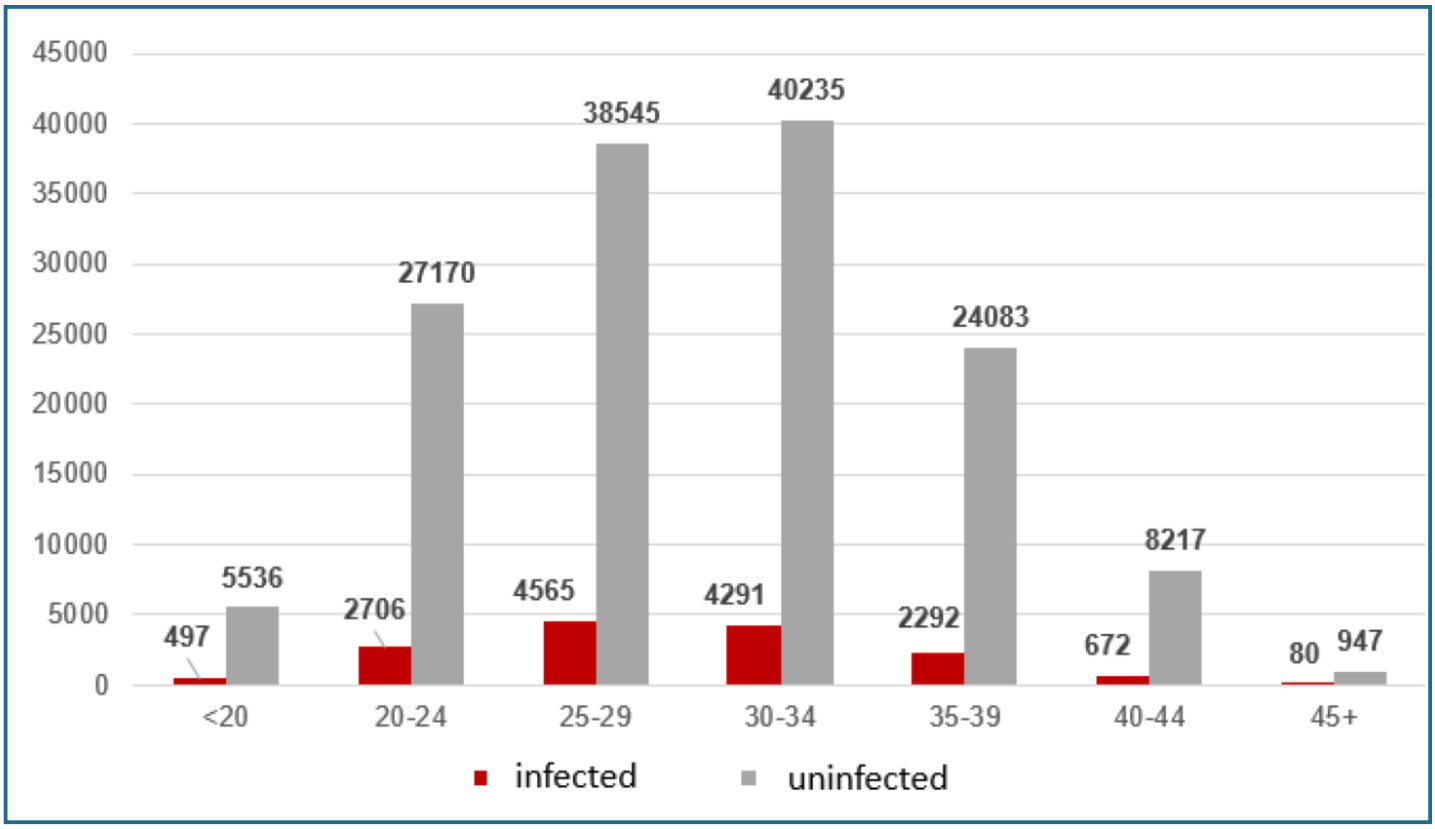
In the same period, the total number of confirmed COVID-19 cases in pregnant women was 15,103, including: in 2020 - 3,362; in 2021 - 7,326; in 2022 – 4, 415.

Figure 21. Daily and Cumulative Number of Pregnant Women Infected with COVID-19, Georgia (as of July 1, 2022)



As of July 1, 2022, the percentage of pregnant women infected with COVID-19 was 9.4%, including: 5.1% of pregnant women registered in 2020; 11.6% of the number of pregnant women registered in 2021; 14.5% of the number of pregnant women registered in 2022.

Figure 22. COVID-19 Confirmed Cases in Pregnant Women by Age Group, Georgia (as of July 1, 2022)



30-34 year age group accounted for the largest share in confirmed cases among pregnant women.

Figure 23. Distribution of infected and non-infected women among those who had given birth, Georgia (as of July 1, 2022)

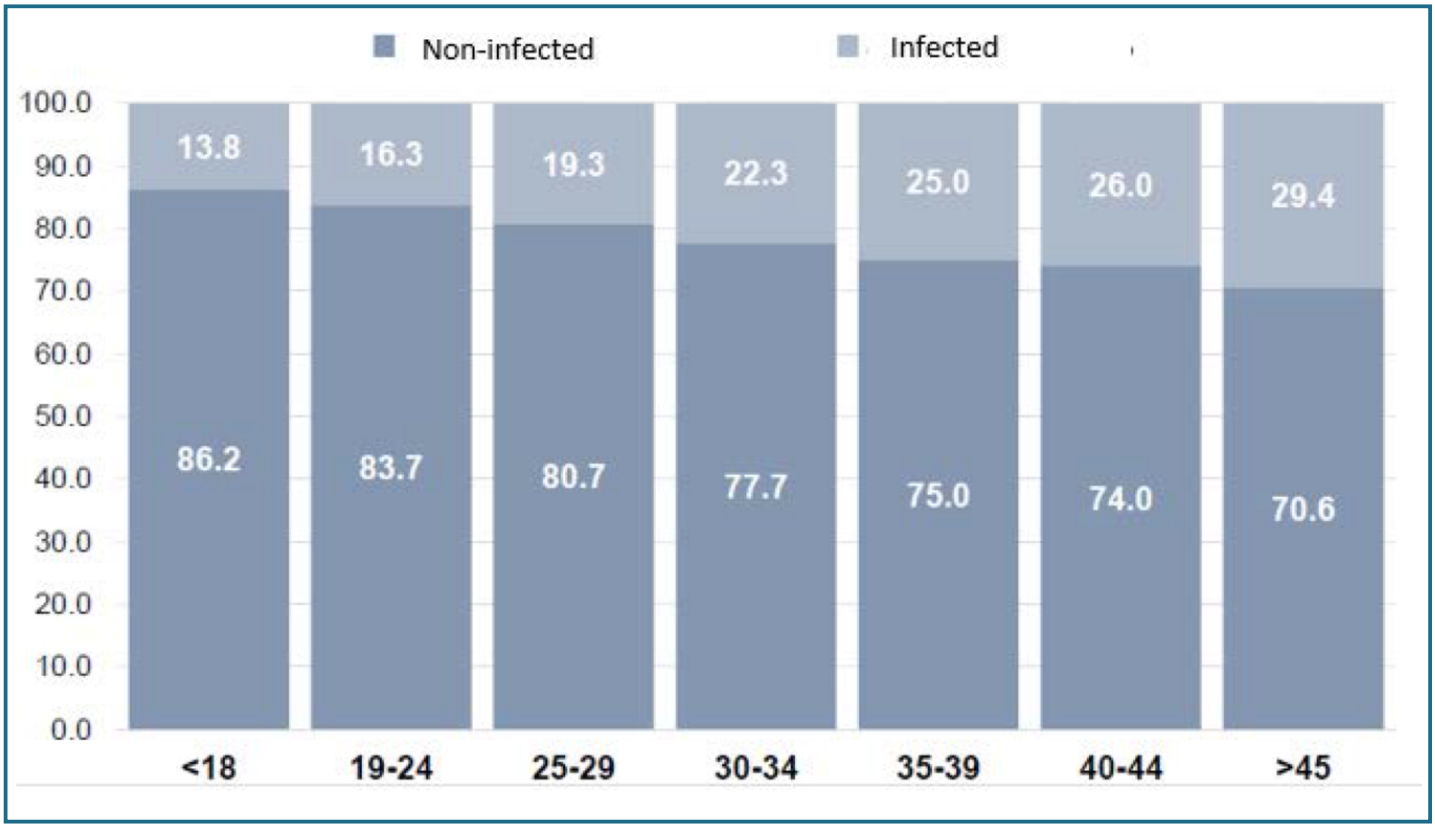


Table 3. Distribution of COVID-19 confirmed cases among pregnant women (%) by region (actual residence), as of July 1, 2022, Georgia

	Number of infected pregnant women	Infected pregnant women %
Adjara	1 704	8.6
Guria	278	9.4
Tbilisi	5 697	10.8
Imereti	2 016	11.4
Kakheti	1 022	8.9
Mtskheta-Mtianeti	285	11.1
Racha-Lechkhumi and Kvemo Svaneti	68	11.5
Samegrelo and Zemo Svaneti	867	9.5
Samtskhe-Javakheti	332	5.2
Kvemo Kartli	1 205	6.3
Shida Kartli	979	9.4
Other	650	-
Total	**15 103**	**9.4**

The share of confirmed pregnant women cases by the region of residence was high in Racha-Lechkhumi and Kvemo Svaneti, Imereti and Mtskheta-Mtianeti.

Map 1. Distribution of COVID-19 confirmed cases among pregnant women (%) by region (actual residence), July 1, 2022, Georgia

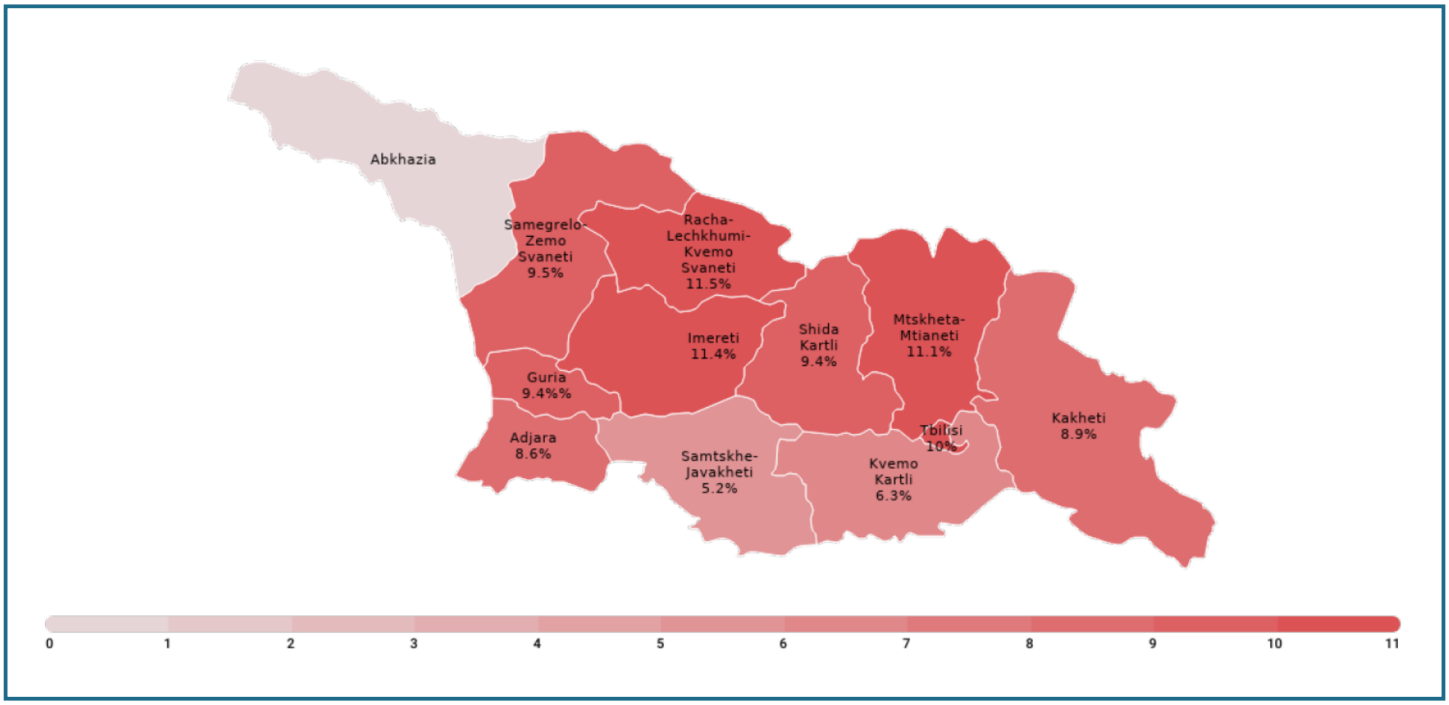


Figure 24. COVID-19 Infection cases by day among pregnant women, including those fully vaccinated, Georgia (as of July 1, 2022)

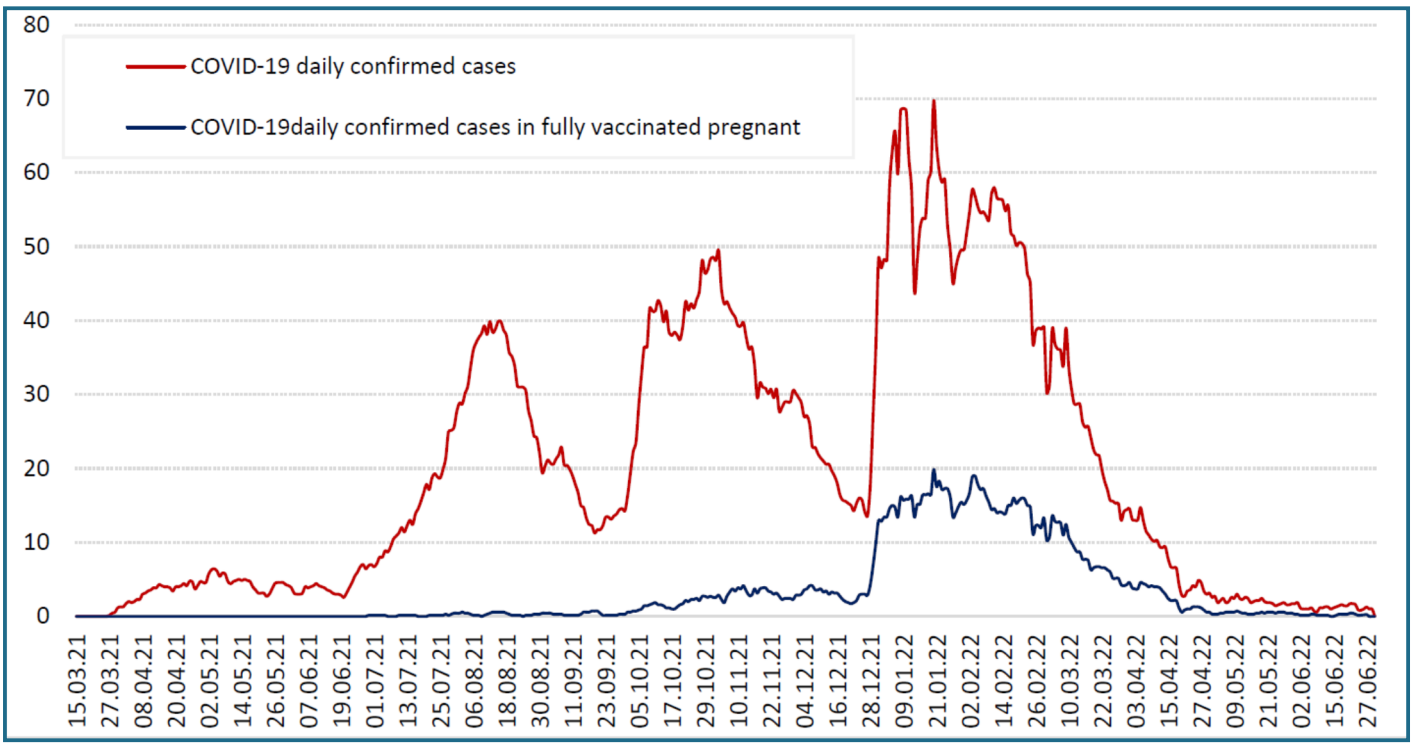


Figure 25. Daily birth numbers among COVID-19 infected and fully vaccinated women, from January 1 to July 1, 2022

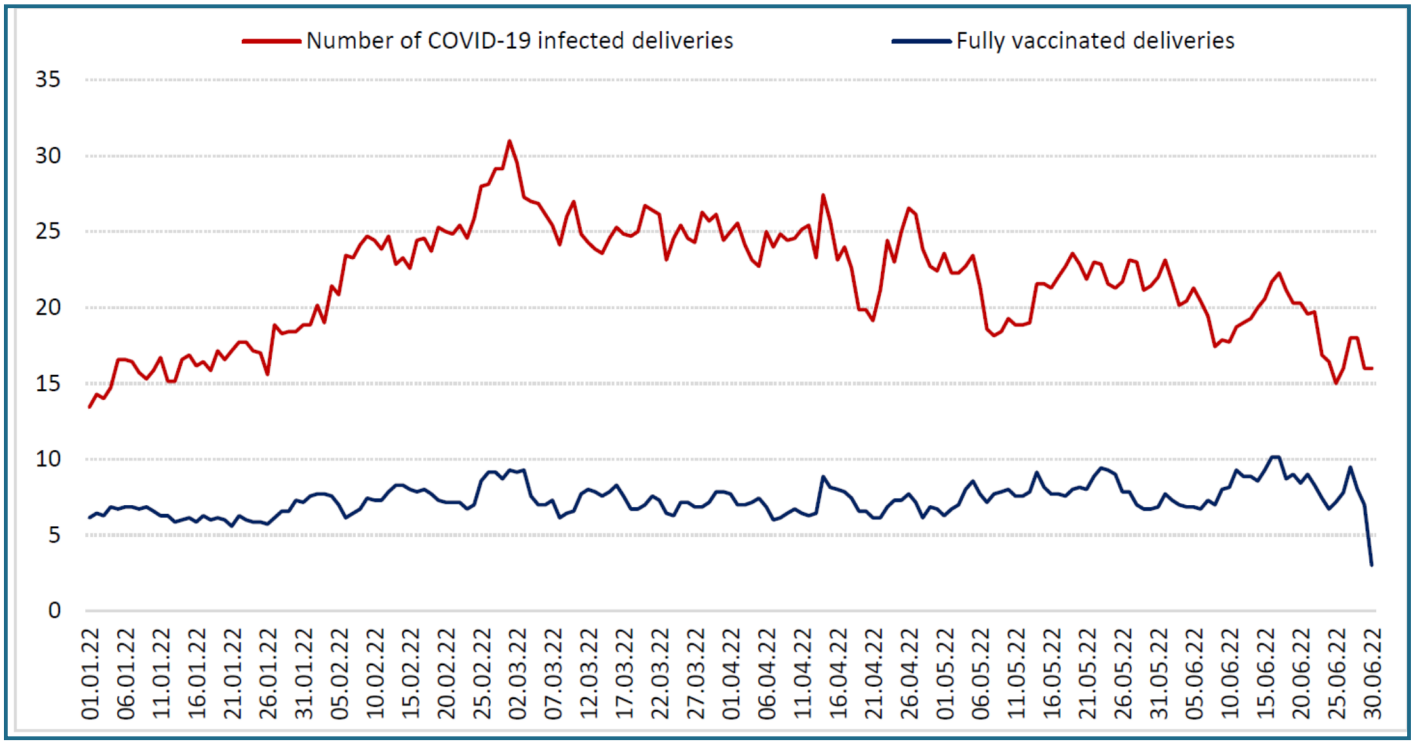


Figure 26. Proportion of previously vaccinated women against COVID-19 among infected women that had given birth (%), Georgia (as of July 1, 2022)

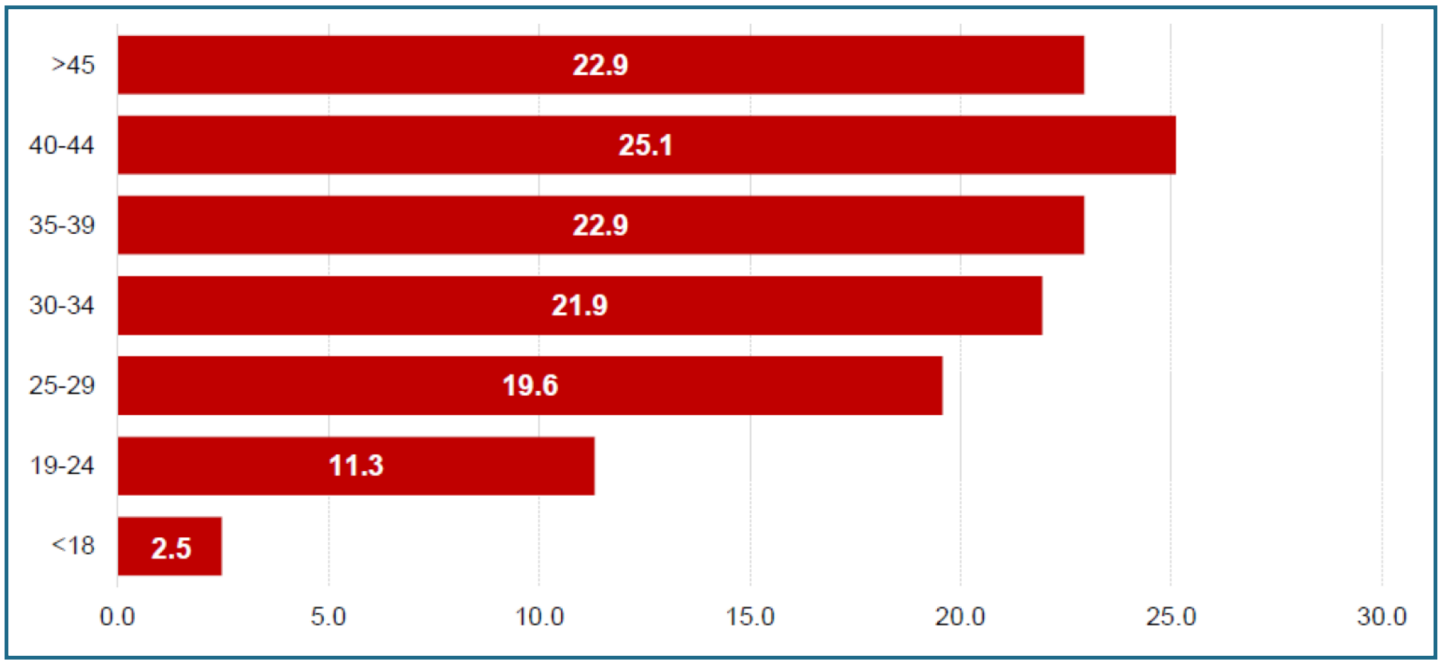


Figure 27. Complete vaccination coverage against COVID-19 among infected women giving birth (%) by actual region of residence, Georgia (as of July 1, 2022)

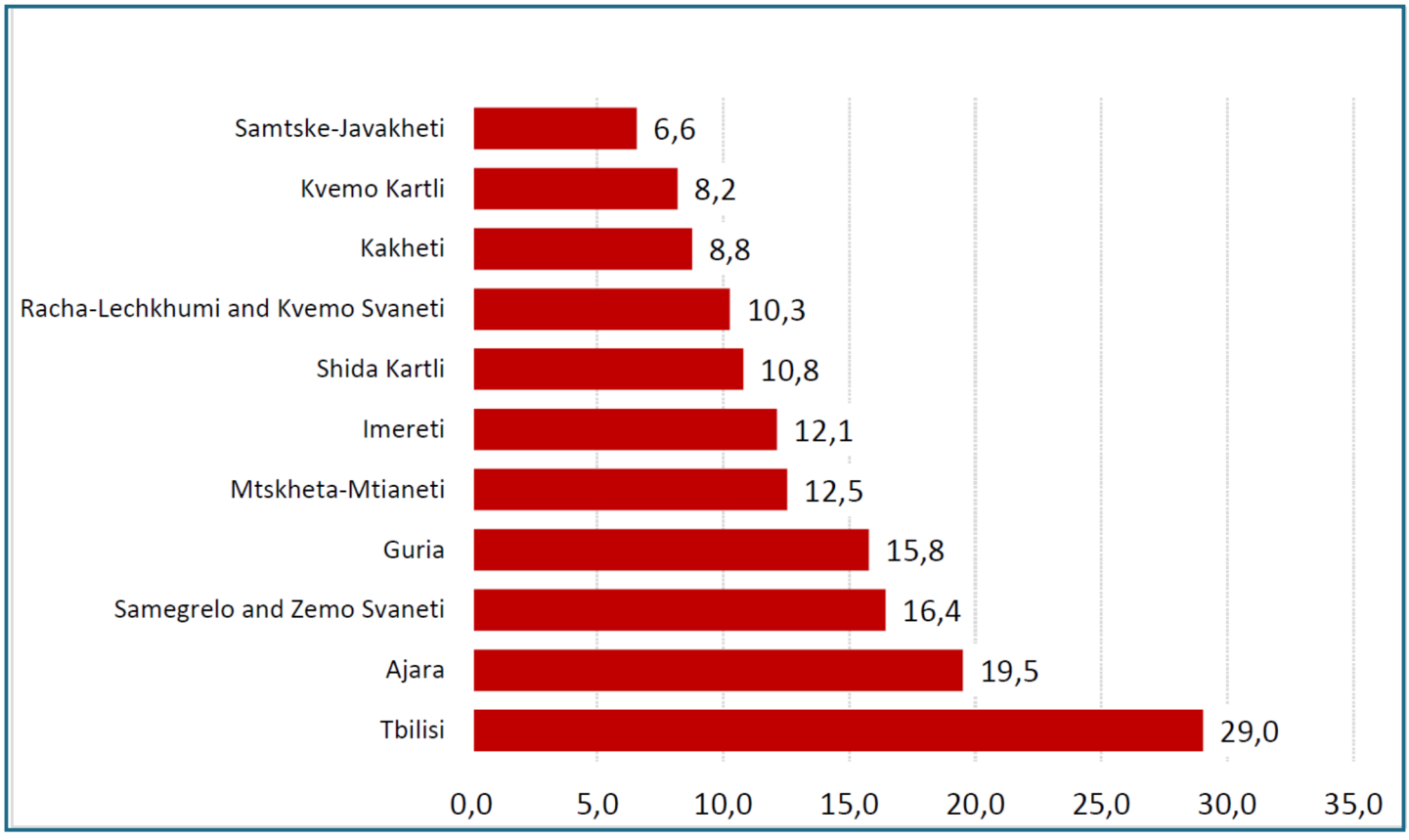
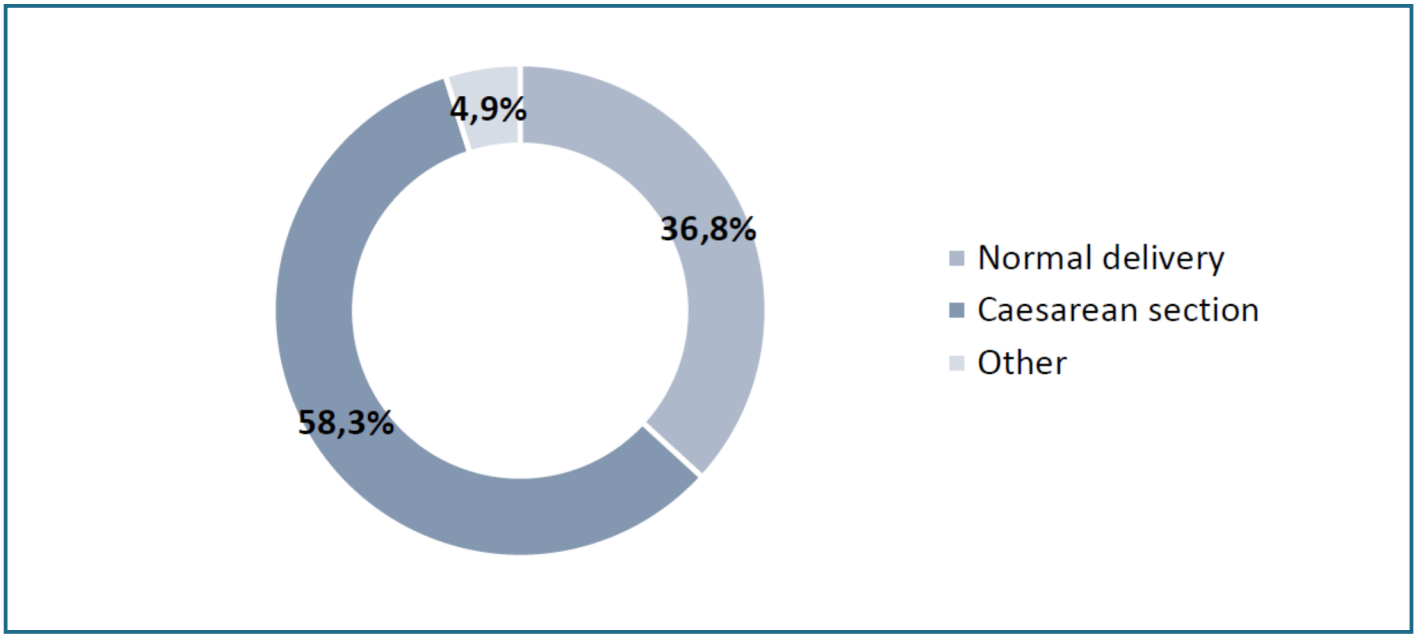
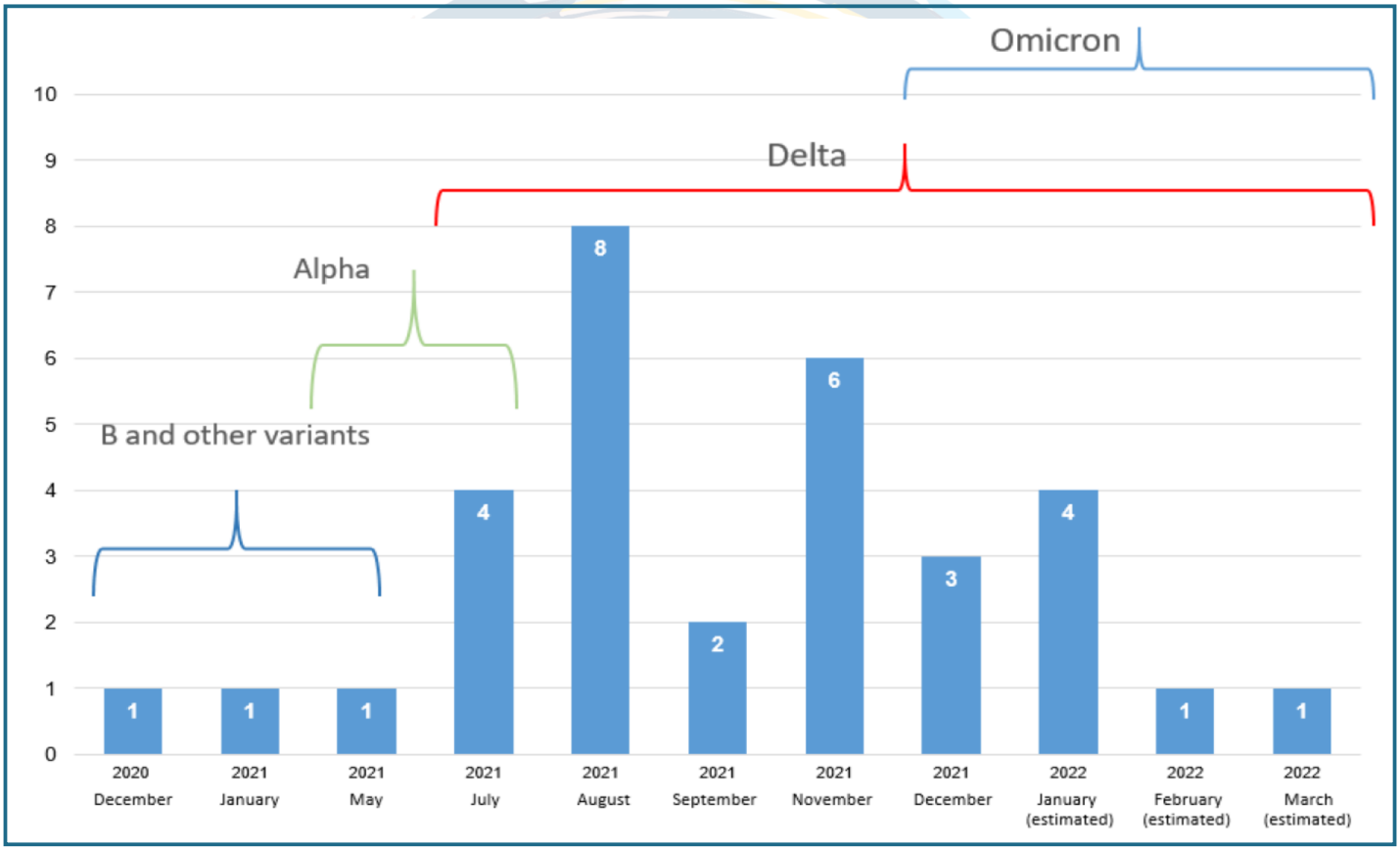


Figure 28. Type of childbirth among COVID-19 infected women, from January 1 to July 1, 2022



As of July 1, 2022, 25 cases of maternal deaths caused by COVID-19 were recorded in Georgia, including 1 case in 2020, 24 cases in 2021.

Figure 29. Number of deaths among pregnant women, mothers in childbirth and breast-feeding mothers due to COVID-19, Georgia (as of July 1, 2022)



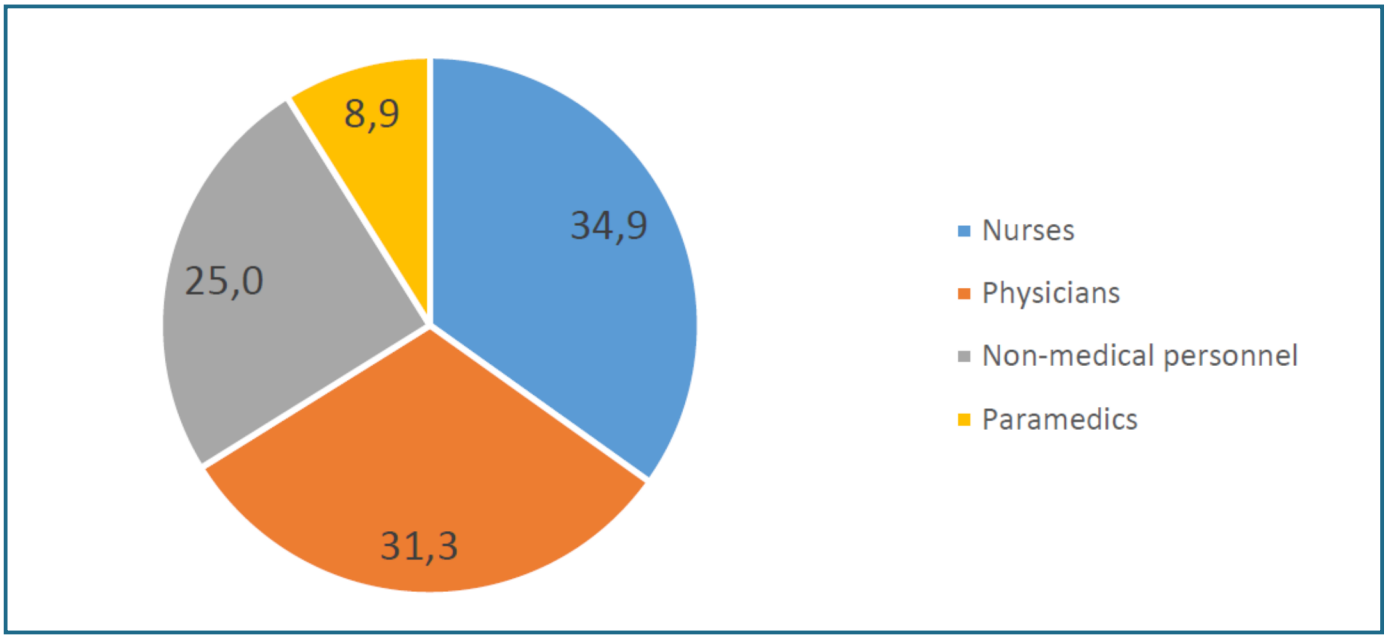
Of the 25 maternal deaths due to COVID-19, 24 were eligible for vaccination (after March 15, 2021), but none were vaccinated.

THE BURDEN OF COVID-19 MORBIDITY AMONG HEALTHCARE WORKERS

Pursuant to the Decree N975 of the Government of Georgia (June 15) on Approving the List of Persons Subject to Mandatory Testing for Coronavirus (SARS-CoV-2) Infection (COVID-19) and Testing Procedure, the risk groups defined by the said decree were tested in the country and the routine testingof medical personnel was identified as a priority. The share of healthcare workers among COVID-19 patients was 3.8%.

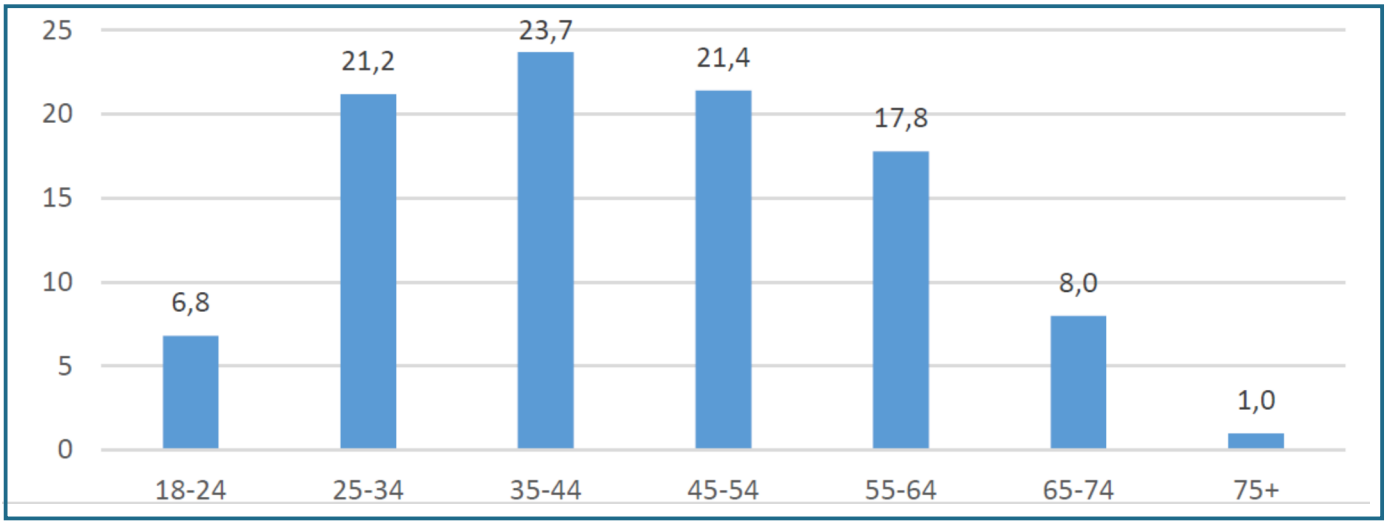
As of July 1, 2022, the share of infected persons among the healthcare workers was 49.7%, including doctors - 42%, among nurses and sanitary workers - 53%-53%, non-medical personnel - 28%.

Figure 30. Percentage distribution of COVID-19 positive cases among healthcare workers by activity subgroups



In 2020-2022, 80% of infected personnel working in medical facilities were in the age group of 30 to 70 years. The share of infected among working women was 40.5%, while among working men - 33.9%.

Figure 31. Percentage distribution of COVID-19 positive cases among healthcare workers by age groups (as of July, 2022), Georgia



The highest share (%) of COVID-19 infected staff at medical institutions was recorded in Tbilisi, Imereti and Kvemo Kartli regions.

Table 4. Share of COVID-19 infected medical staff in the total number of medical personnel by regions (as of July 1, 2022), Georgia

	The number of infected personnel working in medical institutions (2020-2022)	Among them, the number of people infected during the 6 months of 2022
Shida Kartli	2 469	927
Tbilisi	34 850	16 064
Imereti	8 538	3 395
Kvemo Kartli	3 574	1 370
Kakheti	2 585	942
Mtskheta-Mtianeti	987	353
Adjara	5 477	2 058
Racha-Lechkhumi and Kvemo Svaneti	339	102
Samegrelo and Zemo Svaneti	2 778	924
Samtskhe-Javakheti	1 104	390
Guria	800	296
Georgia	**65 301**	**26 821**

During the pandemic, 153 cases of death due to COVID-19 were recorded among the staff working in medical institutions. The lethality among infected women working in healthcare facilities was 0.4%, while among men - 1.4%.

Table 5. Distribution of COVID-19 -caused fatal cases among personnel working in medical facilities by age and gender

	Number
Male	61
Female	92
Age groups	
30-39	2
40-49	5
50-59	34
60-69	66
70+	46
Total	**153**

Table 6. Deaths and Lethality Due to COVID-19 in Medical Facility Staff by Region of Employment

	Number	Lethality (%)
Adjara	20	0.4
Tbilisi	63	0.2
Imereti	31	0.4
Samtskhe - Javakheti	11	1
Kakheti	5	0.2
Mtskheta-Mtianeti	3	0.3
Guria	1	0.1
Samegrelo and Zemo Svaneti	8	0.3
Kvemo Kartli	7	0.2
Shida Kartli	4	0.2
Total	**153**	**0.2**

Table 7. Distribution of fatal cases caused by COVID-19 among the personnel working in medical facilities in groups subject to routine testing

	quantity
Inpatient medical staff (with a 14-day testing regime)	65
Staff of fever/covid clinic/online clinic and all inpatient admissions, intensive Care and resuscitation departments	34
Primary healthcare staff	21
Ambulance personnel	15
Quarantine space personnel	3
Dialysis service personnel	1
Staff of PCR Laboratory	2
Staff of a long-stay (psychiatric /tuberculosis profile) facility	2
Epidemiologist	2
Workers of disaster services	2
Other risk group	6
Total	**153**

Various concomitant chronic diseases were noted in 53 fatal cases (34.6%), among which cardiovascular diseases accounted for the majority. Among the deceased, respiratory system diseases were recorded as complications of the coronavirus disease in most cases.

Table 8. Distribution of Comorbidities and Complications in COVID-19 Induced Fatal Cases among Healthcare Workers, Georgia, as of July 1, 202215

Accompanying diseases	Quantity	%
Cardiovascular diseases (except hypertension)	36	23.5
Hypertension	22	14.4
Diabetes	13	8.5
Cancer	7	4.6
Disease of the hematopoietic organs	5	3.3
Complications	**Quantity**	**%**
Pneumonia	81	52.9
Acute respiratory failure	78	51.0
Respiratory distress syndrome	32	20.9
Polyorgan failure	32	20.9
Septicemia	17	11.1

[15] *In some cases, more than one co-morbidity or complication was present*

REINFECTION

A re-infection caused by SARS-CoV-2 is considered to be the repeated illness of a person with COVID-19 after a specified time interval from recovery. At this stage, according to the information available in the world, there were cases of reinfection with different variants of SARS-CoV-2 recorded. The Center is actively working to inform the public health sector about reinfection; a standard case definition and recommendations for public health professionals have been developed.

The research of possible re-infection cases in Georgia started in September 2020. The developed SARS-CoV-2 (COVID-19) case definition is provisional and subject to revision, as appropriate evidence becomes available or as recommended by the World Health Organization.

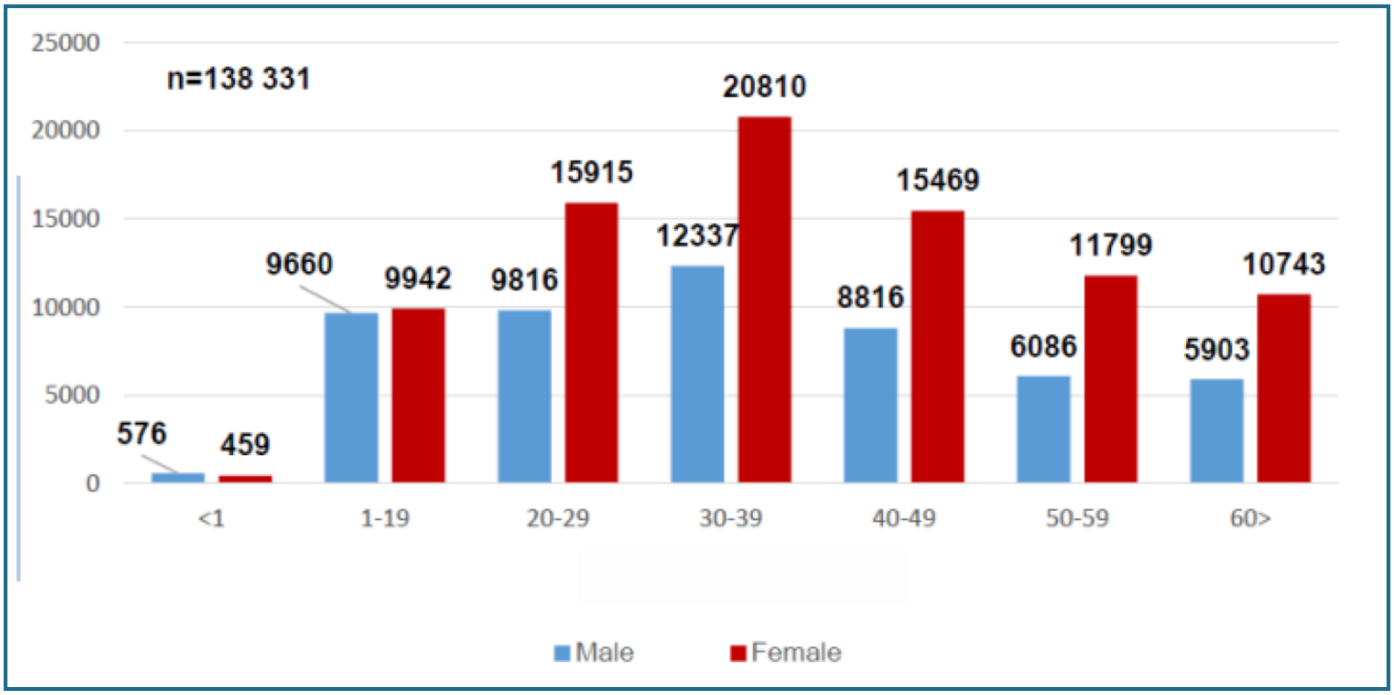
A total of 138 331 possible reinfection cases in persons who tested positive by PCR or rapid antigen testing at least 60 days apart were recorded in the electronic system for laboratory-confirmed cases of COVID-19 between February 26, 2020 and July 1, 2022. Among them, 53 194 (38%) were male, and 85 137 (62%) female. The mean age of possibly reinfected persons at the moment of re-infection was 37 years, minimum age >1 and maximum 103. Mean period between first and last confirmation is 305 days, minimum 60, and maximum 767 (SD = 135). Out of 138 331 cases, 10 997 reinfections occurred in the period from February 26, 2020 to December 31, 2021. From March 2020 to December 31, 2021, sequencing was carried out by the Lugar Research Center on 41 cases of possible reinfection, of which 16 cases of reinfection and 1 case of persistence were laboratory confirmed.

Table 9. Variant Distribution of Confirmed COVID-19 Reinfection Cases, 2020-2021, Georgia

Number of cases	The first sample	The second sample
one	B.1.1.141	Alpha B.1.1.7
five	B.1.1 *	B.1.1 *
two	B.1.1	Delta AY.125
two	Alpha B.1.1.7	Delta AY.125
one	B.1.1	Delta AY.121
one	Alpha B.1.1.7	Delta AY.121
one	B.1.1	---**
two	---**	Delta AY.128
one	---**	Delta AY.121

** 10< nucleotide polymorphism in five cases (SNP).*
*** In four cases, only one biological sample was analyzed. Depending on the epidemiological situation of the country, in one case during the second episode, and in the remaining three cases during the first episode, the Alpha and Wuhan variant were circulating, respectively.*

Figure 32. Distribution of the COVID-19 possible reinfection incidence by age and gender groups in unique persons per 100,000 population, 2020-2022, Georgia



The rate of possible COVID-19 re-infection per 100 000 population was highest among women aged 30-39.

From March 15, 2021 to July 1, 2022, among those reinfected, there were 16 868 hospitalizations, and 102 of them died. Among the described cases, the mean age of the deceased was 69 years [SD 13], the minimum age was 18 years, and the maximum 89 years. Out of total 138 331 possible reinfection cases, 101 306 (73%) reinfections occurred in nonvaccinated individuals.

37 025 (27%) people were vaccinated against Covid between the first and repeated infection, inter alia 2,3% (3 213) of those reinfected received 1 booster dose, and 0,035% (49) 4 doses. There were 13 044 (35%) males and 23 981 (65%) females (N=37 030). The average age of vaccinated persons at reinfection was 42 years, with minimum 12, maximum - 96 (SD=15) (N=37 025).

Table 10. Distribution of possible COVID-19 reinfection of vaccinated cases vaccinated by gender and age, Georgia 2020-2022

Age	Male	Female	Total
12-19	449	762	1 216
20-29	2 792	4 764	7 556
30-39	3 457	6 189	9 646
40-49	2 543	4 904	7 447
50-59	1 744	3 725	5 469
60+	2 059	3 637	5 696
Total	13 044	23 981	37 025

92% of probable and confirmed reinfection cases recorded in the reporting period were related to the spread of Omicron variants of SARS-CoV-2 (mainly BA 1, BA 2) in Georgia.

HOSPITALIZATION

The first COVID-19 patient was hospitalized on February 26, 2020 and the first recovered patient was discharged from the clinic on March 16. As of July 1, 2022, the total number of recovered persons equaled 233 356 (93,3%) people. Most of the patients discharged from inpatient facilities (64,1%) were transported by ambulance and 34,5% referred to clinics by themselves.

Figure 33. Cumulative and monthly number of COVID-19 hospitalizations, as of July 1, 2022

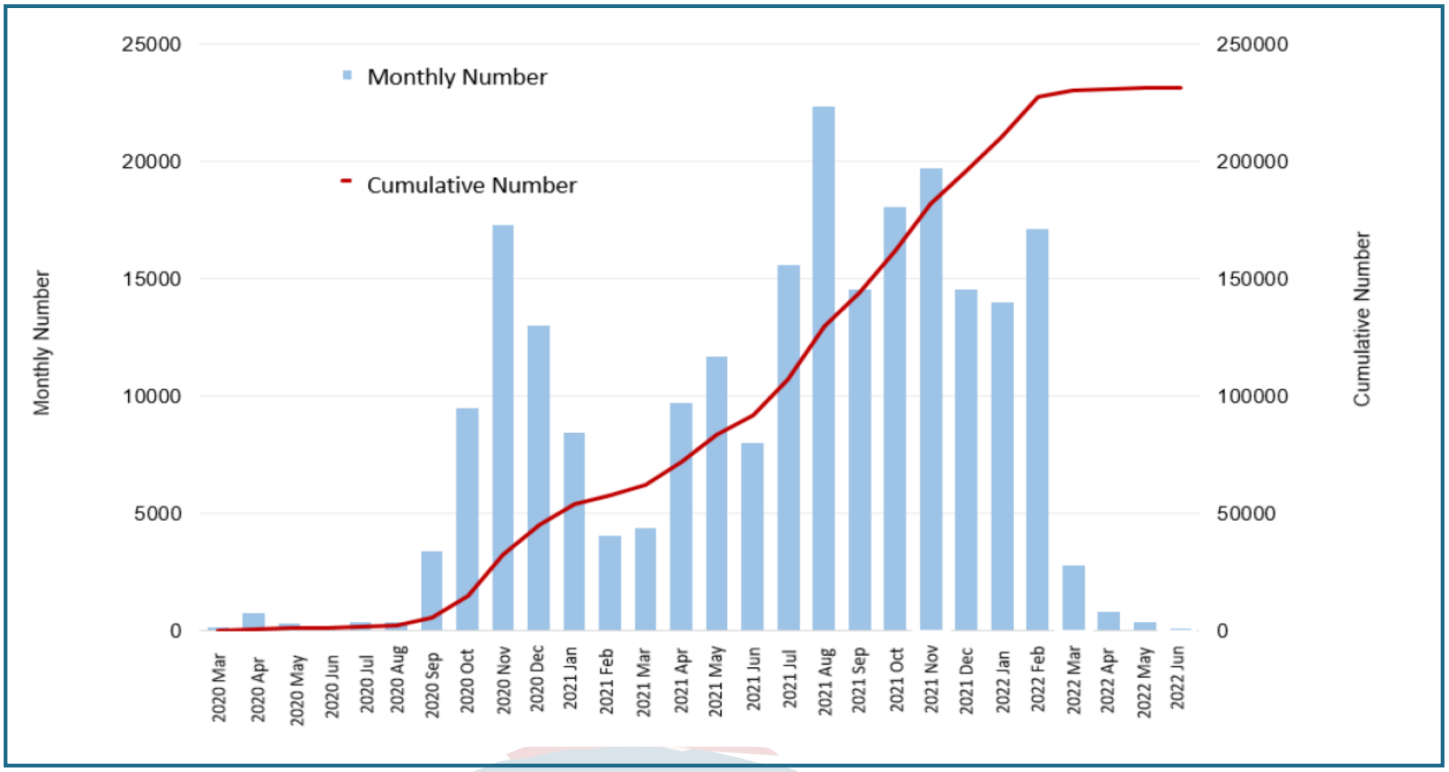


Figure 34. Average number of bed days spent per 1 patient

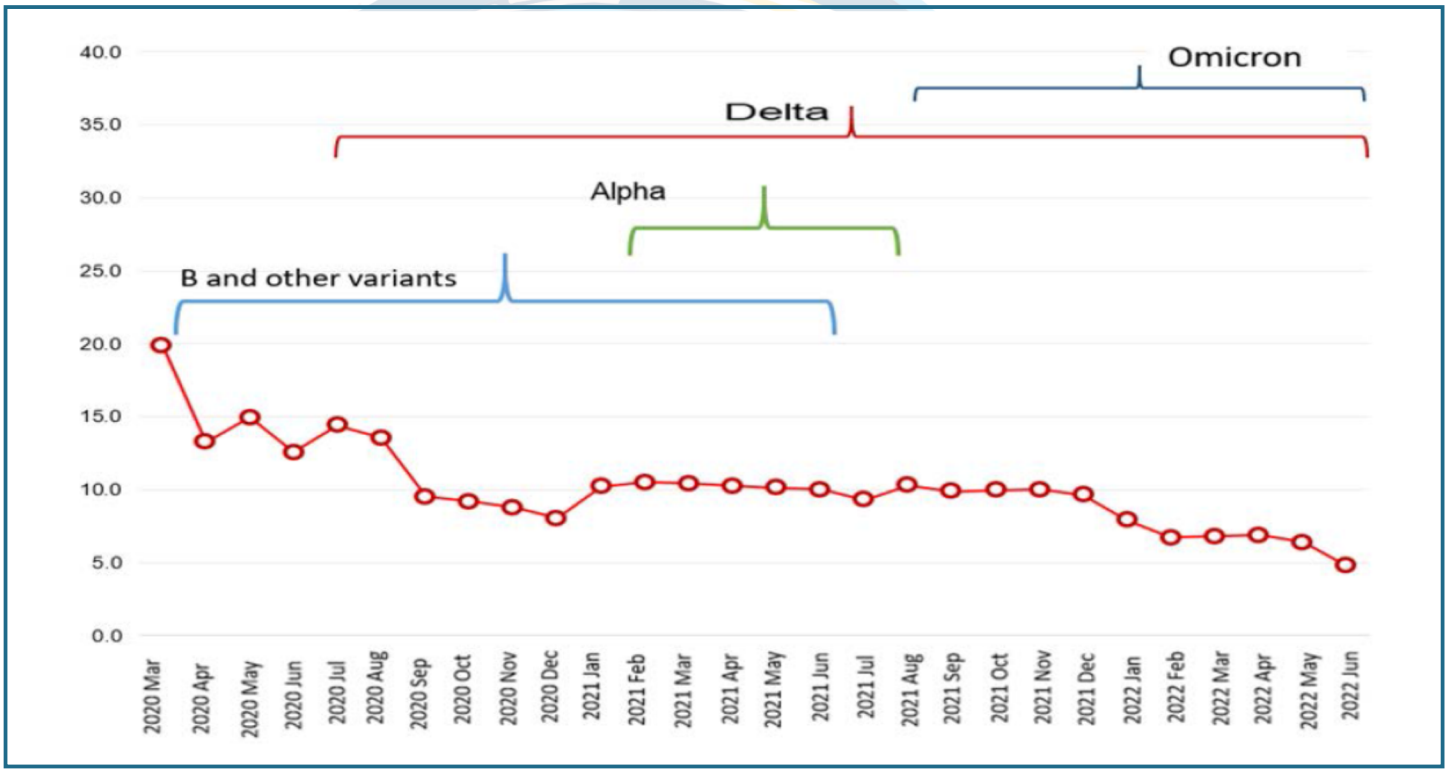
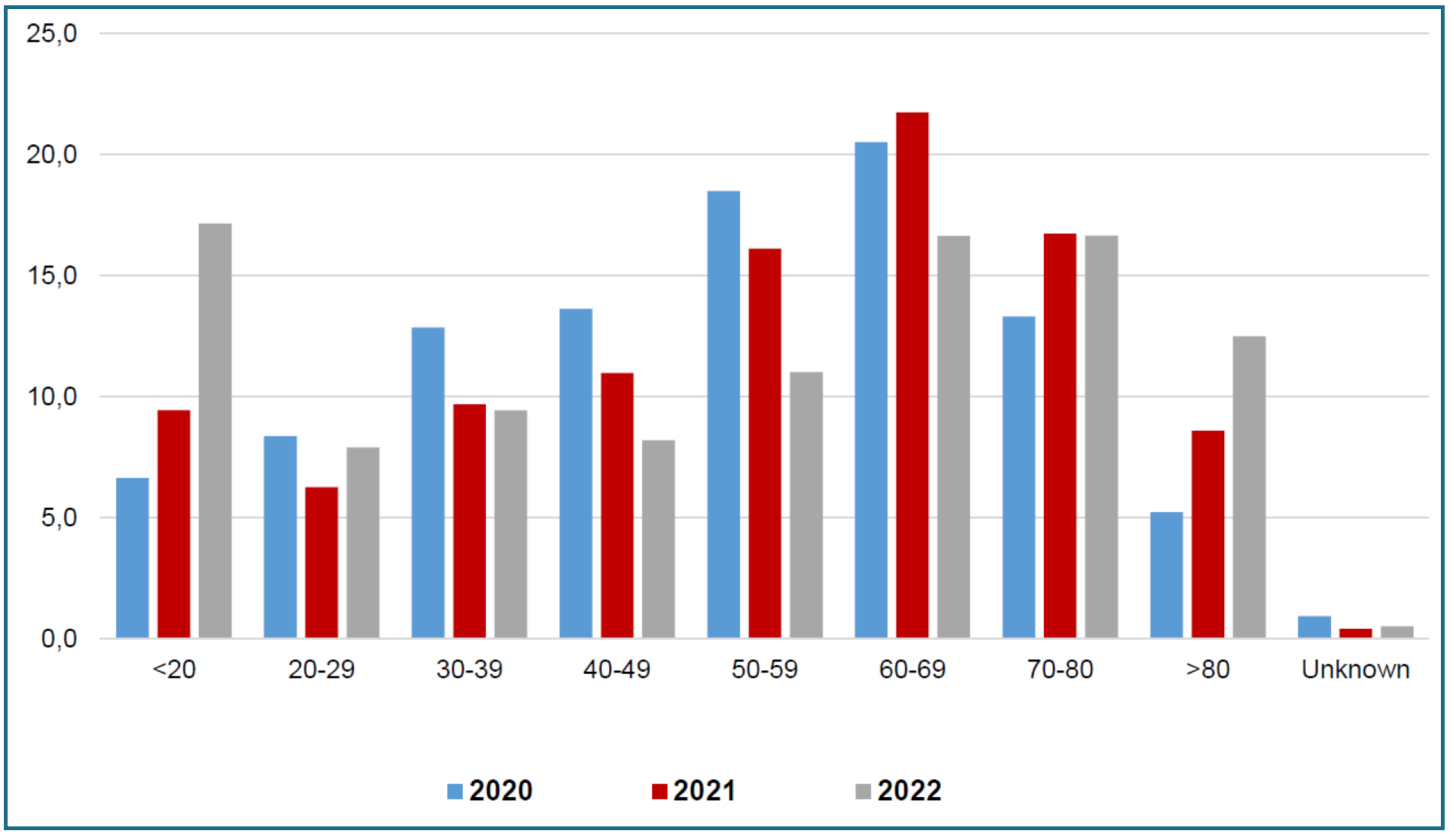


Table 11. Percentage distribution of patients discharged from hospital with a COVID-19 diagnosis according to the type of referral

	2020	2021	2022 (6 month)
Self-flow	38.3	31.1	40
Emergency	60.1	67.8	59
Referral from a medical institution	1.5	1.2	1

The maximum age of the patients was 99 years while the minimum 0 months and the average - 49 years. Among the patients, the age group from 0 to 20 years accounted for 11.6%, while the age group over 60 years - 54.5%. In particular, the age group from 0 to 20 years represented 8.4% in 2020, 9.4% in 2021, and 18.0% in 2022 (as of 6 months). The 60+ age group was 43.1% in 2020, 51.8% in 2021, and 46% in 2022 (as of 6 months).

Figure 35. Distribution of COVID-19 diagnosed patients discharged from hospital by age groups



Among discharged patients, 58,8% are women and 41,2% are men.

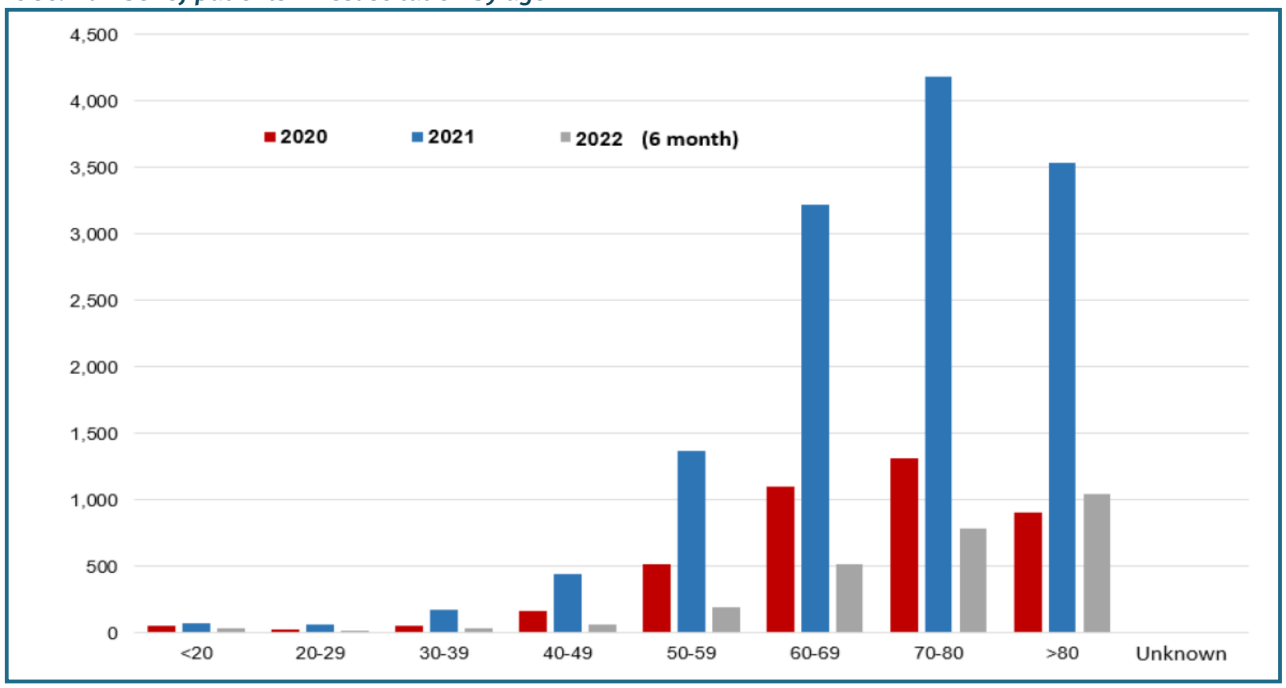
Among 211 673 patients discharged from inpatient facilities, 33% had complications. Pneumonia and respiratory failure predominated among the complications - in 2020, pneumonia occurred in 59,7% of patients, respiratory failure in 17%, in 2021, pneumonia occurred in 52,6%, respiratory failure in 19,7%, in 2022 (as of 6 months), Pneumonia was observed in 45%, respiratory failure in 18% of patients.

Table 12. Distribution of COVID-19 diagnosed patients discharged from hospital by five leading complications of the underlying disease, as of July 1, 2022

2020		2021		2022 (6 months)	
COVID-19 Complications	%	COVID-19 Complications	%	COVID-19 Complications	%
Pneumonia, without specifying the cause	60%	Pneumonia, without specifying the cause	53%	Pneumonia, unspecified	45%
Respiratory failure not included in other rubrics	17%	Respiratory failure not included in other rubrics	20%	Acute respiratory failure	18%
Pneumonia caused by other infectious agents not included in other rubrics	5%	Viral pneumonia not included in other rubrics	9%	Other viral pneumonias	16%
Other and fever of unknown origin	4%	Pneumonia caused by other infectious agents not included in other rubrics	6%	Pneumonia caused by other specified infectious agents	4%
Viral pneumonia not included in other rubrics	2%	Respiratory failure not included in other rubrics	3%	Shortness of breath, unspecified	3%

14,8% of patients, in addition to the coronavirus disease, had various, mainly chronic, diseases. The most common comorbidities are respiratory system diseases (43,3%), cardiovascular diseases (7,5%) and tumors (3,3%). Most of the patients in intensive care are 40-60 years old (34,8%) and 60 and older patients (60,2%).

Figure 36. Number of patients in resuscitation by age



From March 2020 to June 2022, the average number of bed days spent by patients discharged from inpatient facility was 10,2 days. In 2020, the average number of bed days per patient was 9 days, in 2021 - 11,5 days, and in 2022 (as of 6 months) - 7,2 days. 233 356 patients (93,3%) discharged from inpatient facilities recovered.

Table 13. Hospitalization Outcome for COVID-19 Diagnosed Cases, as of July 1, 2022

	2020	%	2021	%	2022 (6 month)	%
Recovery	67, 442	96	129, 656	92	36, 258	92
Deaths	2, 505	4	11, 295	8	3, 044	8
Total	**69, 947**	**100**	**140, 951**	**100**	**39, 302**	**100**

COVID-19 INDUCED MORTALITY

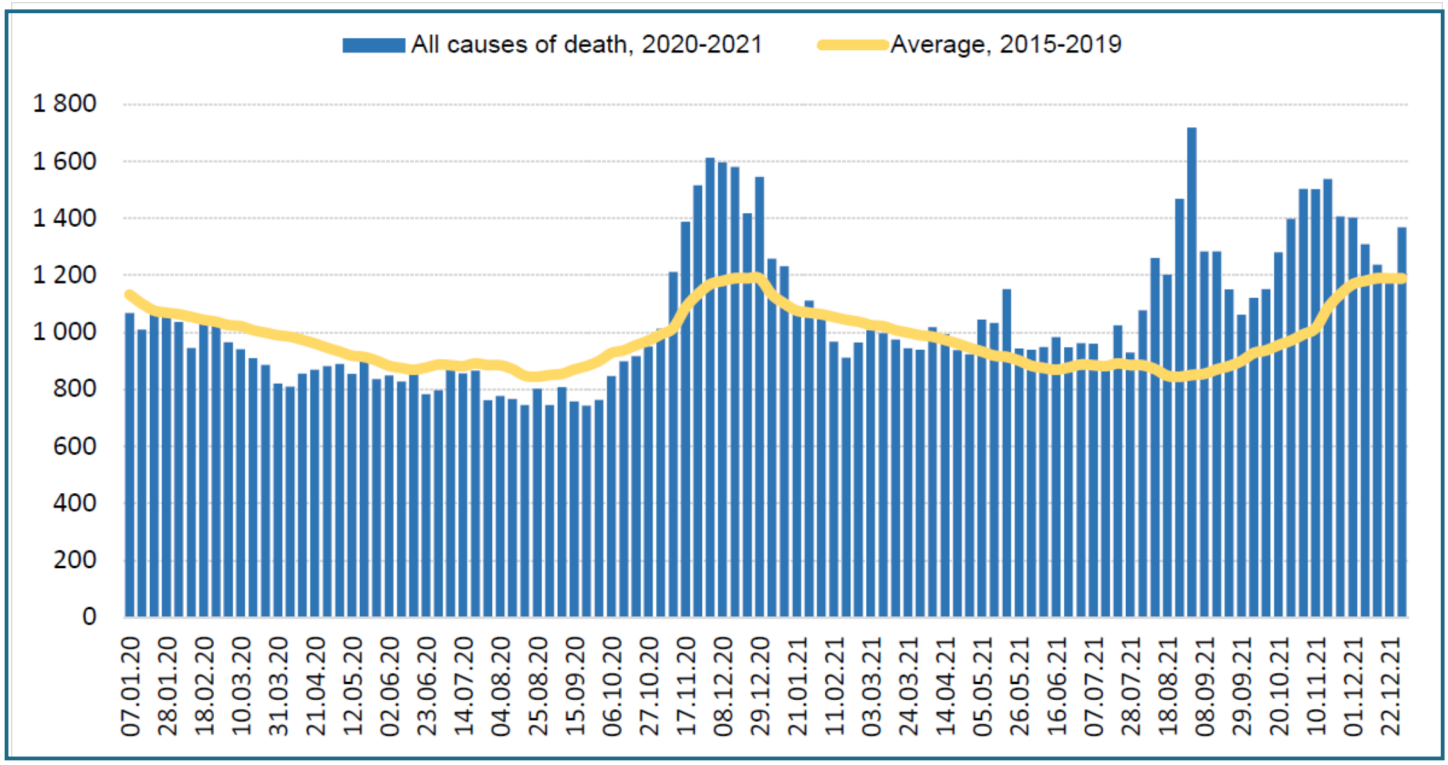
Key indicators for identification, monitoring and evaluation of COVID-19 induced mortality are:

- COVID-19 induced mortality rate (per 100 000 or 1 million inhabitants);
- Lethality rate in COVID-19 confirmed cases (%);
- Excess mortality from all causes.

COVID-19 excess mortality assesses whether the rapid spread of the disease and its associated deaths have affected the overall mortality rate. The excess mortality rate in the sample population is defined as the mortality rate that exceeds the expected rate. Excess mortality has been observed in many European countries between 2020 and 2021.

Excess mortality is calculated as the ratio of the average number of deaths for previous years to the figure of the current year. To derive the average number, mortality recorded for previous years (2015 – 2019) was calculated and compared to 2020 and 2021. .

Figure 37. Weekly increase in deaths as of July 1, 2022, compared to 2015-2019 average, Georgia Figure 38. Daily increase in excess mortality from January to July 1, 202216

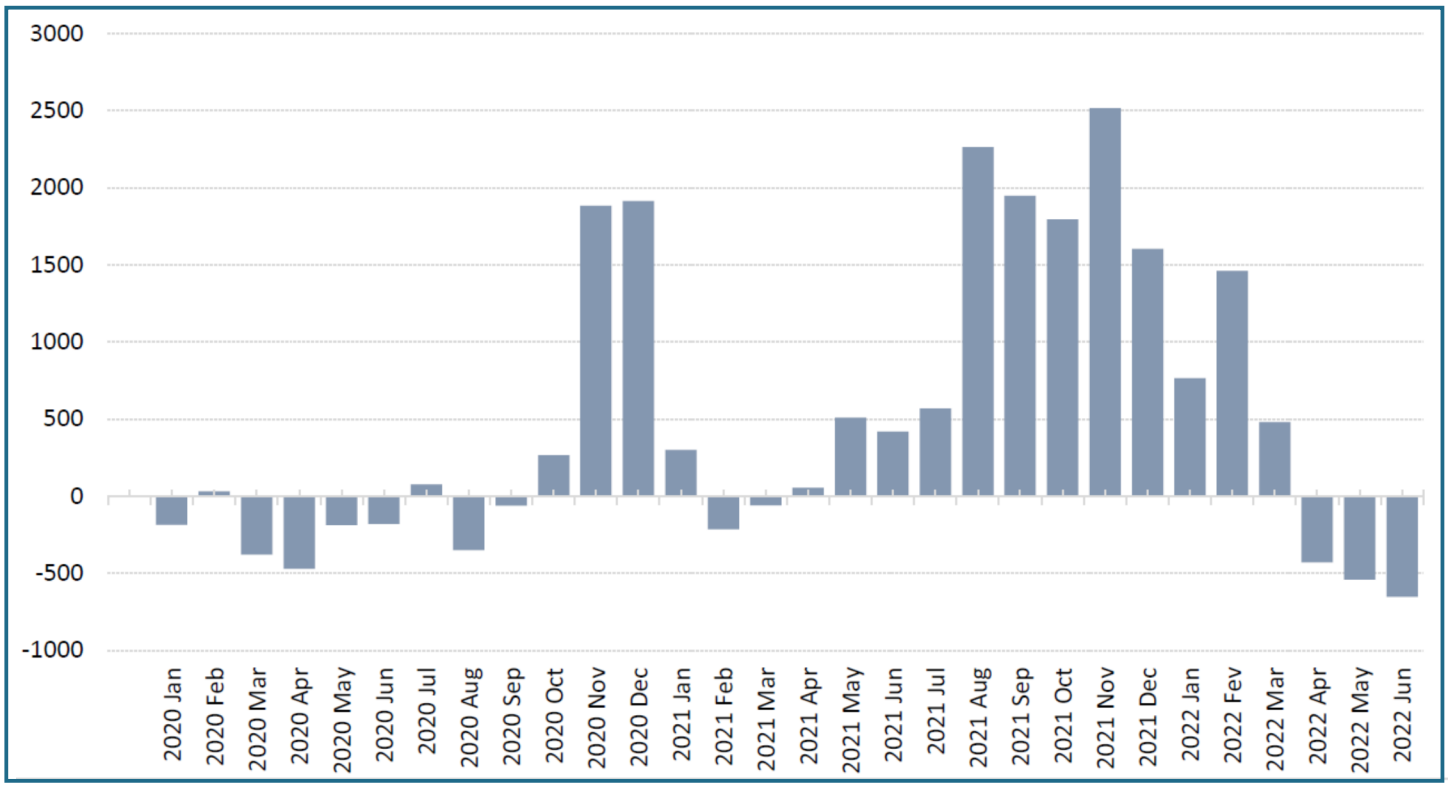


In January-February 2022, increase in excess mortality was observed compared to the average figure of 2015-2019, while from the month of March it was decreasing and reached a negative figure starting from April.

As of July 1, 2020-2022, monthly excess mortality was compared to the 2015-2019 average. The cumulative number is derived by summing up positive and negative excess mortality figures, which as of July 1, 2022, equaled 15,139.

[16] *The number of deaths in 2022 is compared to the average number for the same period of 2015-2019. The zero threshold represents the average number for 2015-2019*

Figure 39. Excess Mortality by Monthly Quantities as of July 1, 2020-2022, compared to the 2015-2019 average



Excess mortality in 2020 and 2021 was different from the 2015-2019 average. In 2020, excess mortality in all age groups was recorded from October, in 2021, excess mortality was observed from the beginning of the year, which later in September showed declining trend.

Figure 40. Comparison of Cumulative Excess Mortality in 2020 and 2021 with 2015-2019 average17

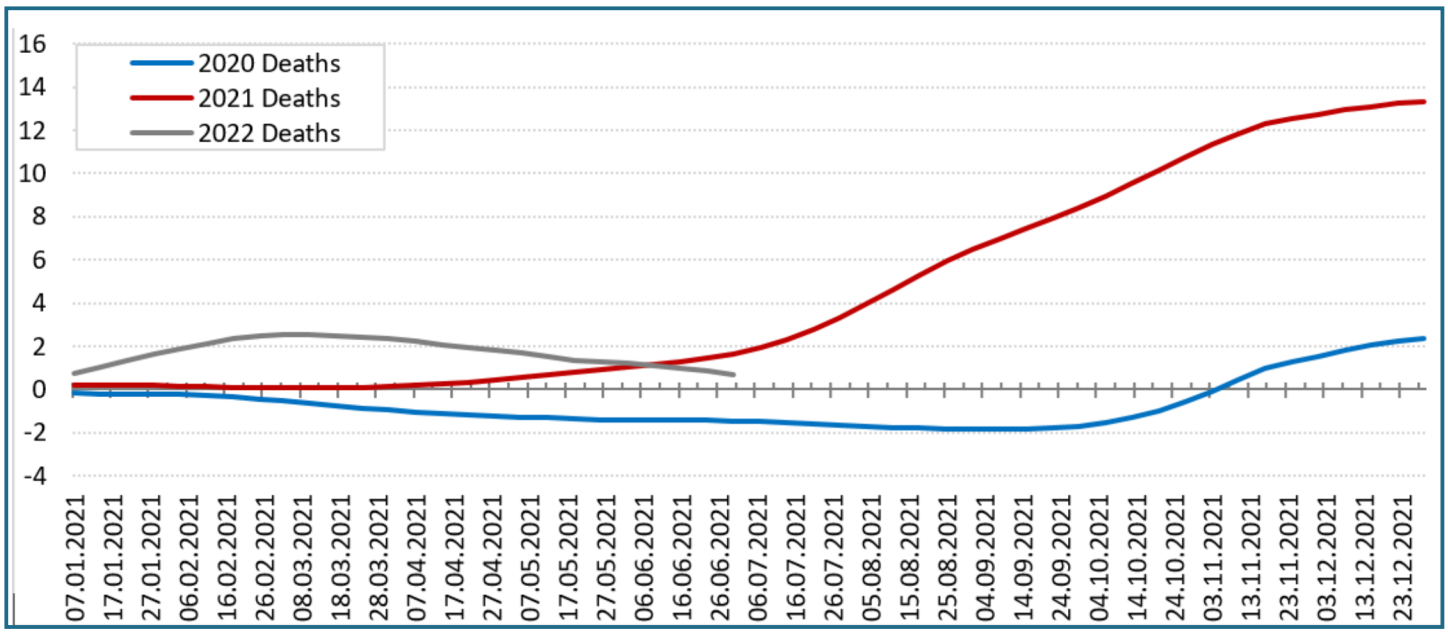


Figure 41. Distribution of COVID-19 induced monthly deaths from and other causes as of July 1, 2020-2022, compared to the 2015-2019 average

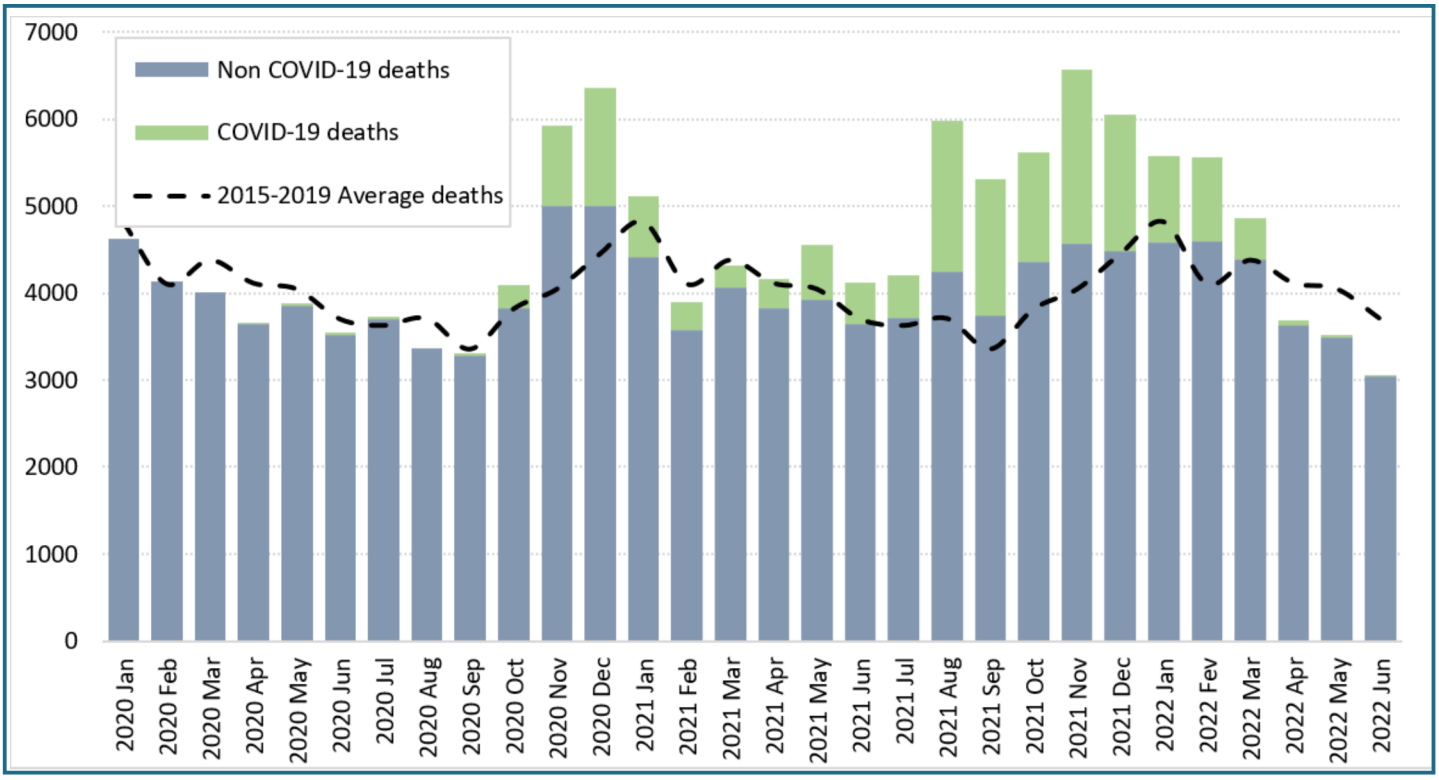
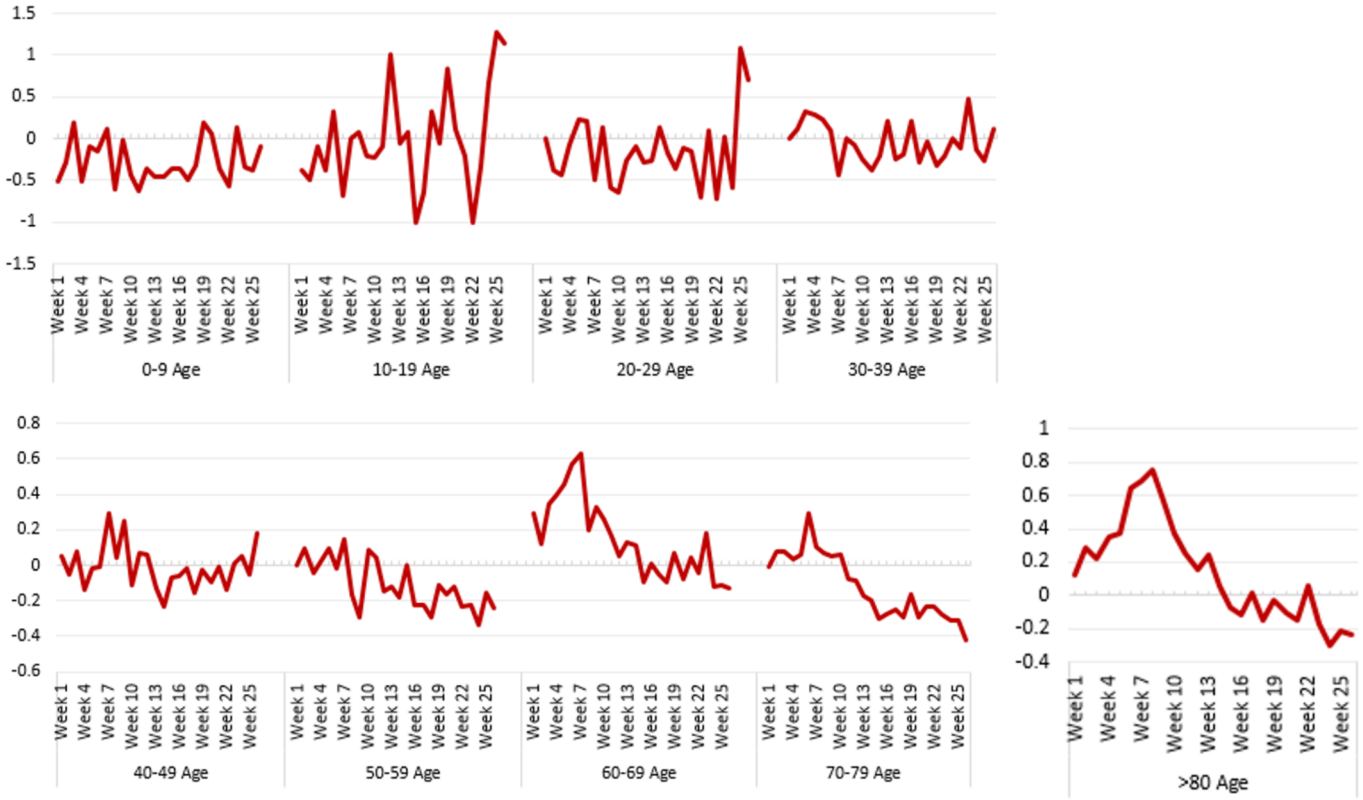


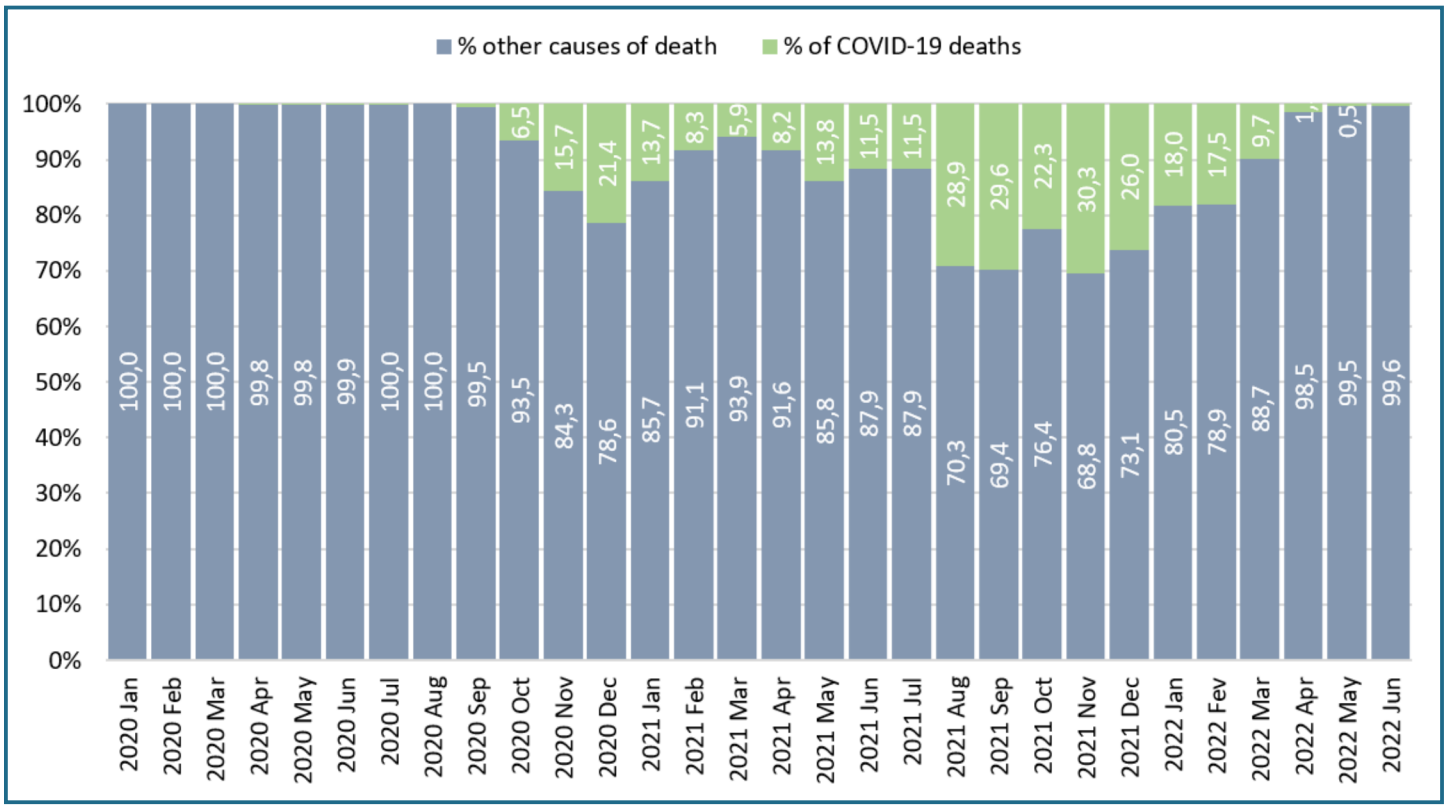
Figure 42. Weekly increase18 in excess mortality as of July 1, 2020-2022



17 Mortality is depicted by the method of cumulative deviation (Deviation in Mortality). The zero threshold represents the average number for 2015-2019

18 Mortality is expressed by the method of deviation (Deviation in mortality) in 10-year age groups. Weekly data is compared to 2015-2019 age group averages. The zero threshold represents the average number for 2015-2019

Figure 43. Distribution of monthly deaths (%) due to COVID-19 and other causes as of July 1, 2020-2022



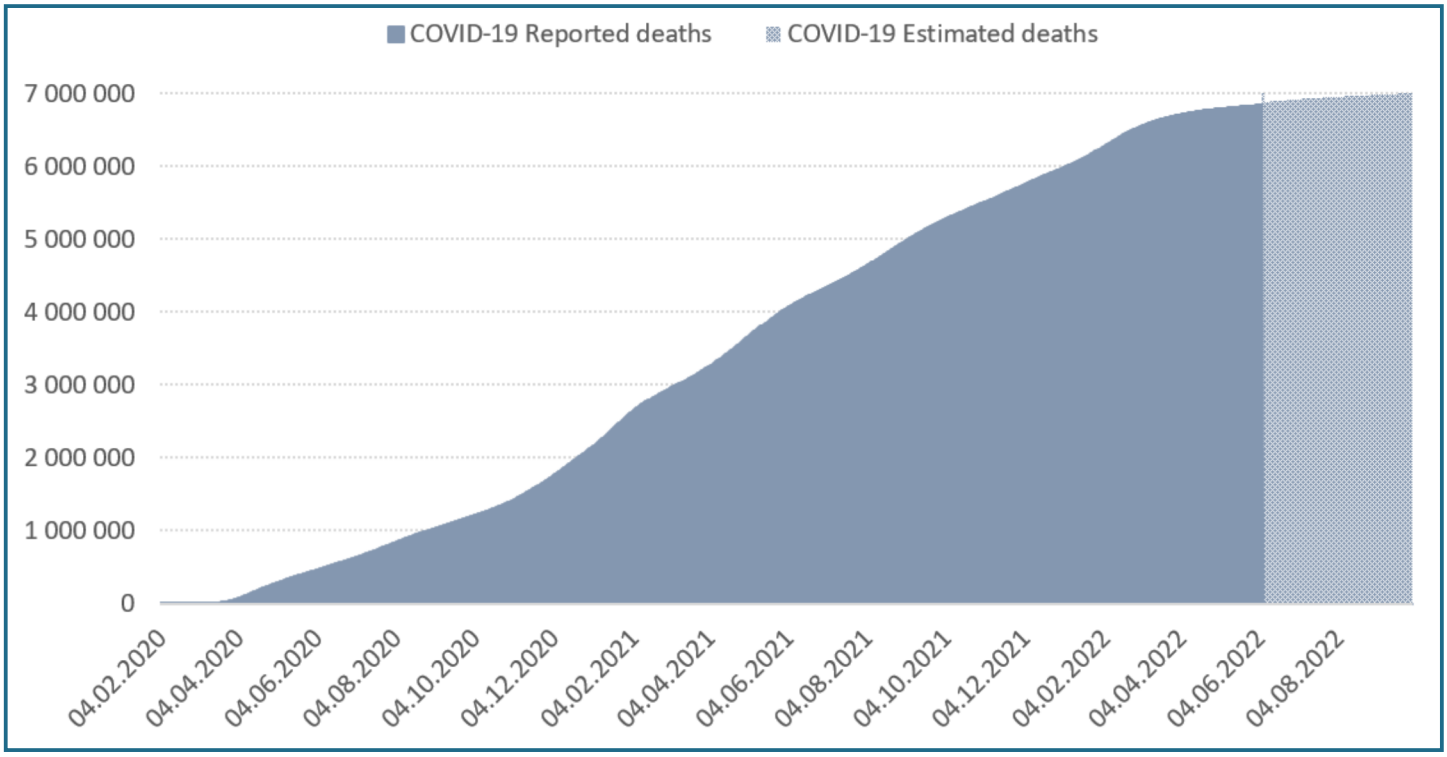
COVID-19-induced mortality represents one of the most important and significant issues and the subject of in-depth study worldwide. Due to the importance of the issue, in Georgia, the study of COVID-19-induced mortality, is carried out with the involvement of clinician groups in coordination with the Ministry of Health. The information on mortality presented in this chapter is based on data obtained within the competence of the National Center for Disease Control.

The Institute for Health Metrics and Evaluation (IHME) of the University of Washington developed a modeling method for the COVID-19 pandemic in 2021, where estimates are calculated for countries globally based on data key indicator data. Various determinants were used in the modeling (positivity rate, vaccination coverage, virus reproduction index, regulations developed by countries, mask wearing rate, etc.). Forecasts are based on data from local and national governments, hospital networks and associations, WHO and other sources. Some locations used data from the Johns Hopkins University (JHU) GitHub repository to summarize daily COVID-19 cases and deaths. The developed models are regularly updated to renew the approaches in time. There are two main uses of modeling: health strategy planning, which allows the mobilization of hospital and health systems in terms of medical personnel and equipment in the coming weeks, and policy development, such as the transition to distance learning in schools, the mask wearing regulation and etc.[19].

According to the global estimation by the Institute, death toll for 2020-2022 as of July 1, 2022 equaled 6 914 216. According to the developed estimation algorithm, the number of deaths up to September of this year would exceed 7 million and presumably reach 7 146 131 cases.

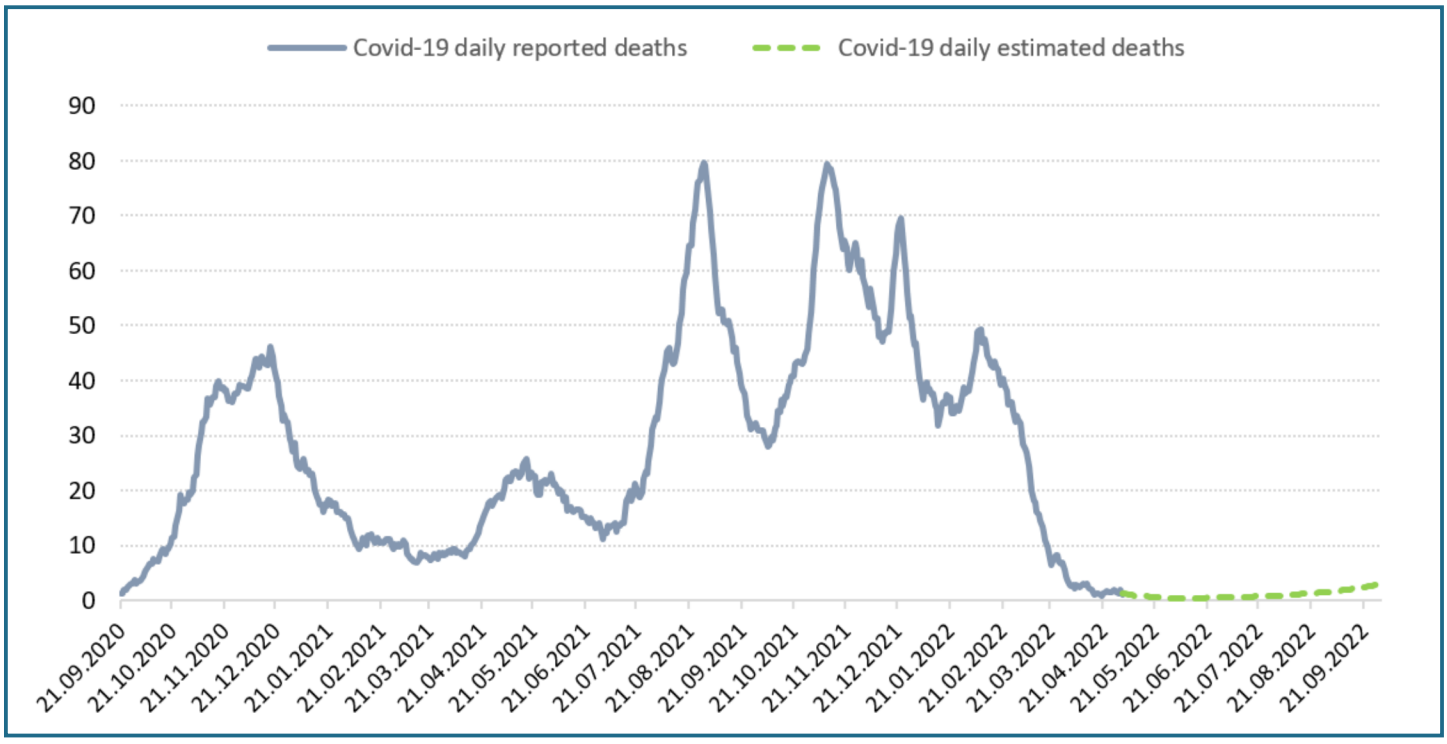
[19] *https://covid19.healthdata.org/global?view=cumulative-deaths&tab=trend*

Figure 44. Global daily confirmed and estimated number of COVID-19 induced mortality from the start of the pandemic through September 2022



Source: https://covid19.healthdata.org/global?view=cumulative-deaths&tab=trend

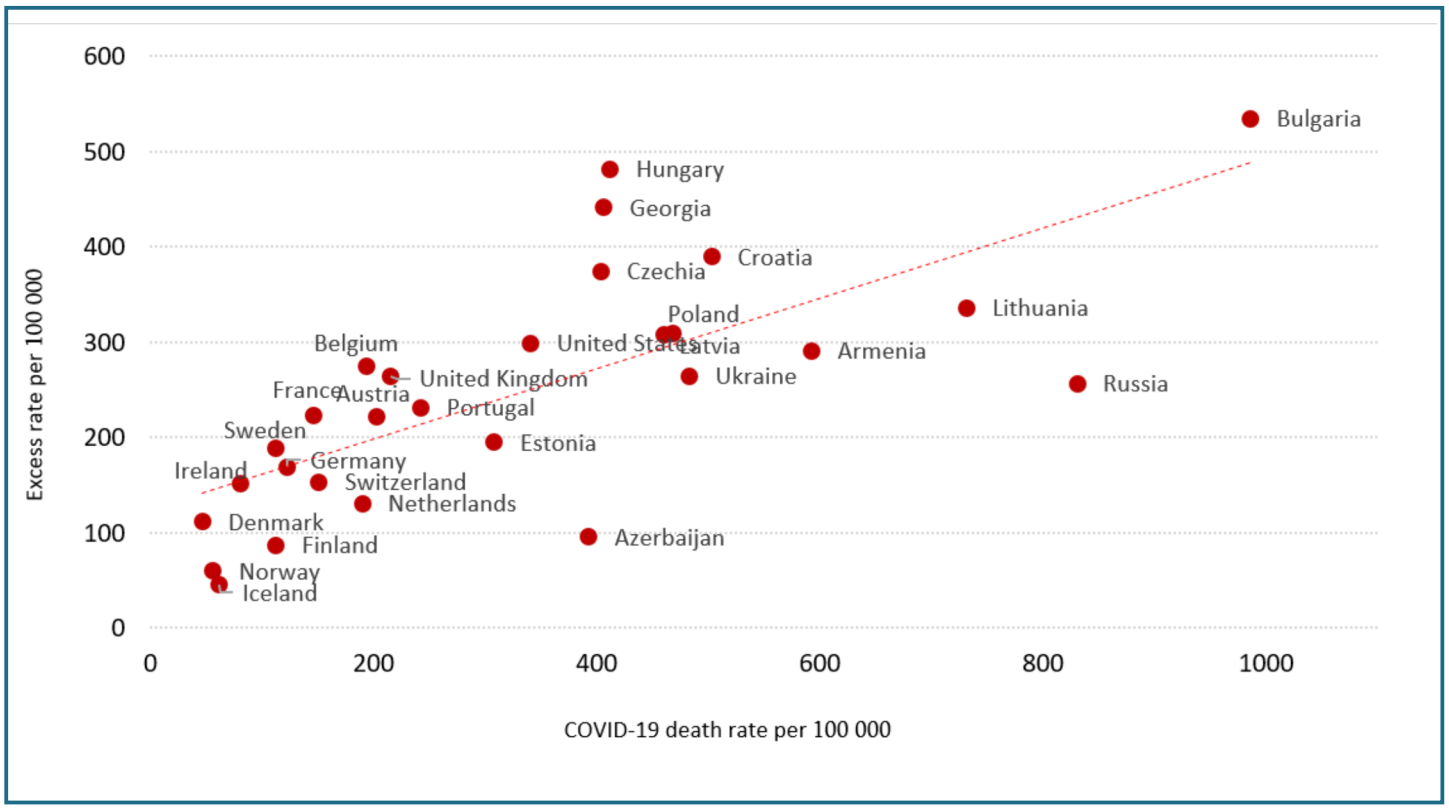
Figure 44. Global daily confirmed and estimated number of COVID-19 induced mortality from the start of the pandemic through September 2022



Source: https://covid19.healthdata.org/global?view=cumulative-deaths&tab=trend

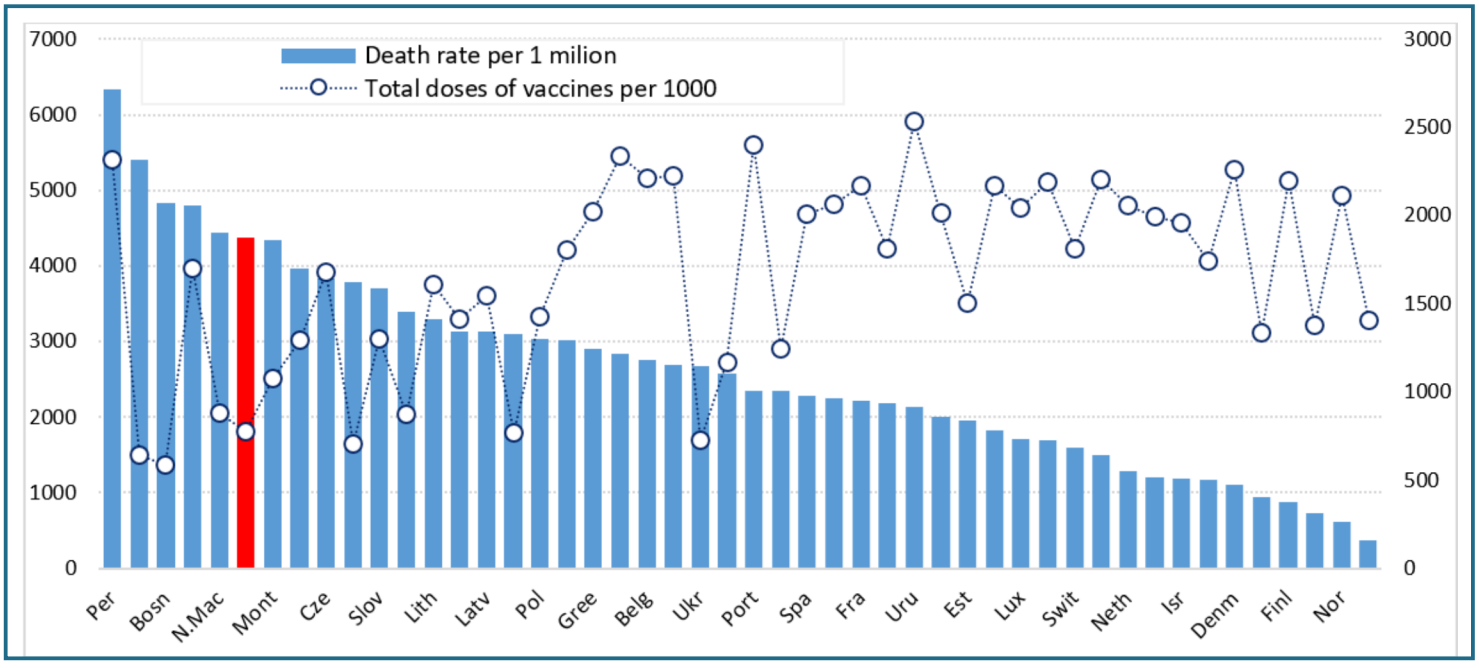
[4]*For more information, see the Communication Campaign on COVID-19 of the National Center for Disease Control and Public Health.*

Figure 3. Cases of SARS-CoV-2 in the European and the USA; Weekly Number of Confirmed Cases per 1 000 Population, 15,07,2022



Source: https://github.com/dkobak/excess-mortality

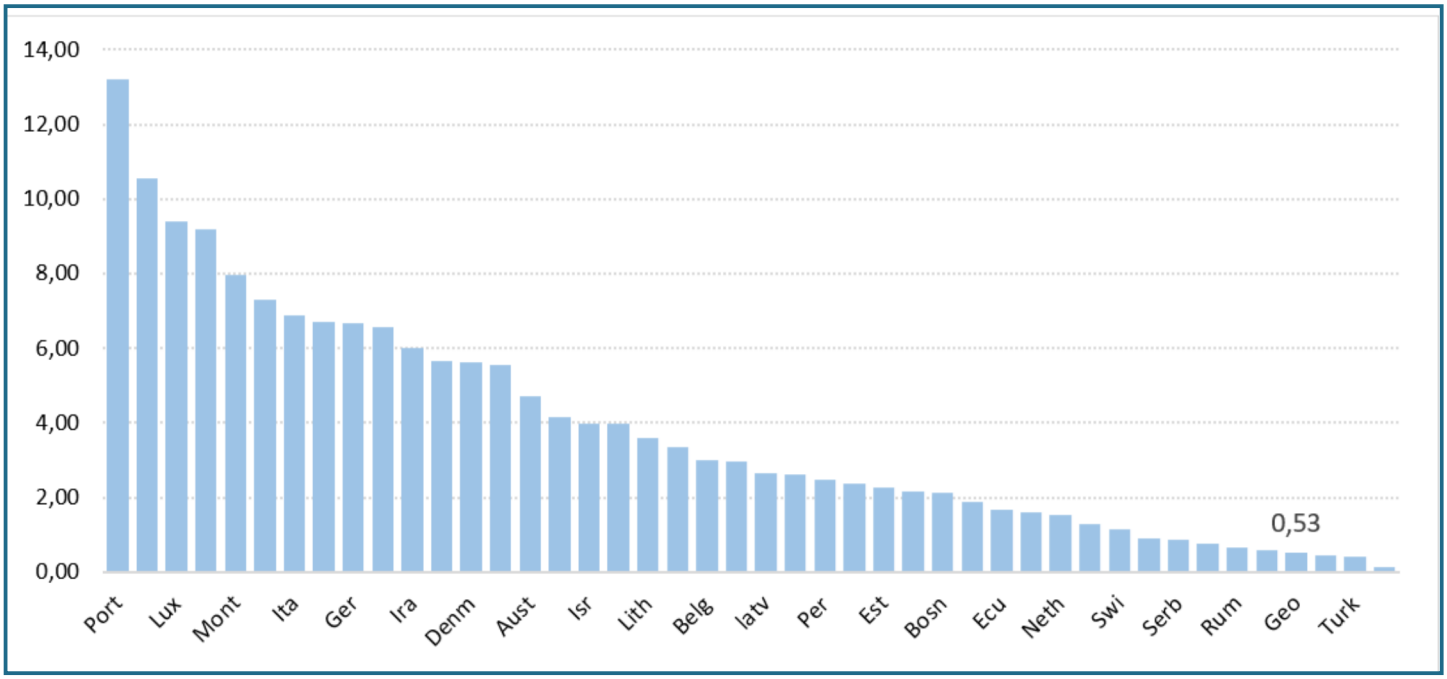
Figure 47. Cumulative COVID-19 mortality and vaccination coverage rates by country as of July 1, 2022



Source: https://ourworldindata.org/covid-deaths

As of July 1, 2022, by the cumulative number of COVID-19 deaths recorded in the last 7 days, Georgia is in the 41st place with the mortality rate per million inhabitants of 0,53. The first place is occupied by Portugal, where 403 deaths were recorded in 7 days and the rate was 13,22.

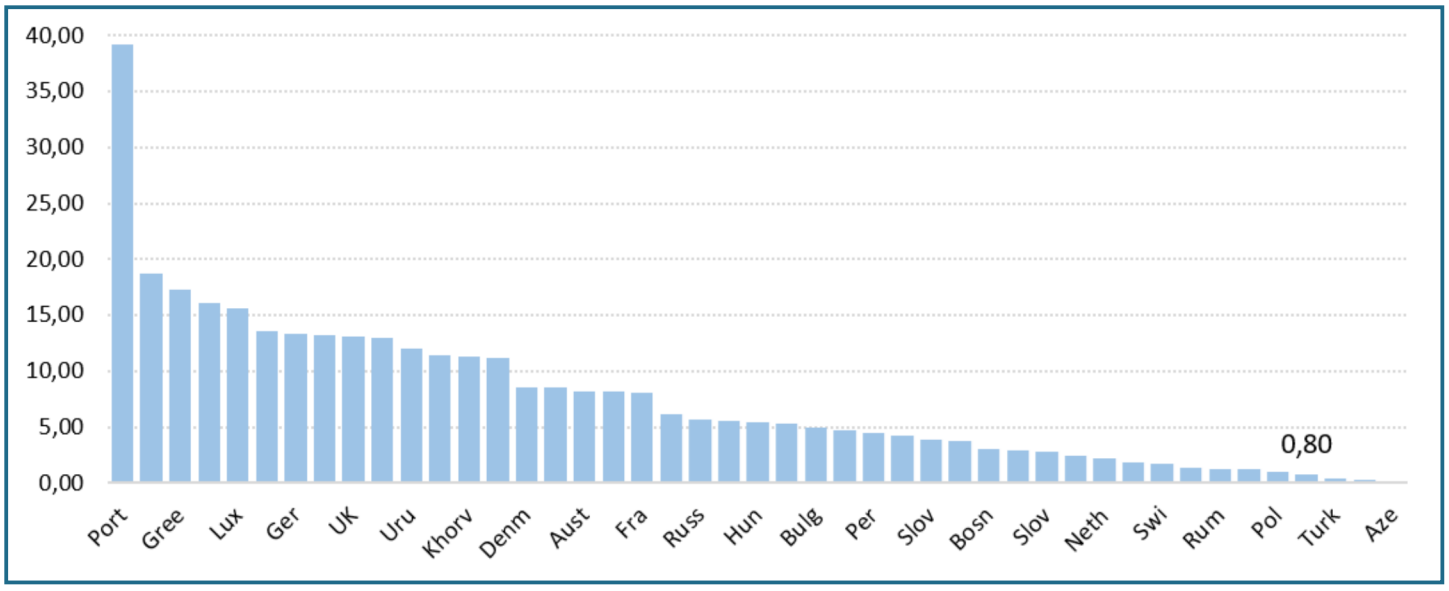
Figure 48. As of July 1, 2020-2022, the 7-day mortality rate due to COVID-19 per million of population by country



Source: https://ourworldindata.org/covid-deaths

As of July 1, 2022, Portugal had the highest cumulative number of COVID-19 deaths in the last 14 days, with 403 lethal cases with the mortality rate of 39,16. Georgia ranked 42nd and the mortality rate per million inhabitants was 0,8.

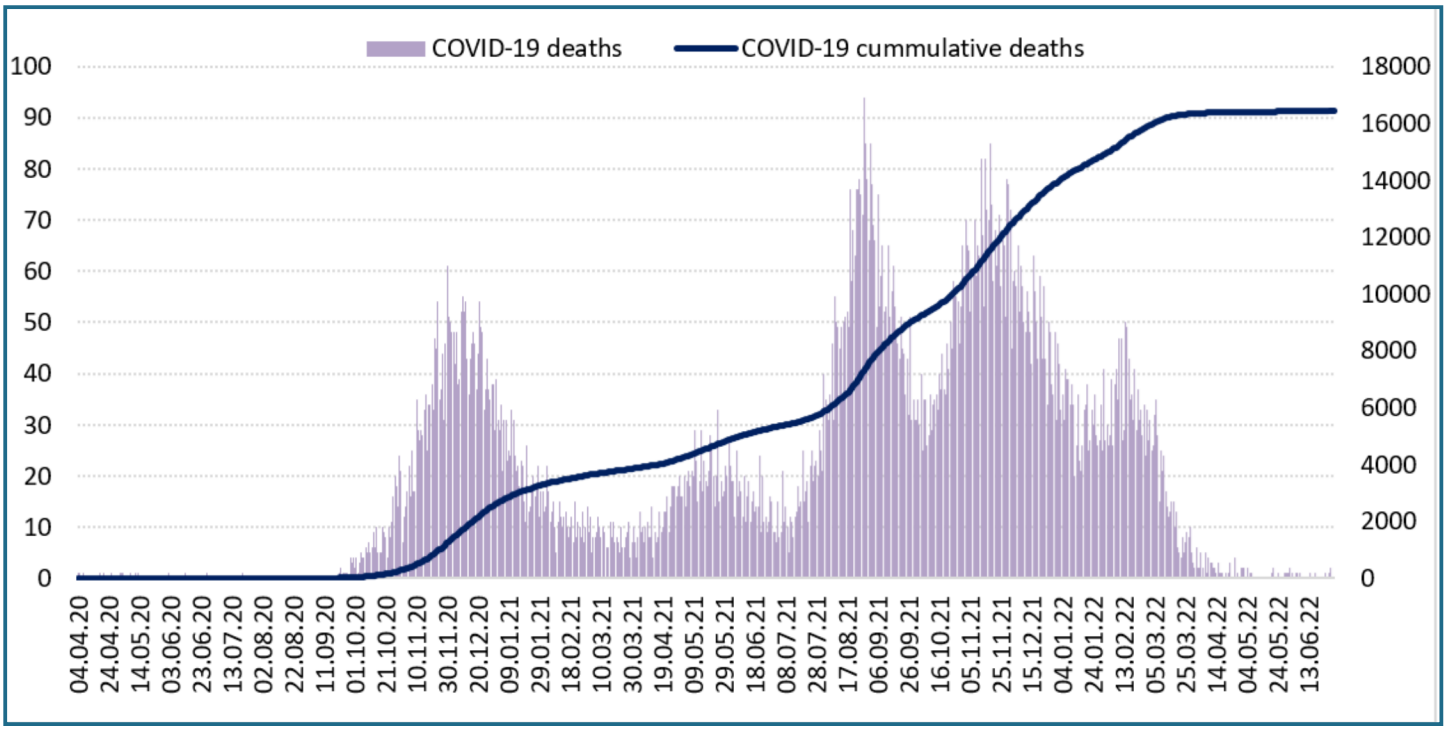
Figure 49. 14-day COVID-19 mortality rate per million of population by country as of July 1, 2022



Source: https://ourworldindata.org/covid-deaths

Since the beginning of the pandemic in Georgia (26,02,20) as of July 1, 2022, the cumulative number of Covid induced deaths was 16 844 (lethality rate 0,98%).

Figure 50. Daily and Cumulative COVID-19 Death Rates as of July 1, 2022



Source: https://ourworldindata.org/covid-deaths

Figure 51. Percentage distribution of COVID-19 deaths by actual place of residence, as of July 1, 2022

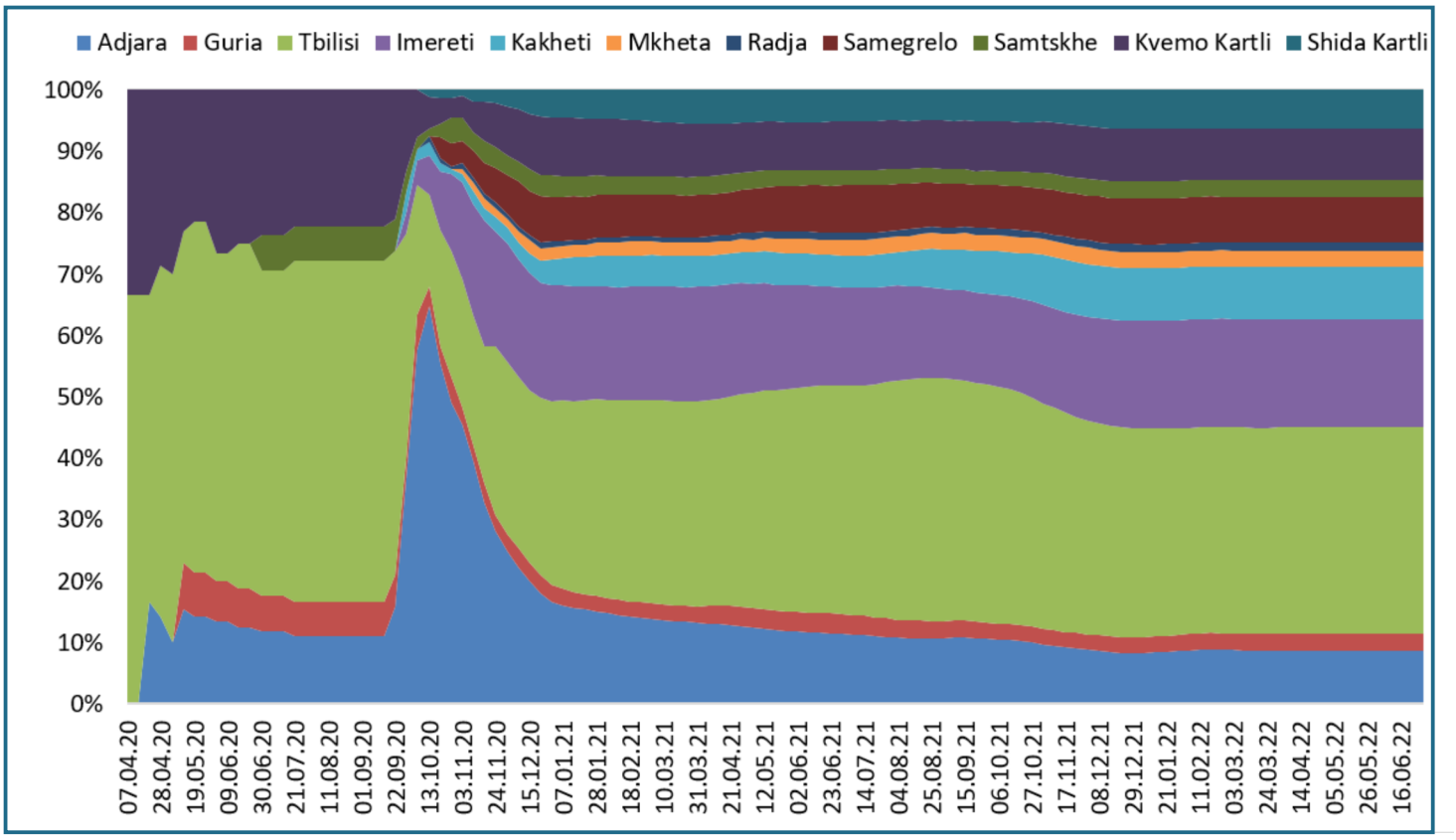
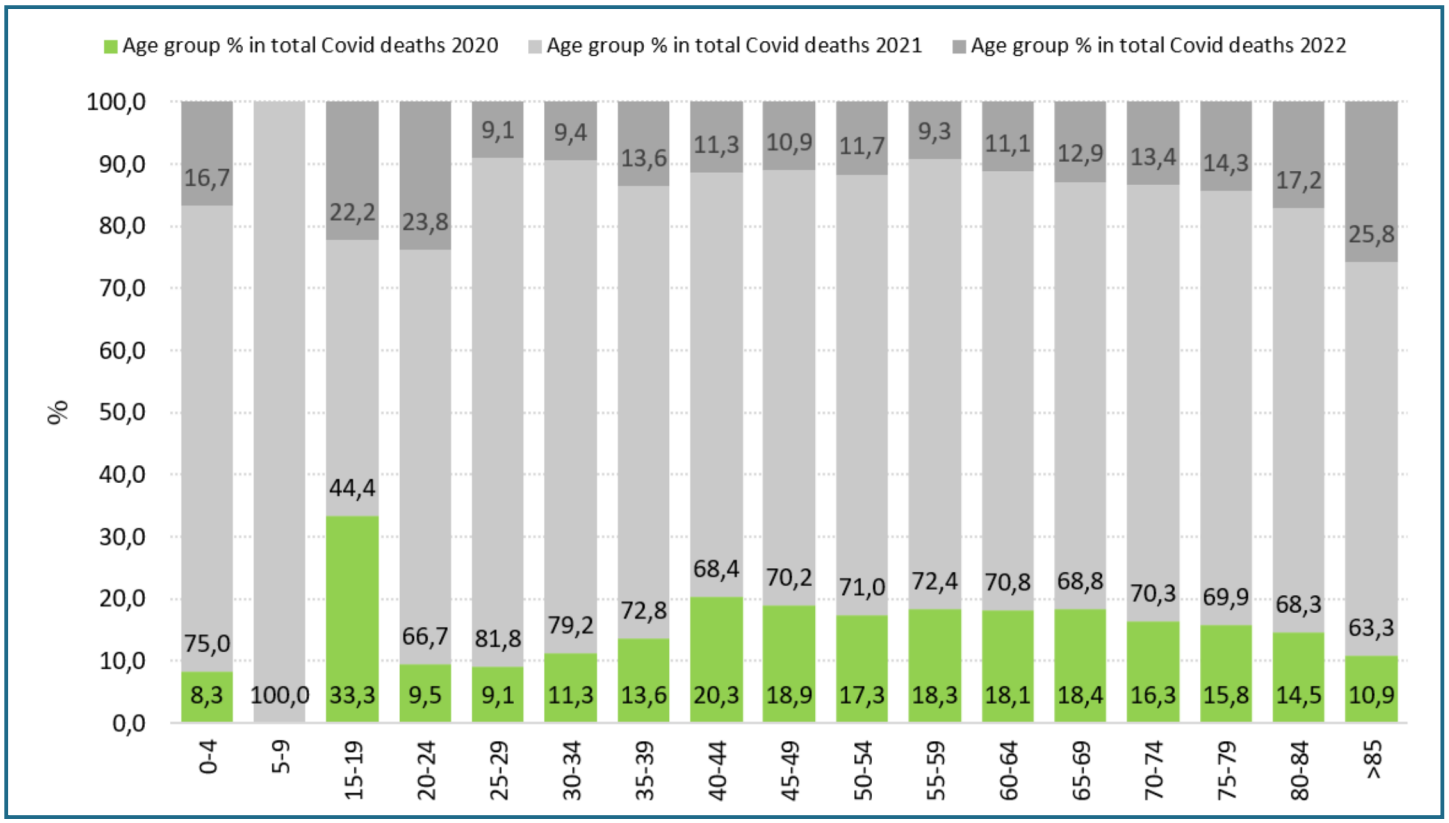
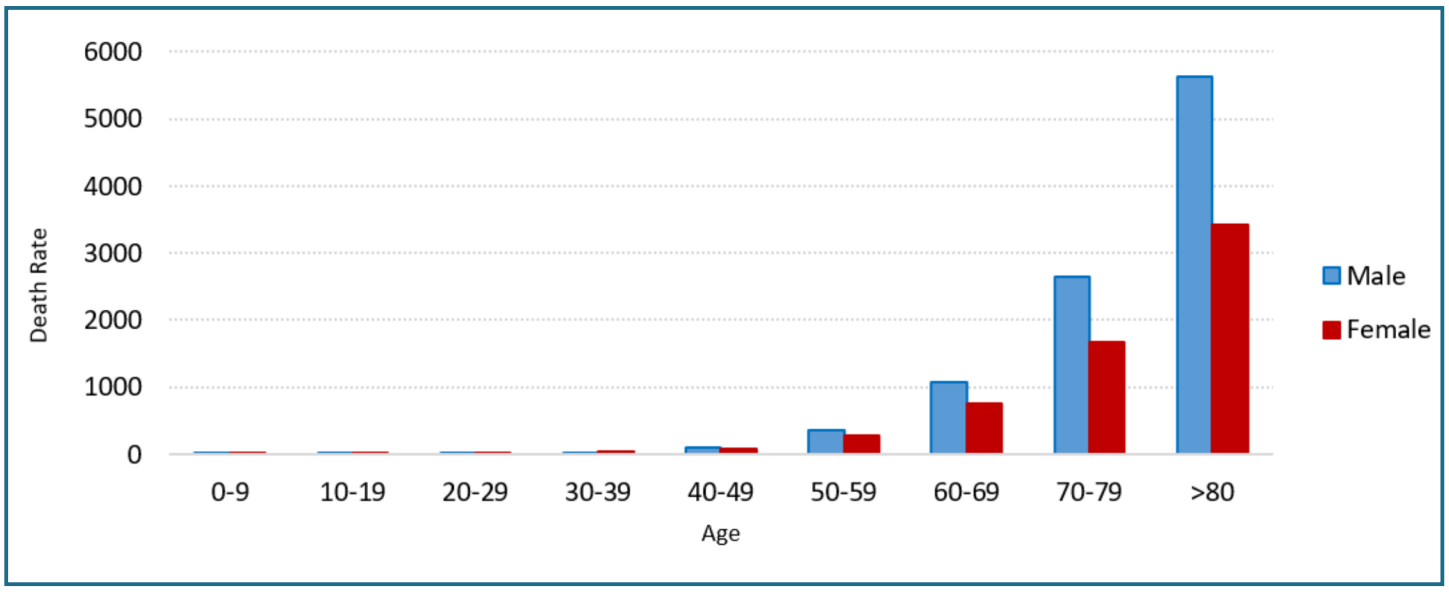


Figure 52. Percentage distribution of age groups in total COVID-19 induced deaths as of July 1, 2022



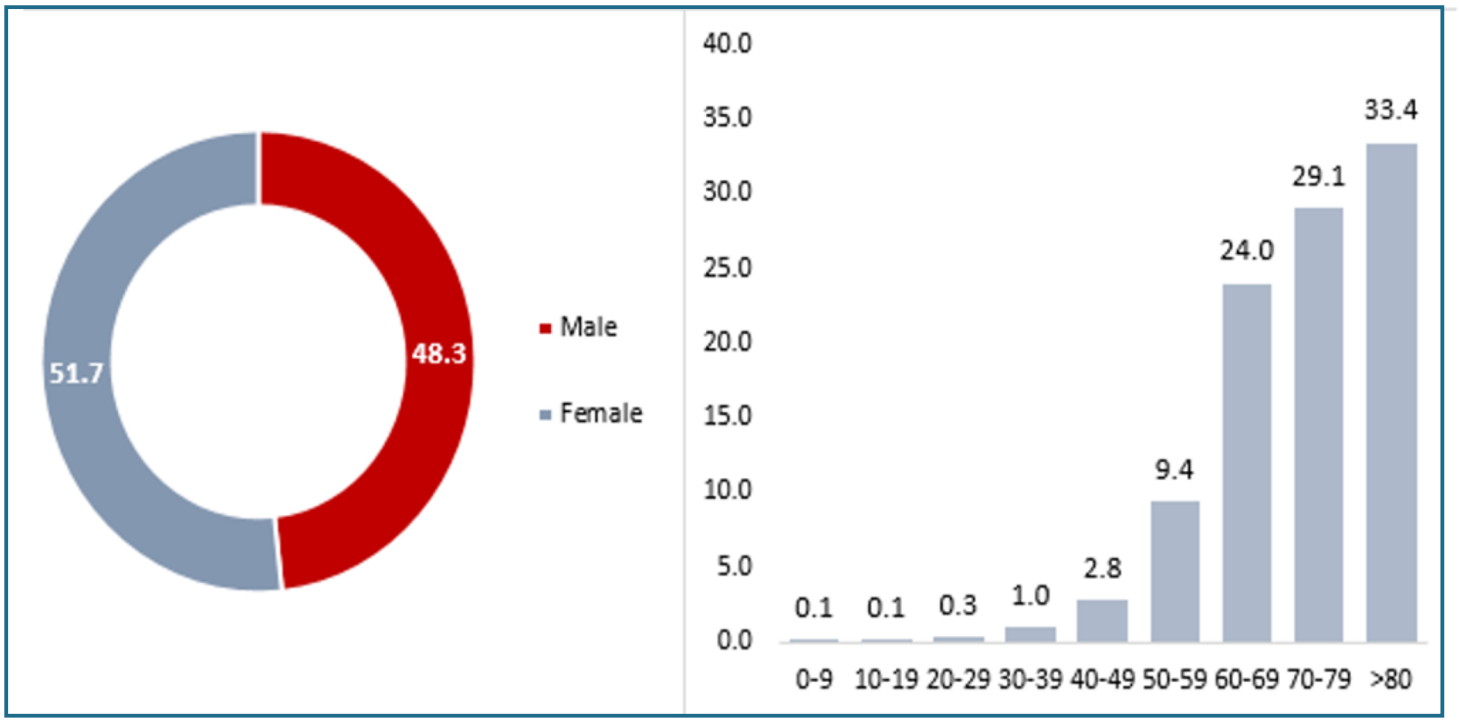
As of July 2020-2022, the cumulative rate of COVID-19 induced deaths was 442,6 per 100 000 of population. The indicators differed by gender, where the cumulative mortality rate for males was 444, and for females - 441,3.

Figure 53. Cumulative rate of COVID-19 induced deaths per 100 000 of population by gender and age groups, as of July 1, 2022



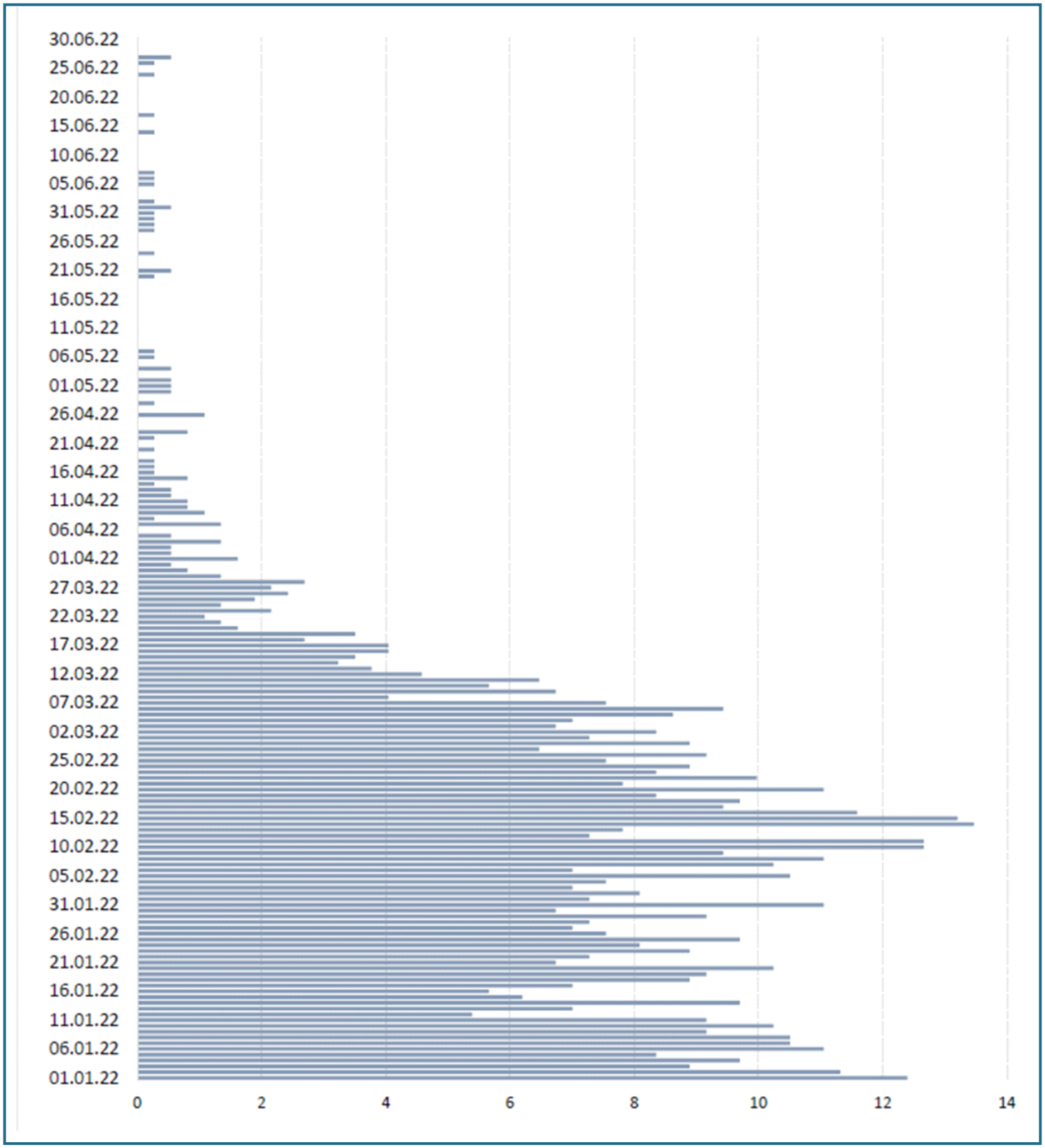
As of July 1, 2020-2022, among the COVID-19 induced lethal cases, as well as among deaths from all causes, the 60+ age category prevailed, accounting for 86,4% of the total deaths, while below 60 year age category equaled 13,6%.

Figure 54. Percentage distribution of COVID-19 lethal cases by age and gender as of July 1, 2022



The highest daily death rate this year was recorded on February 14 and was 13,4.

Figure 55. COVID-19 Daily mortality rate per 100 000 of population from January 1 to July 1, 2022



New confirmed cases of COVID-19 were rising sharply since January 2022, despite high incidence, fatality rate dropped in February.

Figure 56. Daily COVID-19 case lethality rate as of July 1, 2022

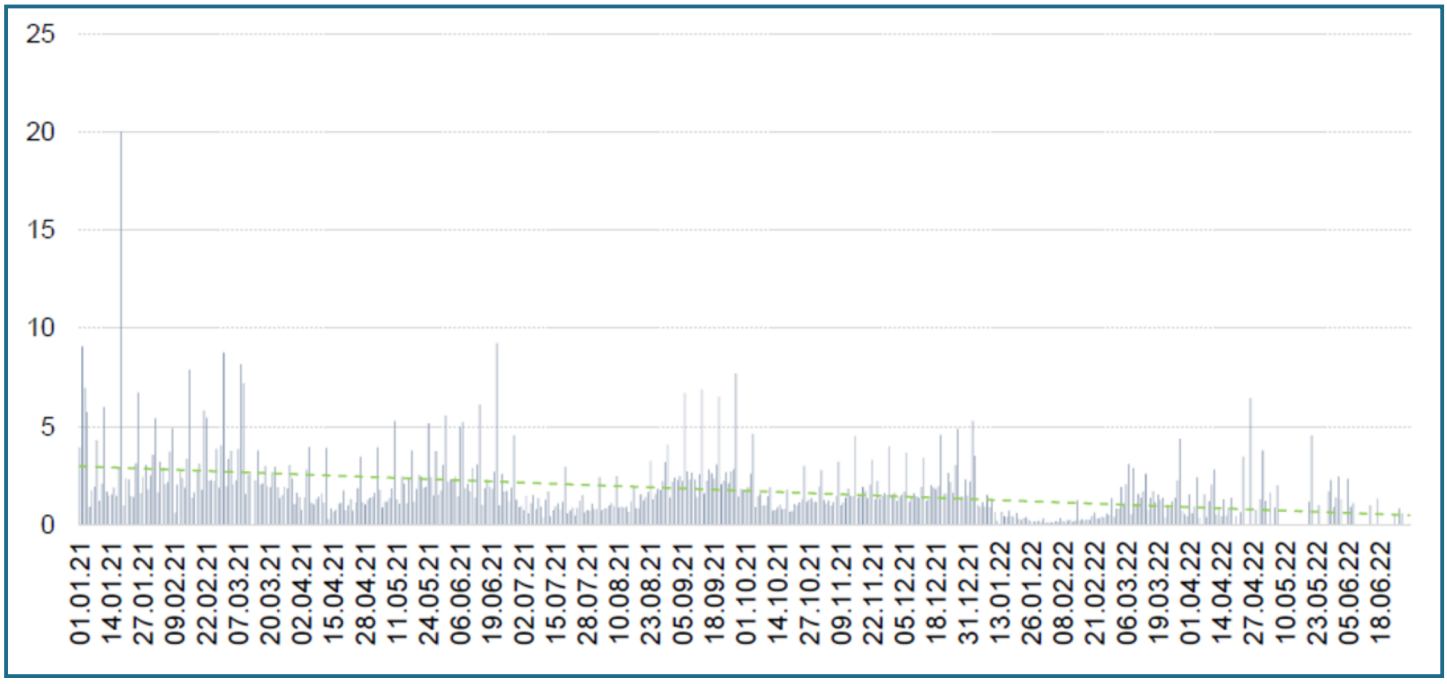
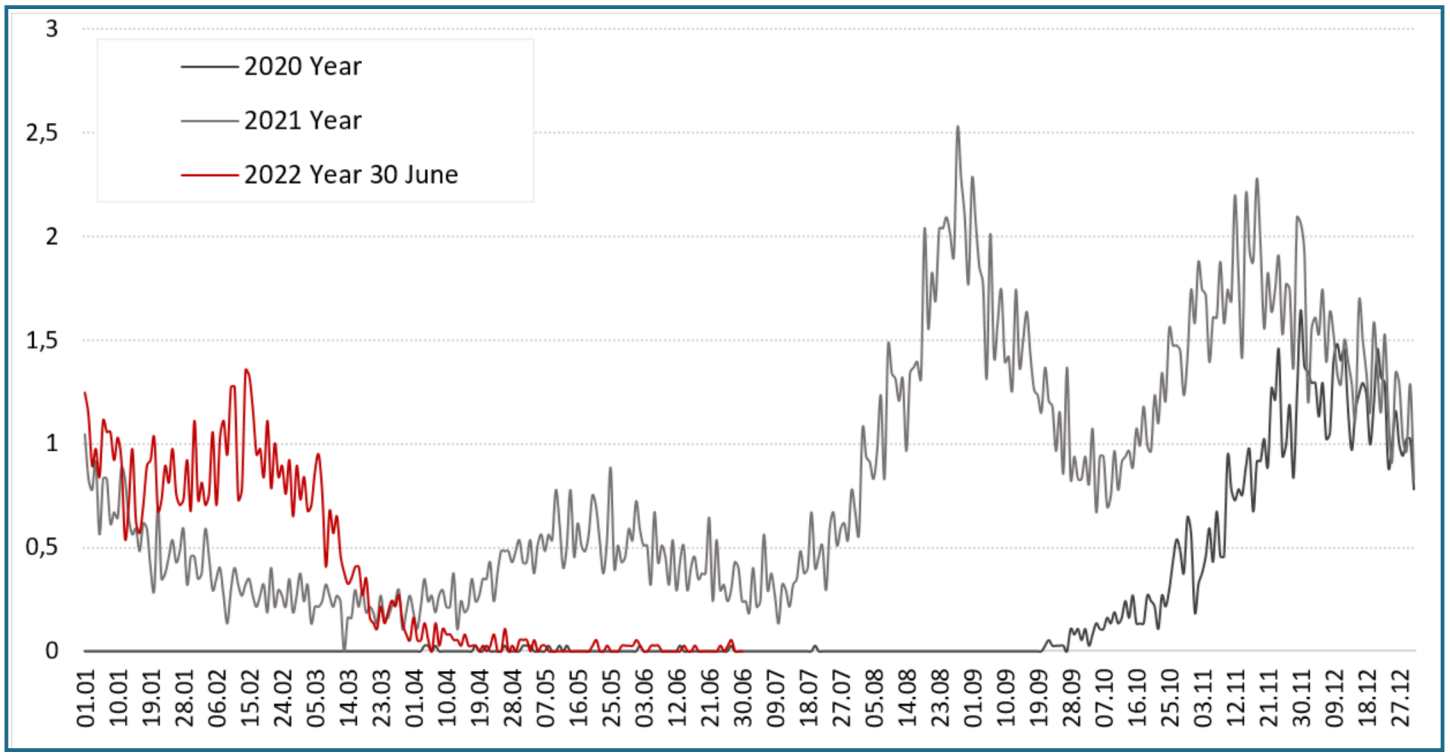


Figure 57. Daily COVID-19 lethality rate per 100 000 of population by year



According to death certificates 59% of patients who died of COVID-19 had various concomitant chronic diseases, specifically 59% (95% CI 58,2-59,7) had cardiovascular diseases and hypertension, 25,6% (95% CI 24,4-26,5) had diabetes and 5,7% (95% CI 5,1-6,1) an oncological disease.

Table 14. Incidence of Comorbidities in COVID-19 deaths, as of July 1, 2022

	%	95% CI
Hypertension	43.7	42.6-44.7
Diabetes	25.6	24.6-26.5
Oncological disease	5.7	5.1-6.1
Chronic lung disease	4.9	4.5-5.4
Coagulation defect	3.7	3.3-4.1
Hepatitis	1.4	1.1-1.6

In all lethal cases, the course of the disease was severe or critical. In 82% of cases (95% CI 81,3-82,6) the disease was complicated by pneumonia. 79% (95% CI 78,3-79,6) of deceased patients had respiratory failure, in 29,1% (95% CI 28,3-29,8) of deceased patients respiratory distress syndrome was noted, and 21,7% (95% CI 21,0-22,3) developed heart failure.

Figure 58. Distribution of COVID-19 induced cases by complications, as of July 1, 2022

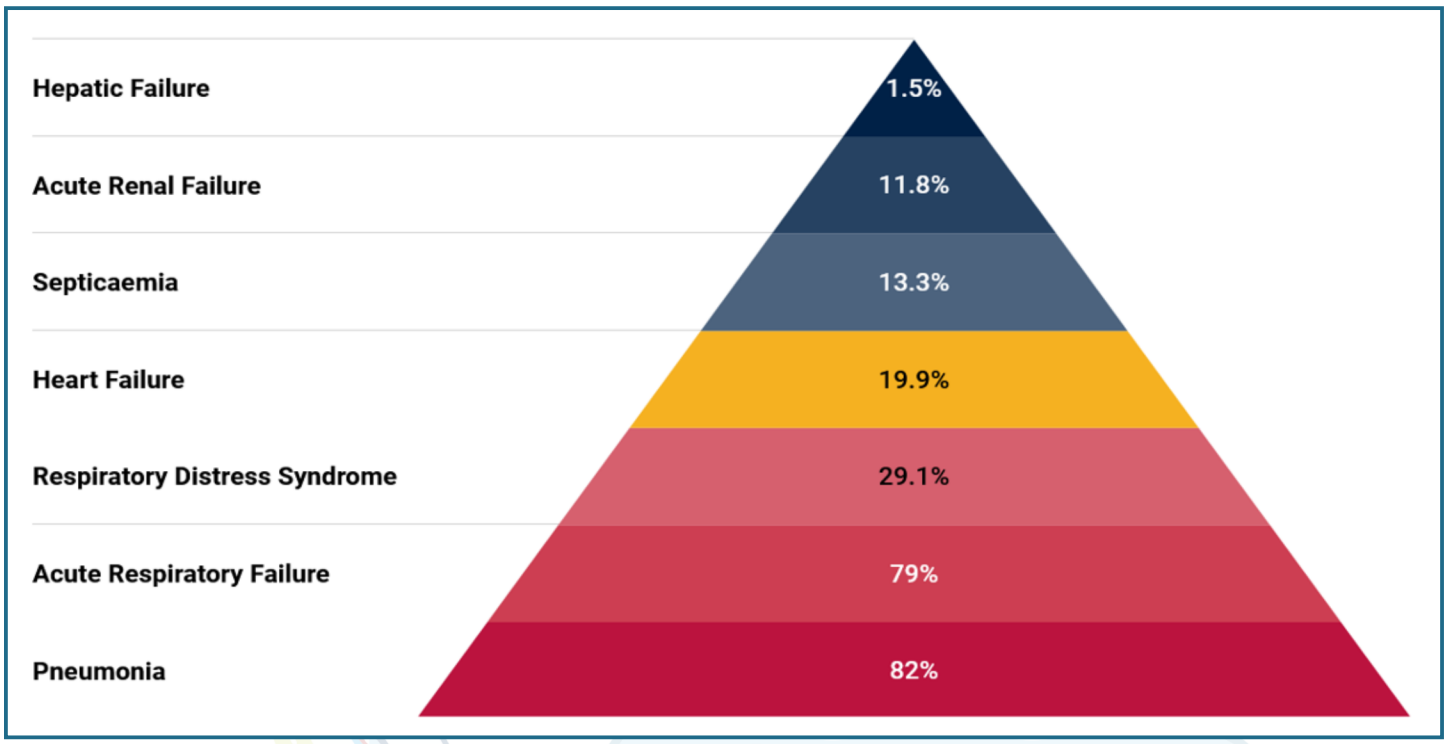
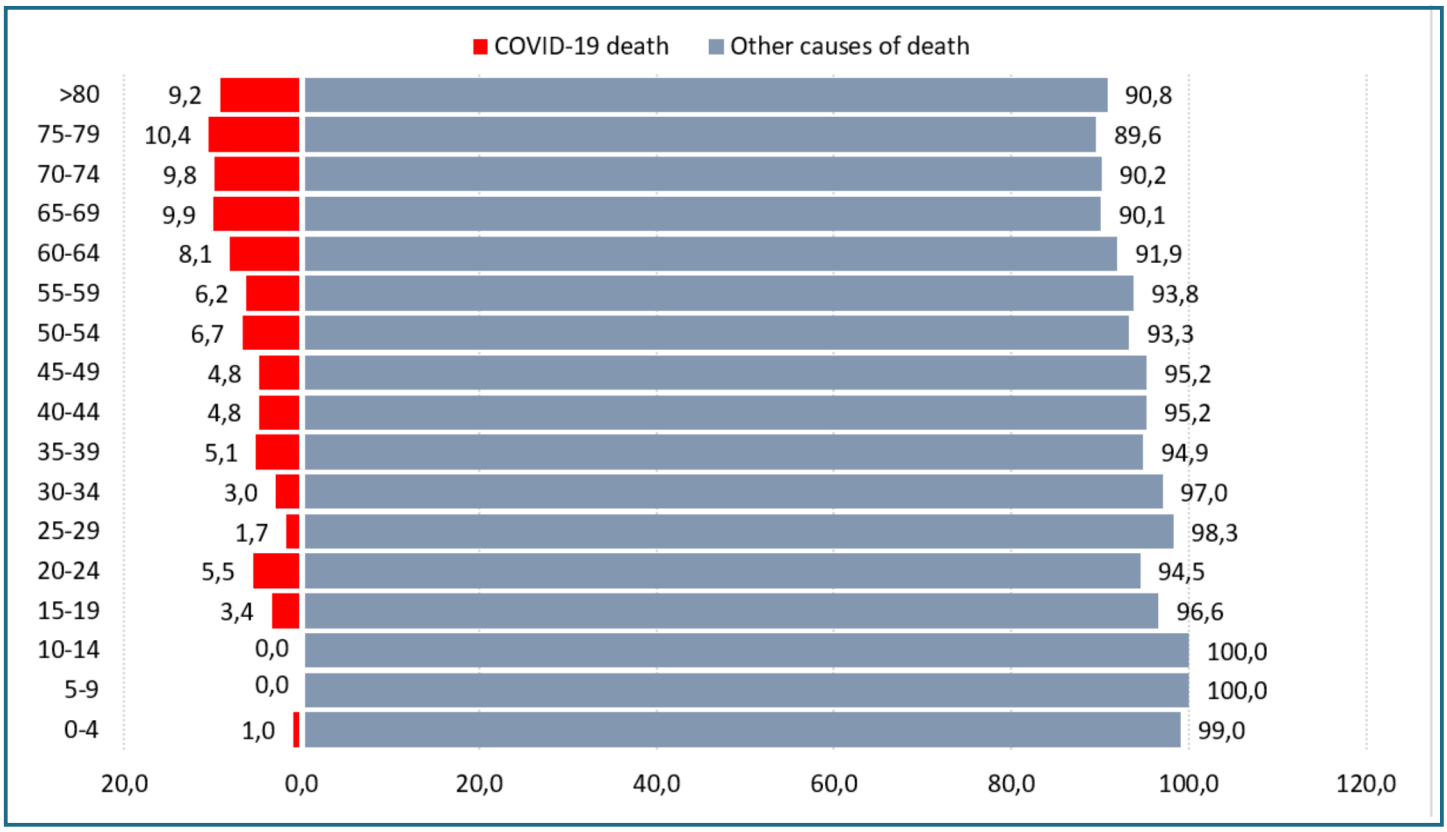


Figure 59. Age Distribution of COVID-19 induced deaths by cause, January to July 1, 2022



PROGNOSTIC CALCULATIONS ON THE BURDEN OF COVID-19 DISEASE

After the announcement of the global COVID-19 pandemic, mathematical models of future prediction have been given a great role to estimate the possible extent of the SARS-CoV virus spreading, hospitalizations and deaths. The resulting simulation calculations are important for decision-making for both policy makers and professionals and provide a solid basis for timely and effective control and response measures. Modeling had a special load in the initial stage of the pandemic, when a number of characteristics of the new virus and the protective effect of preventive measures were unknown even to the scientific community. Since the start of the pandemic, there have been several different sources of modeling, but most of them have focused on a specific geographic area or small location, with projects designed for a short period of time - typically a period of 4 or 6 weeks. However, a large share of them focused on solutions rather than possible development scenarios, which is quite valuable and important information for planning subsequent response measures.

The analytical group of the National Center for Disease Control and Public Health has been working on various versions of preliminary simulation calculations and mathematical models of the possible spread of the COVID-19 disease since the first days of the pandemic. Depending on the objective, the main focus was on three tools for modeling the spread of the disease:

- Centers for Disease Control and Prevention (CDC) – COVID-19 Surge Tool
- University of Basel
- Institute for Health Measurement and Evaluation (IHME) modeling

In the first stage of the pandemic, a tool developed by the University of Basel, based on a simple SIR (Susceptible-Infected-Recovered) modeling method, was largely used.

Prognostic calculations take into account the vulnerable population, the initial number of possible cases, the possible specific proportion of imported cases, the average capacities of the hospital sector and disease-specific parameters such as the average annual R_0 reproductive index, infectious period, average length of stay in the intensive care unit (ICU), ICU Overload Severity Index, estimated seasonality peak, different levels of restrictive and preventive measures, etc.

Calculations made at different stages of the pandemic development showed the reliability of the tool for the short and medium forecast period. The calculations made at this stage of disease spreading show its increasing dynamics for the entire summer-fall period of 2022, with the most pessimistic forecast based on the available prognostic data. Even during the peak period (unless the new variant has radically changed its characteristics), hospital and ICU bed load with COVID patients will not exceed 50% of the available resource.

The goal of the COVID-19 Surge Tool, an instrument of CDCs, is to help public health experts accurately estimate the expected need for hospital services. With the help of the mentioned tool/method, it is possible to count how many patients suffering from COVID-19 will need hospitalization, intensive therapy and artificial ventilation of the lungs. At different stages of the disease spreading, the expected shortage of beds in Georgian clinics, intensive care unit beds and artificial lung ventilation devices was determined with the help of the above-mentioned method. According to the modeling of June 29, 2022, there would be no shortage of beds (including in the intensive care unit) and ventilators regardless of the imposition or abolishment of restrictive measures.

The Institute for Health Metrics and Evaluation (IHME) is an independent Center for global health research based at the University of Washington (Seattle, USA). IHME has been famous for its The Global Burden of Disease study (GBD study), the research on maternal mortality in the world and the Financing Global Health (FGH) study, where in collaboration with the other countries, it carried out annual analyzes worldwide. The results were published by The Lancet the prestigious journal of the medical community. The COVID-19 pandemic has expanded IHME's scope of work in the area of modeling. At first, their target area was only the USA, then the coverage expanded to include the other countries. The National Center for Disease Control and Public Health, within the framework of the existing collaboration, started negotiations with IHME in March 2020 and supplied data for modeling (number of beds, ICU and ventilators, prevalence of infection, active cases, deaths, testing, daily numbers of administered doses of vaccines and boosters, activities held in the country, recommendations issued, etc.). The main characteristics of the forecast are:

- Coverage of the next 4-5 months on average;
- Regular updating and clarification;
- Assuming that both natural and vaccine-derived immunity remain for a certain period of time, which is strengthened by the administration of a booster dose;
- The total population is divided into 4 SEIR groups in relation to the virus: those who may be infected (S-susceptible); those who have been infected but are not yet contagious (E-xposed); infected and contagious individuals (I-nfective); Recovered, with period immunity (R-recovered);
- COVID deaths are an important variable in the model and excess mortality data are also included;
- The number of pneumonia cases in relation to the season is reflected in the model;
- Characteristics of the variant circulating in the country and region;
- Integrated seroprevalence results;
- Taking into account population density, average number of persons in families, use of public transport, flu seasonality, mobility, and number of contacts, restrictive measures, their onset and duration.

Three possible scenarios for the future period are being developed with the listed characteristics. At this stage, IHME modeling is predicting the situation closest to reality for the country. Based on the updated model of July (2022), since the beginning of the pandemic, the estimated rate of the population with certain immunity (created by vaccine and as a result of recovery from COVID) was 98%. Mask wearing indicator among the population is up to 30%. Mobility and social activity are 28% higher than during the pre-pandemic period. In the current scenario, by maintaining this level of preventive measures and administering vaccinations, the number of cases is increasing somewhat, and the peak rate coincides with the second decade of August. During the fall the number of cases will continue to remain within this range and decline slowly, although the hospital sector is not expected to be overloaded.

Mathematical models have played an important role in the current crisis. Formation of public policy and prompt planning of effective preventive measures were based on the calculations obtained as a result of comparing various mathematical models, which made a significant contribution to ensuring the availability of timely and appropriate medical care for all patients during the disease peak period, and in some cases, controlling the spread.

PUBLIC HEALTH THREAT RESPONSE OPERATIONS CENTER

Public Health Threat Response Operations Center (PHEOC) started its operation at NCDC In January 2020. This activity was carried out in an expedited manner for a quick and targeted response to the COVID-19 pandemic.

PHEOC aims to make timely operational decisions on a particular event with the best possible information using policies, technical advice and plans, to communicate and coordinate with the respondent, to collect, reconcile, analyze, present and use event data and information, to obtain and distribute resources, to communicate, prepare and coordinate with respondents to support audience awareness. The operations center was the main area, from which the current epidemic was managed and relevant recommendations were made.

An Incident Management System (IMS) was set up under the Operations Center to integrate all of its units in response to the COVID-19 pandemic. IMS is an internationally recognized model for emergency response. The IMS defines the roles and responsibilities of the respondent group. It is a temporary, formal organizational structure that is activated for response, adapted to meet the rapidly changing requirements of that response, and deactivated at the end of it.

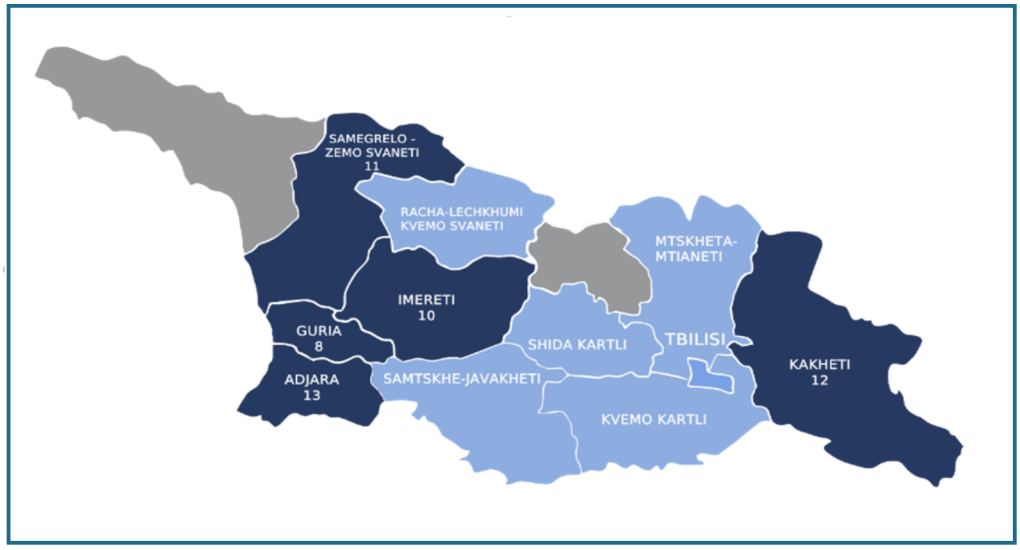
The establishment of the PHEOC made a significant contribution to the timely and targeted response of the National Centers for Disease Control and Public Health to the COVID-19 pandemic. Timely procurement of equipment and materials, training and equipping rapid response teams, which performed epidemiological control in hot spots (sampling, epidemiological research, etc.) were carried out by the Center units. Through the Center, both human and technical resources were correctly and timely distributed, communication materials were prepared and allocated, contacts were tracked, protocols and guidance documents were prepared. One of the most important functions of PHEOC was information retrieval, exchange and reporting with relevant agencies, both nationally and internationally.

From March through September 2020, more than 1 000 case contacts were fully managed by the head office and regional offices of the Center. As the number of cases increased, additional human resources became necessary. As a result, various agencies allocated personnel who were trained by the Center and participated in contact tracing, both in Tbilisi and in the regions, under the guidance of local municipal public health centers and representatives of the NCDC.

The National Center for Disease Control and Public Health, as the National Coordinator of International Health Rules, provides the World Health Organization with daily COVID-19 statistics. The NCDC also reports weekly to the European Platform for Disease Control and Prevention (ECDC) (Tessy) on COVID- 19 confirmed deaths and vaccinations. At the national level, national statistics on COVID-19 are developed and updated daily by PHEOC.

The results of the Center's work revealed the need for the establishment of a similar operating center in Western Georgia. On November 5, 2021, in order to improve preparedness and response to public health risks, the Kutaisi regional PHEOC was established and equipped. One of the main functions of PHEOC

is to prepare and conduct trainings and exercises. In this direction, rapid response teams for COVID-19 were formed and trained in Adjara, Guria, Samegrelo-Zemo Svaneti, Kakheti, Samtskhe-Javakheti, Shida Kartli, Mtskheta-Mtianeti and Imereti. Two field works were also carried out in Kakheti and Imereti by the COVID- 19 rapid response teams, the purpose of which was to jointly go to the field (selected area) and carry out monitoring and evaluation. The groups selected those districts where problems related to the response were noted. As a result of the conducted work, shortcomings were identified, which were reflected in a specially created field work report, and relevant recommendations were issued.

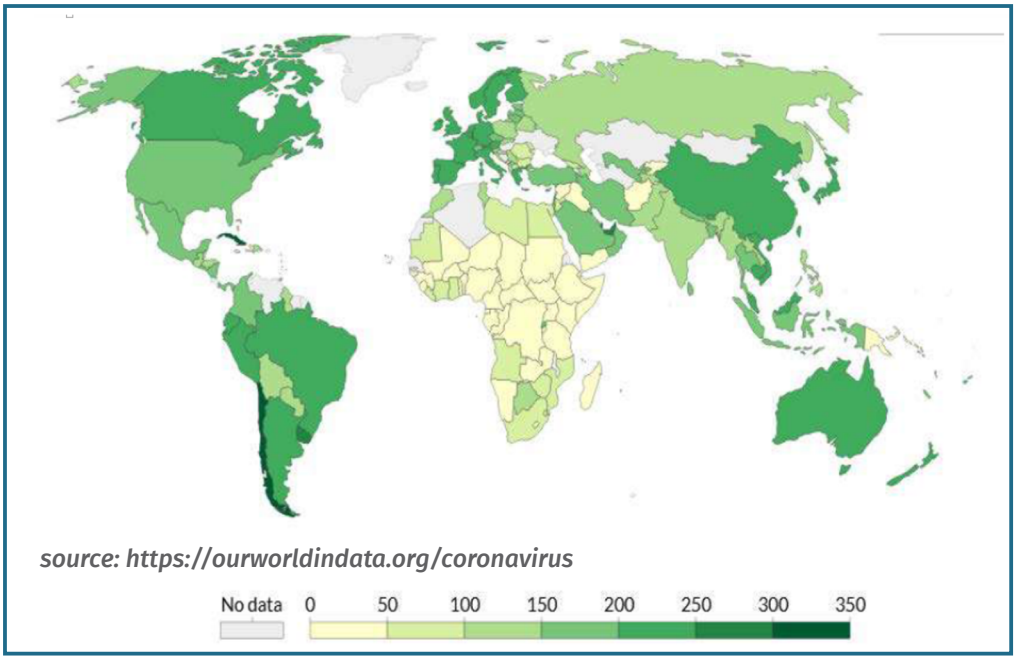


In the future, it is planned to further strengthen the preparedness and response capabilities and develop an appropriate program for this purpose.

VACCINATION AGAINST COVID-19

Vaccination is of particular importance for the prevention and reduction of damage inflicted by COVID-19 pandemic. Vaccines are the most effective tool in the fight against pandemics, enabling the world to overcome this great challenge. As of July 1, 2022, vaccination was underway in 233 countries and territories, with 12,2 billion doses administered globally, an average of 5,5 million doses of vaccine consumed daily, and 66,7% of the world's population vaccinated with at least one dose of COVID-19 vaccine. However, the coverage with at least one dose is the highest in the United Arab Emirates (107% of the population), Cuba (95% of the population) and Portugal (95% of the population).

Figure 60. Administered Doses of COVID-19 Vaccine per 100 of Population, as of July 1, 2022



Georgia's readiness for vaccination against COVID-19 has been determined by the following several preconditions: the priority of the state immunization program and increase in the immunization budget by almost 6 times in the last 8 years before the pandemic; procurement by the country only of WHO pre-qualified vaccines for planned vaccination; routine immunization system having the appropriate cold chain; 5 new vaccines introduced in the country in recent years (mainly with the assistance of GAVI) and several trainings conducted for medical staff involved in immunization; cooperation with the international partners (WHO, UNICEF, GAVI, COVAX, WB, USAID, ADB, etc.) with respect to the immunization program.

Georgia has been preparing for the COVID-19 vaccination since the summer of 2020. The country joined the Covax platform established with the support of WHO, UNICEF, GAVI and CEPI. The negotiations held in the fall ended with the signing a cooperation agreement and the transfer of the corresponding amount, thus guaranteeing Georgia supply of 1,4 million doses for vaccinating 20% of population (700 000 people for vaccination with two doses) from Covax Platform throughout 2021. For reasons beyond the control of the country, mainly due to the limited availability of vaccines worldwide, the Covax platform failed to deliver the agreed quantities in 2021, and a total of 160 020 doses of vaccines were provided to the country. The government was also in intensive negotiations with the vaccine companies while through diplomatic channels it was working on the sharing scheme with the governments of different countries. In total, by 2021, the country mobilized 4 vaccines (authorized by WHO) Pfizer-BioNTech, AstraZeneca, Sinopharm and Sinovac, and a total of 5 034 500 doses of COVID-19 vaccine were gradually introduced in Georgia.

In parallel with the emergence of promising vaccines on the world market in the fall and the commencement of 2/3 research phase, the country has started intensive preparations for a mass program of vaccine receipt, introduction and vaccination and large-scale vaccination, which started and is going in accordance with the national vaccination plan against COVID-19 approved under the Ordinance №67 of the Government of Georgia (January 21, 2021). In order to protect the population of the country and recover and develop economy, 60% of the adult population was identified as the vaccination coverage target. The plan describes the vaccination process in the country, taking into account the relevant legislation. The process is led by the Interagency Coordination Commission with the guidance of the Minister of Internally Displaced Persons from the Occupied Territories, Labor, Health, and Social Affairs. The technical work competence is organized by the National Center for Disease Control and Public Health, and the expertise is provided by consultants, whose mobilization was made possible with the financial support of the Asian Development Bank. A technical committee of immunization experts was involved in the development of the plan. Representatives of donor organizations, universities, and the Public Defender were asked to participate in the work of the Interagency Coordination Commission.

Intensive preparations for receiving the vaccines in the country began during the planning period. Based on international recommendations and the COVID-19 National Vaccine Implementation Plan, gradual expansion of the immunization process of 2021 was planned, taking into account vaccine supply and resources. In parallel with the provided doses, the priority (high risk) groups were covered and then the rest of the citizens. The selection of the groups was based on the recommendations of the ETAGE and aimed at protecting the high-risk population from severe disease caused by COVID-19 and reducing mortality, while at the same time gradually restoring normal economic activity.

Vaccination-related consumables were calculated - syringes, safe boxes, personal protective equipment and other necessary financial resources were identified. All possible resources were mobilized for providing access to the services for the population:

- Hospitals: to vaccinate their own medical staff and priority groups of the population.
- Existing immunization clinics: to vaccinate their own and assigned medical staff, priority groups and the rest of the population;
- Mobile brigades: to vaccinate beneficiaries and caregivers of long-stay facilities and the non-mobile home population;
- Mass vaccination centers (in large cities): to vaccinate priority population groups and general population groups.

Transportation of vaccines and consumables at the regional level is carried out by special vehicles, "vaccine carriers", ensuring vaccine-specific temperature regime. Waste generated under COVID-19 vaccination is managed in accordance with the existing regulations and mechanisms in the country. Covid-vaccination component has been added to the Immunization Management Module (IMM). All vaccinations are registered electronically at IMM, and the web portal booking.moh.gov.ge is available for vaccine registration and queue management. The website https://provax.ge has been launched, where the information is available in 4 languages. A special website dedicated to vaccination has been developed www.ncdc.vaccines.ge , which is also available in several languages. The COVID-19 vaccination process is supervised and monitored through an electronic module20. The report covers the practice in the country and includes the records on immunization / vaccination, vaccine use, adverse reactions and complications after vaccination.

In January 2021, a working group set up on the basis of the Center started training the brigades of the selected medical institutions. A syllabus for specialized training has been developed based on the guidelines of WHO, the US Centers for Disease Control and Prevention, and the European Center for Disease Control and Prevention, which consists of 3 sub-modules: COVID-19 Immunization and Vaccination Practical Skills; management of possible allergic reactions after vaccination (including management of anaphylaxis); cold chain and logistics, electronic registration of vaccinations.

A video guide on the principles and skills of working in the electronic portal has been created for the registrars of service providers. The first phase of the video tutorial (Pfizer-BioNTech) was conducted on February 17-23, 2021. The second phase of trainings (AstraZeneca) was held from February 23 through March 13, 2021. Directors of regional services and persons responsible for immunization of the East and West Georgia Center and Public Healthcare Centers of all municipalities were also be trained. With the start of the vaccination process and the addition of new vaccines (Sinopharm, Sinovac), primary care facilities, including public immunization service clinics, got involved in the training process along with the hospital sector. Overall, 332 operating and reserve medical brigades of 155 institutions were trained in the period from February 17, 2021, to July 1, 2021.

On March 13, 2021, 43 000 doses of the AztraZeneca (British – Swedish production) vaccine were delivered from the Covax platform, launching vaccination against COVID-19 in the country on March 15, 2021. On the first day of vaccination, due to geographical availability, 29 medical institutions got engaged in the program, to which 35 were added from March 17 and an additional 25 from March 18. The vaccination process was rolled out in 89 facilities,

[20] *For detailed information see the chapter "Data sources"*

with on-site monitoring by representatives of the National Center for Disease Control and Public Health and regional primary healthcare centers. Vaccination was initially available to healthcare staff, which has gradually expanded to include age groups, and today universal access to vaccination is available to the population over the age of 12 years. The list of vaccination centers has also gradually increased by adding hospitals and primary health care facilities. As of January 1, 2022, vaccination was available at 376 locations, with vaccinations administered by 609 independent vaccination teams, including 262 rural physicians. Starting from July, when a certain stock of vaccines was created in the country and at the same time it became possible to administer 4 different types of vaccines at the same time, it became possible to get vaccinated at mass vaccination centers open in big cities of the regions besides Tbilisi. There is also a "vaccination bus" in the capital, and for a number of citizens with limited mobility, it is possible to provide a mobile vaccination group service throughout the country.

An important component of the National Vaccination Program is the information campaign and raising public awareness about vaccination. With the involvement of experts, a communication action plan for the introduction of the COVID-19 vaccine was prepared. Various information and educational interventions21 have been carried out with the support of the Center and donor organizations, an information campaign on the introduction of the COVID-19 vaccine is underway, which includes social media activities, a series of shows in regional media and online webinars. Informational-educational videos were prepared in Georgian, Armenian and Azerbaijani languages. Citizens can find information about evidence-based vaccination on the website www.ncdc.vaccines.ge. In order to support the vaccination process, informational meetings are held with state representatives in the regions, heads of local municipalities and primary healthcare representatives.

A vaccination marathon was launched across Georgia on October 18, 2021 to promote vaccination against COVID-19 and increase its availability in regions under the initiative of the National Center for Disease Control and Public Health and the Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health and Social Affairs. The main message of the marathon was "At Georgia's service - we get vaccinated for the benefit of each other! The vaccination is the right choice for saving lives of our children, parents, friends and relatives." Representatives of the Ministry of Health, the National Center for Disease Control and Municipal Centers for Public Health, village trustees, local government representatives, NGOs and other stakeholders took part in the marathon.

38 municipalities / villages from 10 regions were selected to participate in the Covid Marathon within the scope of the micro-planning. Preparatory work was carried out and the immunization process was organized / started in the selected villages with the involvement of the Center's representatives. Meetings were held with local governments, heads of district public health centers, village doctors and the population on a door-to-door basis. In the first phase of the Covid marathon, over 16 000 people were vaccinated from selected villages.

In 2022, with the financial support of the US CDC, support measures to strengthen the process of vaccination against COVID-19 have continued in the directions of training of vaccination personnel, support supervision, supervision of AEFI, communication campaign and improvement of the electronic module.

With the coordination of WHO and the involvement of donor organizations (UNDP, WB, GIZ) and associations of family doctors, the 2022 COVID-19 vaccination campaign was launched in three directions:

[21] For more information, see the Communication Campaign on COVID-19 of the National Center for Disease Control and Public Health.

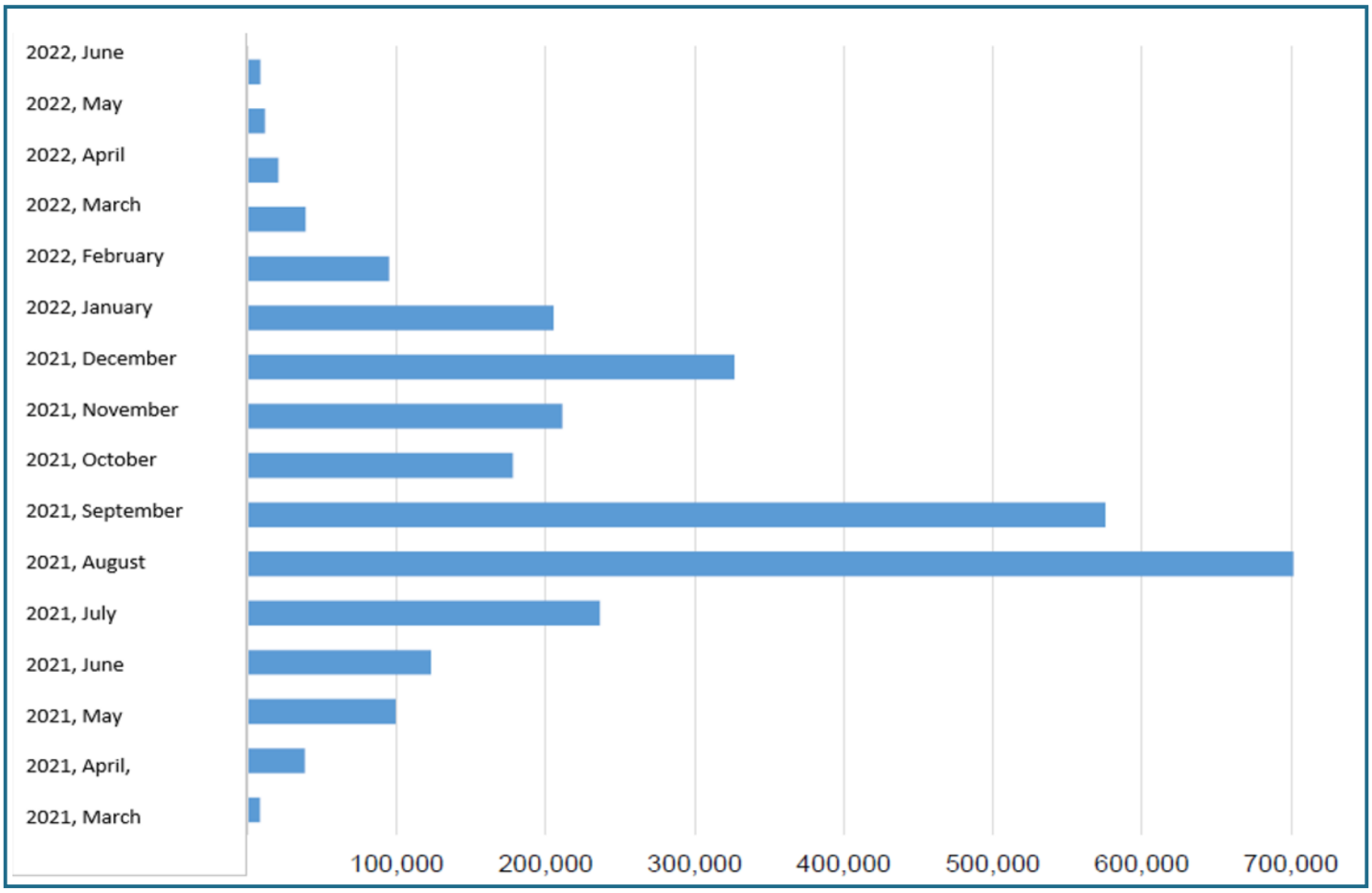
- Trainings for primary care medical personnel on immunization, cold chain and communication issues. A group of experts was formed with the participation of representatives of the Ministry, the Center, donor organizations and associations of family doctors; a training package was developed; within the framework of the activity, more than 3 000 primary care doctors, nurses and public health specialists will be retrained.

- Population mobilization and communication meetings (for improving access to high-risk groups);

- Mass media campaign.

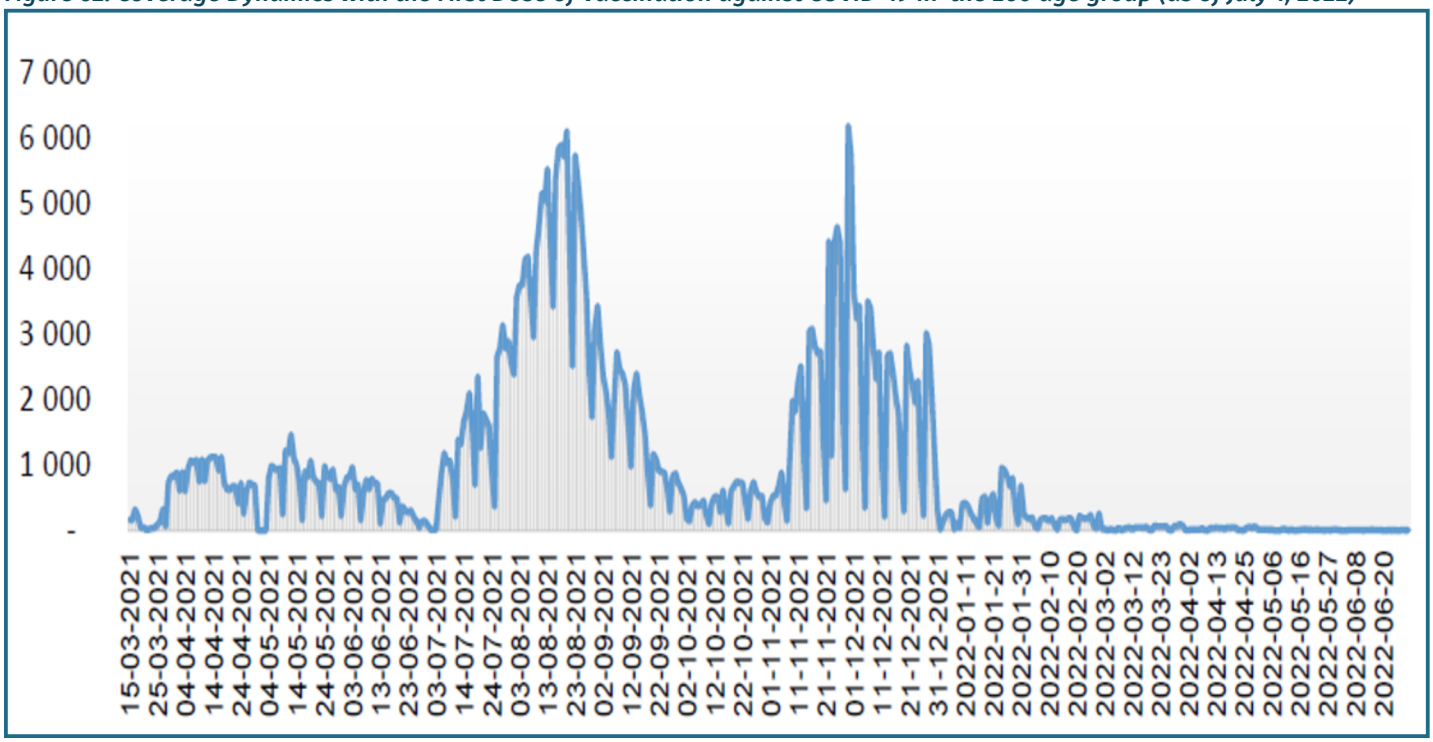
According to the data of the electronic module of immunization management as of July 1, 2022, a total of 2 873 069 vaccinations were administered in the country, 1 356 620 people (>48,5% of the population aged 18) were vaccinated with at least one dose, and 1 256 906 people (44,9% of the population aged >18) were fully vaccinated. 255 463 persons (9,1% of the population aged >18) received one booster dose while 4 080 people received two booster doses.

Figure 61. Dynamics of Vaccinations against COVID19, as of July 1, 2022



The highest number of daily vaccination - 30 459, was recorded on August 23, 2021. According to the age distribution of the fully vaccinated, the most vaccinations were carried out in the 18-49 age group - 50,7%. It should be noted that the vaccination process started first in the 65+ age group and last in the 12-16-year age group. It is important that from November 8, 2021, a monetary incentive of GEL 200 was established by the country's government for the population aged 60+, which contributed to the intensification of vaccination in this age category. Due to the increase in vaccination coverage of the target group, according to the decision of the inter-agency coordination council, from January 1, 2022, a cash incentive of GEL 200 was also established for the population over 50 years of age. According to the decision of the Government of Georgia, a vaccination incentive lottery was played for all age groups. The prize fund of the lottery was GEL 2 800 000, and GEL 100 000 was set as the prize fund of the final, summary draw. Since the inception of the National Vaccination Program, various institutions and businesses have been trying to encourage employees and maximize vaccination coverage.

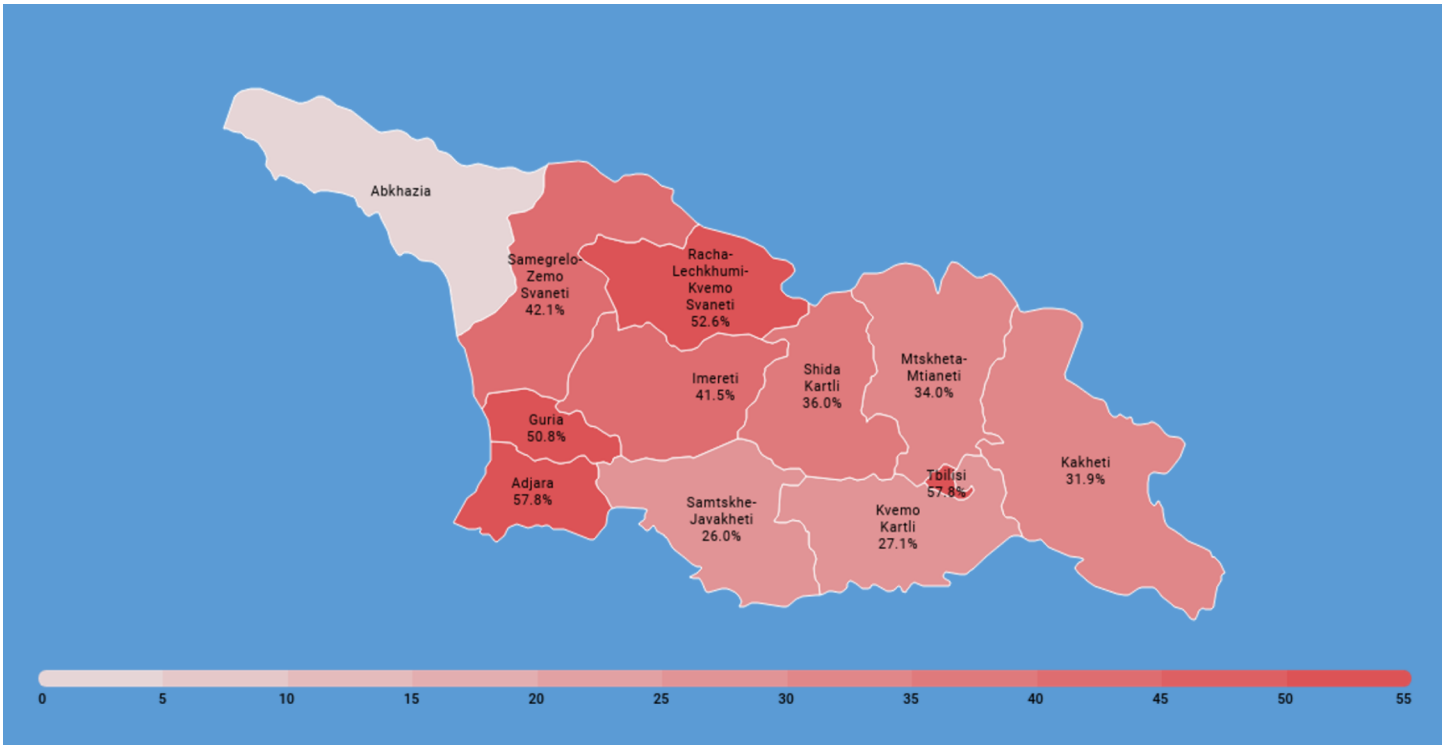
Figure 62. Coverage Dynamics with the First Dose of Vaccination against COVID-19 in the ≥60 age group (as of July 1, 2022)



In absolute numbers, the most vaccinations were carried out in Tbilisi (47,51% of vaccinations), Adjara and Imereti. Given the complete vaccination coverage of the adult population (over 18 years old), the highest number of vaccinations was carried out in Tbilisi (57,8%), Adjara (57%) and Racha-Lechkhumi and Kvemo Svaneti (52,8%).

It is important to vaccinate the representatives of the health sector along with the vaccination of the risk population in terms of age. As of July 1, 2022, in the health sector 83,8% of doctors, 68,2% of nurses, 58,4% of sanitary workers, and 70,4% of administrative and technical staff have been vaccinated with at least one dose.

Map 2. Distribution of vaccination with two doses of the vaccine against COVID-19 by region of the vaccination facility (as of July 1, 2022)



Since October 2021, the rules for administering an additional (booster) dose of the Covid-19 vaccine have been defined as follows:

Persons aged 18 and older are vaccinated with a booster dose of the Covid-19 vaccine;

12-17-year-old immunocompromised persons and persons with chronic diseases.

A booster dose is given after a minimum interval of 3 months after the end of the primary course. From June 2022, the procedure for vaccination with the second booster dose of the vaccine against Covid- 19 has been determined. The second booster dose is administered to:

Persons aged 50 and older, immunocompromised persons and persons with chronic diseases, persons living in long-term care facilities are especially recommended;

Staff employed in a medical institution;

Persons aged 12 - 49 who are immunocompromised and have chronic diseases.

The second booster dose of the vaccine is administered at least 4 months after the first booster dose.

Table 15. Coverage of vaccinations against COVID-19 by municipalities (as of July 1, 2022)

Region/District	Population total	18 years and over	Target (70% of the population over the age of 18)	Vaccinated with at least 1 dose of vaccine	Fully vaccinated	III and vaccinated with a booster dose	Inoculated with an IV dose	At least 1 % covered (population over 18 years old)	Fully covered % (population over 18 years old)	At least 1 % covered (out of target 70%)	Including full coverage (from 70% of the target)
Ajara	**355,462**	**261,266**	**182,886**	**161,403**	**148,938**	**24,079**	**227**	**61.8%**	**57.0%**	**88.3%**	**81.4%**
Batumi	173,745	127,703	89,392	82,979	77,675	13,561	165	65.0%	60.8%	92.8%	86.9%
Kedah	16,612	12,210	8,547	8,012	7,211	1,047	3	65.6%	59.1%	93.7%	84.4%
Kobuleti	70,737	51,992	36,394	29,590	27,060	4,899	43	56.9%	52.0%	81.3%	74.4%
Shuakhevi	14,838	10,906	7,634	7,163	6,395	814	2	65.7%	58.6%	93.8%	83.8%
Khelvachauri	52,696	38,732	27,112	21,288	19,553	2,291	9	55.0%	50.5%	78.5%	72.1%
Khulo	26,834	19,723	13,806	12,371	11,044	1,467	5	62.7%	56.0%	89.6%	80.0%
Guria	**105,347**	**83,832**	**58,682**	**46,727**	**42,557**	**10,424**	**31**	**55.7%**	**50.8%**	**79.6%**	**72.5%**
Lanchkhuti	29,421	23,412	16,389	13,265	12,148	3,125	3	56.7%	51.9%	80.9%	74.1%
Ozurgeti	58,332	46,419	32,493	25,941	23,643	5,836	25	55.9%	50.9%	79.8%	72.8%
Chokhatauri	17,594	14,001	9,801	7,521	6,766	1,463	3	53.7%	48.3%	76.7%	69.0%
Tbilisi	**1,201,769**	**889,610**	**622,727**	**542,985**	**514,102**	**130,204**	**3,044**	**61.0%**	**57.8%**	**87.2%**	**82.6%**
Imereti	**466,648**	**371,274**	**259,892**	**169,476**	**154,162**	**27,570**	**248**	**45.6%**	**41.5%**	**65.2%**	**59.3%**
Bagdati	17,576	13,984	9,789	6,751	6,035	1,289	11	48.3%	43.2%	69.0%	61.7%
Vani	20,534	16,337	11,436	7,402	6,658	1,203	4	45.3%	40.8%	64.7%	58.2%
Zestaphoni	54,271	43,179	30,225	17,766	16,191	2,959	12	41.1%	37.5%	58.8%	53.6%
Terjola	30,421	24,204	16,942	8,826	7,974	1,268	7	36.5%	32.9%	52.1%	47.1%
Samtredia	42,200	33,575	23,503	13,427	12,059	2,049	6	40.0%	35.9%	57.1%	51.3%
Sachkhere	34,109	27,138	18,996	18,926	17,366	3,328	17	69.7%	64.0%	99.6%	91.4%
Tkibuli	17,180	13,669	9,568	6,192	5,654	1,035	5	45.3%	41.4%	64.7%	59.1%
Kutaisi	129,305	102,878	72,014	51,134	46,926	8,024	147	49.7%	45.6%	71.0%	65.2%
Tskaltubo	44,599	35,484	24,839	10,422	9,282	1,416	14	29.4%	26.2%	42.0%	37.4%
Chiathura	37,649	29,954	20,968	15,637	14,331	2,652	10	52.2%	47.8%	74.6%	68.3%
Kharagauli	18,286	14,549	10,184	6,351	5,762	1,226	8	43.7%	39.6%	62.4%	56.6%
Khoni	20,518	16,325	11,427	6,642	5,924	1,121	7	40.7%	36.3%	58.1%	51.8%
Kakheti	**304,919**	**236,142**	**165,299**	**83,185**	**75,268**	**13,414**	**98**	**35.2%**	**31.9%**	**50.3%**	**45.5%**
Akhmeta	27,833	21,555	15,089	5,605	5,072	794	8	26.0%	23.5%	37.1%	33.6%
Gurjaani	50,970	39,473	27,631	16,146	14,529	2,561	20	40.9%	36.8%	58.4%	52.6%
Dedoplistskaro	20,365	15,771	11,040	7,258	6,556	1,298	1	46.0%	41.6%	65.7%	59.4%
Telavi	53,980	41,804	29,263	15,805	14,624	2,892	31	37.8%	35.0%	54.0%	50.0%
Lagodekhi	40,715	31,531	22,072	10,149	8,999	1,595	7	32.2%	28.5%	46.0%	40.8%
Sagarejo	52,015	40,283	28,198	10,636	9,626	1,459	16	26.4%	23.9%	37.7%	34.1%
Sighnaghi	28,740	22,257	15,580	8,568	7,814	1,380	8	38.5%	35.1%	55.0%	50.2%
Kvareli	30,301	23,466	16,426	9,018	8,048	1,435	7	38.4%	34.3%	54.9%	49.0%
Mtskheta-Mtianeti	**92,351**	**71,852**	**50,296**	**26,729**	**24,451**	**4,456**	**31**	**37.2%**	**34.0%**	**53.1%**	**48.6%**
Dusheti	26,130	20,330	14,231	7,445	6,776	1,254	4	36.6%	33.3%	52.3%	47.6%
Tianeti	10,221	7,952	5,567	3,344	3,097	720	1	42.1%	38.9%	60.1%	55.6%
Mtskheta	52,240	40,644	28,451	14,316	13,054	2,214	23	35.2%	32.1%	50.3%	45.9%
Kazbegi	3,760	2,925	2,048	1,624	1,524	268	3	55.5%	52.1%	79.3%	74.4%
Racha-Lechkhumi and Kvemo Svaneti	**27,616**	**23,731**	**16,612**	**13,661**	**12,519**	**2,961**	**16**	**57.6%**	**52.8%**	**82.2%**	**75.4%**
Ambrolauri	10,205	8,769	6,138	5,028	4,641	1,131	5	57.3%	52.9%	81.9%	75.6%
Lentekhi	3,905	3,356	2,349	1,788	1,579	285	1	53.3%	47.1%	76.1%	67.2%
Oni	5,425	4,662	3,263	2,911	2,711	807	2	62.4%	58.2%	89.2%	83.1%
Tsageri	8,081	6,944	4,861	3,934	3,588	738	8	56.7%	51.7%	80.9%	73.8%
Samegrelo-Zemo Svaneti	**301,213**	**239,488**	**167,642**	**110,863**	**100,790**	**16,199**	**146**	**46.3%**	**42.1%**	**66.1%**	**60.1%**
Abasha	19,014	15,118	10,582	5,813	5,277	872	2	38.5%	34.9%	54.9%	49.9%
Zugdidi	97,088	77,193	54,035	41,271	37,573	5,652	38	53.5%	48.7%	76.4%	69.5%
Martvili	30,921	24,585	17,209	9,337	8,352	1,334	2	38.0%	34.0%	54.3%	48.5%
Mestia	9,364	7,445	5,212	2,131	1,942	325	3	28.6%	26.1%	40.9%	37.3%
Senaki	33,069	26,292	18,405	10,386	9,662	1,616	9	39.5%	36.7%	56.4%	52.5%
Poti	41,100	32,678	22,874	17,371	16,294	3,139	71	53.2%	49.9%	75.9%	71.2%
Chkhorotsku	21,036	16,725	11,708	7,416	6,388	1,051	9	44.3%	38.2%	63.3%	54.6%

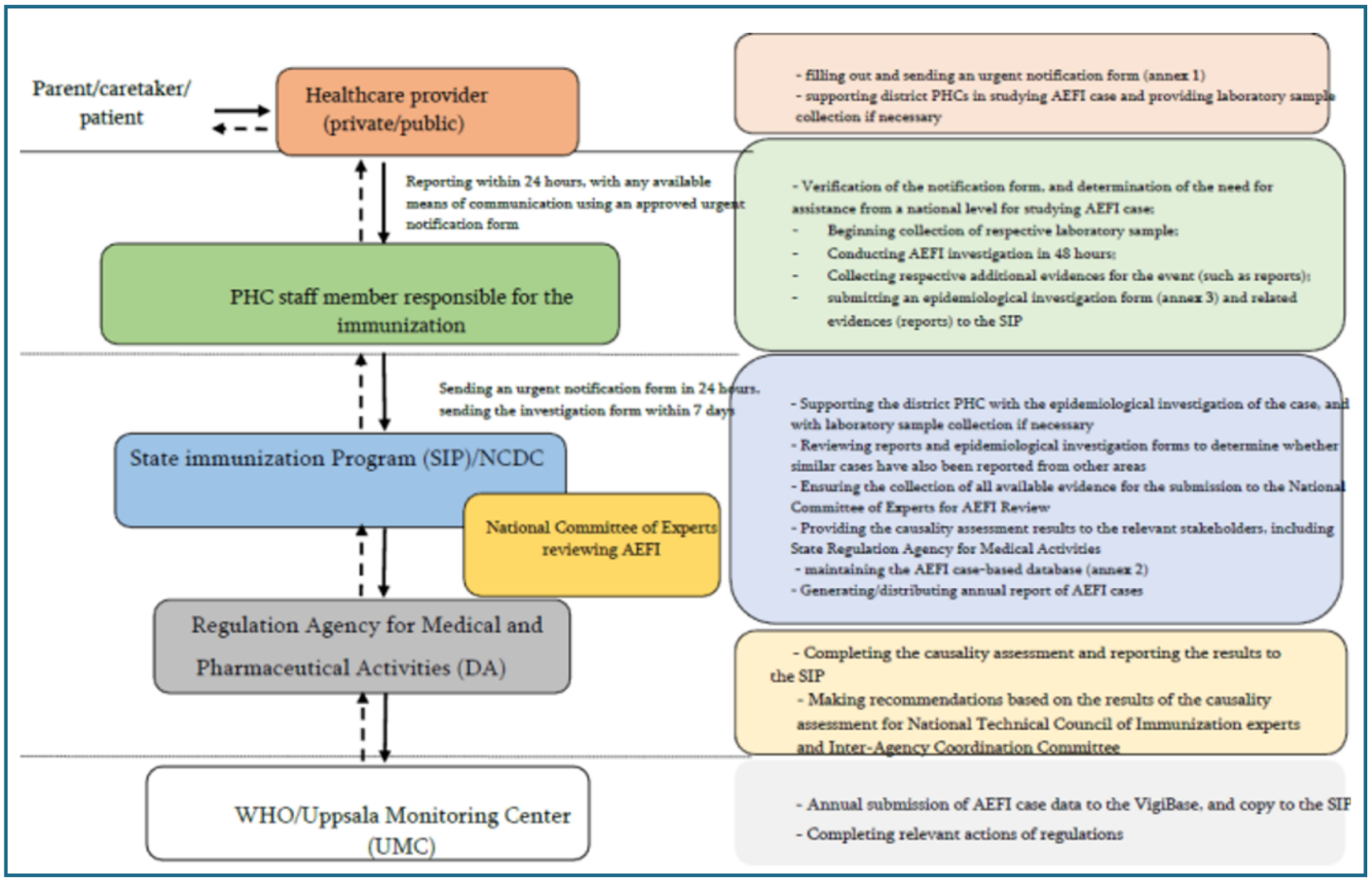
Tsalenjikha	22,551	17,930	12,551	8,227	7,319	1,147	6	45.9%	40.8%	65.5%	58.3%
Khobi	27,070	21,523	15,066	8,911	7,983	1,063	6	41.4%	37.1%	59.1%	53.0%
Samtskhe-Javakheti	**148,336**	**112,090**	**78,463**	**31,658**	**29,148**	**3,887**	**28**	**28.2%**	**26.0%**	**40.3%**	**37.1%**
Adigeni	15,918	12,028	8,420	5,255	4,715	700	2	43.7%	39.2%	62.4%	56.0%
Aspindza	10,537	7,962	5,574	3,085	2,833	323	2	38.7%	35.6%	55.4%	50.8%
Akhalkalaki	40,117	30,314	21,220	3,074	2,875	193	1	10.1%	9.5%	14.5%	13.5%
Akhaltsikhe	39,132	29,570	20,699	9,337	8,665	1,023	13	31.6%	29.3%	45.1%	41.9%
Borjomi	24,693	18,659	13,061	8,159	7,423	1,408	10	43.7%	39.8%	62.5%	56.8%
Ninotsminda	17,939	13,556	9,489	2,748	2,637	240	-	20.3%	19.5%	29.0%	27.8%
Kvemo Kartli	**434,497**	**315,935**	**221,155**	**93,963**	**85,759**	**11,024**	**122**	**29.7%**	**27.1%**	**42.5%**	**38.8%**
Bolnisi	55,936	40,673	28,471	13,323	11,830	929	11	32.8%	29.1%	46.8%	41.6%
Gardabani	79,273	57,642	40,349	12,419	11,365	1,248	9	21.5%	19.7%	30.8%	28.2%
Dmanisi	20,916	15,209	10,646	3,913	3,460	381	-	25.7%	22.8%	36.8%	32.5%
Tetritskaro	22,461	16,332	11,432	5,005	4,571	702	7	30.6%	28.0%	43.8%	40.0%
Marneuli	107,491	78,160	54,712	17,582	15,742	889	5	22.5%	20.1%	32.1%	28.8%
Rustavi	128,788	93,645	65,552	38,556	35,925	6,591	86	41.2%	38.4%	58.8%	54.8%
Tsalka	19,632	14,275	9,992	3,165	2,866	284	4	22.2%	20.1%	31.7%	28.7%
Shida Kartli	**250,489**	**192,145**	**134,502**	**75,970**	**69,212**	**11,245**	**89**	**39.5%**	**36.0%**	**56.5%**	**51.5%**
Gori	118,765	91,102	63,772	36,574	33,428	5,315	57	40.1%	36.7%	57.4%	52.4%
Kaspi	41,134	31,553	22,087	11,355	10,210	1,553	7	36.0%	32.4%	51.4%	46.2%
Kareli	40,255	30,879	21,615	11,149	9,993	1,473	7	36.1%	32.4%	51.6%	46.2%
Khashuri	50,335	38,611	27,028	16,892	15,581	2,904	18	43.7%	40.4%	62.5%	57.6%
Total sum	**3,688,647**	**2,797,365**	**1,958,156**	**1,356,620**	**1,256,906**	**255,463**	**4,080**	**48.5%**	**44.9%**	**69.3%**	**64.2%**

ADVERSE EVENTS FOLLOWING IMMUNIZATION AND MONITORING

AEFI (an adverse event following immunization) is any adverse medical manifestation that follows immunization and that is not necessarily related to the use of the vaccine. A side effect may be any uncomfortable or unwanted manifestation, laboratory deviation, symptom or disease.

Any AEFI is registered in the relevant reporting form (Form 58) by the medical staff / epidemiologist of the medical facility and notified to the respective unit of public health system. The working group of the National Center for Disease Control and Public Health checks the completeness and accuracy of AEFI forms (dosage, brand name, expiration date, and etc.), prepares and analyzes the material - which is submitted to the National Committee of Experts that reviews AEFIs and the other interested parties.

Figure 64. Actions, Flows, and Timing Algorithm for Reporting AEFI in case of Detection, Georgia



AEFI notifications are currently being provided to 3 vaccine manufacturers - Sinopharm, Sinovac and Pfizer-BioNTech (the latter via the website www.cvdvaccine.com).

Since some AEFIs are serious, such cases require further review and investigation, for which a task force at the National Centers for Disease Control and Public Health is gathering additional documentation, which will then be presented to the National Expert Committee on Immunization Safety to determine cause and effect relationships.

The National Committee of Experts is an independent deliberative body established on a pro bono basis under the order of the Minister of Internally Displaced Persons from the Occupied Territories, Labor, Health and Social Affairs of Georgia according to the recommendation of the World Health Organization to determine the causal adverse effects of post-immunization.

The committee meeting is held usually once a week and its functions are:

1. Assess potential cause-and-effect relationships between AEFI and the relevant vaccine;
2. Monitoring of reported AEFI data for early detection of unknown possible vaccine safety concerns;
3. Review all serious AEFI submitted for expert evaluation and, if necessary, make recommendations for further detailed studies;
4. Develop recommendations to eliminate problems;
5. Make a final decision on the assessment of cause and effect and facilitate the improvement of the immunization safety monitoring system; if necessary, liaise with other national and international experts to determine issues related to causality and vaccine quality;
6. Develop recommendations on issues related to the safety of vaccines and immunizations, as well as issues related to AEFI at the request of the Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health and Social Affairs (hereinafter-Ministry) or the State Agency for Regulation of Medical Activities (hereinafter-Regulatory Agency).

The National Committee of Immunization Safety Experts includes the following specialists: Infectionist, Allergologist-Immunologist, Neurologist, Microbiologist, Pathologist, Pediatrician, Epidemiologist, Forensic Physician, Nephrologist, Therapist, Cardiologist.

As of July 1, 2022, a total of 2 903 548 vaccinations were carried out in Georgia, of which 2 055 cases were recorded as AEFI. Since the pace of vaccination against COVID-19 in the country has slowed down significantly over the last 3 months, the number of new AEFIs has decreased accordingly.

Table 16. Distribution of COVID-19 Vaccination AEFIs by vaccine (as of July 1, 2022)

Vaccine	I dose	II dose	III dose	IV dose	sum	Total number of doses administered
Pfizer	633	454	101	2	1190	I dose 770 498, II dose 713 273, III dose 211 997, IV dose 4 027
AstraZeneca	310	54	0	0	364	I dose 61 775, II dose 60 187
Sinopharm	259	95	3	0	357	I dose 418 479, II dose 385 525, III dose 34 196
Sinovac	108	34	2	0	144	I dose 121 563, II dose 112 466, III dose 9 562

Table 17. Distribution of COVID-19 Vaccination AEFIs by age groups (as of July 1, 2022)

Age	Number
12-15	2
16-19	58
20-29	397
30-39	356
40-49	302
50-59	336
≥60	604

Out of 2 055 AEFI cases, 212 cases were considered serious, where 181 patients required referral to a medical facility (48 - inpatient, 133 - outpatient).

Table 18. Distribution of Serious COVID-19 Vaccination AEFIs by age groups (as of July 1, 2022)

Age	Number
16-19	4
20-29	39
30-39	50
40-49	40
50-59	31
≥ 60	48

Figure 19. Percentage distribution of Serious COVID-19 Vaccination AEFIs by vaccine (as of July 1, 2022)

Vaccine	Number
Pfizer	62
AstraZeneca	38
Sinopharm	78
Sinovac	34

The National Committee of Immunization Safety Experts reviewed 202 cases to study the cause and effect relationship, of which 125 were compatible with the causal link to immunization (including 72 cases related to fear of immunization, in 53 cases the reaction related to vaccine was identified), 49 cases were classified as incompatible with immunization, and 20 cases as uncertain.

Table 20. Most frequently reported COVID-19 AEFIs by vaccine, per 2 903 548 doses (as of July 1, 2022)

	Pfizer BioN Tech	AstraZeneca	Sinopharm	Sinovac	Total quantity
Fever ≥ 38	350	151	48	18	567
Temperature rise < 38	305	66	60	20	450
Lymphadenopathy	48	2	3	0	53
Allergic reactions (angioedema, rash, etc.)	109	34	72	25	240
Clinical diagnosis of anaphylaxis	2	3	5	1	11
Laboratory-confirmed diagnosis of anaphylaxis	0	0	0	0	0
Diagnosis of anaphylaxis not confirmed by laboratory research	0	1	0	0	1
Arthralgia	206	60	37	11	314
Myalgia	111	52	28	10	201
Arterial hypertension	54	30	42	13	139
A chill-like phenomenon	66	63	18	9	155
Common weakness	264	64	75	36	439
Pain and swelling at the injection site	272	80	21	12	385
Headache	223	69	62	30	383
Syncope and collapse	19	7	10	10	46
Other (exacerbation of the disease, dizziness, nausea, vomiting, diarrhea, arterial hypotension, tachycardia, numbness, etc.)					850

Table 21. Individual AEFI Figures per 100 000 doses by vaccine (as of July 1, 2022)

	Pfizer BioN Tech	AstraZeneca	Sinopharm	Sinovac	Total quantity
Fever ≥ 38	20.6	123.8	5.7	7.4	19.5
Temperature rise < 38	17.9	54.1	7.2	8.2	15.5
Lymphadenopathy	2.8	1.6	0.4	0	1.8
Allergic reactions (angioedema, rash, etc.)	6.4	27.9	8.6	10.3	8.3
Clinical diagnosis of anaphylaxis	0.1	2.5	0.6	0.4	0.4
Laboratory-confirmed diagnosis of anaphylaxis	0	0	0	0	0
Diagnosis of anaphylaxis not confirmed by laboratory research	0	0.8	0	0	0
Arthralgia	12.1	49.2	4.4	4.5	10.8
Myalgia	6.5	42.6	3.3	4.1	6.9
Arterial hypertension	3.2	24.6	5.0	5.3	4.8
A chill-like phenomenon	3.9	51.7	2.1	3.7	5.3
Common weakness	15.5	52.5	8.9	14.8	15.1
Pain and swelling at the injection site	16.0	65.6	2.5	4.9	13.3
Headache	13.1	56.6	7.4	12.3	13.2
Syncope and collapse	1.1	5.7	1.2	4.1	1.6
Other (exacerbation of the disease, dizziness, nausea, vomiting, diarrhea, arterial hypotension, tachycardia, numbness, etc.)					29.3

Table 22. Numbers of Mild and Serious AEFIs by vaccine (as of July 1, 2022)

Vaccine	Number of mild AEFIs	Number of serious AEFIs	Total quantity
Pfizer BioN Tech	2,314	62	2,376
AstraZeneca	776	38	814
Sinopharm	625	78	703
Sinovac	269	34	303

Table 23. Mild and Serious AEFIs by vaccine per 100 000 doses (as of July 1, 2022)

Vaccine	Mild AEFIs per 100,000 doses	Serious AEFIs per 100,000 doses	Total Mild and Serious AEFIs per 100,000 doses
Pfizer BioN Tech	136.1	3.6	139.8
AstraZeneca	636.3	31.2	667.4
Sinopharm	74.6	9.3	83.9
Sinovac	110.4	14.0	124.4

The share of AEFIs on 2 903 548 doses - 0,1%.
Proportion of serious AEFI s per 2 903 548 doses - 0,01%.

** The table shows not the number of cases but the number of AEFIs (one beneficiary may develop several AEFI at once)*

Table 24. Distribution of AEFIs reported in Europe by vaccine and country (08,12,2020 – 15,06,2022)

Country	Pfizer AEFI -s	AstraZeneca AEFI -s	Moderna AEFI -s	Total doses administered	Corresponding to AEFI s%
England	133,723	202,241	31,547	122,227,915	0.3 %
Wales	8,297	10,873	2,308	7,037,177	0.3 %
Northern Ireland	3,020	2,998	166	3,929,108	0.2 %
Scotland	12,886	17,504	3,388	12,308,702	0.3 %

source: https://www.gov.uk/government/publications/coronavirus-COVID-19-vaccine-adverse-reactions/coronavirus-vaccine-summary-of-yellow-card-reporting

In August 2021, a representative of the WHO Regional Office for Europe visited Georgia to assess issues related to the introduction of COVID-19 vaccination, in particular the AEFI case management system in Georgia. As it is known, since June, in order to improve the quality of reporting on AEFIs, regular meetings have been held with medical staff in major cities of Georgia. WHO/Europe prepared a publication for its website, where the innovative approach of the Georgian AEFI monitoring, recording and management system has been evaluated as one of the most successful models in the region.

PROTECTIVE IMPACT OF COVID-19 VACCINATION ON KEY INDICATORS OF DISEASE PREVALENCE AND PROGRESS, GEORGIA, MARCH 15 - DECEMBER

In order to assess the ongoing vaccination process against COVID-19 in Georgia and the protective impact of the vaccines used, based on international experience and national surveillance data, the main characteristics of the prevalence and course of COVID-19 in the country were evaluated.

The evaluation methodology is based on a descriptive analysis of data from the National Epidemic Surveillance System for COVID-19 and recommendations shared by the CDC for calculation of indicators.22. Data sources included the immunization module, laboratory module, electronic birth and death module, hospitalization module, and data provided by the National Health Agency.

Any person, receiving at least two doses of COVID-19 vaccine and being infected with the SARS-CoV-2 virus, is considered as infected vaccinated case when infection is confirmed after > 14 days following administration of the second dose. The following indicators were selected to assess the protective effect of COVID-19 vaccine due to vaccination against COVID:

1. Infection protection rate (%);
2. Protection rate from hospitalization (%);
3. Rate of protection from the need for intensive and critical care (%);
4. Rate of protection from lethal outcome (%).

As of June 30, 2022, during the last 6 months, a total of 725 076 laboratory-confirmed cases of infection with the SARS-CoV 2 virus were recorded in the country, including 279 571 fully vaccinated persons, of whom 1 booster dose was administered in 28 382 cases.

As of June 30, 2022, 1 271 642 people have been fully vaccinated with the anti-covid vaccine in the country, including 255 928 people who have received the third booster dose.

Table 25. Specific Share of Infected People in the Population Vaccinated with the Appropriate Dose

Dose	Vaccinated Infected Case	Number of People Vaccinated	Share of infected people, %
2	251 189	1 015 714	25%
3	28 382	255 928	11%

The mean age of fully vaccinated infected persons is 46,39 years (with a standard deviation of 16,848).

Table 26. Age of Vaccinated Infected Persons

	N	Minimum	Maximum	Average	Standard deviation
Age	279 571	12	102	46.39	16.848

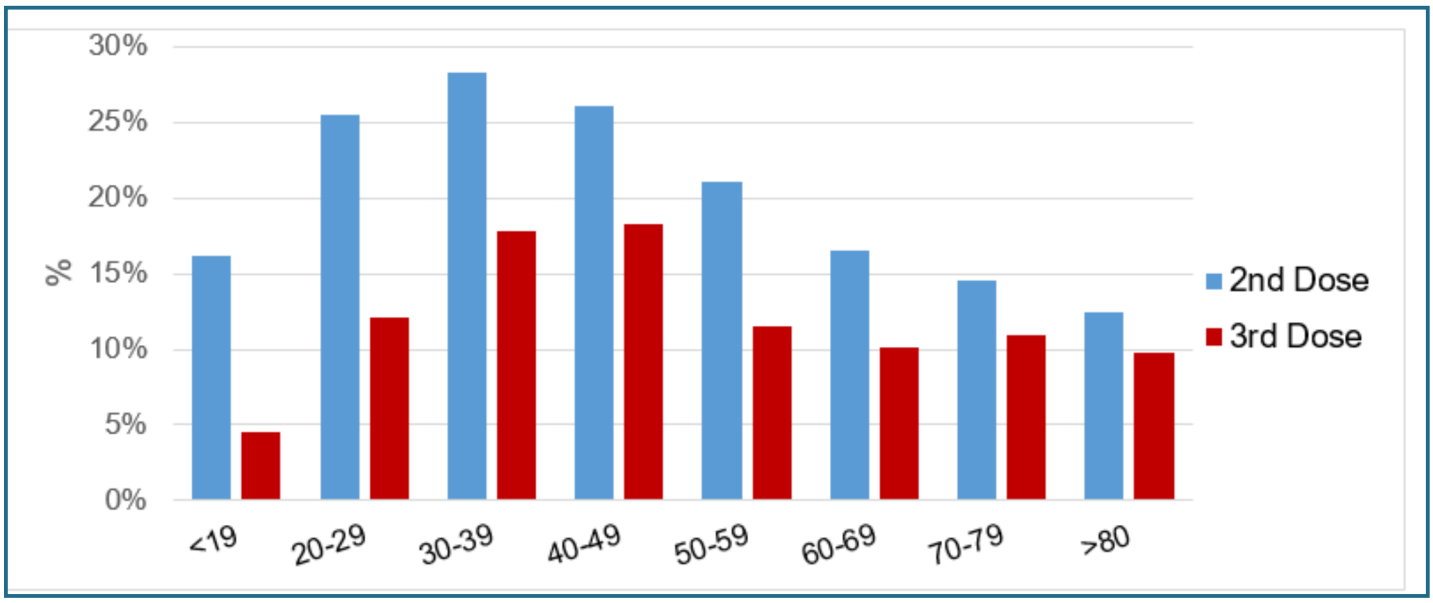
[22] *https://www.cdc.gov/coronavirus/2019-ncov/COVID-data/COVID-net/purpose-methods.html*

Table 27. Age of Vaccinated Infected Persons by Administered Doses

Dose	N	Minimum	Maximum	Average	Standard Deviation
2	251 189	12	102	45.45	16.641
3	28 382	17	97	54.71	16.375

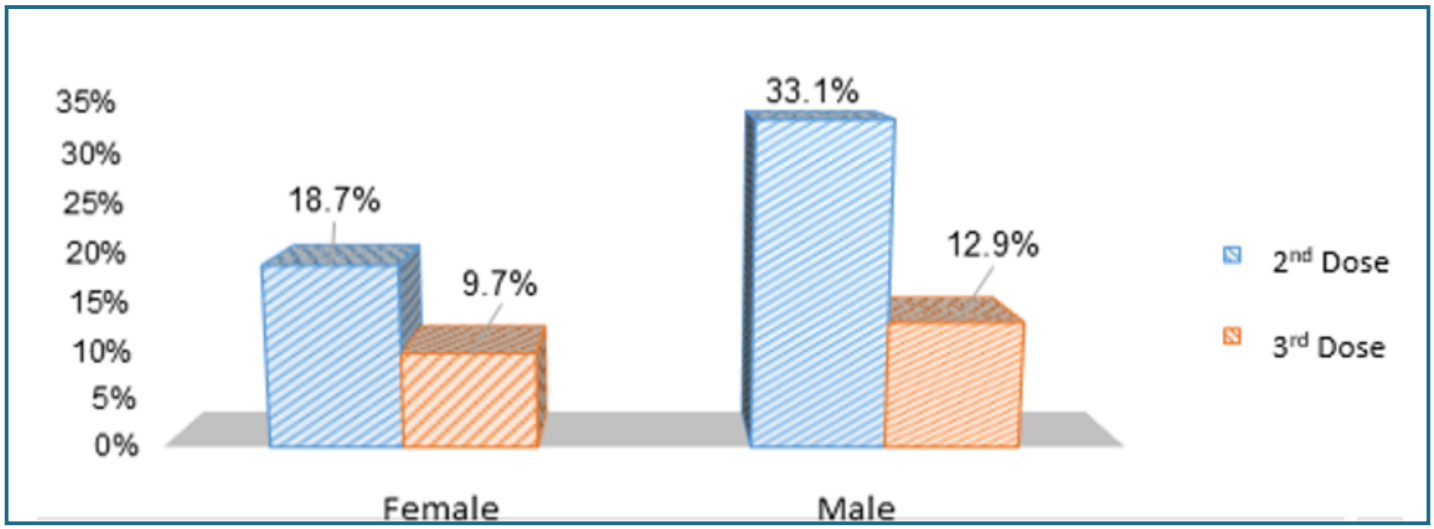
The analysis of vaccinated infected cases by age showed that the highest share of infected people in the fully vaccinated population was observed in the age group of 30-39 years (28,32%), in general, the share of infected people is high in the 30-49 – year-age group, both in the population of those vaccinated with a full and booster dose.

Figure 65. Proportion of Infected People in the Vaccinated Population by Age Group and Administered Dose, January 1 - June 30, 2022



The analysis of the data by gender showed that the specific share of infected people in the boosted population is significantly lower than the same rate in the fully vaccinated population. It should be noted that in both populations, the proportion of infected males is generally higher.

Figure 66. Proportion of Infected Persons in the Vaccinated Population by Gender and Administered Dose, January 1 - June 30, 2022



The analysis of the time period from the administration of the last dose of the vaccine for fully vaccinated and boosted infected persons to the moment of confirmation since January 2022 shows that the dynamics of the infection rate in the fully vaccinated is sharply increased after 120 days, and the infection rate drops sharply 50-60 days after the administration of the booster dose.

The analysis of the indicators for the assessment of the protective impact of vaccination against COVID-19 on the spread and severity of the disease for the period January 1 - June 30, 2022 showed that the indicators had decreased compared to the indicators for the period March 15 - December 31, 2021, which is clearly determined by circulation of Omicron BA.1 and BA.2 variants in the country.

From January 1, 2022, through June 30, 2022, unvaccinated individuals were 1,03 times (95% CI 1,023 - 1,036 P<0,0001) more likely to be infected compared to fully vaccinated individuals during the same period, and booster-vaccinated individuals were 2,15 times less susceptible to infection (95% CI 1,023 - 1,036 P<0,0001) % CI 2,12 - 2,18 P<0,0001) compared to unvaccinated individuals. Accordingly, those vaccinated with a booster dose have a lower chance of infection - the probability of infection decreases by 53,5% (95% CI 52,85% - 54,12%, P<0,0001).

Analysis of hospitalization among vaccinated persons included all laboratory-confirmed cases of SARS-COV- 2 infection with a hospital stay of ≥ 24 hours, as well as cases with a hospital stay of < 24 hours though with a lethal outcome. In accordance with the mentioned definition, in the first six months of 2022, 10 763 cases were hospitalized among vaccinated infected people, including 898 cases vaccinated with a booster dose. In the same period, 41 019 Covid-infected persons were hospitalized throughout the country. Based on the mentioned data, vaccination against COVID-19 among infected people reduces the chance of needing hospitalization for COVID-19 disease by 43,9% (95% CI 42,58% - 55,19%, P<0,0001) compared to the unvaccinated population. In case of boosters, this figure reaches 55,16% (95% CI 52,03% - 58,09%, P<0,0001).

In the reporting period, treatment in the intensive care unit was required in 344 vaccinated cases, while in the same period, 2 581 unvaccinated Covid-infected patients needed intensive care and resuscitation assistance. Based on the analysis of the above data, vaccination against COVID-19 during the period January 1-June 30, 2022 reduced the risk of requiring critical care in fully vaccinated infected individuals by 58,28% (95%CI 42,9% - 63%, P<0,0001) compared to the unvaccinated population. In case of administration of only one booster dose, this rate is 62,65% (95%CI 44,71% - 74,78%, P<0,0001).

The evaluation identified any lethal outcome as the death of a vaccinated person due to COVID-19, where COVID-19 is registered as the primary cause of death in the medical report and at the same time infection with the SARS-CoV-2 virus is laboratory confirmed after > 14 days following administration of at least 2 doses of any vaccine against CoVID-19 and the lethal outcome occurred within ≤45 days following confirmation of SARS-CoV-2 infection.

Overall 357 death cases due to COVID-19 were recorded among the fully vaccinated population (1 271 642) between January 1 and June 30, including 22 cases among the boosted population. In the same period, 2 530 cases of death due to COVID-19 were recorded in the country. In the same period, the lethality among those fully vaccinated with the vaccine against COVID-19 was 0,028% (in the same period, the lethality caused by the SARS COV-2 virus was 0,35%).

According to the mentioned data, the chance of lethal outcome in fully vaccinated infected persons was less by 72,75% (95%CI 69,47%- 75,72%, P<0,0001) compared to non-vaccinated persons, and in the case of one booster dose administration, the probability of lethal outcome was reduced by 84,17% (95%CI 76%-89,6%, P<0,0001).

The protective effect of the COVID-19 vaccines against SARS-CoV-2 variants was analyzed and the results were summarized in the presented table. According to the results of the above analysis, the protective effect of vaccination against COVID-19 in the first half of 2022 in relation to the risk of infection caused by the Omicron variant circulating in Georgia was weakened compared to the previous reporting period (March 15-December 31, 2021),

when other variants of the SARS-CoV were circulating in the country and the chance of infection in the fully vaccinated population was 7 times lower compared to unvaccinated population. At the same time, the analysis of data registered during the period of January 1-June 30, 2022, showed a significant protective effect due to the anti-Covid vaccination on the severity and outcome of the disease in infected persons.

REVIEW OF SARS-COV-2 VARIANTS OF THE NEW CORONAVIRUS CIRCULATING IN GEORGIA AND MOLECULAR EPIDEMIOLOGY

The length of SARS-CoV-2 virus genome is 29,9 kb (29 900 nucleotide bases) and is 86,9-96% similar to the other bat SARS-like coronaviruses. Its RNA includes ORF1a, ORF1b, spike (S), ORF3a, envelope (E), membrane (M), ORF6, ORF7a, ORF7b, ORF8, nucleocapsid (N) and ORF10 genes. SARS-CoV-2 variants emerge naturally during viral replication, as RNA viruses are generally more prone to replication errors than DNA viruses. In addition, the number of infected people is the main factor in the selection of viral variants. Consequently, more attention is paid to variants that attack the immune system, multiply more quickly, and /or spread more easily. In the case of SARS-CoV-2, clinically and scientifically, changes in the spike (S) protein, which binds to the host cell's ACE-2 receptor, have been found to alter the ability of the virus to colonize the respiratory tract and the likelihood of transmission to another person. It is for this reason that these changes are particularly noteworthy for public health.

Over the course of the COVID-19 pandemic, nomenclature systems have gradually evolved to characterize genetically distinct types and lineages of SARS-CoV-2. These are: GISAID system (Wu et al. 2020), Nextstrain (Hadfield et al. 2018) and Pango (Li 2021). The first two include only a few main groups (clades), while the Pango nomenclature system is more structured, it was developed and published in early 2020 (Rambaut et al. 2020) and has since been widely used to classify SARS-CoV-2. Each Pango lineage defines an epidemiologically relevant phylogenetic cluster and includes multiple subvariants. In contrast, the Greek letter system proposed by WHO is intended for communication with the population and includes only VOC and VOI variants.

The Lugar Research Center of the National Center for Disease Control and Public Health has been continuously deciphering the entire genomes of SARS-COV-2 strains since the beginning of the pandemic using new generation sequencing technology on the Illumina MiSeq platform. The aim of the study was to genetically characterize the virus strains common in Georgia, their phylogenetic analysis and monitor newly formed mutations. Complete genomic sequences of the sequenced SARS-COV-2 strains were uploaded to the international databases GISAID and BaseSpace and compared with the genetic data of the worldwide strains.

At the beginning of the pandemic, the method of direct sequencing of positive samples was used, which allowed only a few samples to be run at a time. Since 2021, a much higher productivity method has been introduced at the Lugar Center that could sequence 90 or more viruses simultaneously. With the help of the Bundeswehr Institute of Microbiology (IMB) and the US Centers for Disease Control (CDC), the Lugar Center's capacity for SARS-COV-2 sequencing has been significantly increased. In September 2021, an online training was organized by CDC colleagues, which provided details of updated methods of sequencing and database analysis in the BaseSpace database, provided by CDC and Illumina representatives.

Phylogenetic analysis of sequenced SARS-COV-2 strains was performed in the first months of the pandemic and compared with world strains, as a result of which SARS-COV-2 strains spread during the first wave of

the disease (Wuhan variant) in Georgia were divided into several groups according to their source. The cases were brought from different countries: Iran, Spain, Italy, France, Russia and etc. For example, two local cases hit two different clusters of strains common in Spain, which confirmed the stories of their travels; and a number of cases imported from Italy, as well as their contacts, were grouped together with the strains of the same country.

Figure 67. Example of SARS-COV-2 strains uploaded to GISAID database

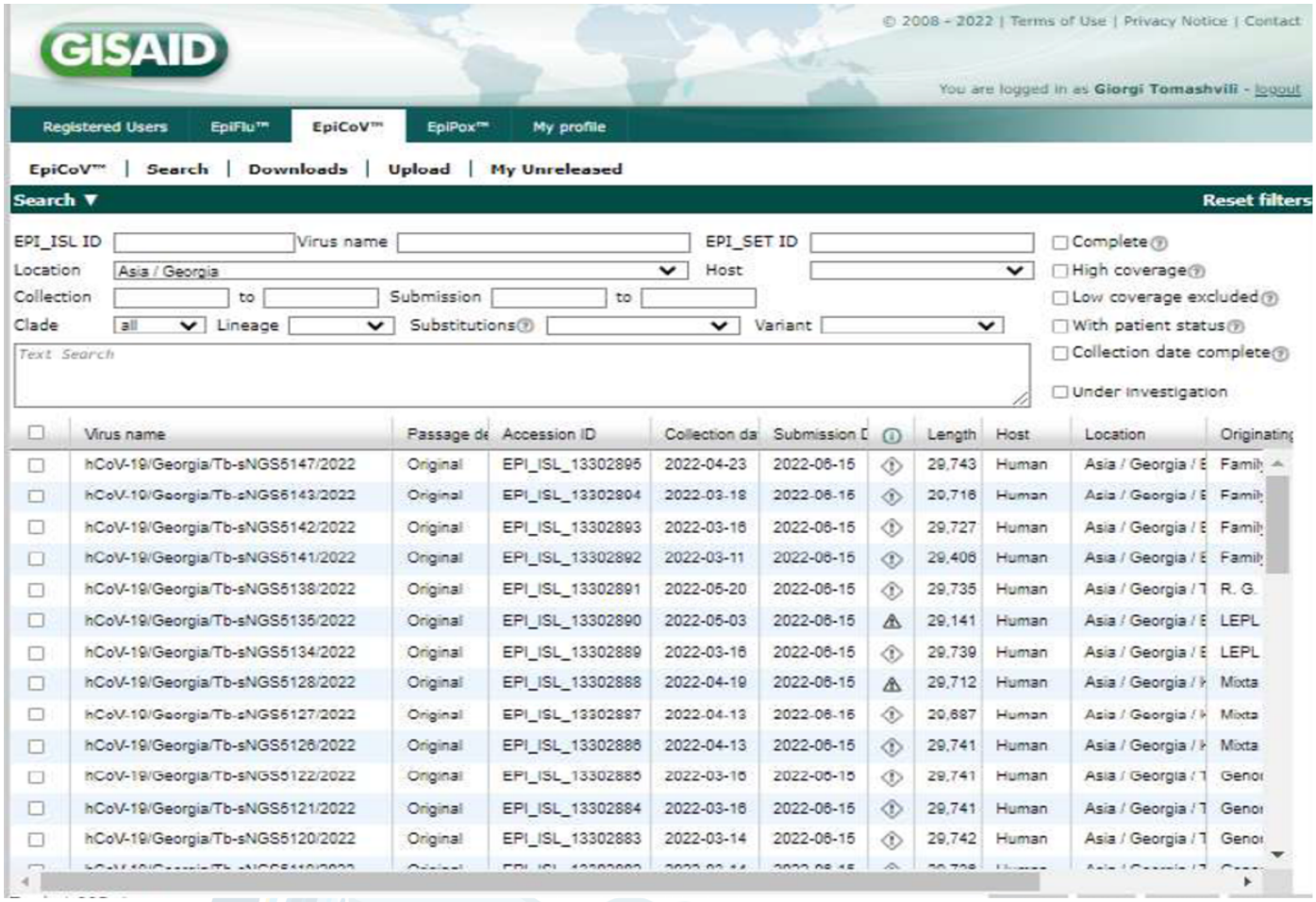
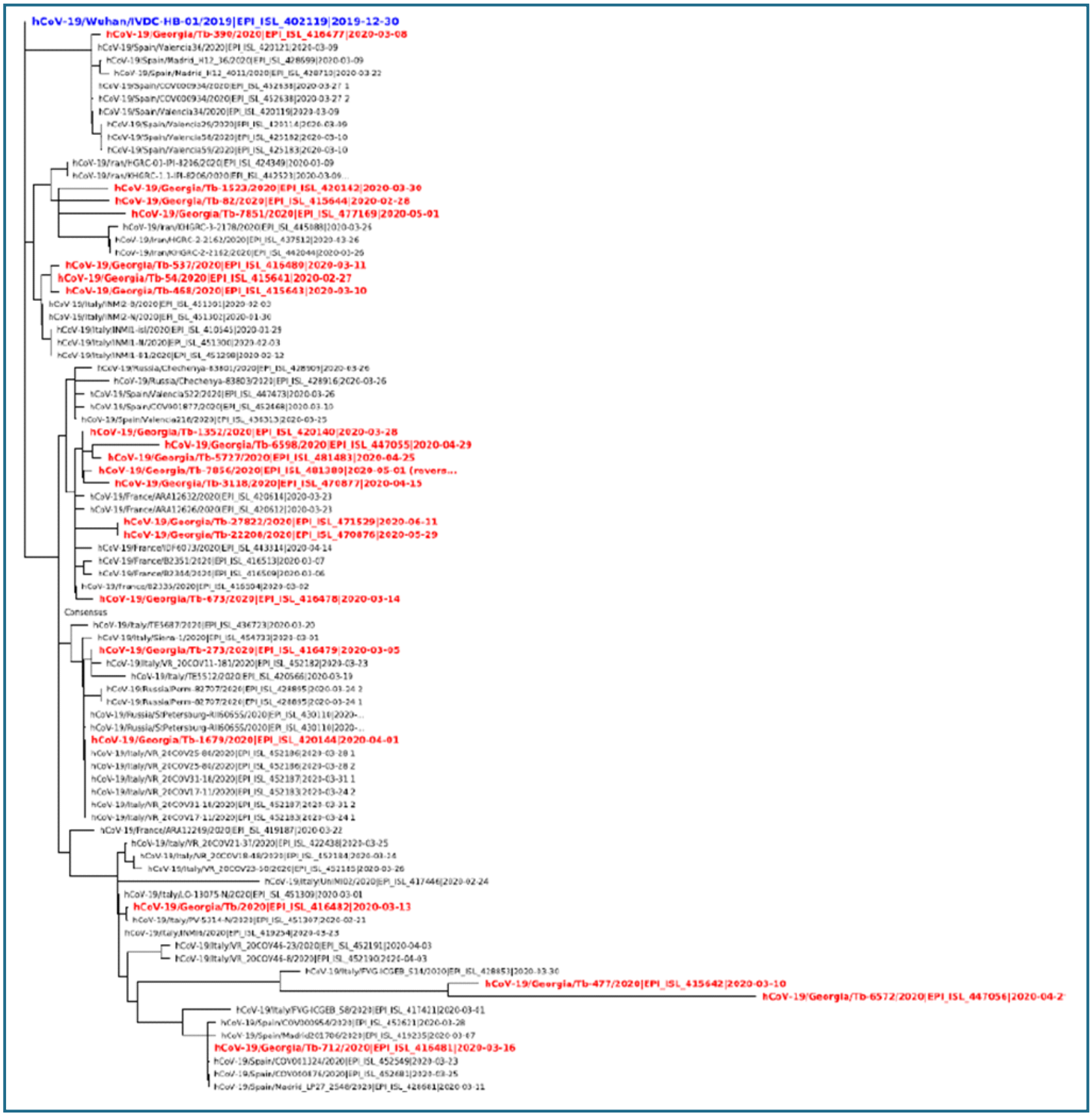


Figure 69. Phylogenetic tree (red) of 21 SARS-COV-2 strains circulating during the first wave in Georgia and comparison with their world strains



Later internal transmission started and local outbreaks occurred in different regions of Georgia, one part of which was related to the Iranian strains (Marneuli outbreak), and the other - to the Russian /French case cluster (Tetritskaro and Bolnisi outbreaks). Overall, the complete genomes of 66 samples collected in February-March 2020 were uploaded to the GISAID database. As a result, it was identified that at the

beginning of the pandemic, various variants of Group B.1 were circulating in Georgia. Also, one case of group A.2 and five cases of group B.4 were reported.

The original Wuhan variant of SARS-CoV-2 mutated multiple times. D614G mutation in the spike (S) protein turned out to be of particular importance, as it rapidly spread and became dominant. Due to this mutation, the virus was binding more effectively to the ACE-2 receptor in humans and, accordingly, acquired the ability to rapidly replicate in the epithelial tissue of the upper respiratory tract and lungs and had increased infectivity. The virus carrying this mutation was more stable than the original variant. As a result, in August-September 2020, in Georgia as well as around the world, a new big wave of Covid infection started, which is connected to this first important mutation D614G.

In December 2020, several cases of 69-70 deletions in spike protein (B.1,1,10) were observed in the country that did not have other mutations of the S gene, characterizing the variant representing concern. However, the Alpha variant, the so-called British strain (B.1,1,7) was detected shortly, which started spreading intensively since February 2021 and in a short period of time practically completely replaced most of the SARS-COV-2 strains previously circulating in Georgia. This strain was characterized by a number of new mutations in the S gene sequence (del69-70, del144, N501Y, A570D, D614G, P681H, T716I, S982A, D1118H), which contributed to it's more intense and rapid transmission. For example, the N501Y mutation increased the ability of the virus to spread. According to the data published on the website of the British government, with the spread of the alpha variant, the reproductive index, hospitalization and, consequently, the lethality rates were expected to increase.

ThermoFisher-made PCR kit (TaqPath COVID-19 CE-IVD RT-PCR Kit) was actively used for primary screening of Alpha strains in Georgia, as a drop of the S gene from the three target genes (N, Orf-ab, S) in this kit indicated at the deletion of 69-70 amino acids in spike protein. Because of this feature, the Thermo kit played a crucial role in monitoring the spread of the alpha strain (which was characterized by 69-70 deletions) first and later of the Delta strain (which no longer had this deletion). Confirmation testing for Alpha strain was performed by PCR testing of N501Y mutation and complete sequencing of virus genome.

The first cases of Alpha strain in Georgia, which were imported from a neighboring country, were detected in late 2020. From mid-January 2021, a cluster of 6 cases related to travel to the UK was identified. The largest cluster that emerged since late January included 18 cases, one of which ended with lethal outcome. New clusters appeared soon, related to import of cases from overseas and then traveling within Georgia to Adjara, Imereti and Samegrelo. By March 2021, Alpha Strain was already fully dominant compared to the other variants.

A total of 113 genomes of the Alpha variant sequenced in the Lugar Center were uploaded to the GISAID database.

In addition, B.1,351 / beta, the so-called South African strain was detected in Georgia but did not spread further. The E484K mutation characteristic to this variant was inhibiting the neutralization of the virus by the antibodies.

In May 2021, Delta /so-called Indian Strain (B.1,617,2) appeared in Georgia. This "disturbing" variant was spreading even faster and had increased infectivity due to new mutations in the S gene sequence (L452R, D614G, P681R, ± (E484Q, Q107H, T19R, del 157 / 158, T478K, D950N).

For the initial screening of the Delta variant, a ThermoFisher-made PCR kit (TaqPath COVID-19 CE-IVD RT-PCR Kit) was still used, where drop of S gene allowed to distinguish between alpha and delta strains. Confirmation testing was performed by PCR testing of other specific mutations (L452R, P681R, E484Q, T478K) and complete genome sequencing of SARS-CoV-2 samples. The share of Delta strains was rapidly increasing and by August 2021 this variant was already fully dominant compared to all other strains circulating previously. The nomenclature of this variant was soon supplemented by the so-called Delta + (AY) variants with additional mutations (K417N, Y145H, A222V ...), which continued to spread in different countries with new combinations. As can be seen in the graphs below, the most common delta variants in Georgia were AY.121, AY.122 and AY.128. The latter strain AY.128 was first introduced to Georgia by an Egyptian citizen and this variant, according to data uploaded to GISAID, was being detected during the wave in a stable manner. It is interesting that this variant was not widely distributed in the world and only 901 of its sequences were uploaded to GISAID, of which 139 were from Georgia (sixth of the world's samples). Only Estonia was ahead of Georgia (178) by this absolute indicator, however, taking into account the number of samples sequenced by these countries and, accordingly, the percentage distribution of the data, this variant was most common in Georgia (Fig. XX). AY.121 variant was more widely spread and Syria, Georgia, Turkey and Israel were leading by the degree of prevalence. The AY.122 variant was the largest group and circulated in many more countries: the highest prevalence rates (according to the sequences uploaded to GISAID) were reported in Seychelles (83%), followed by Tunisia (56%), Armenia (53%), Russia (46%), Kazakhstan (41%), Moldova (35%), Ukraine (22%), Finland (21%), China (19%), Georgia (18%) and the other countries.

A total of 767 specimens of different delta strains were sequenced at the Lugar Center.

In mid-December 2021, the Omicron strain (B.1,1,529) appeared in Georgia. It has more than 30 mutations in the S protein, many of which were in previous variants and which have caused significant changes in the virus life cycle. Of these mutations, E484A, N501Y, S477N, and K417N are located in the RBD region of the virus and are responsible for enhancing the binding of the virus to the host cell's ACE receptor. This is so-called affinity, which in turn leads to the rapid penetration, multiplication and spread of the virus; mutations T547K, H655Y, N679K, and P681H also increase the virus's ability to spread, while mutations A67V, T95I, G142D are likely to help the virus escape from the antibody.

Due to the numerous mutations in the spike protein, the Omicron variant has become even more contagious and resistant to immunity, although, at the same time, these mutations have also reduced its virulence. It was the combinations of the above mutations that altered the mechanisms of virus invasion into the host cells, which also altered the disease clinic. Changes such as a decrease in the ability of a lung cell protein to bind to TMPRSS2, or an increase in affinity for the ACE2 protein (combination of N501Y and Q498R mutations is responsible), reduced the degree of lung cell damage and ultimately alleviated the disease. However, despite all of these, Omicron is not considered a "mild" clinical course virus because it can still cause serious illness, especially in unvaccinated individuals.

Table 28. List of Major Disturbing Variants (VOCs) and their Characteristic Mutations in the Spike Protein

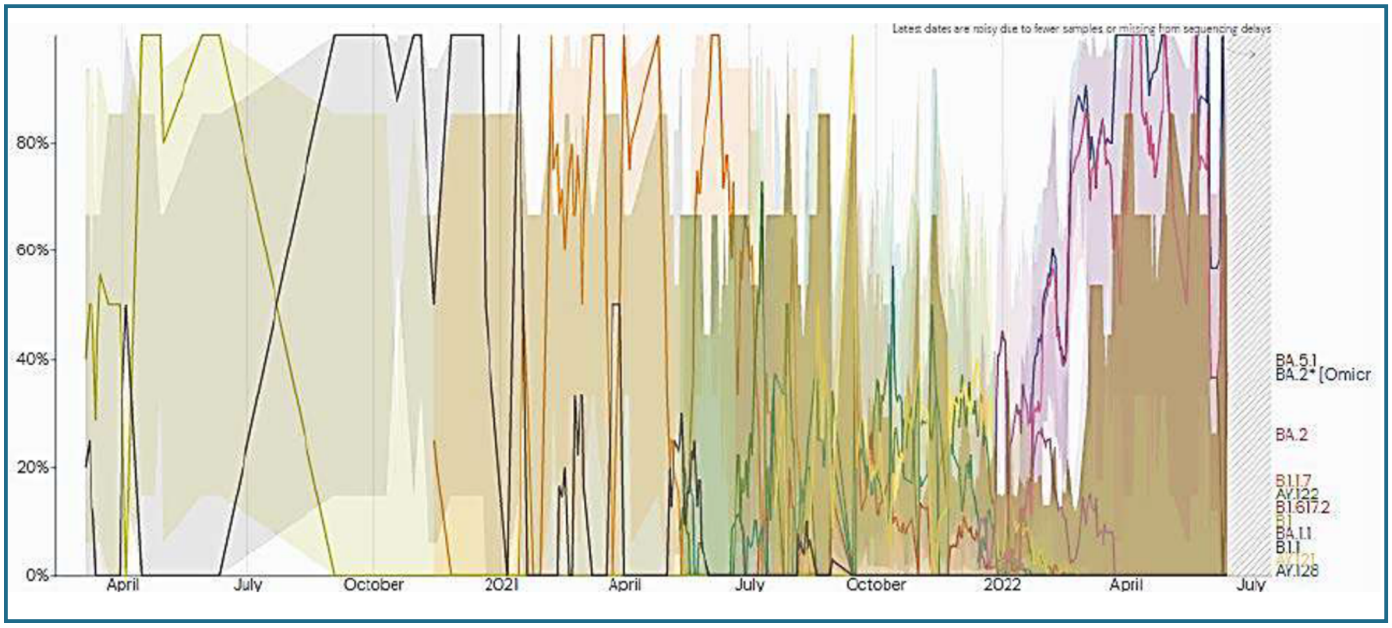
WHO / Pango Name	The first detection	Characteristic mutations in the Spike (S) protein
Alpha B.1.1.7	UK, Sep-2020	69 /70del, 144del, N501Y, A570D, D614G, P681H, T716I, S982A, D1118H
Beta B.1.351	South Africa, May-2020	D80A, D215G, 241 /243del (Del242, Del243, Del244), K417N, E484K, N501Y, D614G, A701V
Gamma P.1	Brazil, Nov-2020	L18F, T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, D614G H655Y, T1027I, V1176F
Delta B.1.617.2 +K417N	India, Oct-2020	L452R, D614G, P681R, ± (E484Q, Q107H, T19R, del 157 /158, T478K, D950N) +K417N
Omicron B.1.1.529 (BA.1; BA.2)	South Africa, Nov-2021	A67V, Δ69-70, T95I, G142D, Δ143-145, Δ211, L212I, ins214EPE, G339D, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493K, G496S, Q498R, N501Y, Y505H, T547K, D614G, H655Y, N679K, P681H, N764K, D796Y, N856K, Q954H, N969K, L981F
Omicron BA.4; BA.5	South Africa Jan-2022	Unlike the BA.2 variant: Δ69-70, L452R, F486V, Q493

ThermoFisher PCR kit (TaqPath COVID-19 CE-IVD RT-PCR Kit) was still used for the initial screening of Omicron in Georgia, drop of S gene from which was characteristic for Omicron BA.1 variant, indicating at deletion of 69-70 amino acids. However, the second variant of Omicron BA.2 was detected soon. Therefore, confirmatory testing is performed by PCR testing and subsequent sequencing of other specific mutations characteristic to Omicron (S371L / S373P; 67V-del69 / 70; ins214EPE; E484A, etc.).

The spread of the Omicron strain was growing rapidly since late 2021, and by the end of December, 144 laboratory-confirmed official cases were reported, while by the end of the third week of January, 90-95% of cases were caused by Omicron variants BA.1 and BA.2. Omicron showed an unprecedented spreading speed and practically replaced the previously circulating delta variant in a month, while it took 2-3 months the alpha and delta variants to do so. However, the BA.2 variant tended to spread much faster, accounting for half of the cases in just three weeks, and by March it had completely replaced the BA.1 variants. After a record number of cases in February and a quiet period in April-May, the BA.5 variant appeared in the country in early June, which became the main reason for the re-increasing trend of cases.

The figures below show the dynamics of the frequently detected variants of SARS-COV-2 in Georgia during the pandemic based on data uploaded to GISAID. B variant appeared first which is the first variant of the SARS-CoV-2 virus discovered in the world and is one of the initial two haplotypes. From the end of 2020, the alpha variant dominated, which was replaced by the delta /delta plus variants that reached the peak rate at different times, one after another, - first AY.122, then AY.121 and finally AY.128. Starting from 2022, the rapid spread of Omicron variants began.

Figure 69. Dynamics of the percentage spread of the most common variant in Georgian sequences during the pandemic23



As of July 5, 2022, 2 021 sequences of the SARS-CoV-2 variant prevalent in Georgia were uploaded to the GISAID database. As can be seen in the table, 89 variants of SARS-CoV-2 have been spread in Georgia so far. The number of sequences uploaded during the last year was 95,8% of the total number of sequences uploaded during the pandemic. The number and spectrum of SARS-CoV-2 variants is changing as a result of analysis of newly uploaded samples. Due to constant updating, the number and nomenclature of previously uploaded and classified options also changes. For example, within a few weeks of uploading five samples of the Omicron subvariant under the WHO nomenclature, the pangolin algorithm could not be assigned to any of the Pango lineages, and later they were grouped into variants under the new classification. And due to the emergence of new sub-groups of Delta, several options have completely disappeared from the list of Georgian options.

[23] *The graph is obtained according to GISAID data on the site https://outbreak.info/*

Table 29. Distribution of SARS-COV-2 Variants in Georgia by Variant Circulation Period and Subgroups, based on Sequences uploaded to the GISAID Database (as of July 5, 2022)

#	WHO nomenclature	Pango nomenclature	Quantity	Date of first appearance	Last detection date	Duration (days)
1	Wuhan option	B	5	27 /02 /20	11 /03 /20	13
2	Other	B.1	15	05 /03 /20	11 /06 /20	98
3	Other	B.1.1	48	05 /03 /20	31 /08 /21	544
4	Other	A.2	1	08 /03 /20	08 /03 /20	1
5	Other	B.1.91	2	13 /03 /20	22 /03 /20	9
6	Other	B.4	5	22 /03 /20	01 /05 /20	40
7	Other	B.1.1.174	1	18 /10 /20	18 /10 /20	1
8	Alpha	B.1.1.7	116	14 /11 /20	31 /08 /21	290
9	Other	B.1.1.10	4	21 /12 /20	06 /01 /21	16
10	Other	B.1.1.141	13	21 /01 /21	10 /06 /21	140
11	Zeta	P.2	1	21 /01 /21	21 /01 /21	1
12	Other	B.1.258	1	17 /02 /21	17 /02 /21	1
13	Other	B.1.1.163	2	19 /03 /21	02 /05 /21	44
14	Other	C.36	3	01 /05 /21	16 /05 /21	15
15	iota	B.1.526	1	05 /05 /21	05 /05 /21	1
16	Alpha	Q.4	5	07 /05 /21	15 /07 /21	69
17	Delta	AY.75	1	11 /05 /21	11 /05 /21	1
18	Delta	AY.122	229	12 /05 /21	31 /01 /22	264
19	Other	B.1.177.86	1	12 /05 /21	12 /05 /21	1
20	Other	B.1.1.419	2	13 /05 /21	25 /05 /21	12
21	Delta	AY.128	139	15 /05 /21	15 /01 /22	245
22	Beta	B.1.351	1	23 /05 /21	23 /05 /21	1
23	Delta	B.1.617.2	94	12 /06 /21	08 /02 /22	241
24	Delta	AY.100	1	28 /06 /21	28 /06 /21	1
25	Delta	AY.4	3	02 /07 /21	13 /12 /21	164
26	Delta	AY.1	17	05 /07 /21	17 /10 /21	104
27	Delta	AY.45	2	11 /07 /21	11 /07 /21	1
28	Delta	AY.121	215	20 /07 /21	18 /02 /22	213
29	Delta	AY.9.2	2	07 /08 /21	09 /12 /21	124
30	Delta	AY.112	2	09 /08 /21	31 /08 /21	22

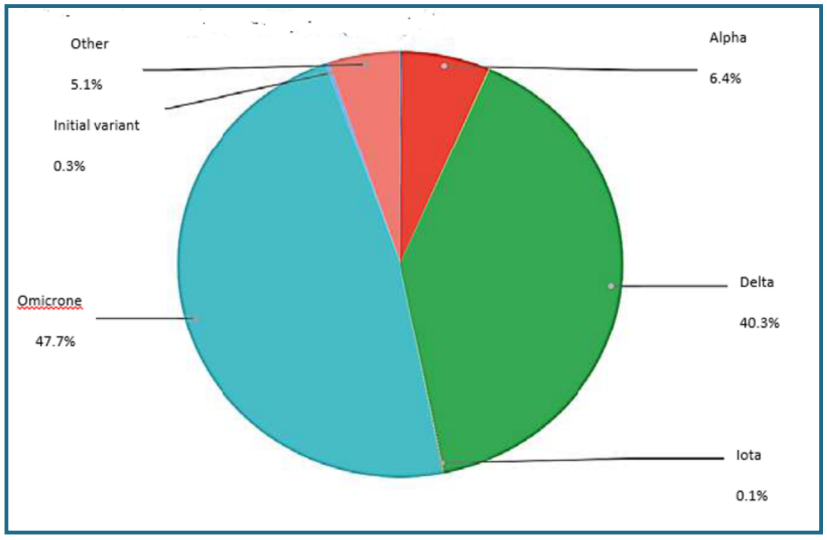
31	Delta	AY.32	2	09 /08 /21	21 /12 /21	134
32	Delta	AY.126	10	20 /08 /21	14 /01 /22	147
33	Delta	AY.129	1	29 /08 /21	29 /08 /21	1
34	Delta	AY.46	5	21 /09 /21	27 /11 /21	67
35	Delta	AY.4.6	2	25 /09 /21	06 /10 /21	11
36	Delta	AY.125	12	01 /10 /21	28 /12 /21	88
37	Delta	AY.33	4	01 /10 /21	26 /11 /21	56
38	Delta	AY.109	1	03 /10 /21	03 /10 /21	1
39	Delta	AY.107	2	06 /10 /21	15 /12 /21	70
40	Delta	AY.39	2	06 /10 /21	06 /10 /21	1
41	Delta	AY.127	1	15 /10 /21	15 /10 /21	1
42	Delta	AY.17	1	15 /10 /21	15 /10 /21	1
43	Delta	AY.37	2	15 /10 /21	22 /10 /21	7
44	Delta	AY.42	3	15 /10 /21	27 /11 /21	43
45	Delta	AY.86	5	15 /10 /21	09 /12 /21	55
46	Delta	AY.106	1	11 /11 /21	11 /11 /21	1
47	Delta	AY.43	5	16 /11 /21	10 /01 /22	55
48	Delta	AY.92	1	16 /11 /21	16 /11 /21	1
49	Delta	AY.131	1	27 /11 /21	27 /11 /21	1
50	Delta	AY.43.8	1	11 /12 /21	11 /12 /21	1
51	Omicron	BA.1.1	204	14 /12 /21	17 /03 /22	93
52	Omicron	BA.1	81	15 /12 /21	09 /03 /22	84
53	Omicron	BA.1.17	23	15 /12 /21	18 /02 /22	65
54	Omicron	BA.1.17.2	61	15 /12 /21	10 /02 /22	57
55	Omicron	BA.1.15	7	16 /12 /21	06 /01 /22	21
56	Omicron	BA.1.14	2	19 /12 /21	21 /12 /21	2
57	Omicron	BA.1.18	10	21 /12 /21	17 /02 /22	58
58	Omicron	BA.1.1.1	26	22 /12 /21	22 /02 /22	62
59	Omicron	BA.1.19	2	25 /12 /21	09 /01 /22	15
60	Omicron	BA.1.13	2	28 /12 /21	04 /01 /22	7
61	Omicron	BA.2	466	28 /12 /21	20 /05 /22	143
62	Omicron	BA.1.1.11	4	06 /01 /22	19 /02 /22	44
63	Omicron	B.1.1.529	8	15 /01 /22	17 /02 /22	33
64	Omicron	BA.2.38	3	15 /01 /22	12 /02 /22	28
65	Omicron	BA.2.3	26	17 /01 /22	22 /06 /22	156
66	Omicron	BA.2.3.2	2	18 /01 /22	10 /02 /22	23
67	Omicron	BA.2.10	2	24 /01 /22	04 /02 /22	11
68	Omicron	BA.2.36	2	28 /01 /22	26 /06 /22	149
69	Omicron	BA.1.1.7	1	02 /02 /22	02 /02 /22	1

** Complete immunization between primary infection and re-infection.*

70	Omicron	BA.2.1	3	10 /02 /22	13 /04 /22	62
71	Omicron	BA.2.51	5	10 /02 /22	19 /02 /22	9
72	Omicron	BA.2.9	8	20 /02 /22	02 /06 /22	102
73	Omicron	BA.2.25	1	20 /04 /22	20 /04 /22	1
74	Omicron	BA.1.1.14	1	24 /05 /22	24 /05 /22	1
75	Omicron	BA.2.12.1	10	01 /06 /22	02 /07 /22	31
76	Omicron	BA.2.41	2	01 /06 /22	01 /06 /22	1
77	Omicron (BA.5)	BA.5.1	16	01 /06 /22	16 /06 /22	15
78	Omicron (BA.5)	BA.5.2.1	10	02 /06 /22	03 /07 /22	31
79	Omicron (BA.5)	BA.5.2	16	08 /06 /22	03 /07 /22	25
80	Omicron	BA.2.40.1	1	11 /06 /22	11 /06 /22	1
81	Omicron (BA.5)	BA.5.6	3	13 /06 /22	30 /06 /22	17
82	Omicron	BA.4	3	14 /06 /22	25 /06 /22	11
83	Omicron (BA.5)	BE.1.1	4	16 /06 /22	01 /07 /22	15
84	Omicron	BA.4.1	4	20 /06 /22	27 /06 /22	7
85	Omicron (BA.5)	BA.5.1.2	1	23 /06 /22	23 /06 /22	1
86	Omicron (BA.5)	BF.5	3	26 /06 /22	04 /07 /22	8
87	Omicron (BA.5)	BE.1	1	27 /06 /22	27 /06 /22	1
88	Omicron (BA.5)	BF.1	2	27 /06 /22	30 /06 /22	3
89	Omicron (BA.5)	BA.5.5	1	30 /06 /22	30 /06 /22	1

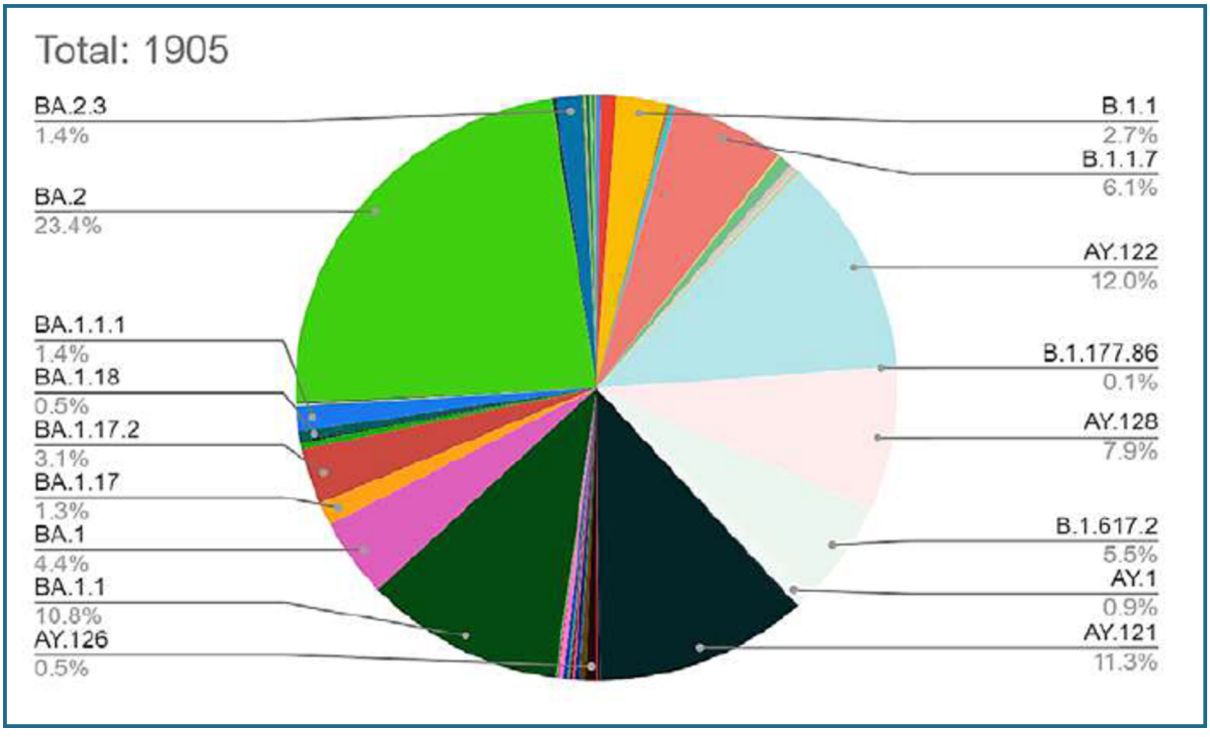
The distribution of common variants in Georgia is shown on Figure 70. According to the pie chart, omicron variants predominate in the uploaded sequences (47,7%), which is followed by the delta variant (40,3 %). 6,4% of the sequences belong to the alpha variant. One case each of beta, zeta, and iota variants was reported.

Figure 70. Percentage Distribution of SARS-CoV-2 Variants in Sequences Uploaded to GISAID according to WHO Nomenclature



The percentage distribution of SARS-CoV-2 variants in the samples sequenced in Georgia according to the Pango nomenclature is shown on Figure 71. As can be seen on the diagram, there are a total of 7 variants accounting for more than 5% of the sequences. Among the sequences uploaded to GISAID, BA.2 (Omicron) is the most numerous (23,4 %). It is followed by Delta subvariants AY.122 (12,0 %) and AY.121 (11,3 %). The next is again the Omicron subvariant BA.1,1 (10,8%), followed by Delta AY.128 (7,9%), Alpha initial variant B.1,1,7 (6,1%) and Delta initial variant B.1,617,2 (5,5 %). Together, these 7 variants represent 76,9% of the samples sequenced in Georgia throughout the pandemic. It must be taken into account that these data cannot be interpreted in connection with the distribution of the number of infected people during the pandemic. The algorithm for preparation of samples for sequencing and processing data was gradually refined so that during the last wave it was possible to work with the highest capacity. Therefore, it is not surprising that the Omicron variants dominate among the uploaded samples.

Figure 71. Distribution (%) of SARS-CoV-2 Variants in Sequences Uploaded to GISAID according to Pango Nomenclature



According to the available data, the longest-circulating variant in Georgia is B.1,1 (544 days with sequencing between the first and last confirmation), followed by the British B.1,1,7 (290 days), AY. 122 (264 days), AY. 128 (245 days), Delta B.1,617,2 (241 days) and AY.121 (213 days). In case of other options, the period between detections is less than 200 days. With the help of the GISAID tool Audacity, it is possible to observe the distribution of the samples sequenced in Georgia on the global phylogenetic tree. Georgian sequences (in pink on the Figure) are distributed throughout the tree. This indicates that Georgia has gone through all stages of the pandemic along with the rest of the world, and also highlights the effectiveness of sequencing to determine the diversity of variants prevalent in Georgia.

Figure 72. Distribution of Georgian Sequences against a Global Phylogeny. Georgian samples are shown in pink, others in gray

Out of the 5 variants declared as VOC by WHO, the gamma variant was not detected in Georgia. Only imported case of the beta variant was recorded, which was not transmitted to other persons. The three variants of concern remaining after the original Wuhan variants have disappeared—Alpha, Delta, and Omicron—are the primary variants prevalent in Georgia throughout the pandemic. In total, 94,4% of the samples sequenced in Georgia are represented by these three variants.

Lugar Center continues to systematically monitor the variants prevalent in the country in order to detect possible new mutations and variants in a timely manner. The obtained results are added to the international database, which is of great service to the surveillance of the COVID-19 epidemic and monitoring of new variants' emergence in the world.

VARIOUS STUDIES RELATED TO COVID_19

The National Center for Disease Control conducted several prevalence studies in conjunction with routine epidemiological surveillance to monitor the spread of COVID-19 in the country:

- In the period of May 22-26, 2020, a survey of current seroprevalence was conducted in two selected municipalities (Telavi and Bolnisi) of two regions of Georgia, Kvemo Kartli and Kakheti, with similar demographic parameters. 15 clusters identified by random sampling were studied within each municipality. A total seroprevalence survey included 30 clusters, with 300 individuals surveyed. A rapid coronavirus antibody test was used in the study. The type of sample used in the study was capillary blood.

  During the study, positive results against SARS-CoV-2 antibodies (IgM, IgG) were observed in 2 cases, both of them were Bolnisi residents. The current seroprevalence study showed that in those municipalities where the surveillance system did not register a COVID-19 case at the time of the study, no positive antibody (IgM and / or IgG) results were detected. The share of positive cases in Bolnisi Municipality was 1,3% (2 /150) and 0% in Telavi Municipality. The overall share of positive cases across the study was 0,67%.

- On August 17-25, 2020, under the auspices of WHO, a seroprevalence survey was conducted in 4 municipalities of Georgia (Khelvachauri, Martvili, Borjomi, and Kobuleti). Elecsys AntiSARS-CoV-2 Electrochemiluminescent Immunoassay (ECLIA) was used in the study. The sample type was Blood / Plasma.

  1 222 persons were interviewed and 1 222 samples were collected (Khelvachauri - 305, Martvili - 302, Borjomi - 311, Kobuleti - 304), of which the presence of human SARS-CoV-2 antibodies (in Martvili resident) was confirmed in only one. The positivity rate within the study was 0,08%.

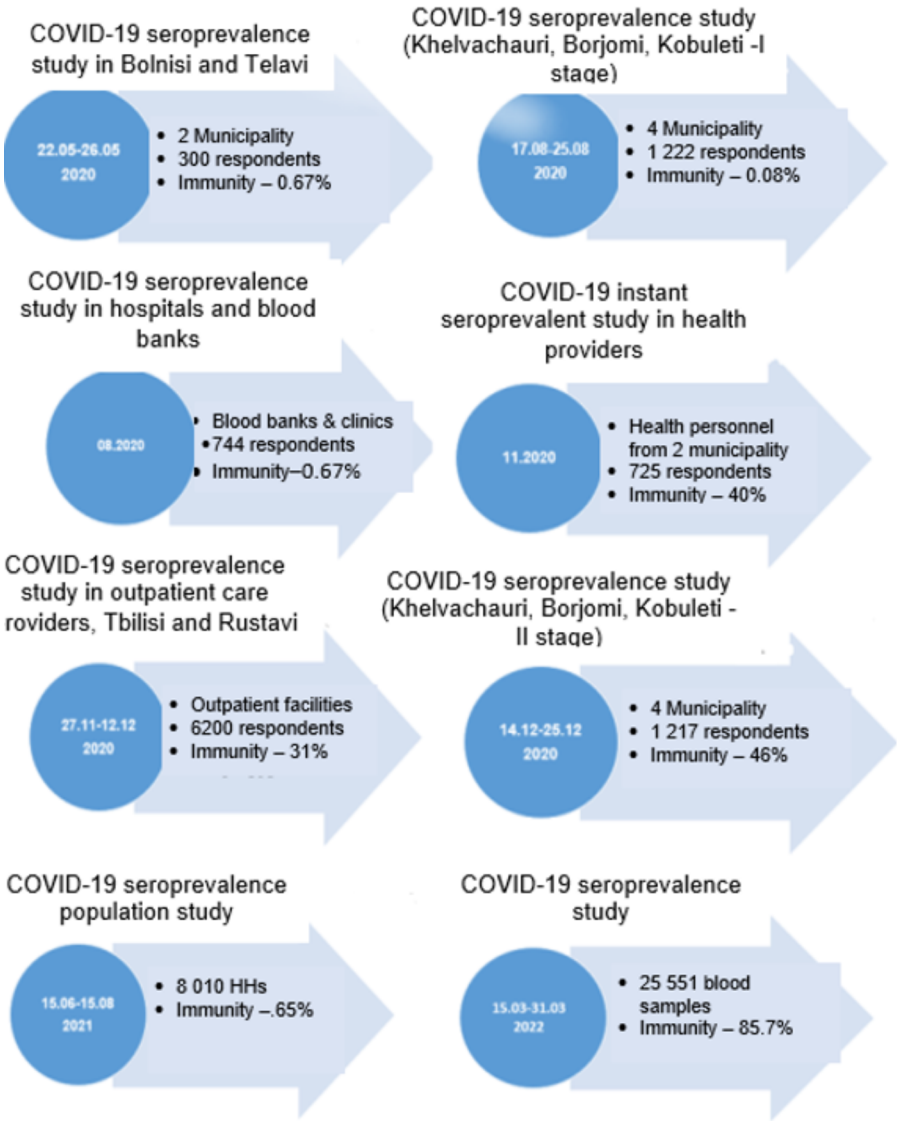
- A seroprevalence study was conducted in August 2020, which included serological examination of blood samples taken from patients and donors in hospitals and blood banks. The number of samples from each facility was tested according to predetermined sample size. The study examined 744 blood samples from blood banks and hospitals across the country, five of which identified IgG antibodies to SARS-CoV-2. The positivity rate within the study was 0,67% (5 /744).

- In the first half of November 2020, instant seroprevalence survey among medical service providers was conducted on the basis of COVID clinics, fever centers and on-site emergency coordination centers in Adjara and Imereti regions. 725 medical staff were involved in the study across both regions. Laboratory test method: Elecsys AntiSARS-CoV-2 Electrochemiluminescent immunoassay (ECLIA) method. Sample type Venous blood / plasma. The proportion of positive cases for total antibodies was 40% (290 /725).

- From November 27 to December 12, 2020 - a survey of seroprevalence was conducted in the outpatient service providers of the cities - Tbilisi and Rustavi. 10 institutions in Tbilisi and 5 institutions in Rustavi participated in the study. 6 200 individuals were included in the seroprevalence survey. The study involved interviewing each person with a standard questionnaire and sampling for laboratory research. Sample type: blood / plasma). Laboratory tests confirmed the presence of human SARS-CoV-2 total antibodies in 31,5% of the samples collected in Tbilisi institutions and in 30,7% of the samples taken from Rustavi institutions.

- On December 14 - 25, 2020, under the auspices of WHO, the second phase of the Seroprevalence Survey was conducted in the 4 municipalities of Georgia (Khelvachauri, Martvili, Borjomi and Kobuleti), where the first phase was conducted in August 2020. Elecsys AntiSARS-CoV-2 Electrochemiluminescent Immunoassay (ECLIA) was used in the laboratory study. Sample type was venous blood / plasma. A total of 1 217 people were involved in the study. Laboratory research of samples collected during the research (in Khelvachauri municipality, in 43,6% of those surveyed, in Martvili municipality - 46,3%, in Borjomi municipality - 46,5%and in Kobuleti municipality) confirmed presence of total antibodies SARS-CoV-2.

Figure 73. Several COVID-19 Prevalence Studies, Georgia



Seroprevalence studies conducted in the dynamics reflect the epidemiological picture in the country and show the trend of increasing prevalence since the beginning of the epidemic. In addition to the above-mentioned seroprevalence studies, an instantaneous prevalence study was conducted in September 2020 in Tbilisi within the framework of the State Program for the Management of New Coronavirus COVID-19 to determine the circulation intensity of the SARS-CoV-2 virus. Voluntary PCR testing of citizens was performed as part of the study. 974 persons were involved in it, from whom a nasopharyngeal smear was taken. 0,62% (6 /974) of the samples tested positive for SARS-CoV-2 via laboratory PCR testing.

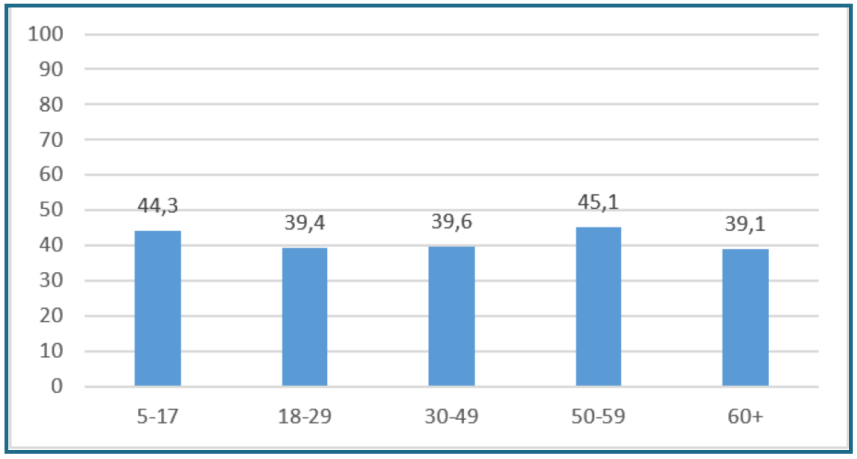
POPULATION SURVEY OF COVID-19 SEROPREVALENCE IN GEORGIA

During June-August 2021, the National Center for Disease Control and Public Health, with funding and technical assistance from the United States Centers for Disease Control and Expert Assistance, conducted a nationwide survey of stratified, multistage cluster systematic sampling of COVID-19, C and B hepatitis in population to determine the prevalence. By means of a standardized questionnaire demographic, clinical, epidemiological, and infection prevention and control information was collected. 8 010 households participated in the survey (8 711 persons: 3 109 males and 5 602 females). Data analysis was performed in two main age groups: children within the 5-17-year age range (total 1 473) and adults aged ≥18 (total 7 238).

The study found that antibodies to COVID-19 were detected during this period: 41,1% in the general population (95% CI: 39,4-42,8), 44,3% in children (95% CI: 40,6-48), and 40,3% (95% CI: 38,4-42,3) - in adults.

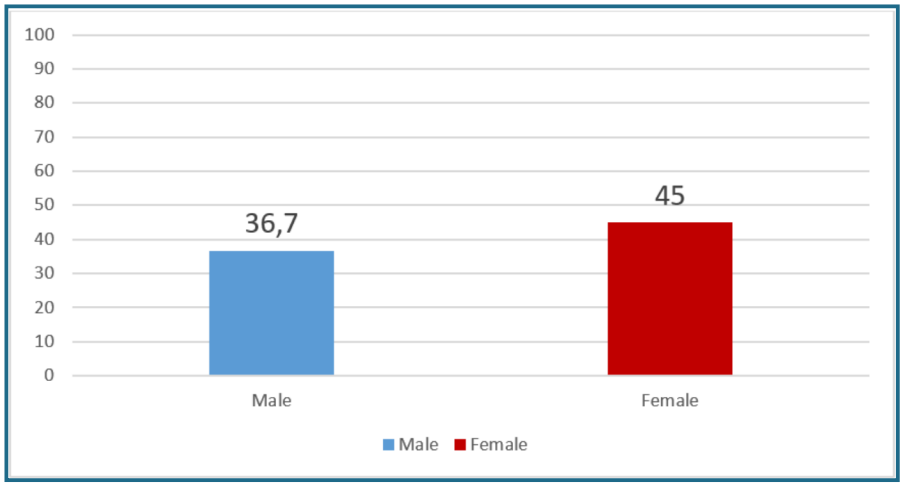
In addition, seroprevalence was found in the following age groups: 18-29 years - 39,4% (95% CI: 35,1-43,9); 30-49 years - 39,6% (95% CI: 36,8-42,5); 50-59 age group - 45,1% (95% CI: 41,6-48,7) and 60+ age group - 39,1% (95% CI: 36,3-42,1). Based on these numbers, it can be seen that the highest prevalence 45,1% was identified in the 50-59 -year age group.

Figure 74. COVID-19 Seroprevalence (%) by Age Groups in Georgia (June – August 2021)



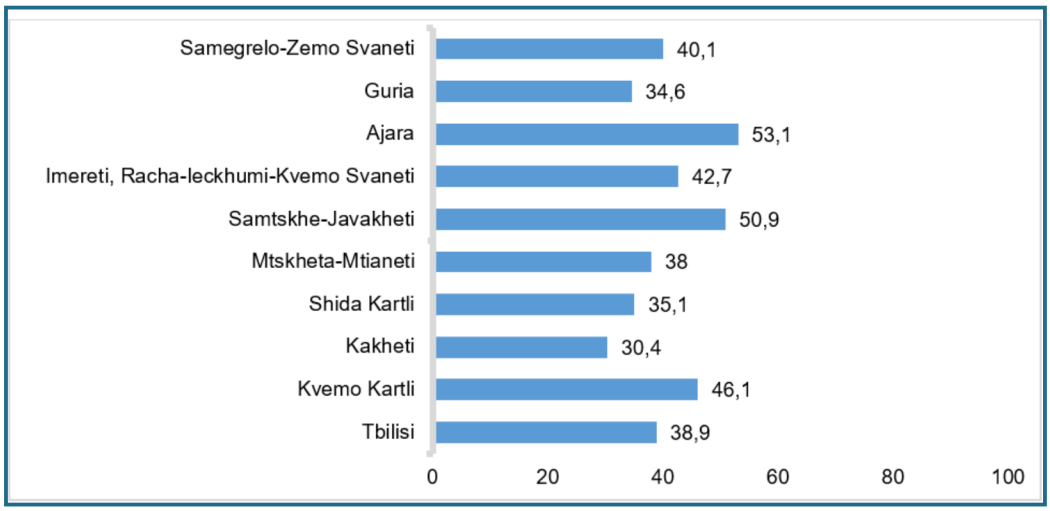
Seroprevalence by gender was 36,7% in males (95% CI: 34,3-39,3) and 45% in females (95% CI: 43-47,1).

Figure 75. COVID-19 Seroprevalence (%) by Gender in Georgia (June – August, 2021)



The following results were obtained by regions: Tbilisi - 38,9% (95% CI: 35,5-42,4); Shida Kartli - 35,1% (95% CI: 30,6-39,9); Mtskheta-Mtianeti - 38% (95% CI: 32,7-43,6); Kvemo Kartli - 46,1% (95% CI: 40,5- 51,8); Samtskhe-Javakheti - 50,9% (95% CI: 45,3-56,6); Kakheti - 30,4% (95% CI: 25,6-35,6); Guria - 34,6% (95% CI: 30,1-39,3); Samegrelo-Zemo Svaneti - 40,1% (95% CI: 34,5-46,1); Imereti, Racha Lechkhumi and Kvemo Svaneti - 42,7% (95% CI: 38,6-46,9) and Adjara - 53,1% (95% CI: 47,3-58,7).

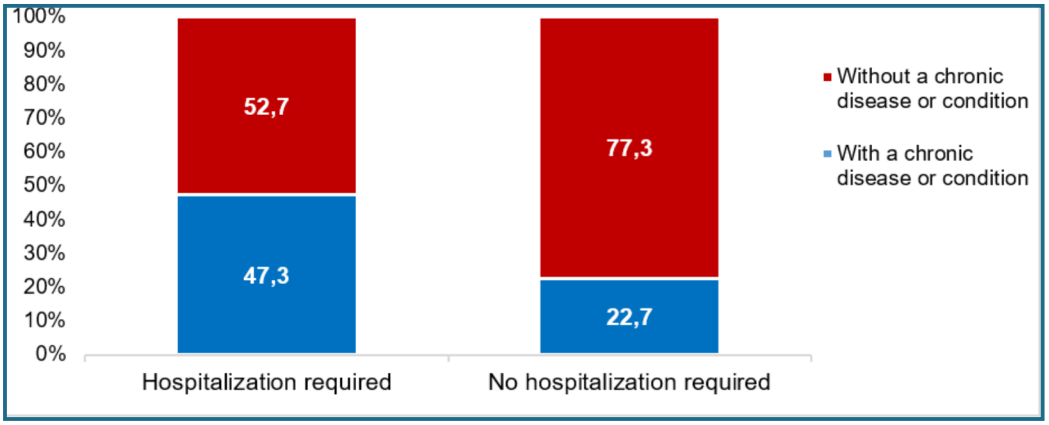
Figure 76. COVID-19 Seroprevalence (%) by Region (June - August, 2021)



6,4% of participants (95% CI: 5,5-7,4) said they had been vaccinated with the COVID-19 vaccine at least once at the time of the study. Serological examination revealed that 74,9% of those vaccinated (95% CI: 69,6- 79,6) had COVID-19-specific antibodies (including those vaccinated only once at that time).

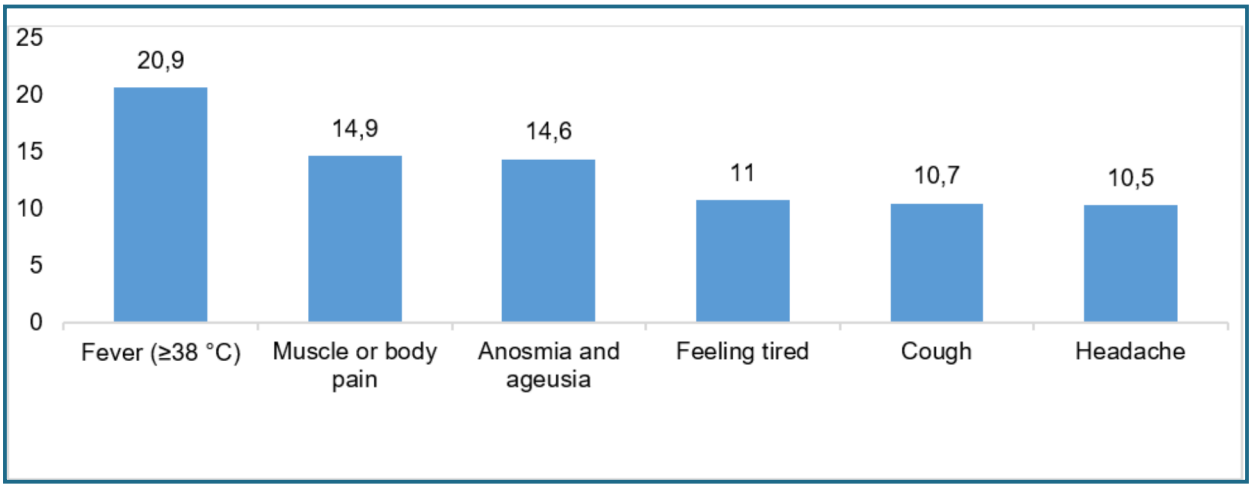
35% of the study participants (2 799 individuals) (95% CI: 33,2-36,8) reported having symptoms characteristic of COVID-19 at various points in time since the onset of the pandemic. 274 persons - 34% (95% CI: 28,5-40,2) required hospitalization for these symptoms and 142 of them - 47,3% (95% CI: 39,7-55,1) had one or more chronic diseases or conditions.

Figure 77. Percentage Distribution of Chronic Disease or Condition according to Survey by Hospitalization Status (June-August 2021)



1 The most common were the following 6 symptoms:
2 Fever (≥38 ° C) - 20,9% (19,5-22,2);
3 Muscle or body pain -14,9% (95% CI: 13,7-16,2);
4 Anosmia and ageusia - 14,6% (95% CI: 13,4-15,9);
5 Feeling of fatigue -11% (95% CI: 9,9-12,1);
6 Cough - 10,7% (95% CI: 9,8-11,7);
7 Headache - 10,5% (95% CI: 9,3-11,9).

Figure 78. The 6 most common symptoms of COVID-19 according to the survey (June-August 2021)



The seroprevalence survey made it possible to study the COVID-19-related situation in the country in more detail and to plan for future prospects and activities in this area.

SPECIAL RESEARCH COHORT, NOVEMBER-DECEMBER 2020, GEORGIA

The highest number of cases in the country in 2020 since the start of the pandemic was recorded during the second wave when 98 616 new cases were detected in November and 89 067 in December. Due to the sharp increase in the number of people infected with SARS-COV-2, case-based oversight was suspended. Therefore, to assess the epidemiological status of COVID-19, 1 307 laboratory-confirmed COVID-19 cases were selected across the country in November and December 2020 through random sampling, and a retrospective study of these cases was performed. A telephone interview was conducted with each of them using standard questionnaires.

Of the infected patients, 551 (42,2%) were male and 756 (57,8%) were female. The average age was 41 years. The minimum age was 1 month and the maximum 98 years.

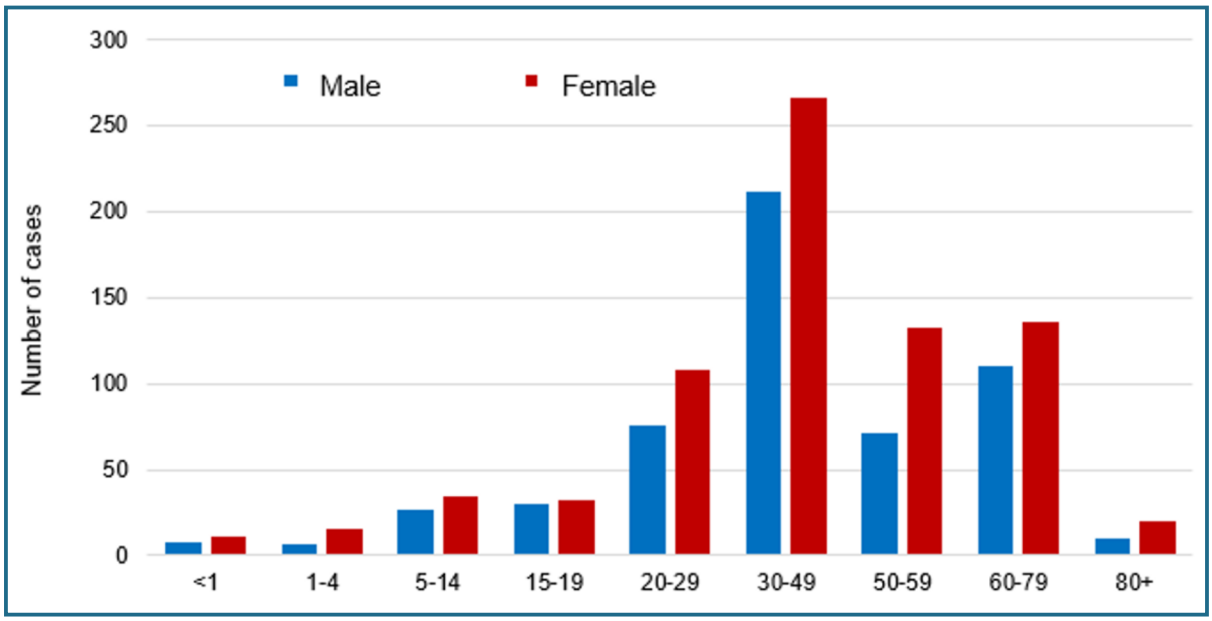
In the study cohort, laboratory testing on COVID-19 was self-administered in 48,1% of cases, 44,9% of the infected had contact with a confirmed case, 2,9% were detected through routine testing, and planned testing of risk groups revealed 2,1% of COVID-19 cases. The asymptomatic course was reported in only 4,7% of cases and 5 deaths were registered.

Table 30. Characteristics of the study participants, special study cohort (random sample n = 1 307), November-December 2020, Georgia

Patient characteristics	n=1,307
Age, median (range), age	41 (1 month - 98 years)
Male	551 (42.2%)
Reason for laboratory testing	
Revealed at the border checkpoint	1 (0.1%)
Revealed by routine testing	38 (2.9%)
Revealed during scheduled testing	28 (2.1%)
Spontaneous appeal	628 (48.1%)
Contact with the case	587 (44.9%)
Other	25 (1.9%)
Asymptomatic course	62 (4.7%)
Death	5 cases

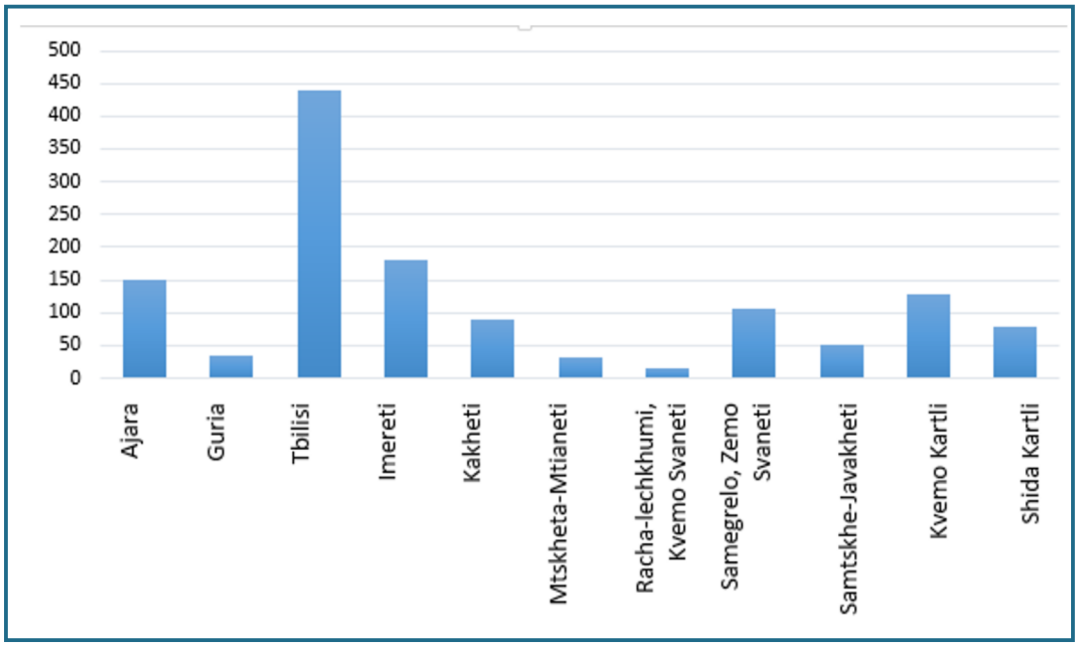
Most detected cases were above the age of 20, especially in the 30 – 49-year age range group. The number of infected women in all age categories exceeded the number of men.

Figure 79. Distribution of COVID-19 cases by Gender and Age Groups, Special Study Cohort (random sample n = 1 307), November-December 2020, Georgia



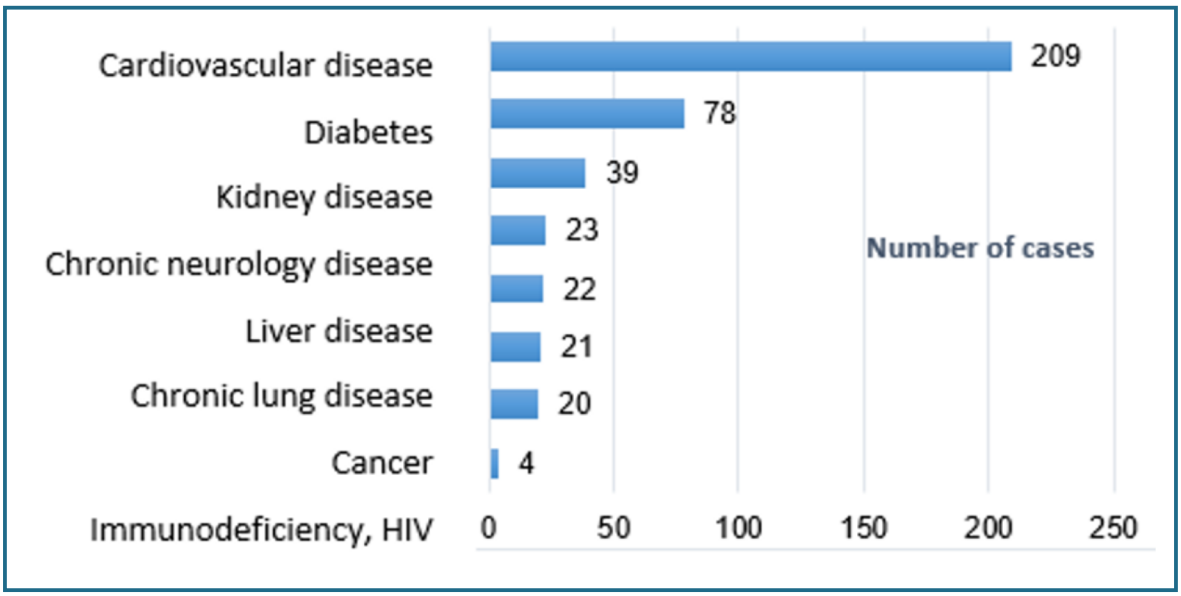
Cases of COVID-19 were randomly selected from all regions of Georgia. Out of 1 307 cases, 440 cases were selected from Tbilisi, 181 cases from Imereti, 149 cases from Adjara, and the rest from other regions.

Figure 80. Number of COVID-19 cases by region, Special Study Cohort (random sampling n = 1 307), November-December 2020, Georgia



Of the studied COVID-19 cases, 209 (16%) had cardiovascular disease, 78 (6%) diabetes, 39 (3%) kidney disease, and 4 (0,3%) immunodeficiency.

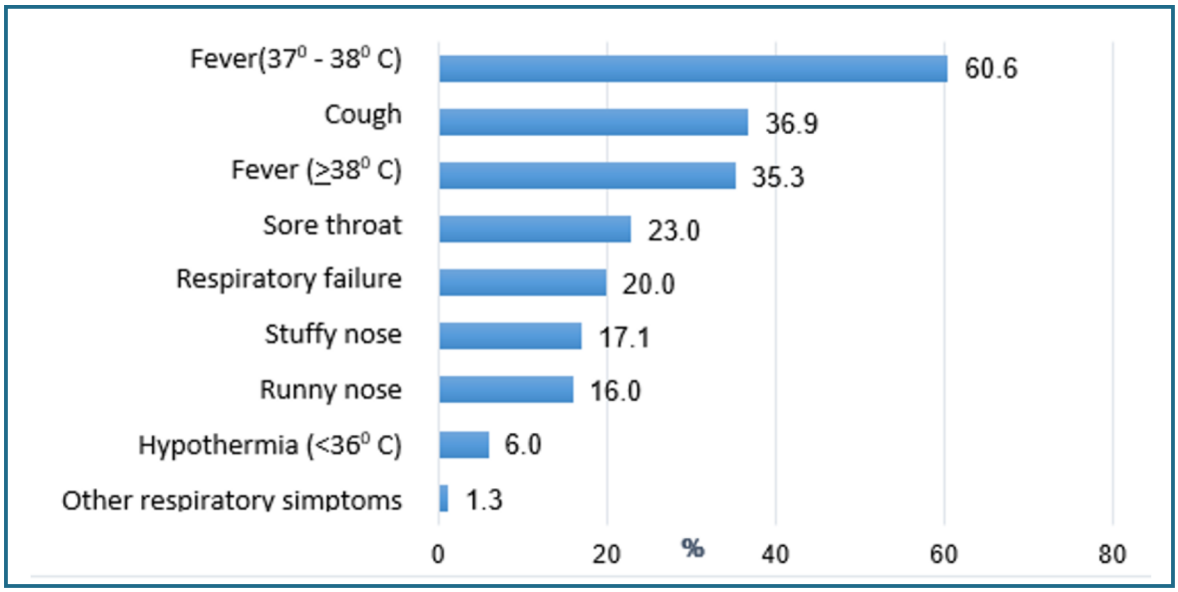
Figure 81. Co-morbidities of COVID-19 cases, Special Study Cohort (random sample n = 1 307), November-December 2020, Georgia



Clinical signs showed in 60,6% of cases was the fever of 37-38 °C, the temperature of ≥38 ° C was observed in 35,3% of cases and 37% showed cough. Nearly a quarter of those infected had a sore throat and a fifth developed respiratory failure.

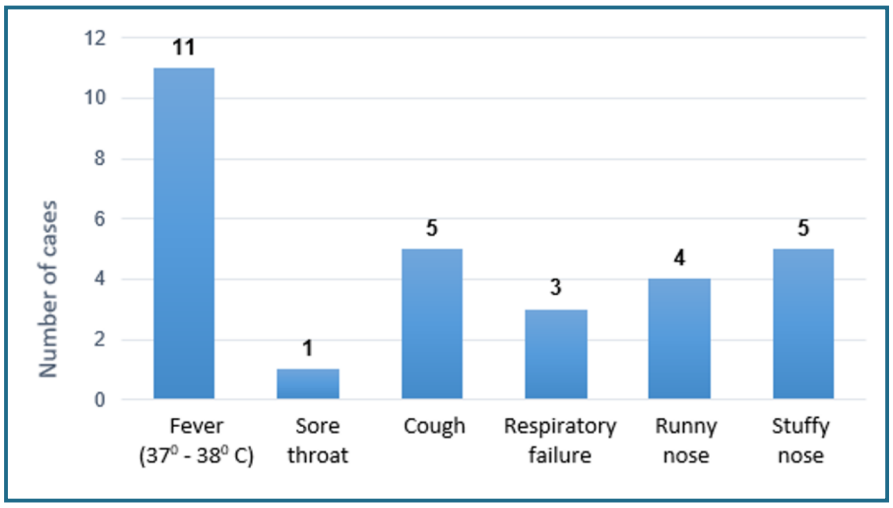
Pneumonia developed in 183 patients, oxygen supply became necessary in 102 patients, and artificial ventilation of lungs in 16 cases. The average score for lung damage was 7,97.

Figure 82. Symptoms Observed in SARS-COV-2 infected patients, Special Study Cohort (Random Sampling n=1 307), November – December 2020, Georgia



From the above cases, 15 infected pregnant women were identified. 6 of them were infected in the first trimester of pregnancy, 2 - in the second, and 7 - in the third. The disease was mainly symptomatic in pregnant women, only 1 case was asymptomatic. 4 pregnant women required hospitalization, but none of them developed pneumonia and did not need intensive therapy.

Figure 83. Main COVID-19 Symptoms Detected in Pregnant Women Infected with SARS-COV-2, special study cohort (random sampling n = 15), November-December 2020, Georgia



Overall 783 patients applied to the medical institution (hospital), which was 59,9% of the total number. Of these, 216 (27,6%) patients required hospitalization, and 58 (7,41%) patients were placed in intensive care. The average number of days for a patient stay in the intensive care unit was 8,5.

It should be noted that Tbilisi had the highest number of clinic referrals, where 308 (70%) out of 440 surveyed cases referred to the medical institution, 77 (77 /440; 17%) required hospitalization, and 24 (5,5%) patients underwent intensive therapy.

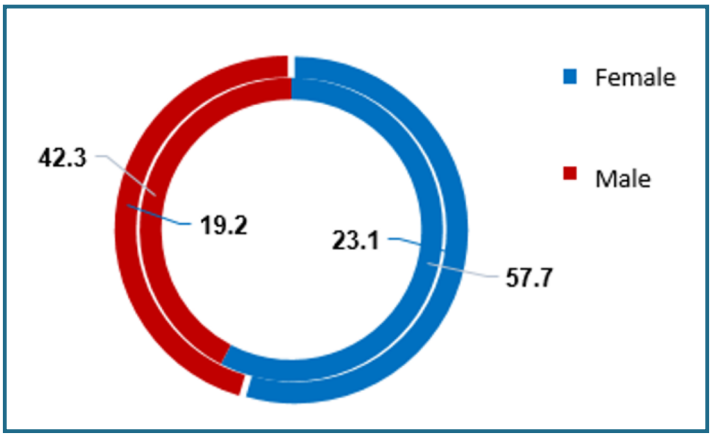
INVESTIGATION OF THE FIRST FEW X CASES AND CONTACTS OF COVID-19 USING GO.DATA SOFTWARE

One of the first clusters was selected for the study of the first few X cases of COVID-19 in Georgia (The First Few X Study - FFX) and its contacts. Case #X was defined as an index case and oversight was exercised over its close contacts. The Index case was studied and its 26 close contacts were examined, with whom, during the first and subsequent 14-21 days provided for in the Protocol, a telephone interview was conducted through standard questionnaires developed by the World Health Organization. At the same time, a nasopharyngeal smear PCR study was performed, while data entry and processing were performed in Go.Data, a software tool used to investigate cases and find contacts.

The index case was a 44-year-old male patient who was diagnosed with COVID-19 infection after returning to Georgia from a trip abroad. He had a high fever, diarrhea, and joint pain, and later developed pneumonia.

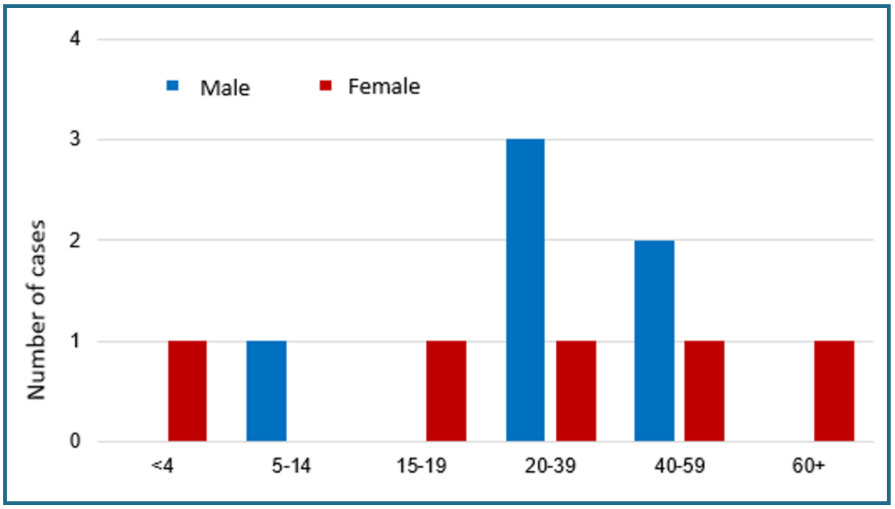
Of the 26 contacts in the index case, 11 (42,3%) were males and 15 (57,7%) were females. 5 (19,2%) of the positive contacts were males and 6 (23,1%) were females.

Figure 84. Distribution of all close and positive contacts in the index case by gender (%), FFX Survey, Georgia



The minimum age for positive contacts was 2 years, and the maximum - 65, for median and moda 36 years. Most of the positive cases were detected in the age group of 20-59 years, where the number of male cases exceeded the number of female patients.

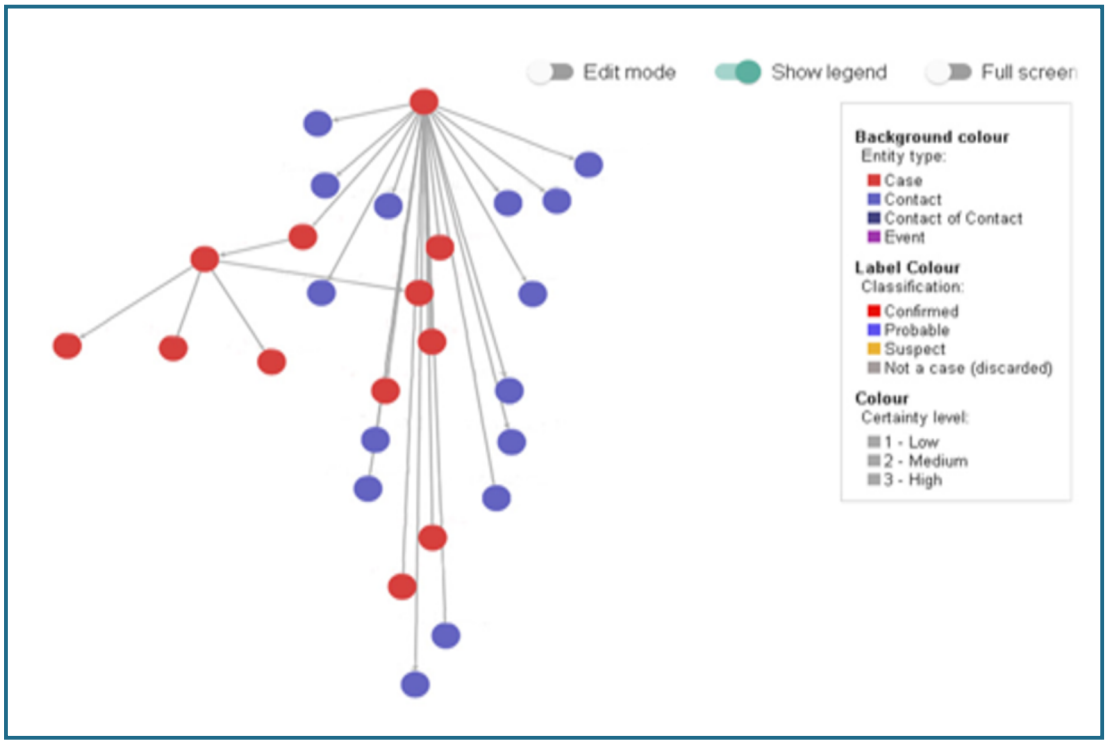
Figure 85. Distribution of COVID-19 Cases by Gender and Age Groups, FFX Study, Georgia



Number of days from contact of positive cases with the index case was ranging from 3 to 5 days with average of 3,7 days, while the duration of contact with the index case was ranging from 15 minutes to 300 minutes.

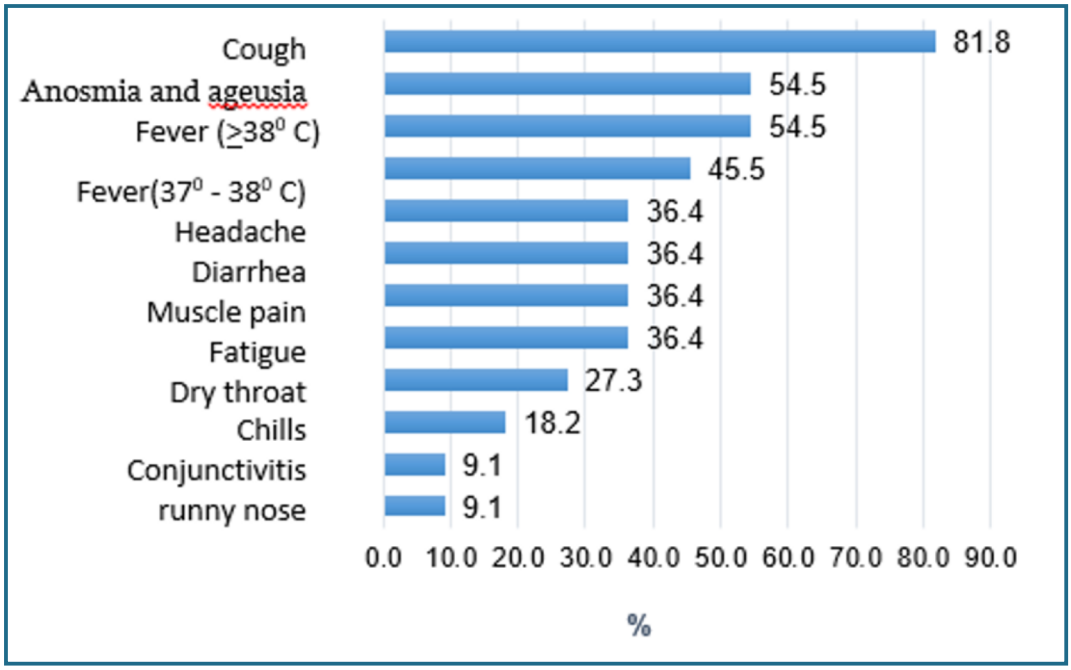
Cases confirmed in Go.Data and related contacts were grouped and classified according to common characteristics and variables.

Figure 86. COVID-19 Distribution Chain in a Cluster, FFX Survey, Georgia



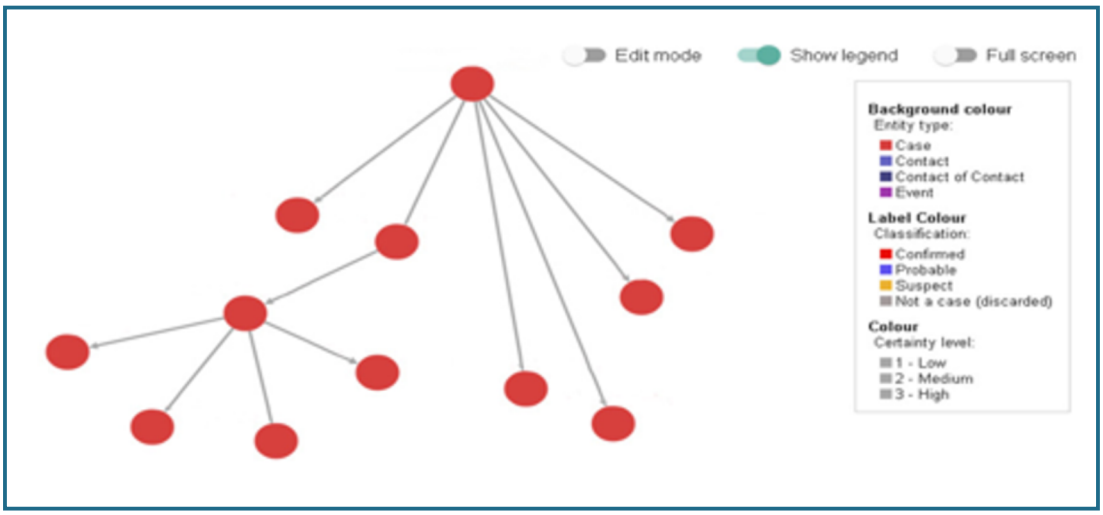
Approximately 82% of the positive contacts experienced a cough, while 54,5% had a temperature above 38°C and loss of taste and smell. Only 5 patients (45,5%) had a temperature rise in the 37-38°C range and 26% had headaches and muscle aches, diarrhea, and fatigue.

Figure 87. Symptoms Identified among Positive Contacts of Index Case, FFX Study, Georgia



Most of the confirmed contacts were ones from the workplace (36,4%) and family contacts (45,5%) of the index case. The same cluster recorded the first domestic transmission in the country when an infection from one of the contacts of the index case spread to his family members

Figure 88. Index Case and COVID-19 Transmission among his Positive Contacts, FFX study, Georgia



STUDY OF COVID-19 RISK FACTORS IN MEDICAL STAFF, TBILISI, GORI, SEPTEMBER 2020 - JUNE 2021

In order to study the risk factors related to COVID-19 infection of medical staff, from September 2020 through June 2021, a case-control study was conducted in nine so-called Covid Clinics. Medical personnel who tested positive for COVID-19 through PCR testing was selected as the case, while the workers being tested regularly (once a week) via PCR, who never tested positive were selected as a control group. The ratio between cases and controls was approximately 1: 2.

One week after COVID-19 laboratory confirmation of controls and cases, information on demographic, clinical, epidemiological, and infection prevention and control was collected through a standardized World Health Organization questionnaire (telephone interview) on 21-28th day. Data analysis was performed using univariate and multivariate conditional logistic regression methods.

The study involved 203 medical staff, including 65 cases and 138 controls. The age-gender distribution of cases and controls was almost similar (median age (IQR) = 41 (25) and 44 (22) years, p = 0,901. 80% and 82% of females; p = 0,748).

The majority of cases (95%) and controls (98%) were trained in the care of patients infected with COVID-19 Among the cases, 29% were doctors, 56% were nurses, and 15% were the junior medical staff, while in controls 46%, 36%, and 18%, respectively. 42% of the cases and 63% of the controls (p = 0,004) had higher education. A significant proportion of controls during patient care, compared to cases, adhered to hand hygiene recommendations (86% and 55%; p <0,001) and standard safety measures for infection prevention and control (94% and 62%; p <0,001).

Adherence to infection prevention and control measures (OR = 0,06, 95% CI: 0,02-0,21) and higher medical education (OR = 0,25, 95% CI: 0,11-0,58) among the 63 cases and 138 controls, paired by a medical facility, was independently associated with a reduced risk of COVID-19 infection. As a result, the best way to prevent COVID-19 infection of medical personnel is to adhere to infection prevention and control measures and increase the level of knowledge among medical personnel.

Seroprevalence Survey, March 15-31, 2022

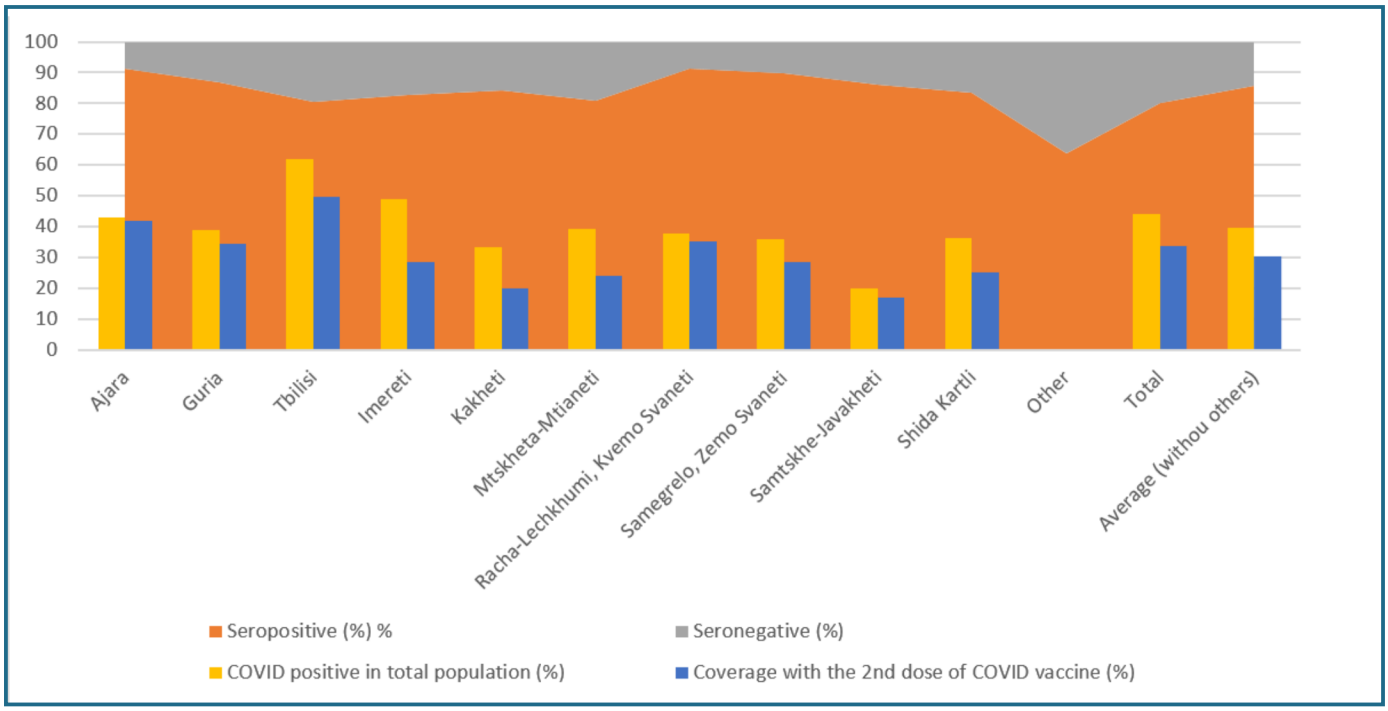
To detect the presence of antibodies against SARS-CoV-2, a nationwide seroprevalence study using rapid antibody tests was conducted. Large medical institutions and public health centers of all municipalities were involved in the study. Services were provided to employees of institutions, patients who referred to the service provider at the research stage, and in some cases practically healthy population - without special referral for services (e.g.: staff of educational institutions, penitentiary system, etc.).

The survey was conducted from March 15 to April 1, a total of 25 551 tests were conducted, which was 0,7% of the country's population. The percentage of tested titles by region ranged from 0,3% to 1,6% and was a representative number for assessing the situation. Bias to be taken into account - there was no special random selection of the research contingent carried out, the study included mainly adult population; it was impossible to make assessment by age and or special groups, except for one category (different category), for which vaccination and disease transmission status was not determined at that stage.

The research showed that the seropositivity among all those tested was 80%, while in the general population (regions) 85,7% was seropositive. In a different category 63,7% of the surveyed were seropositive. A direct correlation of seropositivity with the percentage of covid-positive and those vaccinated with 2 doses of anti-covid vaccine by regions was not established. The subject of special attention and further supervision is the so-called different category.

SARS-CoV-2 Antibody Seroprevalence Study, Georgia, March 15-31, 2022					
Region	% of population surveyed	Seropositive %	Seronegative %	COVID+ % in population	Coverage % by 2nd dose of COVID-19 vaccine
Adjara	0,76	91,2	8,8	43,1	42,0
Guria	0,3	86,7	13,3	39,1	34,5
Tbilisi	0,3	80,5	19,5	61,9	49,8
Imereti	0,8	82,6	17,4	49,1	28,5
Kakheti	1,1	84,2	15,8	33,3	20,1
Mtskheta-Mtianeti	0,2	81	19	39,2	24,2
Racha-Lechkhumi and Kvemo Svaneti	0,5	91,3	8,7	37,6	35,1
Samegrelo and Zemo Svaneti	1,6	89,8	10,2	36,0	28,5
Samtskhe-Javakheti	0,8	86,1	13,9	20,1	16,8
Shida Kartli	0,6	83,4	16,6	36,3	25,2
Other*	_	63,7	36,3	_	
Total	0,7	80	20	44,2	33,7
Average (excluding "Other")	0,696	85,68	14,32	39,57	30,47

Figure 89. SARS-CoV-2 antibody seroprevalence survey, Georgia, March 15-31, 2022



COVID-19 COMMUNICATION CAMPAIGN OF THE NATIONAL CENTER FOR DISEASE CONTROL AND PUBLIC HEALTH

Prior to reporting the first case of COVID-19 in the country, starting from January 2020, the Center strengthened communication with the population, began risk communication, and implementation of various necessary measures.

The Center mobilized its own resources and involved industry experts, and with the help of partners and donors, it has been actively conducting communication campaigns through almost all communication channels for the last two years.

Communication strategy and action plan documents were developed with the assistance of relevant experts and donors, such as:

- COVID-19 Related 2020-2022 Risk Communication and Community Engagement Strategy Paper and Action Plan (2020) was prepared, inter alia, for the population of the regions inhabited by ethnic minorities, through the joint efforts of the Ministry of Labor, Health and Social Affairs, IDPs, the United Nations Children's Fund and the World Health Organization.

- Risk Communication Strategy in times of Public Health Crisis in Georgia (2020) was developed by the Center with the support of the United Nations Development Program, the Government of the United Kingdom, and the United Nations Association of Georgia

- Communication Action Plan for the introduction of the COVID-19 Vaccine (2021) (within the framework of the National Plan for the introduction of the COVID-19 vaccine in Georgia)

The goal of strategic documents and plans is to raise public awareness, promote their involvement, and effectively manage risks through educational, media, or various marketing activities.

Communication activities and main directions implemented in 2020-2022 to support the prevention of COVID-19 and vaccination against COVID-19 in order to increase public awareness:

Education

- Informational and video clips and lectures were prepared for medical staff;

- Information and educational materials were created, including for ethnic minorities living in Georgia

- Translation-adaptation of evidence-based educational material developed and disseminated by the CDC, WHO and other international organizations on an ongoing basis; Visual material, educational posters, infographics, video materials are made on a regular basis and distributed through the digital platforms of the Center.

Social Networks - Digital Communications and Media

- The social media campaign has been active on all digital platforms of the Center (Facebook, Twitter, Instagram, YouTube) since the beginning of 2020;
- In order to popularize preventive measures, events were carried out with the support of celebrities, including the production of motivational videos on the observance of regulations;
- Digital news banners were prepared and placed on various websites and video portals;
- Information material on measures against COVID-19 from successful experiences in different countries of the world is translated and posted on a daily basis;
- Motivational content is created on a daily basis to intensify the fight against pandemics, to increase community involvement, and to improve compliance with COVID-19 regulations;
- During the first and second quarters of 2021, live briefings were systematically held on the official Facebook page of the Center;
- Dozens of illustrations and videos were prepared in collaboration with local and international organizations and placed on the digital platforms of the Center and partner organizations;
- With the support of WHO, an information and popularization website for COVID-19 vaccination was created: https: / /vaccines.ncdc.ge, which was translated into 4 languages: Abkhazian, Ossetian, Azerbaijani and Armenian.
- According to the 7th revision of the COVID-19 situation in Georgia, statistical information posters were prepared and placed on the Center's digital platforms. These posters have received the most responses in recent months and have been used in almost every recent study, presentation, or TV show covering a pandemic topic.
- Daily COVID-19 statistical data posters were updated on the Center's Facebook page to inform the population.
- COVID-19 statistics page was digitized on the Center's website and it became interactive since February 2022.
- Center hotline 116001 continues operation in active mode 7 days a week, from 9:00 to 23:00.
- In 2020-2021, the weekly briefings of the Center's representatives to the media and the public were actively held.

Printed Materials

- A recommendation card was prepared to provide information to the population in case of a positive response to the COVID-19 antigen rapid test.
- Brochures, posters, and vaccination cards were printed with the support of the Center and the United Nations Development Program and distributed throughout the country to service providers.

- In cooperation with various agencies and donor organizations, posters were created in Georgian, Azerbaijani, and Armenian for different target groups (pregnant women, the elderly, people with chronic diseases, etc.), materials on preventive measures against COVID-19, for electronic distribution. It was also translated into Ossetian and Abkhazian languages.

- Various information posters were prepared and printed for distribution in public places. Materials prepared by the Center are fully available on the Center's website: https: / /www.ncdc.ge /# /pages /content /d3e9f9d2-c980-4937-a880-34cb1313ac95

Outdoor advertising

- From the beginning of the pandemic, informational advertisements were prepared and placed on street monitors and billboards in ethnic minority areas. Vaccination support billboards were also prepared and placed in Tbilisi and the regions.

Marketing

- In the spring of 2020, the campaign #StayAtHome was promoted;

- In October 2021, for further strengthening the communication, a marketing group was set up at the Center, which started working to improve its marketing communications;

- Unified messaging and communication language was updated; It was formed as a new message and motto of the current campaign: "At Georgia's service - we get vaccinated for the benefit of each other!".

Video footage

- The marketing team was actively involved in the production of a unified national campaign led by a communication team set up with the government administration. In collaboration with the government group, up to 20 videos were created with the participation of representatives of the medical field, as well as the people who recovered from Covid. Up to 10 graphic videos about current regulations were made and posted on media and social networks. Numerous news posters have been created on social networks.

Video footage

Informational-educational videos were prepared with the support of WHO:

- Registration Instruction for COVID-19 Vaccination https: / /www.youtube.com /watch?v=VlI2WvBDZQU

- What is the way taken for the COVID-19 vaccination? https: / /www.youtube.com /watch?v=WQcX3l2Uwe

- Vaccination brings us closer https: / /www.youtube.com /watch?v=S8EXwKSx0Qc

- Is it necessary to follow preventative measures after vaccination? https: / /www.youtube.com /watch?v=7n5mEn2ijgo&feature=emb_imp_woyt

- Bidzina Kulumbegov talks about the side effects of COVID-19 vaccines https: / /www.youtube.com /watch?v=pYuQ5uxI0gk

- What is the path of COVID-19 vaccines from creation to authorization https: / /www.youtube.com /watch?v=BhoMLBnZYNk
- Healthcare workers call on the population to be vaccinated https: / /www.youtube.com /watch?v=Q515X0Dhh98&t=1s
- What does emergency authorization mean https: / /www.youtube.com /watch?v=4PTOL8zR0sU
- Jan Warisek - Public Health Expert on Vaccination Day https: / /www.youtube.com /watch?time_continue=2&v=r6Lxm6GOAJA&feature=emb_logo
- Father Giorgi Chachava on the day of vaccination https: / /www.youtube.com /watch?v=gxidpDB1sc0&feature=emb_imp_woyt
- 92-year old Nunu Dumbadze on the day of vaccination https: / /www.youtube.com /watch?v=Hnxkb76LhPY&feature=emb_imp_woyt
- Irma Khetsuriani on the day of vaccination https: / /www.youtube.com

Education

Informational and Educational Videos were translated into Armenian and Azerbaijani.

- How the vaccine works (WHO) - in Azerbaijani: https: / /www.ncdc.ge /# /pages /video /71a21b42-5001-48e8-b3fe-026c6546f792
- Road to COVID-19 vaccine - WHO. In Armenian: https: / /www.ncdc.ge /# /pages /video /4470d97c-f8f9-47a7-bc3b-8bf6a91cd359
- Information about registration for vaccination: https: / /vaccines.ncdc.ge /video /#registration - in Armenian https: / /vaccines.ncdc.ge /video /#registration - Azerbaijani
- Information materials in Armenian: https: / /ncdc.ge /# /pages /content /ccaa3aff-8d10-4b7b-90d2-e0378b99f857
- Information materials in Azerbaijani languages: https: / /ncdc.ge /# /pages /content /117316d6-ce72-41a9-a32e-c45696356e47

Campaigns to promote vaccination and increase pandemic involvement

- Let us get vaccinated for saving lives
- “At Georgia's Service - We Get Vaccinated for the Benefit of Each Other“
  Campaign: Let Us Get Vaccinated for Saving Lives
  The United Nations Development Program (UNDP), in cooperation with the Center, has launched a 4-month information campaign entitled "Let Us Get Vaccinated for Saving Lives" with the aim to inform the Georgian population about coronavirus vaccines and dispel false information that hinders the vaccination process. The information was disseminated to the most vulnerable groups of the population.
  As part of the campaign, about 70 information meetings were held throughout Georgia and covered more than 80,000 people. 8 videos were made with the participation of representatives

of the medical field; special brochures were distributed to the population during the campaign; numerous media activities were carried out.
Lots of supporters joined the "Let Us Get Vaccinated for Saving Lives" campaign, including the European Union (EU), the governments of Denmark, the United Kingdom, Sweden, and Switzerland, and the United Nations Sustainable Development Goals Fund. Georgian public agencies, private companies, non-governmental organizations, young activists, and local municipalities participated in the campaign.
With the active support of the Georgian Railway, information leaflets were distributed on the trains, which serve up to 3,000 passengers daily.
The young volunteers, mobilized with the support of the Georgian Red Cross Society and Liberty Bank, provided information about the vaccines to more than 30,000 people.
More than 4,500 students, athletes, farmers, and public servants participated in the online meetings.
Well-known doctors answered questions about vaccination both face-to-face and online.
Ambassadors accredited to Georgia, heads of international organizations, and representatives of the medical field addressed the public through social networks. Hundreds of thousands of users were covered by their posts on Facebook, Instagram, and Twitter.

Video clips made within the campaign:

Madona Jugheli – Gynecologist https: / /www.youtube.com /watch?v=AIC5AvNC5Yk

Nino Dolidze – Endocrinologist https: / /www.youtube.com /watch?v=_-WpM6fUETc

Nia Sharikadze – Oncologist https: / /www.youtube.com /watch?v=eO7ivf4SDP4

Bidzina Kulumbegov – Allergist https: / /www.youtube.com /watch?v=SCGydxdPRSE

Eka Uberi – Pediatricianhttps: / /www.youtube.com /watch?v=5jlRoYyPo_4

Nika Kacharava – Doctor https: / /www.youtube.com /watch?v=hB4COB_QqDo

Mamuka Nemsadze - Obstetrician-Gynecologist https: / /www.youtube.com /watch?v=HZDLWqWeT5U

Detailed information about the communication interventions implemented by the center is published in the form of reports of the National Center for Disease Control and Public Health - COVID-19 in Georgia. You can see the document on the website of the center

https: / /ncdc.ge /Api /api /File /GetFile /07ad44ba-95c0-4a9b-9682-f19ded67d51a

- TV clip in Azerbaijani language with the participation of local popular people to support preventive measures
https: / /www.youtube.com /watch?v=x4MUVVK11PU

During the pandemic, the need for psychological support for the quarantined population was especially highlighted. A crisis psychological help hotline (911,000) was established in April 2020, organized by the National Center for Disease Control and Public Health and supported by the Open Society - Georgia Foundation. Due to the relevance of the mentioned service, the provision of hotline service was continued from May 2021 within the framework of the state health promotion program. As of December 31, 2021, 4,268 people used the hotline service since its launch.

VACCINATION MARATHON "AT GEORGIA'S SERVICE - WE GET VACCINATED FOR THE BENEFIT OF EACH OTHER"

In order to encourage the vaccination process, the Center carried out the vaccination marathon with the message "At Georgia's Service - We Get Vaccinated for the Benefit of Each Other!" The marathon was carried out in two stages, at the first stage in 49 villages selected throughout Georgia, and at the second stage in Ozurgeti and Gurjaani municipalities.

As part of the marathon, rural doctors were trained on the ground and access to vaccinations was increased. Various information-educational meetings were held with the target groups, the population in the villages was informed on a door-to-door basis, and information materials specially prepared for the marathon were distributed to the population.

The project was initiated by the National Center for Disease Control and Public Health and the Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health, and Social Affairs.

Village doctors, representatives of the Center and Municipal Centers for Public Health, local government, non-governmental organizations, and others took part in the marathon.

Within the framework of the marathon, in accordance with the updated message and concept, new attributes of the campaign were created with the support of partner international donors: booklets, banners, posters.

Three videos were created as part of the marathon, with the support of WHO, - (1) Address of the Center's Director calling the population to be vaccinated; Motivational videos in support of the ongoing marathon in (2) Gurjaani and (3) Ozurgeti municipalities, which were posted on social media and in the local media network of the respective municipalities.

- https: / /rb.gy /dkgzjk- Address by the Director General
- https: / /rb.gy /lcs1xn - About Ozurgeti Marathon
- https: / /rb.gy /wkos0d- About Gurjaani Marathon

To promote the marathon and vaccination process, the marketing team prepared dozens of informative photo posters and illustrations for digital platforms.

Immunization Week 2022

On April 24-30, 2022, the European Immunization Week campaign was launched with the slogan – "Long life for everyone!" with the main message – "Vaccines for a Long and Dignified Life". As part of the campaign, on May 26, with the support of the World Health Organization and the participation of representatives of the Ministry of Labor, Health and Social Protection, partner organizations and the medical community, a press conference was traditionally held at the Center. In additon, WHO communication posts (both in Georgian and ethnic minority languages) were placed on social media, communication clips were prepared, media activities were carried out (programs with the participation of famous doctors and experts) and an exhibition called "Long life for everyone!" was held at the Peace Bridge, where the European Immunization Program Informational posters made during the week were presented.

Take the Test, Decide the Well-being

From May to December 2022, a pilot project of self-testing for COVID-19 was implemented in 3 regions of the country with the cooperation of the FIND organization and the Center. The goal of this initiative was to increase access to testing through high-quality COVID-19 self-tests and reduce the burden of the pandemic on healthcare systems.

Teachers, staff of medical institutions, and nursing homes from Tbilisi, Kutaisi, and Mestia municipalities were involved in the campaign.

The beneficiaries of the project were introduced to the importance of self-testing, the design of the project, the current activities of the project and the instructions for using self-testing. It should be noted that the self-testing pilot project included 24 schools in Zemo Svaneti, 3 medical institutions in Tbilisi (Central University Clinic, Infectious Pathology and AIDS Center, Curatio Clinic) and also nursing homes in Tbilisi and Kutaisi.

The project also envisaged an information campaign, the purpose of which was to raise awareness among the population about general testing and self-testing, and within the framework of the pilot project, to distribute various educational or cognitive materials both in social media and on TV.

Coordination and Cooperation

A coordination mechanism for the communication of vaccination against COVID-19 was established, within the framework of which, under the coordination of the WHO, with the involvement of the Ministry, the NCDC, various donor organizations, and associations of family doctors, interventions are being planned and implemented in three strategic directions across the country, such as:

- Capacity building of primary care medical staff in COVID-19 management, immunization, and communication;
- Population mobilization and communication meetings (increasing access to high-risk groups);
- Mass media campaigns (including TV, with active use of digital media).

The goal of the coordination initiative is to implement evidence-based interventions, develop standardized training modules, and coordinate partner engagement, taking into account the recommendations of the WHO COVID-19 Vaccination Implementation Evaluation Mission. In order to generate demand for vaccination against COVID-19 in the country and to promote the achievement of the target vaccination coverage rate, especially among high-risk and vulnerable groups, a regional public health capacity building pilot program was implemented in Samegrelo – Zemo Svaneti and Guria regions with the support of the US Centers for Disease Control and Prevention. on planning communication for COVID-19 vaccination (rapid situational analysis of vaccination uptake and vaccination strategies against COVID-19).

Center Hotline 116 001

Acceptance of calls related to COVID - 19 issues on the Center hotline started on January 23, 2020. As of July 1, 2022, the hotline operator function was being performed by 80 people at different times (with a three-group shift schedule).

The hotline operates on working days as well as on weekends: 09:00 - 23:00.

The total number of incoming calls to the hotline is 612,889:

- Answered: 427 759 calls (70%)
- Missed: 185 130 calls (30%)

INTERNATIONAL PARTNERSHIP

During the COVID-19 pandemic period, the National Center for Disease Control and Public Health actively communicated with the public and various target groups, as well as with international partners. Collaborating with international partners has played an important role in strengthening the Centre's capacity to fight COVID-19 infection, both technically and financially. This cooperation aims to obtain the most transparent, timely information from the Center's key strategic partners, as well as to share recommendations based on the best practices with the target audience. Intensive meetings with diplomatic corps and foreign officials took place during this period.

Technical and financial support for important measures to mitigate the negative impact of COVID-19 (capacity building for the pandemic response, immunization support, human resource training, communication activities, etc.) were provided by the WHO, EU, Global Fund, UNICEF, UNFPA, UNDP, US CDC, DTRA, Georgian Red Cross Society and other partners.

Under an agreement with the World Health Organization, the European Commission's Eastern Partnership Initiative on Solidarity for Health activities have been undertaken in the following areas: updating the National Pandemic Preparedness Plan, strengthening the capacity of the Public Health Emergency Operations Center (PHEOC), epidemiology, development of services to deal with non-communicable diseases and their risk factors, establishment and support of a cross-sectoral platform to strengthen the public health sector in Georgia, piloting preparatory work for the introduction of WGS diagnostic and surveillance technologies in Georgia, etc.

The World Health Organization is implementing a large-scale initiative with the financial support of the European Union, aiming to facilitate the process of vaccination against COVID-19 in Georgia, which is a significant investment in strengthening the routine immunization system. Technical support includes various areas, including improving the country's preparedness for COVID-19 vaccination at central, regional, district, and municipal levels, supporting the vaccine information campaign; and implementing a short-term vaccination training course, consisting of 3 modules: Practical Immunization, Cold Chain and Logistics.

The website dedicated to vaccination has been developed with the support of the European Union and WHO, (https: / /vaccines.ncdc.ge), where citizens have access to evidence-based information on vaccination.

Georgia was among the top 11 countries out of 181 Global Fund beneficiaries to receive $ 484 500 for COVID- 19 response. By means of this amount it became possible to:

- Support primary health care - launching 112-based "online clinic"; Development and approval of "Suspicious Case Management for New Coronavirus (SARS-CoV-2) Infection (COVID-19) in Primary Health Care" in collaboration with the Union of Family Medicine Professionals; training personnel of primary healthcare; monitoring and periodical evaluation of quality of medical services, the results of which were taken into account when planning further trainings.

- Receive the Xpert® Xpress SARS-CoV-2 Automated Molecular Test, which has been in use since April 2022 by Georgia, which became the first country in the region to have it;

- Develop and approve a clinical management protocol (COVID-19) for tuberculosis and new coronavirus (SARS-CoV-2) infection with the support of the GF program. In order to facilitate its implementation, the staff involved in the National Tuberculosis Program received distance training from an international expert.

- Provide the Republic Hospital with 50 UV light devices purchased under the Global Fund TB program to improve infection control.
In 2020 the country received additional $ 1,27 and $5,2 million in funding under the C19RM. By means of this assistance:

- Healthcare system infrastructure was improved and additional measures were taken to maintain basic services for TB and HIV / AIDS programs in conditions of the pandemic. Laboratory and computer equipment for Lugar Center and flu sentinel surveillance sites, COVID-19 diagnostic tests, and personal protective equipment for TB and HIV / AIDS medical facilities, laboratories, and community organizations were purchased. The oxygen delivery system at the National Center for Tuberculosis and Lung Disease has been improved.

- More than 1 500 beneficiaries, members of the main vulnerable groups, HIV-infected and tuberculosis patients, were provided with food parcels as one-time assistance.

  Medical equipment was purchased to expand and building the Lugar Center's sequencing and PCR testing capacities at the Telavi Laboratory. COVID-19 antigen-based and PCR tests, as well as personal protective equipment were purchased. Additional training was provided to primary healthcare personnel in the management of COVID-19 across the country, as well as to physicians employed in the hospital sector - in accordance with updated COVID-19 clinical management protocols.

  An anti-crisis action plan for the health sector for 2022 has been prepared under the technical assistance supported by the World Bank. Also, with the joint support of the World Bank and the Asian Development Bank, a National Vaccination Plan for 2022 was developed (National Plan for the introduction of the COVID- 19 vaccine in Georgia).

  Procurement of Covid-19 antigen-based rapid tests and PCR-diagnostic systems (tests and equipment) was carried out funded by the World Bank within the framework of the Rapid Response Project against COVID- 19, to strengthen Georgia's healthcare system. In order to support the vaccination program, the project procured appropriate vaccine equipment for the cold chain and syringes needed to administer the Pfizer vaccine, as well as personal protective equipment. The World Bank also made significant contributions to the purchase of Pfizer vaccines. In order to facilitate COVID-19 vaccination and improved virus testing, Georgia has also received medical and technical equipment from the following partners:

- The World Health Organization, with the financial assistance of the European Union, has provided Georgia with cold boxes for vaccines, medical ice refrigerators and their accessories, thermometers, a specialized vaccination vehicle, and high-quality laptops for the preparation of COVID-19 mass vaccination. In addition, the World Health Organization provided Georgia with personal protective equipment, test systems, video conferencing equipment, medical equipment, etc.

- In support of the vaccination process, within the scope of EUCOM Humanitarian Assistance Program Georgia was provided with three -80°C freezers, vaccine carriers, cold boxes for vaccine transportation, vaccine injection syringes, temperature monitoring devices, safe containers for sharp waste, etc.

ANNEXES

- The Embassy of the People's Republic of China, with the support of the Government of China, has provided significant support to Georgia since the beginning of the pandemic. In March 2020, the country received a donation from the Sichuan Government - 1000 PCR tests with 2 analyzers. In addition to this assistance, the Chinese government has provided Georgia with personal protective equipment, diagnostic test systems, thermoscreening devices, etc. Also, the Embassy of the People's Republic of China donated GEL 74 960 worth computer equipment to the NCDC.

In support of COVID-19 vaccination, representatives of the United Nations Development Program (UNDP) and the National Center for Disease Control and Public Health, in cooperation with the Government of Georgia and the Civil Service Bureau, held briefings with various target groups in the regions (including ethnic minorities, densely settled displaced persons, beneficiaries of the Violence Asylum and the Deaf Union of Georgia, etc.), where citizens received comprehensive information on vaccines and their effectiveness. Significant information was provided within the scope of the joint campaign of the United Nations Development Program, the Red Cross and the Liberty Bank in Shida Kartli, Kvemo Kartli and Samtskhe-Javakheti. Information posters and brochures were placed on passenger trains within the framework of cooperation between the Georgian Railway and UNDP; up to 15 regional televisions and public broadcaster are airing doctor addresses and various news clips on vaccines and the importance of vaccinations in Georgian, Armenian and Azerbaijani languages.

Georgian Red Cross Society volunteers carried out a population mobilization campaign, supporting electronic registration of vaccinations for ethnic minorities and older citizens, printing and disseminating information materials. Caritas of the Czech Republic, with the support of the Czech Development Agency, the European Union and the World Health Organization, has developed a COVID-19 vaccination registration portal www.booking.moh.gov.ge .

A Memorandum of Understanding was signed between the National Center for Disease Control and Public Health and the LEPL “WORLD VISION INTERNATIONAL” (Georgia Branch). The purpose of the memorandum is to support awareness-raising and information-educational activities related to immunization and vaccination against COVID 19 in Georgia.

With the coordination of the World Health Organization and the involvement of donor organizations (UNDP, World Bank, GIZ) and associations of family doctors, the 2022 COVID-19 vaccination campaign has been launched, which will be implemented in three directions: (i) PCR medical staff trainings on immunization, cold chain and communication issues; a group of experts was formed with the participation of representatives of the Center, donor organizations and associations of family doctors; training packages were developed; the regions of Georgia are distributed according to coverage (so-called “mapping”); (ii) population mobilization and communication meetings (access to high-risk groups); (iii) Mass media campaign.

A grant agreement was signed with the US CDC Global Health Vaccine Task Force to facilitate and strengthen the COVID-19 vaccination process in the country. The contract provides for financial and technical support for the performance of specific components. These are ongoing retraining of medical human resources; additional supervision of the vaccination process, recording, and reporting of adverse and post-vaccination side effects; creation of vaccine demand and advocacy campaigns; development of electronic systems.

In 2021, Georgia received a certain supply of vaccines from partner countries as a donation:

- 100,000 Doses of Sinovac-CoronaVac (Donated by the Government of China)
- 5,000 Doses of AstraZeneca / Oxford (Austrian donation)
- 15,000 Doses of AstraZeneca / Oxford (Donated to Lithuania)
- 500,000 Doses of Pfizer / BioNTech (US Government Donation)
- 100,000 Doses of Sinopharm BBIBP (Red Cross Society Donation)
- 83,070 Doses of Pfizer / BioNTech (Donated by the Government of Latvia)
- 468,000 Doses of Pfizer / BioNTech (Donated by the Government of Poland)

The Government of the Federal Republic of Germany donated more than 3,000 doses of monoclonal antibodies (from Kasirivimab / Imdevimab) to hospitalized patients infected with Covid-19 in Georgia.

At the Special Session -"Experience of National Public Health Institutions in Responding to COVID-19: Perspectives on Equality in Health" of the 2021 Annual Meeting of International Association of National Institutes of Public Health (IANPHI) the NCDC was selected together with the other participants to share experience and future perspectives. A report was presented by the representatives of the Center, which is available at the link:
http: / /www.ianphi.org /_includes /documents /sections /tools-resources /annual-meetings /2021annualmeeting /session-3-natia-skhvitarizde.pdf

Meetings were held with Extraordinary and Plenipotentiary Ambassadors of different countries to Georgia, most of which were dedicated to sharing experiences between the countries regarding the COVID-19 pandemic and discussing future plans.

On April 19, 2021, a meeting was held with Ms. Afshan Khan, UNICEF Regional Director. Georgia received AstraZeneca / Oxford and Pfizer / BioNTech vaccines through the COVAX platform with the UNICEF assistance. UNICEF also implemented communication activities and training of physicians in ethnic minority regions and held meetings with religious leaders.

COVID-19 Vaccination of Chinese citizens being on a working visit to Georgia was launched in cooperation with the Embassy of the People's Republic of China in Georgia, on June 25, 2021.

As part of the bilateral cooperation, important online meetings, webinars, masterclasses, and video conferences organized by respective agencies of the United States, the European Union, Germany, the Republic of Korea, China, the United Kingdom, Turkmenistan, etc. and international institutions (KOICA, DTRA, CEPA, ASPHER, IANPHI, BMJ, etc.) were held to share experiences and best practices in fighting the pandemic. Articles, interviews and medical abstracts have been published in various international publications (BMJ Leader, Annals of Global Health, European Journal of Public Health, The Lancet, National Geographic, etc.).

Data on daily confirmed cases are sent to the World Health Organization on a daily basis.

Total data on cases (by age groups and gender) and the number of vaccinated people by vaccines are being uploaded to TESSy platform of the European Center for Disease Control and Prevention (ECDC) on a weekly basis.

With the support of the United Nations Development Fund (UNDP) and the Government of Sweden, within the framework of the project Expanded Access to Innovative Public Health Services, an e-learning platform of the National Center for Disease Control and Public Health https: / /learn.ncdc.ge was created for healthcare personnel, to raise awareness about health issues and increase the effectiveness of preventive measures in the context of the COVID-19 pandemic. The training program - Prevention and Control of Infections in Medical Institutions was launched, which was based on the recommendations of authoritative international organizations and was available through any device connected to the Internet. Healthcare personnel are provided with 24 /7 access to training materials, testing and certification, as well as consultation with experts in the field according to the topic of the modules. Within the framework of the project, 2,858 healthcare specialists already received training on infection prevention and control, both on-site and online.

In 2022, information posters in different languages and a video clip were prepared in cooperation with the International Organization for Migration in order to promote the preventive COVID-19 vaccination. Posters will be placed at transport stops in Tbilisi, Batumi and Kutaisi, while the information link will be distributed through social networks and TV channels.

INFORMATION SYSTEMS

The National Center for Disease Control and Public Health operates a large number of information systems that store medical information about citizens' health. During the COVID-19 pandemic, special importance was given to the development of existing systems and the creation of new modules, as it became necessary to collect, sort, rapidly retrieve, process, monitor, manage, report etc. the real-time data.

SARS-CoV-2 Coronavirus Diagnostic Electronic Registration System (COVID LAB)

Covid Lab, a system for recording the COVID testing results, was introduced with the financial and technical support of the Czech Government Development Agency and the Czech Caritas in cooperation with the National Center for Disease Control to tackle the COVID-19 pandemic challenge. The system electronically records all laboratory tests for SARS-CoV-2 coronavirus and their results namely:

- Recording for rapid test results (nCov result / rapid test COVID-19 Ag / antigen, nCov result / rapid test for antibodies);
- Recording data related to blood sampling and transportation required for PCR confirmatory research;
- Electronic registration of data related to PCR research.

Information about both state and commercial surveys is registered in the system. An integrated intermediate system "Data Collector" has been developed, which provides data exchange between the "Covid Lab" system and electronic systems for internal management of laboratories. This feature simplifies the work of the portal for laboratory users, as well as facilitates the timely display of research results in the "Covid Lab" system.

The reporting function in the system simplifies the submission of work performed by organizations under the state program, the processing of data by the Center for Disease Control and Public Health, and the payment from the treasury. Covid Lab analytics section by means of pre-designed graphs, tables and diagrams performs statistical data processing and analysis, including, most importantly, reporting and monitoring of positive cases registered in the system, which is a prerequisite for follow-up of Covid patients.
The uniqueness of the Covid Lab system database ensures its integration with the electronic systems of different government agencies, which facilitates the unified management of the Covid pandemic control.

Electronic Module for User Management

At the end of 2020, the Center for Disease Control, in order to enforce the Law of Georgia on Personal Data Protection, created an electronic system "System Users", which provides for the introduction of certain mechanisms for organizations registered in the electronic modules of health care under the Center's administration, to ensure the prohibition of unauthorized access to electronic modules by using a two-tier authentication mechanism for data protection. By means of this mechanism, the persons employed in the electronic modules of healthcare in medical institutions were identified and individual user profiles were opened for them. In order to manage a large number of users, one main user is opened in the medical institution, through which the persons working with the electronic systems and their rights are managed by the medical institutions themselves. Users are sent an authorization code by SMS every time they enter the system.

Electronic Module for Immunization Process Management

The electronic immunization management module, which has been operating in the center since 2019, was developed within the framework of financial and technical assistance of the UN Children's Fund. Its purpose is to register vaccinations performed in the country in one space, record vaccine balances in institutions, manage stocks, and produce reports. The facility has the ability to search for a specific beneficiary or group of beneficiaries in the electronic immunization module, view their current history, and conduct vaccinations.

The module allows registering scheduled vaccinations based on the vaccination calendar and unplanned vaccinations, which are not provided for in the prophylactic vaccination calendar and are done with different indications. Vaccination can be state or commercial. It is also possible to register the vaccination of a foreign citizen in the module.

The vaccination registered in the electronic immunization module is automatically entered in the application, as a result of which the beneficiary (the parents of the minor) can download the information about the vaccination at any time. From 2021, the module was added the function to record information about vaccination against Covid19.

The System for Electronic Queues, Referral and TV Medicine

The system of electronic queues, referrals, and telemedicine was established in close cooperation with the Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health and Social Affairs and the National Center for Disease Control and Public Health with the financial and technical support of the Czech Development Agency and the Czech Caritas. In 2021, the system was introduced by the National Center in close cooperation with the World Health Organization. The queue management component is a simplified and convenient tool for receiving the Covid Vaccination Service to manage the entire vaccination process in the country. The system, helps medical institutions to manage the flow of citizens, as well as allows citizens to make online bookings for vaccination services, at a pre-determined time in the desired medical institution.

E-learning and Communication Platform

E-learning and communication platform for the National Center for Disease Control and Public Health has been set up with the support of the United Nations Development Program (UNDP) and the Government of Sweden, to support the continuing education of medical staff. Georgian healthcare staff through use of this mechanism, will have the opportunity to improve their professional qualifications in important areas of public health, such as prevention and control of infectious diseases in medical institutions, environment and health, prevention and control of non-communicable diseases. Training materials, testing and certification developed in accordance with the recommendations of international organizations are available 24 /7, both through the web and mobile applications; consultation with industry experts is available through using a hotline, by module topics. The implementation of the system during the COVID-19 pandemic acquired a special role in terms of staff training-retraining.

Georgia e-Health Application

The Georgia e-Health mobile app was created in the first half of 2021, in close collaboration between the World Health Organization and the National Center for Disease Control and Public Health, providing a tool for citizens to manage their own health information. The system consists of various modules, which uses COVID-19 status-determining component for a citizen, in particular, the mobile application reflects the confirmed information on vaccination, recovery and COVID - testing on the territory of Georgia.

In the second half of 2021, the mobile app was merged with the EU Gateway by the Information Technology Agency. The QR code generated by the application has legal force and can be used both in Georgia and in all other countries whose system is integrated with a similar system in the EU. The app is compatible with Google Android and Apple iOS mobile operating systems and is available on Google Play and the App Store.

The application ensures secure exchange of information through EU compatible Gateway architecture, which makes it possible to confirm the information issued by the authorized organization through readers used in partner countries. The system allows printing the form on vaccination administered to the beneficiary.

Inventory Management System

The purpose of the "Logistics Module" created under the auspices of the National Center for Disease Control and Public Health is to provide electronic recording of state health programs and logistics processes across the country, in particular: immunization, blood banks, screening, COVID-19 laboratory diagnostics and other processes.

The modern platform of the system and the programming language and easy-to-use interface, which is focused on different types of users, enable the detailed registration of information about all transactions within the logistics and the optimization of processes.

The following is done through "Logistics Module" functionalities:

- Creating a catalog of goods and registering product characteristics;
- Warehouse registration;
- Recording the goods' receipt transaction within the warehouses (including from "RS");
- Recording goods transfer transactions within warehouses;
- Recording goods write-off transaction within warehouses;
- Recording the return transaction to the supplier of goods and to the warehouse;
- Reporting on all and individual types of transactions;
- Report on balances of goods taking into account different time intervals.

The main sources of information about hospitalized and deceased patients were:

- Ministry of Internally Displaced Persons from the Occupied Territories of Georgia, Labor, Health and Social Affairs;
- Birth-death database;
- Electronic module for registration of patients discharged from inpatient facility - Form IV - 066 (Order N01-43 / N of the Minister of IDPs from the Occupied Territories, Labor, Health and Social Affairs of April 16, 2020);
- Database of the National Health Agency.

Various Internet resources are also used in the preparation of the document.

DEFINITIONS

Novel Coronavirus (SARS - CoV - 2) - the third zoonotic coronavirus outbreak of the 21st century, when the infection was transmitted from person to person.

Pandemic - An epidemic characterized by the spread of an infectious disease in a wider region or around the world.

National COVID - 19 Vaccination Plan - a plan developed in Georgia by the Interagency Coordination Commission on the basis of a methodological document proposed by the WHO for the Implementation of COVID - 19 Vaccination. It is a guide for conducting vaccination and covers all necessary actions, responsible parties and financial needs.

PCR method - Real-time reverse transcription-polymerase chain reaction / RT – PCR.

Antigen - Based Testing Ag - RDTs - Rapid chromatographic immunoassay that qualitatively determines the presence of new coronavirus antigen in a nasal swab sample.

Rapid antibody - based testing - detects the presence of IgG; IgM and IgA antibodies in the blood, which are produced as an immune response in case of infection with the virus and are detected in the active phase of the disease and / or after, indicating the presence of immunity to the virus.

Cumulative incidence - an indicator that determines the number of new cases of infection in a given period of time.

COVID - 19 Effective Reproduction Index (Rt) - An indicator of the infection transmission potential in real time, used to assess whether an epidemic is increasing, decreasing or remains stable.

Mortality rate from COVID - 19 (per 100,000 or 1 million of population) - The number of deaths from COVID - 19 for 100,000 or 1 million of population.

Mortality rate in confirmed cases of COVID - 19 (%) - share of COVID - 19 induced deaths in all confirmed cases.

Excess mortality due to all causes - an indicator of whether the rapid spread of a particular disease and related deaths have affected the overall mortality rate. It is defined as a mortality rate that exceeds the expected rate.

AEFI - adverse event following immunization.

Activities carried out in Georgia in relation to the new coronavirus (COVID-19)

January - February 2020

January 6
The National Center for Disease Control and Public Health informed the Ministry of Health about the outbreak of unusual pneumonia in China, which resulted in the development of response measures by the state.

January 13
For coordinated response, an operational center for response to public health threats was created and equipped in the Center.

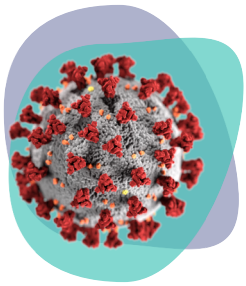
January 23
The Interagency Coordination Council was created and its first meeting was held to make multisectoral decisions on the issues related to the coronavirus.

January 28
Decree N164 of the Government of Georgia On Approving the Measures to Prevent the Possible Spread of New Coronavirus in Georgia and the Operational Response Plan against Disease Cases caused by New Coronavirus was issued.

Mandatory isolation was imposed initially on those returning from China, and subsequently on those returning from other high-risk countries.

January 29
All border checkpoints have been equipped with equipment necessary for thermal screening. Thermal screening at airports has started.
Information leaflets were prepared for informing the passengers.
As a result of the worsened epidemiological situation, air traffic with China was suspended.

January 31
The definition of a new coronavirus infection case was approved, an algorithm for managing and tracking COVID-19 cases and contacts was prepared, the country switched to active surveillance.



February 4
Richard Lugar's Laboratory can test and diagnose COVID-19 cases.

February 6-12
During the period, various methodological recommendations and protocols related to COVID-19 were developed and approved.
Risk communication was intensified across the country, video lectures and educational materials were circulated.

February 14
To improve the coordinated response to COVID-19, a desk exercise was held with members of the Coordination Council and other agencies involved in the response, on case detection and appropriate measures.

February 21
The gradual return of Georgian citizens from different countries to their homeland began organized by the state.

February 24
Based on the analysis of the epidemiological situation, air and land traffic with Iran was suspended.

February 26
The first case of coronavirus was recorded in Georgia. The citizen of Georgia entered the country from Iran through Azerbaijan at the Red Bridge border crossing point.
As a result of an operative and coordinated response, the infected citizen was transferred from the border to the "JSC Infectious Diseases, AIDS & Clinical Immunology Research Center".

Activities carried out in Georgia in relation to the new coronavirus (COVID-19)

March 2020

March 1
Risk communication related to COVID-19 has been strengthened and intensified across the country.

March 10
In order to strengthen the country's epidemiological situation and readiness and response capacity, the decentralization of laboratory diagnostics has begun..

2 March
Due to the worsening of the epidemiological situation, in order to slow down the spread of the virus, the educational process in educational institutions was suspended.

March 13
In order to increase the awareness of the population, a nationwide social campaign was started.

March 4
In order to screen and detect cases of infection early, preparation of quarantine zones has begun to house persons suspected of having or at high risk for the coronavirus..

March 14
Some of the employees in government agencies switched to remote working mode. The private sector was recommended to switch to remote working mode .

March 15
Ski resorts were closed to control the spread.

16 March
The first positive case was confirmed by the Batumi laboratory.

March 17
Kutaisi laboratory confirmed the first positive case.

March 18
Traffic at the borders was gradually stopped and reduced to a minimum. Cafes, bars, restaurants, fitness clubs, swimming pools and shops were closed, except for essential shops and pharmacies

March 21
According to the decision of the National Security Council of Georgia, due to the need to limit various spheres of public life at the same time, a state of emergency was declared in the country. Intercity passenger traffic by minibuses and buses and the transportation of passengers by minibuses in the territory of self-governing cities and municipalities have been suspended.

March 22
The first fact of internal transmission of infection was recorded in Georgia.

March 23
მაღალი ეპიდემიოლოგიური რისკისა და ვირუსის გავრცელების შესაკავებლად, საგანგებო მდგომარეობის ფარგლებში მარნეულსა და ბოლნისში დაწესდა მკაცრი საკარანტინო შეზღუდვები.

March 31
Due to the worsening of the epidemiological situation, a general quarantine was announced.

Activities carried out in Georgia in relation to the new coronavirus (COVID-19)

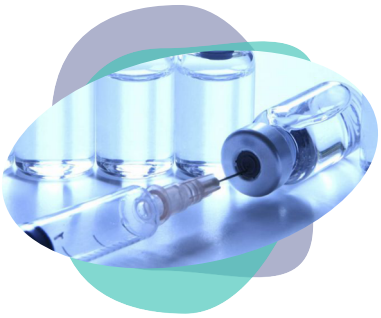
April 2020

April 1
A social campaign was activated on the Center's Twitter and Instagram, to improve communication with the media and to reach the wider population, speakers' briefings were replaced by the Center's Facebook Lives.

April 3
Within the scope of the state of emergency, additional restrictions were imposed on night movement from 21:00 to 06:00 and the so-called "Curfew". Gatherings of individuals in public spaces, social events with more than 3 people were prohibited. Rail and road transport of passengers between cities and within the borders of the municipality and movement by public transport were suspended.

April 5
Videos were shared for the target population, and educational materials developed and distributed, including translations for ethnic minorities.

April 6-13
In order to encourage routine vaccination, Immunization Week was held throughout the country.



April 7
In connection with the World Health Day, the exhibition "Medical personnel on the front line of the COVID-19 epidemic" was organized and the "Stay at home" campaign got launched.

April 10
As a result of the epidemiological situation assessment the strict quarantine regime was implemented in the municipality of Lentekhi .

April 12
A strict quarantine regime was imposed in the administrative units of Kobuleti Municipality.

1April 13
A strict quarantine regime was imposed in the village of Khidiskuri of Khashuri municipality.

April 14
ქვეყნის მთელ ტერიტორიაზე საგანგებო მდგომარეობა გახანგრძლივდა 22 მაისამდე.

April 15
Entering and leaving Tbilisi, Rustavi, Kutaisi and Batumi, movement of motor vehicles (except motorcycles) and entering cemeteries got prohibited. The obligation to wear a face mask was imposed when gathering in a closed public space.

April 22-28
The capacity of molecular diagnostics at laboratories was expanded and an additional 7, and a total of 12 laboratories got involved in molecular diagnostics of COVID-19.

April 24
The Office of the Prime Minister of Georgia presented a six - stage economic anti-crisis plan.

April 27
The first phase of the anti-crisis plan was launched throughout Georgia. Transportation by automobiles and taxis was restored. Online trade, delivery services resumed and open agricultural markets of appropriate standards were opened.

Activities carried out in Georgia in relation to the new coronavirus (COVID-19)

May 2020

May 5
Based on the improvement of the epidemiological situation, traffic was restored in the municipalities of Batumi and Kutaisi. Car wash and car repair services were opened. The work of construction companies and manufacturers of building materials was resumed.

May 8
Strict quarantine restrictions were lifted in the administrative units of Kobuleti.

May 11
Tbilisi Municipality was opened. The work of all retail and wholesale stores was resumed (except for large shopping centers).

May 12
The awareness raising campaign on COVID-19 was activated through all social platforms of the Center (Facebook, Twitter, Instagram).

May 13
Within the scope of the SARS-CoV-2 epidemic surveillance, a wastewater study was conducted in Marneuli and Tetritskaro.

May 14
Rustavi municipality was opened

May 17
The first COVID-analysis of the National Center for Disease Control and Public Health was published.

May 18
Due to the improvement of the epidemiological situation, the activities of beauty salons and aesthetic centers were allowed.

May 23
The state of emergency ended and the curfew got abolished, the restriction on the movement of more than 3 people in a car, except for taxis, got lifted.

May 22-26
During the period, a study of COVID-19 seroprevalence was conducted in Bolnisi and Telavi regions, material related to seroprevalence was prepared.

Activities carried out in Georgia in relation to the new coronavirus (COVID-19)

June - July 2020

June 12
The control of established rules and standards in public gathering places, transport and restaurants throughout Georgia was tightened.

June 15
As a result of the assessment of the epidemiological situation, by the decision of the coordination council, domestic tourism was restored.

June 16
The second report of the NCDC on COVID -19 in Georgia was published.

June 19
Open-air seminars, trainings and adventure activities were allowed.

July 2
The rules for conducting unified national exams, general master's exams, student grant competition and subject exams were specified.

July 6
Quarantine restrictions were lifted in the village of Mushevan.

July 7
It was allowed to conduct trainings and conferences in a closed space, with a limited number of participants.

July 8
Germany, France, Latvia, Lithuania and Estonia opened their borders to Georgian citizens unconditionally

July 9
Swimming pools and gyms that met the established regulations were opened.

July 12
The COVID-19 Risk Communication and Community Engagement Action Plan was published.

July 18
A webinar on the COVID-19 issues was held for ethnic minorities.

July 20
It was allowed to hold any social, festive, ritual and other events in the open space, and the recommended maximum number of attendees was set at 100 people.

July 21
Active intensive temperature screening of the population and epidemiological studies began in Gardabani municipality.

July 22
The control over the enforcement of regulations at the markets was tightened .

The country joined the COVAX platform to ensure equal access to COVID-19 vaccines for all countries.

Activities carried out in Georgia in relation to the new coronavirus (COVID-19)

August – September 2020

August
In order to control the epidemiological situation, testing of drivers of international shipment vehicles at the border started.

August
The first case of internal transmission was recorded in Adjara. Social events, anniversaries, weddings, feasts and other rituals were banned. In order to ascertain the current situation among the population, COVID-19 seroprevalence study was conducted.

September 18
The contract was signed with the COVAX platform.

September
The 2020 exams for practicing teachers were held with consideration of the epidemiological situation,.

The quarantine period for persons arriving from abroad was reduced to 8 days. The Ministry of Health approved the Healthcare Sector Capacity Building and Emergency Preparedness Plan for Response to COVID-19.

In addition, the laboratory network was expanded and the list of laboratories involved in diagnostics was increased. A media-webinar was held for journalists in West and East Georgia.

Targeted training for public health workers was held on the epidemiology, infection prevention and control of COVID-19.

The trend of infection spreading was noted in the country, against the background of a sharp increase in the number of COVID-19 cases in Adjara. An algorithm was developed for the apartment monitoring of COVID-19 patients.

Activities carried out in Georgia in relation to the new coronavirus (COVID-19)

October 2020

October 10
Targeted training for public health specialists was delivered in Tbilisi, Kakheti and Imereti.

October 15
In Tbilisi and Imereti, the work of restaurants and entertainment establishments was restricted due to the increase in the number of COVID-19 cases.

October 19
The country purchased the seasonal flu vaccine and began vaccination of risk groups.

October 21
It became mandatory for citizens of Georgia arriving from abroad to present a negative PCR test result and to self-isolate.

October 23
According to the decision of the Coordination Council, it became mandatory to wear a mask in open spaces.

October 24
In order to improve the general epidemiological situation, a social distancing campaign was activated.

October 26
The laboratory network and access to diagnostics for the population was further expanded throughout the country.

October 27
Based on the assessment of the epidemiological situation, the number of beds for patients infected with COVID-19 and the number of Covid-hotels increased.

October 29
A nationwide survey of COVID-19 seroprevalence was conducted.

Activities carried out in Georgia in relation to the new coronavirus (COVID-19)

November – December 2020

November 1
Risk communication has been further strengthened to effectively manage COVID-19.

November 3
Due to the epidemiological situation, the distance learning regime for schools was extended.

November 4
A limit has been set for restaurants until 10:00 p.m., with take-out service provided thereafter.

November 5
Both municipal and private kindergartens were temporarily closed in Tbilisi, Kutaisi, Batumi, Rustavi, Zugdidi, Gori and Poti..

November 6
The guideline for the treatment of covid-infected patients was updated.

November 9
In large cities (Tbilisi, Kutaisi, Batumi, Rustavi, Zugdidi, Gori, Poti) the movement of pedestrians and vehicles was restricted fr om 22:00 to 05:00.

November 10
Strict control was imposed on the number of people in municipal transport.

November 11
The coverage of the primary healthcare facilities increased and they got intensely integrated in the sector surveillance algorithm. Continuous medical surveillance of Covid-confirmed patients was ongoing.

November 15
An information portal was launched
http://ambulatoria.moh.gov.ge/

November 17
In addition, the laboratory network involved in covid-testing was expanded and access improved.

November 28
Movement was restricted from 23:00 to 04:00.

November 29
Based on the epidemic situation and risk assessment, the operation of ski tracks and cable cars was suspended. Schools, vocational schools, higher educational institutions and shopping facilities switched to the remote working mode. The operation of municipal transport was stopped. All kinds of conferences, training, cultural and entertainment events was decided to hold in online format. Restaurants and caterers switched to delivery service.

November 30
Testing was expanded to the entire territory of the country (PCR and new generation rapid antigen test).

December 15
An Interagency Coordination Commission for vaccination against COVID-19 was established.

Activities carried out in Georgia in relation to the new coronavirus (COVID-19)

January February March 2021

January 1
The risk communication campaign on COVID-19 for target groups was strengthened.

January 10
In order to raise the awareness of public health personnel, a cycle of trainings on "unusual respiratory events and infection control" was started in the regions.

January 21
Special COVID-19 vaccination cabinets were designated in medical institutions.

February 1
Based on the improvement of the epidemiological situation, the operation of municipal transport, schools, shops and shopping centers was restored in the big cities of Georgia.

February 2 – 25
During this period, the border crossing regime was eased for both Georgian and foreign citizens entering the country by air. Intercity transport resumed operation and outdoor and closed markets were opened in all cities. In schools from 5th to 12th grade, wearing a face mask became mandatory.

February 25
შეირჩა COVID-19-ის ვაქცინაციის სპეციალური კაბინეტები სამედიცინო დაწესებულებებში.

March 1
The work of municipal transport and kindergartens was resumed.
Students of vocational and higher education institutions returned to auditoriums.

March 4
The first case of re-infection with SARS-COV-2 was officially recorded in Georgia. The epidemic surveillance was strengthened.

March 8
Due to the decrease in cases of COVID-19, cable cars were opened at mountain resorts. Conferences and trainings were resumed following the relevant protocol.
Live music became allowed in restaurants.
Following the specified regulations, the sports halls resumed their operation.

March 12
Vaccination hotline 15 22 was established.

March 13
Oxford-AstraZeneca vaccine entered the country.

March 15
The country started vaccinating all healthcare workers with the Oxford-AstraZeneca vaccine, and on March 25, vaccination was expanded to include the population aged 65 and older. The registration portal for vaccination against COVID-19 was launched and the vaccination of persons employed in the health sector began https://booking.moh.gov.ge/Hmis/Hmis.Queue.Web/

March 25
Vaccination of the population aged 65 years and older with Oxford AstraZeneca began.

March 30
The country purchased Pfizer-BioNTech vaccine and started the vaccination process.

Activities carried out in Georgia in relation to the new coronavirus (COVID-19)

April May June July 2021

April 1
In order to expand vaccination in the country, vaccination of citizens aged 55 and older, dialysis patients and organ transplant patients started.

April 5
Vaccination of citizens aged 55 and older, dialysis patients and organ transplant patients began.

April 10
A survey of risk factors for COVID-19 was conducted to collect and share information among medical personnel.

April 15
Recommendations were developed and promotional materials shared in the appropriate language for ethnic minorities. Risk communication was enhanced .

April 19-25
"Within the framework of the immunization week" a targeted vaccination campaign was conducted.

April 25
In parallel with the vaccination process, the effectiveness of vaccines against COVID-19 was studied in the country.

April 27
Registration for Sinopharm vaccination started.
A population survey was conducted in Georgia.

May 3
Movement of municipal transport and access to cemeteries were restricted throughout Georgia.

May 4
Vaccination with Sinopharm vaccine started.

May 5
Vaccinations with Sinopharm vaccine for the population aged 18 and older started.

May 13
Sinopharm vaccine was authorized for emergency use by the World Health Organization .

May 21
Vaccination with Sinovac for the population aged 18 years and older started.
Oxford-AstraZeneca vaccine became available in 49 immunization offices of 32 medical institutions in Tbilisi and regions..

May 24
Vaccination with Sinovac started.

May 25
Research of a vaccine effectiveness against COVID-19 began.

June 1
Sinovac vaccine got authorized for emergency use by the World Health Organization. Land borders were opened for those fully vaccinated and those with a negative response to the PCR test.

June 2
A website for vaccination against COVID-19 was developed https://vaccine.ncdc.ge/

June 15
The plan for organizing mass vaccination points was approved.

June 16
A population-based study to assess the seroprevalence and risk factors of SARS-CoV-2, hepatitis C and hepatitis B viruses was launched.

June 22
In the Imereti region, a rapid response team for COVID-19 was created and trained.

July 1
The restriction on movement between 23:00 and 04:00 was cancelled.

Activities carried out in Georgia in relation to the new coronavirus (COVID-19)

April May June July 2021

July 2
One million doses of Sinopharm and Sinovac vaccines entered Georgia. Mass vaccination began. The vaccination campaign was expanded in the regions.

July 5
Genome sequencing was enhanced.

July 12
In the Samegrelo -Zemo -Svaneti region, a rapid response team against COVID-19 was created and trained.

July 14
The national COVID-19 vaccination program in the regions and monitoring visits were being strengthened (Shida Kartli, Kvemo Kartli, Adjara, Samegrelo-Zemo Svaneti, Imereti, Samtskhe-Javakheti, Kakheti).

July 23
500,000 doses of the Pfizer-BioNTech vaccine arrived in the country as a donation from the USA. In support of the COVID-19 vaccination process, informational meetings were being held intensively in the regions.

July 30
In the country, the national vaccination program for COVID-19 began to vaccinate the foreign citizens who met the relevant criteria.

July 31
As a result of negotiations between the government of Georgia and the manufacturing company, the purchase of 1 million doses of the Pfizer-BioNTech vaccine was gradually started. The first mass vaccination center was opened in Tbilisi, on the territory of TSMU.

August 10
In order to expand vaccination, a mass vaccination center started operating in Batumi.

August 12
In order to expand vaccination, a mass vaccination center was opened in Mtskheta with the support of the Red Cross society.

23 August
In order to expand vaccination, a mass vaccination center was opened at Akaki Tsereteli State University in Kutaisi.

August 14
One million doses of Pfizer-BioNTech were purchased by the government. Additional beds were mobilized. In conditions of municipal transport restrictions, regular transporting of the population to the main immunization centers was launched. Vaccination was expanded, brigades of military doctors were involved in the process. The working hours of catering facilities were reduced and according to new rules, they were being closed at 11:00 p.m. The work of children's entertainment centers was restricted. Festivals, entertainment events, concerts and sports competitions were suspended. The movement of municipal transport was stopped.

August 27
Mobile vaccination buses were put into operation in Tbilisi.

September 1
Mobile immunization centers were launched in Batumi.

September 13
The movement of municipal transport was restored.

September 15
Vaccination promotion lottery for population of all ages was launched.

September 17
In order to attend the events, it became mandatory to present a vaccination certificate, or a negative response to a PCR test conducted within the last 72 hours, or a negative response to a rapid antigen test conducted within the last 24 hours. Vaccination certificates were made available at Public Service Halls across the country.

September 20
Webinars were held for the media about the vaccination of COVID-19, educational materials were distributed, etc. in the appropriate language for ethnic minorities .

September 25
A rapid COVID-19 response team was created and trained in the Guria region.

September 26
Vaccination centers were expanded and the number of mobile vaccination brigades increased.

Activities carried out in Georgia in relation to the new coronavirus (COVID-19)

November - December 2021

October 6
Based on the assessment of the epidemiological situation, the work of catering establishments was extended from 22:00 to 23:00. Restrictions on holding concerts and festivals were removed and regulations were introduced for holding them.

October 7
In order to strengthen and increase access to vaccination against COVID-19, mobile vaccination teams were sent to regions and remote settlements.

October 8
The country purchased the seasonal flu vaccine and started vaccinations .

October 10
Educational booklets were prepared for the rural population to strengthen the COVID-19 communication campaign.

October 12
Vaccinated with the Pfizer-BioNTech became possible for 12 -year -old adolescents. Vaccination with a booster dose was made possible for persons aged 50 and older and patients with chronic diseases. For the booster, any vaccine registered in the country can be used 6 months after the vaccination with the second dose. Additional vaccination with Pfizer-BioNTech was allowed for those wishing to travel, if necessary.

October 16
80,000 doses of Pfizer-BioNTech vaccine entered the country with a donation from Latvia .

November 4
460,000 doses of Pfizer-BioNTech vaccine entered the country as a donation from Poland.

November 8
To encourage vaccination, a one-time pension supplement of GEL 200 was paid to citizens aged 60 and older who were vaccinated with the first dose until December 31, 2021.

November 10
The Pfizer-BioNTech vaccine made vaccination available for all adolescents from 12 years of age.

November 15
The European Union and Georgia harmonized the vaccine databases. As a result, the Covid-certificate issued in the country is valid on the territory of the European Union.

November 20-21
In order to encourage vaccination, targeted cognitive and informational events were held in different cities.

November 20 - 21
A new variant registered in South Africa, Omicron, was assigned a Status of Concern (VOC) by the WHO. For prevention, additional regulations were introduced in the country for those arriving from 8 countries of the African continent .

November 27
A new variant registered in South Africa, Omicron, has been assigned a Status of Concern (VOC) by the WHO. For prevention, additional regulations were established in the country for those arriving from 8 countries of the African continent.

November 29
The rapid COVID-19 response team was trained in the Kakheti region.

December 1
"Green Passport" was launched throughout the country for entry to various facilities. Georgia e-Health and Covidpass Georgia mobile applications were introduced.

December 2
In cinemas, theaters and opera, the number of allowed spectators increased from 30% to 50%.

December 7
A booster dose is allowed to be administered with the Pfizer-BioNTech vaccine, with the second dose at least 5 months after vaccination, and 3 months later for Sinopharm and Sinovac.

December 8
Billboards promoting vaccination were installed in various locations across the city

December 9
In order to encourage and expand vaccination, a vaccination marathon was held in Ozurgeti.

December 17
The vaccination website vaccines.ncdc.ge was translated into 4 languages (Georgian, Abkhazian, Azerbaijani and Armenian) .

December 20
The first case of Omicron infection was confirmed in Georgia.

Activities carried out in Georgia in relation to the new coronavirus (COVID-19)

January-June 2022

January 1
A social campaign was additionally activated on Twitter and Instagram and risk communication was strengthened.

February 1
The largest number of COVID-19 cases was recorded - 26,320 people.

January 4
For those Georgian citizens aged 50 and older who would get vaccinated before January 31, 2022, a one-time monetary incentive was introduced after the first dose. This incentive will be offered to citizens aged 60 and older.

February 2
The algorithm for the implementation of medical supervision in isolation of patients with a mild form of COVID-19 was updated.

January 15
For asymptomatic and mild patients, the quarantine period was reduced to 8 days. It was strongly recommended to wear a mask for the next 5 days after the end of isolation. For moderate and severe cases, the quarantine period was determined for 10 days. In addition, for ending isolation improving dynamic should have been obvious during the last 24 hours. Wearing a mask was strongly recommended for 5 days after the end of the isolation. The decision to end isolation was to be made by the patient's family doctor, depending on the patient's state of health.

February 11
The period of isolation of the contacted person was reduced from 8 to 5 days. Based on the analysis of the current epidemiological situation in Georgia, the inter-agency coordination council made a decision to ease the current regulations.

February 27
50% of spectators were admitted to the Georgia-Russia rugby match .

March 1
Entry by air, land and sea borders was allowed for all citizens/residents of foreign countries who were fully vaccinated, and in case of lack of vaccination, submitted a negative PCR-test with 72-hour validity. The allowed number of people around one table at open space of a catering facility was defined as 15 (instead of the existing 10), while in closed space 10 people (instead of the existing 6); The limit on the maximum number of guests was canceled. Holding social events (party, birthday, wedding, funeral reception) was allowed under the same condition - 10 people at one table in a closed space, and 15 people at one table in an open space.

March 2
Quarantine spaces, the so-called Covid-hotels, were abolished. The obligation to conduct temperature screening and keep the log was cancelled. The obligation to have a disinfection barrier was canceled. The restriction on buffet service was canceled.

March 4
It was allowed to operate clubs with 60% occupancy of the total space.

March 15
It was allowed to hold conferences, seminars and trainings without restrictions.

March 22
The first batch of Paxlovid, a drug for the treatment of COVID-19, arrived in Georgia.

May 2
Wearing a face mask became mandatory only when visiting medical institutions, pharmacies and public transport (including metro).

June 14
A second booster dose could be given to anyone aged 50 and over, especially it became recommended for immunocompromised and chronically ill people and people living in long-term care facilities, as well as persons aged 12-49 with immunocompromised and chronic diseases and staff employed in medical institutions.

June 15
A person entering the country from a foreign country in any way will no longer be required to present a document related to Covid-vaccination at the border. Testing of staff employed in schools was cancelled.

June 20
The use of a mask became mandatory in medical facilities, and recommended in buses, minibuses, pharmacies and other crowded places..