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### Assessment of Healthcare Services at the Caracal Municipal Hospital during the COVID-19 Pandemic

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**Abstract:** The COVID-19 pandemic exerted substantial pressure on healthcare systems and significantly altered both access to and the organization of medical services. In this context, the present study assesses the activity of the Caracal Municipal Hospital in 2021, when the institution functioned as a designated support hospital for patients diagnosed with SARS-CoV-2 infection. The analysis is based on a retrospective examination of 4,404 hospital admissions. The findings reveal a predominance of female patients, an ageing age structure, and a high proportion of emergency admissions. Furthermore, a clear seasonal pattern in both admissions and discharges was identified, with peak values recorded during the summer months, particularly in August. Respiratory pathology represented the most frequently encountered condition, while a considerable share of patients presented a confirmed secondary diagnosis of COVID-19. At discharge, favourable clinical outcomes were predominant; however, hospital mortality remained notable, with higher rates observed among male patients.

#### Introduction

In December 2019, a new form of severe pneumonia, later identified as the novel coronavirus disease (COVID-19 or SARS-CoV-2), was first reported in Wuhan, Hubei Province, China. In the subsequent months, the infection spread rapidly worldwide, although its impact was not uniformly distributed across countries. The COVID-19 pandemic found Romania with a predominantly public healthcare system that still relies to a considerable extent on ageing infrastructure developed during the former communist regime [1]. At the same time, the country is characterized by a declining population, accounting for no more than 3.8% of the total European population, and by the lowest healthcare expenditure levels within the European Union, amounting to approximately one third of the EU average, despite ongoing processes of restructuring and improvement in healthcare financing [2]. In Romania, the first confirmed case of COVID-19 was reported on 26 February 2020 [1, 3], followed by the implementation of strict quarantine measures. The pandemic necessitated a substantial reorganization of the healthcare system, as certain hospitals, departments, and outpatient units were designated as COVID-19 facilities. In 2021, Romania experienced a catastrophic fourth wave of the COVID-19 pandemic, which attracted international concern due to the rapid escalation in infection rates and the high associated mortality. The COVID-19 pandemic exposed the insufficient capacities and preparedness of countries worldwide to effectively respond to global infectious disease threats, while simultaneously highlighting the urgent need to strengthen the international health security framework. In this context, the existence of an efficient and comprehensive healthcare system, capable of adequately addressing public health emergencies, represents a fundamental prerequisite for enhancing overall health security [4]. The present study aims to evaluate the healthcare services provided by the Caracal Municipal Hospital in the context of COVID-19 infections, taking into account the institution's designation as a support hospital during the pandemic period.

#### Material and method

The Caracal Municipal Hospital is a public healthcare institution located in Caracal, Olt County, Romania, with a longstanding tradition in the provision of medical services. From the perspective of competency-based classification, it is designated as a Category IV hospital. The institution serves an estimated population of approximately 31,000 individuals, comprising residents of the municipality of Caracal as well as those from the surrounding affiliated rural communities. The served population is predominantly rural, characterized by a relatively low level of health education, an ageing demographic structure, limited living standards, and a high proportion of unemployed individuals. At present, the hospital operates a total of 22 departments and specialized units [5]. The data obtained from the Medical Evaluation and Statistics Department of the Caracal Municipal Hospital were processed using Microsoft Excel 2010 and subsequently subjected to statistical analysis. The analysed sample comprised 4,404 patients who were hospitalized in this medical institution during the year 2021. The reference period covered approximately one year and coincided with the COVID-19 pandemic, within the context of which the hospital was designated as a support facility for patients who tested positive for the SARS-CoV-2 virus.

#### Results and discussions

Table 1. Sample structure by gender

| Gender | Number of patients | Percent |
|--------|--------------------|---------|
| Female | 2,392              | 54%     |
| Male   | 2,012              | 46%     |
| Total  | 4,404              | 100%    |

Table 3. Sample structure based on age groups and gender

| Age group   | Male  | Percent | Female | Percent |
|-------------|-------|---------|--------|---------|
| 0-10 y.o.   | 351   | 8%      | 265    | 6%      |
| 10-20 y.o.  | 28    | 1%      | 98     | 2%      |
| 20-30 y.o.  | 36    | 1%      | 231    | 5%      |
| 30-40 y.o.  | 71    | 2%      | 168    | 4%      |
| 40-50 y.o.  | 175   | 4%      | 209    | 5%      |
| 50-60 y.o.  | 308   | 7%      | 299    | 7%      |
| 60-70 y.o.  | 449   | 10%     | 442    | 10%     |
| 70-80 y.o.  | 444   | 10%     | 463    | 11%     |
| 80-90 y.o.  | 140   | 3%      | 203    | 5%      |
| 90-100 y.o. | 10    | 0%      | 14     | 0%      |
| Total       | 2012  | 46%     | 2392   | 55%     |
| Min         | 0     | -       | 0      | -       |
| Max         | 94    | -       | 98     | -       |
| Mean        | 51.40 | -       | 55.19  | -       |

Table 2. Sample structure by age groups

| Age group   | Number of patients | Percent |
|-------------|--------------------|---------|
| 0-10 y.o.   | 616                | 14%     |
| 10-20 y.o.  | 126                | 3%      |
| 20-30 y.o.  | 267                | 6%      |
| 30-40 y.o.  | 239                | 5%      |
| 40-50 y.o.  | 384                | 9%      |
| 50-60 y.o.  | 607                | 14%     |
| 60-70 y.o.  | 891                | 20%     |
| 70-80 y.o.  | 907                | 21%     |
| 80-90 y.o.  | 343                | 8%      |
| 90-100 y.o. | 24                 | 0%      |
| Total       | 4404               | 100%    |

Table 4. Sample Structure by Type of Admission

| Type of Admission                       | Number | Percent |
|---|--------|---------|
| without a referral note                 | 3754   | 85%     |
| specialist physician's referral (BI MS) | 347    | 8%      |
| interhospital transfers                 | 301    | 7%      |
| Admissions upon patient request         | 2      | 0%      |
| Total                                   | 4404   | 100%    |

Table 5. Sample Structure by Health Insurance Status

| Health Insurance Status | Number | Percent |
|-------------------------|--------|---------|
| CNAS insured            | 4100   | 93%     |
| Uninsured               | 298    | 7%      |
| Voluntarily insured     | 6      | 0%      |
| Total                   | 4404   | 100%    |

Table 6. Sample Structure by Length of Hospital Stay

| Hospital stay interval | Number | Percent |
|------------------------|--------|---------|
| 0-5 days               | 1677   | 38%     |
| 5-10 days              | 1579   | 36%     |
| 10-15 days             | 817    | 19%     |
| 15-20 days             | 228    | 5%      |
| 20-25 days             | 66     | 1%      |
| 25-30 days             | 22     | 1%      |
| 30-35 days             | 10     | 0%      |
| 35-40 days             | 3      | 0%      |
| 40-45 days             | 1      | 0%      |
| 45-50 days             | 0      | 0%      |
| 50-55 days             | 0      | 0%      |
| 55-60 days             | 1      | 0%      |
| Maximum                | 58     | -       |
| Minimum                | 0      | -       |
| Average                | 7      | -       |

Table 7. Sample Structure by Hospital Departments at Both Admission and Discharge

| No. | Hospital Departments                             | Number of admissions | Percent | Number of discharge | Percent |
|-----|--|----------------------|---------|---------------------|---------|
| 1.  | Neurology  | 377                  | 9%      | 374                 | 8%      |
| 2.  | Internal Medicine                                | 417                  | 9%      | 389                 | 9%      |
| 3.  | Pulmonology                                      | 359                  | 8%      | 376                 | 9%      |
| 4.  | Pediatrics                                       | 394                  | 9%      | 393                 | 9%      |
| 5.  | Orthopedics and Traumatology                     | 281                  | 6%      | 279                 | 6%      |
| 6.  | General Surgery                                  | 396                  | 9%      | 397                 | 9%      |
| 7.  | Plastic and Reconstructive Surgery               | 33                   | 1%      | 34                  | 1%      |
| 8.  | Cardiology                                       | 399                  | 9%      | 405                 | 9%      |
| 9.  | Diabetes, Nutrition and Metabolic Diseases       | 78                   | 2%      | 79                  | 2%      |
| 10. | Infectious Diseases                              | 319                  | 7%      | 301                 | 7%      |
| 11. | Obstetrics and Gynecology                        | 459                  | 10%     | 462                 | 10%     |
| 12. | Neonatology (newborns)                           | 205                  | 5%      | 205                 | 5%      |
| 13. | Neonatology (premature infants)                  | 35                   | 1%      | 35                  | 1%      |
| 14. | Otorhinolaryngology (ENT)                        | 123                  | 3%      | 138                 | 3%      |
| 15. | Urology  | 77                   | 2%      | 82                  | 2%      |
| 16. | Dermatovenerology                                | 6                    | 0%      | 6                   | 0%      |
| 17. | Medical Oncology                                 | 324                  | 7%      | 324                 | 7%      |
| 18. | Acute Psychiatry                                 | 21                   | 0%      | 24                  | 1%      |
| 19. | Neurological Medical Rehabilitation              | 13                   | 0%      | 13                  | 0%      |
| 20. | Rehabilitation, Physical Medicine and Balneology | 88                   | 2%      | 84                  | 2%      |
| 21. | Respiratory Medical Rehabilitation               | 0                    | 0%      | 3                   | 0%      |
| 22. | Chronic Care                                     | 0                    | 0%      | 1                   | 0%      |

Table 8. Sample Structure by Month at Both Admission and Discharge

| Month         | Admissions | Percent | Discharges | Percent |
|---------------|------------|---------|------------|---------|
| December 2020 | 50         | 1%      | -          | -       |
| January       | 213        | 5%      | 220        | 5%      |
| February      | 154        | 4%      | 149        | 3%      |
| March         | 307        | 7%      | 266        | 6%      |
| April         | 276        | 6%      | 311        | 7%      |
| May           | 158        | 4%      | 189        | 4%      |
| June          | 374        | 8%      | 329        | 8%      |
| July          | 539        | 12%     | 512        | 12%     |
| August        | 560        | 13%     | 546        | 12%     |
| September     | 549        | 12%     | 499        | 11%     |
| October       | 554        | 13%     | 529        | 12%     |
| November      | 301        | 7%      | 434        | 10%     |
| December      | 369        | 8%      | 420        | 10%     |

Table 9. Sample Structure by the Most Frequently Encountered Pathologies

| Pathology                                    | Number | Percent |
|--|--------|---------|
| other viral pneumonias                       | 590    | 37%     |
| interstitial pulmonary disease, unspecified  | 168    | 11%     |
| bronchopneumonia, unspecified                | 248    | 16%     |
| primary uterine inertia                      | 107    | 7%      |
| single liveborn infant delivered in hospital | 122    | 8%      |
| Congestive cardiac failure                   | 102    | 6%      |
| Cardiac arrest, unspecified                  | 242    | 15%     |
| Total  | 1,579  | 100%    |

Table 10. Analysis of the Number of Surgical Interventions among the Individuals Included in the Study

| Patient category   | Number | Percent |
|--|--------|---------|
| Patients which underwent at least one surgical procedure | 958    | 22%     |
| Patients which did not require any surgical procedure    | 3,446  | 78%     |
| Total  | 4,404  | 100%    |

Table 11. Sample Structure by the Presence of a Secondary Diagnosis of COVID-19, Virus Identified

| Patient category   | Number | Percent |
|--|--------|---------|
| COVID-19, identified virus   | 1,606  | 36%     |
| Patients who did not present the respective diagnosis or who were recorded with other secondary diagnoses. | 2,798  | 64%     |
| Total  | 4,404  | 100%    |

#### Conclusions

Therefore, it can be concluded that the morbidity rate was higher among female patients compared to male patients; however, mortality was considerably more pronounced among men than among women. Another important observation emerging from the analysis is the substantial increase in the number of patients during the summer period, with a marked rise in hospital admissions recorded in the second half of 2021. The most frequently encountered conditions were respiratory diseases, a pattern that may be associated with the seasonal spread and transmission of viral pathogens, particularly during transitional periods of the year, as well as with the overlapping impact of the COVID-19 pandemic. Regarding the age profile of the individuals, the analysed sample displayed an ageing demographic structure, predominantly originating from rural areas, with the majority of patients presenting to the hospital without a formal referral note. Considering the high number of cases that resulted in recovery or clinical improvement, it can be asserted that, in 2021, the investigated medical institution achieved notable outcomes, particularly in the context of its designation as a support hospital for patients who tested positive for the SARS-CoV-2 virus.

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