

Case Report

Epidemiological COVID-19 Data for Eastern Rodopi, Bulgaria

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Abstract

In a brief summary we present a report of the results from rtPCR diagnostic tests of individuals with travel arrangements and border-crossing movement, and the importance of restrictive measures, diagnostic testing and travel limitations in order to contain the COVID-19 pandemic during the summer months of 2020. rtPCR test results were a prerequisite for any planned trip and border crossing, therefore the collected data are cumulative and the statistics extremely helpful and necessary. Our Molecular Diagnostics Unit is licensed within the territory of Bulgaria. Our methods were strict protocols from the guidelines of the National Center for Infectious and Parasitic Diseases, Bulgaria, the kits used were all CE, the overall concept in sync with the global regulations as from the CDC and the WHO. We demonstrated an increase in the number of infected randomly tested travelers during the summer months and thereafter, giving a glimpse of the magnitude of the pandemic that followed. We showed a total increase of infection from 12.5% in July to almost 56% for the month of November. The current report presents retrospective data and makes suggestions that are available to nations and applicable locally; it is of immense importance for the regions located near border-crossing points in a situation of pandemic of such magnitude without immediate access to vaccines or reliable treatment for the novel infectious disease outbreaks.

Keywords: COVID-19, SARS-CoV-2, global pandemic, border-crossing restrictions

Резюме

Настоящата статия представя кратко обобщение на резултатите от rtPCR диагностичните тестове за хора, осъществяващи организирани пътувания и преминаващи през граничните пунктове, както и значението на ограничителните мерки, диагностичните тестове и ограничението на пътуванията с цел овладяване на пандемията от Covid 19 по време на летните месеци на 2020 г. В този период, задължително изискване за планирано пътуване и преминаване през границата беше резултат от rtPCR тест. Това даде възможност за събиране на кумулативни данни, които след статистическа обработка се оказаха изключително полезни и необходими. Те са събрани в Лаборатория за молекулярна диагностика, лицензирана на територията на България. Прилаганите методи са съобразени с протоколите от Националния център по заразни и паразитни болести, България, а използваните китове са разрешени от ЕС. Цялостната концепция на изследването е в синхрон с глобалните разпоредби от Центъра за контрол и превенция на заболяванията и СЗО. Получените резултати демонстрират нарастващия брой на заразените сред тестваните на случаен принцип пътници през летните месеци и дава представа за мащаба на пандемията, която последва. Установено е, че от месец юли до месец ноември инфекцията нараства от 12.5% до почти 56%. Статията представя ретроспективни данни и предлага възможности, приложими на местно ниво и особено в региони с гранично-пропускателни пунктове в ситуация на пандемия с такъв мащаб и без незабавен достъп до ваксини и надеждно лечение за нови инфекциозни огнища.

Introduction

In the beginning of the year 2020, news of a new and deadly disease broke. We only had limit-

ed information of this novel virus of the family of Coronaviruses; some vague specifics were yet to be discovered. Swiftly it became evident that the en-

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tire world would be affected and partake in the fight against it, as well as in describing the symptoms and major manifestations, the treatment of patients and testing, contributing to the global knowledge of its prevention and cure. Our COVID unit testing lab was established within the Microbiology and Virology Division in the main County Hospital in the town of Kardzhali, Eastern Rodopi, Bulgaria. Upon the beginning of our new line of work, we immediately started testing huge amounts of inpatients and outpatients as we did our best to provide prompt service, deliver results the same day, report to physicians and local health authorities for the appropriate measures and prescribe quarantine to whoever tested positive. We worked according to mandatory regulations for border crossings globally [<https://wiki.unece.org/display/CTRBSBC/Bulgaria#page-banner-start>] and locally [https://ec.europa.eu/regional_policy/en/projects/Greece/new-greece-bulgaria-border-check-point-makes-for-safer-faster-travel; Pueyo, 2020], and provided standard testing plus verified result certification. Globally, new regulations on migration and border crossing were introduced, while in Europe each country provided a bulletin and informative data with recommendations for migration.

An important aspect was presented by authors, suggesting increased tension in areas with higher rates of migration with population emerging from Wuhan as the main infection source in other cities and provinces. In China some cities with a low number of cases showed a rapid increase in case load. Owing to the upcoming Spring Festival return wave, understanding the risk trends in different regions is crucial to ensure preparedness at both the individual and organization levels and to prevent new outbreaks (Chen *et al.*, 2020).

In the USA since the outbreak, the FBI anticipated a rise in hate crimes across the United States citing examples such as the stabbing of an Asian American family, including children ages 2 and 6, whom the assailant believed were spreading COVID-19. Their prediction was confirmed by the Asian Pacific Policy & Planning Council, with over 1.000 documented reports from Asian people of coronavirus discrimination and hate crimes from March 19th to April 1st of last year. Common incidents included verbal harassment, shunning, and physical assault. These accounts, along with associations between “Chinese” and “virus”, suggest the emergence of a more sinister phenomenon, namely, the personification of COVID-19 as Asian people. This is especially tragic for Asian healthcare workers, who make up 17% of physicians in active practice and are the most

represented ethnic group among foreign-born medical professionals currently in the USA (Ze-Liang Chen *et al.*, 2020).

Pueyo (2020) recently published a paper of particular interest on the development of the pandemic and the importance of coronavirus measures. According to the author, it is enough to introduce strong measures in just a few weeks, which will reduce the peak of coronavirus infection and will save the lives of millions of people at a reasonable cost. Otherwise, tens of millions will be infected, many will die, and the healthcare system will have collapsed.

In our study, the tested patients for the months of the pandemic produced data from July to November and 2020, which we report as we believe they might be an important piece of evidence toward the global understanding of the spread, contagiousness, significance, morbidity and mortality. We believe our data are very important for the region in which we live, not only in terms of treating patients, controlling the spread and guiding the health authorities measures locally, but also contributing to the bigger picture of understanding this new and deadly disease globally.

With the current work, we aim to show COVID results at regional level and potentially help to better understand the territorial patterns of the epidemic and to support the definition of place-based policies to tackle the crisis at local and national level.

Case Report

Our statistical data are based on the results collected directly from patients tested in our hospital on a daily basis. Our testing methods were the rtPCR for COVID-19 according to the global standards of the WHO and the CDC guidelines. Our methodology utilized isolation of RNA from patient samples prior to the rtPCR protocol. The isolation was done manually. The rtPCR was run in the Applied Biosystems StepOne Real-Time PCR System. The supporting methods of testing were the rapid tests with whole blood or plasma, as well as nasopharyngeal antigen testing via swabs. The reagents used were procured from different sources, governmental, official central supply, local grants or purchases. All of our reagents and kits were CE.

For the testing, the following data were collected: (a) key dates, which included the date of onset of disease, date of admission to hospital, date of confirmation of infection, and dates of travel; (b) demographic information about the age and sex of patients/cases; (c) geographic information at the highest resolution available down to district level (information at building level was excluded so that

cases could not be identified, this information was subdivided into administrative units (county, city, and, where available, specific locations); (d) symptoms, (e) any additional information, such as exposure to specific places with higher density of people, record of exposure to infected individuals, if known. All the information collected with the results was entered into the national system for COVID for Bulgaria within the same day. Summaries of the data are shown in Fig. 1.

the epidemiological data are given in Table 1.

As the volume of collected data increased, we can report solid evidence of one very good reason for the spread of the COVID infection in regions near border crossing points. For the Greek authorities to grant entrance to the citizens with Greek passports, rtPCR, negative results were a prerequisite. We also observed percentages of positive cases not in peaks, but rather as a steady increase in their number. The increase in positive tests further

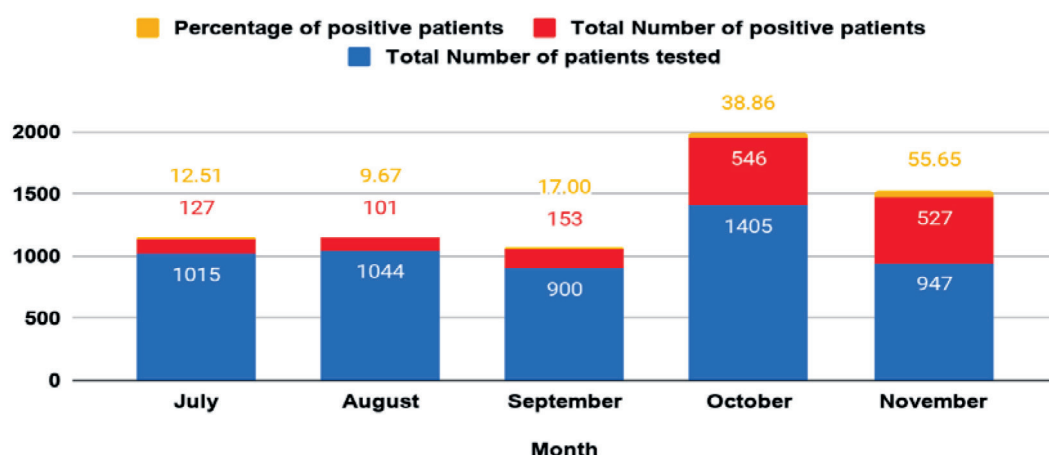


Fig. 1. Percentage of positive and negative for the months from July through November

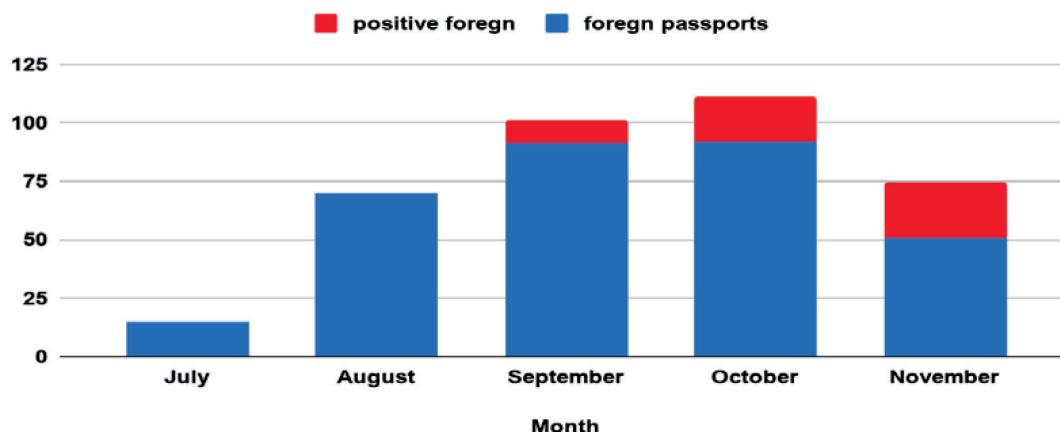


Fig. 2. Distribution of positive test results in foreign passport holders by month

According to the data, there was an increase in the number of patients who tested positive from the beginning of the summer through July until November. During the summer months, travelling across borders was possible only with evidence of a negative PCR test. We recorded mainly negative and healthy individuals traveling through earlier on, but with the shift of the seasons, the number of patients with positive tests increased (Fig. 2).

We have no information about the purpose of people's travels and the need to cross borders, but we speculate the summer months were for family annual vacations, as well as business-related, and the need to travel back home for people with seasonal jobs throughout Europe. The important aspects of

led to an increase in morbidity and mortality (not presented), a large number of patients with a need of hospitalization by far exceeding the numbers of available hospital beds, and exhausting hospital resources and staff. The increase in infected people exposed many doctors and healthcare workers to an immense risk on the job, a rather grave situation, just like anywhere else in the world.

Discussion

While our data were being collected daily and reported to local and national authorities, we continued to study the trends and nuances of the mass number of tested individuals. Although foreign passport holders are listed separately in our database, we firmly believe the reason for testing was for

Table 1. Distribution of patients with foreign passports who tested positive for each month from July through November

Month	Total number of patients tested	Total number of positive patients	Number of patients with foreign passports	Patients with foreign passports tested negative	Patients with foreign passports tested positive
July	1015	127	15	15	0
August	1044	101	70	70	0
September	900	153	91	81	10
October	1405	546	92	73	19
November	947	527	51	28	23

travel across borders. We cannot tell though what percentage of Bulgarian passport-holder healthy individuals subjected to testing had the intention of traveling and therefore we can only speculate based on the data presented. However inaccurate and biased the results are, the trend shows clear evidence of spread due to people's travel and movement, regardless of the mechanisms of spread - via infected patients or simply by mechanical dissemination of the virus particles. Furthermore, apart from the actual rtPCR protocol as such, there is a considerable amount of waiting time before the results become available, so we have no control over the patients' physical contacts during that time; the time they spend at the local grocery store or a restaurant, the lingering at the actual hospital and the like. Based on our evidence, that we observe a higher percentage of infected, tested positive and ultimately sick patients in the larger cities near border, where testing for SARS-Cov2 is done. Based on our evidence, it can be assumed that a higher percentage of infected, positive-testing and ultimately sick patients are observed in larger cities near border crossing points where SARS-Cov2 testing is performed.

As we have experienced several full lockdowns followed by slight removal of restrictions, we can only hope we can follow the scheme outlined by "The Hammer and the Dance". Our greatest hope is that with the growing number of medicinal products now available, more and more peo-

ple will take advantage and, hopefully, will slowly move back to normalcy.

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