

## COVID-19 clinic as a basis of quality primary health care in the light of the pandemic – an observational study

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### ABSTRACT

**Aim** The COVID-19 pandemic has had a major impact on societies and has required adjustments of health systems and changes in work processes, especially in the light of an aging population with increased morbidity and mortality. The primary health care level has a key role in maintaining access to healthcare and in addressing the largest proportion of patients with COVID - 19 and should therefore take steps to manage the condition. The aim is to determine the adequacy of COVID-19 clinic model for patients, who are suspected or have a confirmed infection with COVID-19.

**Methods** In Health Centre Sevnica we have formed a model of the COVID Outpatient Clinic with unlimited access to safe and efficient health care. The introduction of COVID-19 disease diagnostic protocols, regular monitoring of patients, early detection of severe course of the disease and complications have made it possible to treat most patients at the primary health care level without the need for hospitalization.

**Results** In our COVID clinic in the period 12 March 2020 - 31 January 2021 a total of 22,259 examinations were performed, of which only 284 patients were referred to the hospital level. As expected, the largest share of referrals was in the age group of 65 and over.

**Conclusion** We believe that the established organization of work represents an optimal solution for managing the COVID-19 pandemic and is also a model with which we can manage future threats.

**Key words:** access to health services, general practitioner, health services for aged, SARS CoV2 infection

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## INTRODUCTION

This pandemic was officially declared on 11 March 2020. It immediately and immensely affected the society and led to a halt in social and economic life. At the same time, it required adjustments of healthcare systems and urgent changes of work processes (1). One of the most essential goals of the World Health Organisation is to ensure healthy life and good well-being, universal coverage and accessibility to primary health care (2). In Slovenia it is often emphasized that the weakness of the healthcare system is shortage of workforce and consequently limitations to accessibility, which is often the biggest obstacle of the health care efficiency (3). According to Slovenian data an average doctor of family medicine in Slovenia has only 7 minutes available to treat a patient, which does not suffice for an overall and quality treatment, and is thus a clear sign of the shortage of medical staff (4). The increase in work due to the pandemic along with ageing of the population and correlated increase in morbidity demands a design and an execution of new models of care with the goal of establishing a quality, safe and cost-efficient healthcare protection.

Globally patient care is more and more focused on the patients themselves, which in its essence means the quality of interactions between patients and their doctors, which is proven to improve treatment of the disease or illness and the quality of life (5). Healthcare that is patient-focused indicates a change in the paradigm in the relationship between the doctor and the patient, which is based on the decision making for the best measure taken for every single patient taking into consideration all of the patient's information (6). This is the basis of the functioning of primary healthcare that improves patient's satisfaction (7), as well as quality systems of healthcare in the world allowing greater quality, accessibility, equality, lower expenses and greater level of satisfaction with the healthcare system (8). Quality of work is often measured by the patients' satisfaction, which should not be the only variable because patients often cannot evaluate the quality of technical aspects of healthcare.

Quality of healthcare should not be based solely on the patients' satisfaction but on a broader concept that includes markers of quality and treatment outcomes (9). Safety is a fundamental

component of an inclusive environment where healthcare workers play an enormous role (10). Patients see safety in the personal relationship between them and their doctor on the primary level of healthcare where the majority of connections are made. The doctor-patient relationship is tightly related to the trust the patients have in the provider of the primary healthcare protection (11). Duration of the treatment (12), empathy and holistic approach (13), personal relationship with the patients and clinical credibility of the healthcare workers (14) play the key role in ensuring a quality treatment with positive outcomes.

The new coronavirus disease (COVID-19) is a broad danger. Its clinical and epidemiological features are still being researched. The disease has caused a change from an in-person to a distance consulting through new ways of patient interaction (15). COVID-19 can quickly cause a deterioration in breathing function especially in the second week of the disease. Because of this possibility the safety aspects of the disease monitoring are essential, which is the task of primary healthcare. COVID-19 predominately attacks respiratory systems. However, it can also attack other organ systems and cause weakness and deterioration of chronic illnesses, which is especially concerning with the elderly. The diagnosis is usually confirmed by a PCR test or by a nasopharyngeal swab or respiratory specimen collection. Mild cases can be managed in home environment with self-isolation, symptomatic treatment and monitoring (16). All patients of weaker health that experience shortness of breath, chest pain, loss of consciousness must be adequately treated (17).

A lot of attention has been given to hospital care of COVID-19 patients, however, this is only a peak of the iceberg for only a smaller percentage of patients are hospitalized, whereas the majority of COVID-19 patients are treated at the primary healthcare level.

The aim of this observational study was to determine the adequacy of COVID-19 clinic model for patients, who are suspected or have a confirmed infection with COVID-19.

In this article we were guided by the Declaration of Helsinki of the World Medical Association. A consensus of the Institutional Ethics Committee of the Community Health Centre Sevnica institution was obtained for research and its publishing.

## **PRIMARY HEALTHCARE LEVEL IN THE COVID-19 PANDEMIC**

Universal healthcare systems are among the pillars of a society that respects basic human rights (16). Primary healthcare level is the place of first contact, first defence line and control over infections (18), and it has a key role in decreasing inequalities in health (8).

Primary healthcare providers, general practitioners (GP) and paediatricians in Slovenia have often been exposed to the lack of information and instruction during the COVID-19 pandemic. Sarti et al. (16) have emphasized the importance of reorganisation of current patient flows following a goal of a safe and quality provision of services at the primary healthcare level for which a reorganisation of services and precise definition of work and protocol is necessary. General Practitioners in Slovenia have been battling for many years to enable and increase accessibility to healthcare. During this time, they found themselves in a dilemma between the desire to maintain accessibility and safety regulations. Guidelines provided daily by the Slovenian Ministry of Health offered a framework for operations and tasks for reducing the risk of disease spreading. However, the organisation, testing, diagnostics, treatment and control were left to the healthcare providers. This meant it was essential to do a timely research of examples of good practice and adjust them to the local environment. Guidelines from abroad mostly offered recommendations regarding the assurance for the basic healthcare services and via virtual forms of care (19). Rawaf et al. (1) stated that some primary healthcare practices have organized separate hours for treating suspected patients and some have had separate practices where the primary role was given to family physicians to ensure the foundations of healthcare accessibility. Blazey-Martin et al. (20) demonstrated their algorithm of monitoring patients and identifying patients with greater risk factors for disease complications between days 5 and 10 when patients seem to be most vulnerable. The news about the overload on the system of the primary healthcare level and the need for strategic planning of visits and patient triage have been reported from all over the world (21).

### **Accessibility**

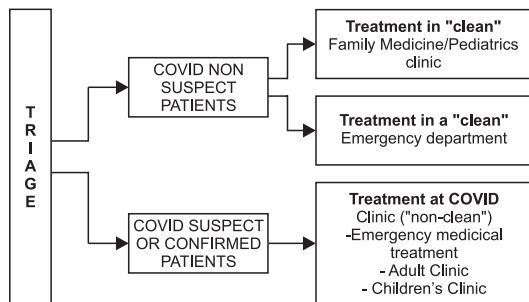
Accessibility is the foundation of quality and satisfaction with primary healthcare (22), and

is directly connected with the prolonging life-expectancy (23), and a decrease of mortality (24). Despite of that, growing needs and accessibility remain a challenge of today's healthcare systems (25) mostly because of human resources shortage (26). In Slovenia problems regarding accessibility of primary healthcare have also been reported even though the geographical organization of providers in Slovenia enables easy access to primary healthcare. The system of primary healthcare level in Slovenia is based mainly on healthcare centres which offer adequate responses to the needs of the population and ensure fairness regarding accessibility to healthcare. Emergency medical assistance as an integral part of primary health care ensures continuous emergency medical assistance including transport of patients. In Slovenia emergency medical assistance is mostly implemented by family physicians, which allows better access to medical services. The preservation of accessibility in the time of general restrictions has demonstrated to be a challenge. In our establishment we have created a model of the COVID clinic, which allows uninterrupted work in secure and equipped spaces.

### **THE MODEL OF A COVID CLINIC**

The main priority of the clinic was to ensure the preservation of accessibility regardless of the possibility of an individual seeking help having a COVID infection. Data from abroad and the directions of national healthcare politics have put virtual form of treating patients in the forefront. However, in our environment, where we struggle with the ageing of the population that has no adequate knowledge and skills to set up and maintain this type of communication and work, we have decided for both options: to keep live contact with our patients and set up a system of virtual treatment. Triage of patients proved to be of key importance. It was performed by qualified medical personnel in the central entry point of our healthcare centre, family physicians and paediatric physicians over telephone and virtual applications. Since some patients could no longer receive certain medical services independently or by their own wishes because medical personnel set guidelines according to patients' needs, a change in the paradigm was needed for the goal to maintain accessibility, holistic approach and quality of healthcare. The patients were, according to the level of their vulnerability, treated

virtually, by phone, in person in "clean" rooms of family medicine clinic/paediatrics/emergency medical assistance or within the COVID clinic. They were also triaged into categories (27). The patients in need of emergency medical assistance were treated immediately, others were treated within 16 hours (Figure 1).



**Figure 1. Patient triage**

Every patient in need enters the healthcare system either through the central entry point of our healthcare centre, through physicians or emergency medical assistance. The patient is triaged into a category considering his anamnesis (presented problems, patient's history, contacts) and is directed to one of three working points.

### Work space

In our healthcare centre we have ensured separate inner areas for treating patients that might be infected or are positive to COVID-19 thus providing support for technical medical procedures like swabbing, first and control checks and monitoring of patients in need of longer diagnostic and therapeutic procedures, and allowing access of ambulance vehicles for critically ill patients. We were guided by models of quality suggesting that work spaces should provide adequate, heated and safe environment in which medical personnel can offer holistic patient care in full protective equipment.

### Equipment

The areas of the COVID clinic are equipped in a way that enables regular work of family medicine clinic, paediatrics clinic and emergency medical assistance. Additionally, we have organized the following (within the COVID clinic):

POCT Laboratory (Point Of Care Testing) for laboratory diagnostics during the time when Laboratory Diagnostics Service does not provide services (night time, weekends and holidays) (28);

ultrasound diagnostics as the golden standard of discovering complications of COVID infections (pneumonia and thromboembolic events) and patient monitoring (29); area for reanimation, that enables execution of emergency procedures for critically ill patients (30).

### Human resources

General lack of medical personnel presented a challenge when setting up a new complex and specific healthcare work space such as the COVID clinic. It was essential to appoint personnel that would fit the needs and demands of the working space of the COVID clinic. We did this by appointing the most qualified personnel to work in the clinic and by additional employments to fill in the shortage caused by re-organization of human resources. We have excluded personnel who would pose a healthcare burden upon possible infection with COVID-19 and a possible severe course of the disease. We have included the following personnel: family physicians, emergency medicine physicians, paediatric physicians, residents, graduate nurses, other doctors with adequate qualifications and nurses for support and administrative work.

### Accessibility and continuity

Separate organization of the COVID clinic as a new work space enables unlimited access to healthcare services even for the patients with COVID-19 disease along with daily record keeping of accepted cases, the percentage of individual patients by age group and additional needs. The key role was performed by emergency medicine physician (within the continuous 24-hour healthcare) who provided healthcare during the critical time period of the clinic (night time) when other physicians were given a break and were called in only if necessary.

### Knowledge and introduction of clinical pathways

Lack of knowledge about COVID-19 in initial stage of the pandemic caused fear amongst all healthcare workers. The forming of a work group whose task was to research examples of good practice, obtain new information, diagnostic methods and treatment, along with the organization of work in our establishment enabled us to design work protocols and clinical pathways for treating patients who might be infected or are positive to

COVID-19. We focused on: the design of work protocols and clinical pathways of triage and work organization in clinics; education of personnel regarding COVID-19 disease, transmission and usage of protective equipment according to the level of risk of each specific work space; the design of internal guidelines about the ways of treating COVID-19 patients at the primary healthcare level; and education of physicians about the use of contemporary devices in diagnostics and treatment of COVID-19, which have been revised minimally once a month.

The goal of the clinical pathway is to improve the quality of healthcare treatment of patients with an improving outcome for the patients emphasizing their safety, improving patients' satisfaction along with the most optimal use of given resources and an improved communication in the team work.

### Evaluation and supervision

Supervision over the provided services and their evaluation represent a key concept in ensuring the quality of services. COVID-19, as a new disease on a global scale, did not offer the possibility of the development of equal and already tested clinical pathways. Daily collection of data on a national and global scale and adjustments of internal protocols, education of everyone involved and finally the implementation represent the steps of quality activation of new work methods. In our establishment we have focused on the following markers of work quality: accessibility of healthcare, safety of healthcare, waiting period for an appointment, which should not exceed 16 hours after the expressed need, decrease of the percentage of individuals who need hospital care, patients' satisfaction and percentage of infected employed medical personal under 20%.

## RESULTS AND DISCUSSION

The establishment of COVID-19 diagnostics protocol, continuous patient monitoring, early discovery of possible severe course of the disease and complications enabled treatment of most patients on primary healthcare level without any need for hospitalization. During the COVID-19 pandemic the COVID-19 clinic in our establishment ensured unlimited and uninterrupted 24-hour healthcare of infected and possibly infected patients. Meanwhile we have established daily cooperation with establishments taking care for the elderly and those

in need as well as with other economic establishments in a broader area of Posavje and Zasavje. The clinic played a key role in discovering infections, control over them, contact tracking, early discovery of severe courses and decreases of conditions, treatments of these and transporting patients to suitable establishment for secondary and tertiary care in case the need was presented. On 11 February 2021 Slovenia recorded 175,795 infections (31). Our COVID clinic performed 22,259 check-ups in the period between 12 March 2020 and 31 January 2021 and 4,246 nasopharyngeal swabs were collected for PCR diagnosis SARS-CoV-2 of which 2,412 (56.8%) were positive. Patients with confirmed COVID-19 infection were called in for a follow up between the 5th and 7th day of the disease course for quicker discovery of possible complications and severe courses, which is an action suggested by data from abroad (20) (Table 1).

**Table 1. Prevalence of cases and transfers to COVID Clinic**

Age group (years)	Number (%) patients	No of patients transferred to Hospital Clinic	Ratio of hospital transfers and number of patients
< 18	2,149 (9.6)	7	0.003
18-64	14,398 (64.7)	29	0.002
≥65	5,712 (25.7)	248	0.043

There were 284 patients in need of hospital diagnostics for their health conditions, which represents 0.013% of all treated patients and 0.18% of COVID positive patients. As expected, the majority of people being transferred to hospital care were people over the age of 65 (32). However, the percentage of people transferred to hospital care is lower compared to data from abroad (33), which we can associate with early discovery of severe courses and the implementation of new ways of diagnostics and treatment on primary healthcare level (Table 2).

**Table 2. Quality markers realization of COVID Clinic**

Quality markers	Result	Realization
Accessibility of healthcare	Enabled 24-hour uninterrupted healthcare	Yes
Treatment safety	Treatment in closed, separate and protected spaces. Modern clinical pathways. Holistic approach.	Yes
Waiting period	Treatment of patients within 16 hours from the expressed need	Yes
Transfers	284 patients transferred (0.013%)	Yes
Patients' satisfaction	0 (zero) filed complaint regarding violation of patients' rights upon first treatment	Yes
Percentage of infected healthcare personnel	28 employees (20%)	Yes

Safety of treatment is ensured by separated, heated and adequately equipped work spaces in which qualified healthcare personnel worked. Considering the fact that there were no filed complaints regarding violation of patients' rights upon the first treatment, which is a standard complaint procedure, we can indirectly conclude that patients were satisfied with their treatments in the COVID clinic. Separate treatment of infected and those who were suspected to be infected, resulted in a low percentage of infected healthcare personnel. Out of 140 employees a total of 28 people got infected during the monitored period, which represents 20% of all employees, which is less than abroad (34) and less than the Slovenian average (35).

The world has found itself in uncertainty and fear due to the rise of SARS-CoV-2 infections. The pandemic revealed the shortcomings and unpreparedness of primary health care and threatened its foundation - accessibility. The new reality required the design of a new model that enables

undisturbed and safe treatment of all patients with an emphasis on the most vulnerable groups of the population - the chronically ill and the elderly.

In conclusion, the COVID clinic model that was introduced in the Healthcare Centre Sevnica proved to be efficient regarding treatments of patients who were suspected to be infected and those with a confirmed infection with COVID-19. It reduced the number of severe courses and transfers to hospital care and subsequently decreased the load on hospitals on the secondary and tertiary level. As such, this model represents a foundation for effective work organization in continuation of the COVID-19 pandemic and for possible future threats.

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## TRANSPARENCY DECLARATION

Competing interests: None to declare.

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