ORIGINALNI RAD

UDK BROJEVI:
616.98:578.834(497.16)
DOI: https://doi.org/ 10.5937/zdravzast50-33907

ZNAČAJ NACIONALNE KOORDINACIJE ZA BRZI ODGOVOR NA COVID-19 U CRNOJ GORI TOKOM PRVOG TALASA PANDEMIJE

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SAŽETAK

Uvod/Cilj: Prvi detektovani slučaj SARS-CoV-2 infekcije u Crnoj Gori zabilježen je 17. marta 2020. godine, a već 20. marta počeo je sa radom nacionalni kol-centar za COVID-19, čija je osnovna svrha bila blagovremena reakcija usljed sumnje na COVID-19, kao i pružanje podrške lokalnim epidemiološkim službama uključivanjem velikog broja prethodno edukovanih volontera kao operatera kol-centra. Cilj ove deskriptivne studije bio je prikazivanje rezultata rada nacionalne koordinacije za brzi odgovor na COVID-19 u Crnoj Gori tokom prvog talasa pandemije.

Metode: Podaci o broju realizovanih i primljenih poziva preuzeti su iz kontakt aplikacije koja se koristila u svakodnevnom radu i koja je omogućavala detaljno izvještavanje o statusu poziva, dok su podaci o anketiranim licima preuzeti iz baze nastale popunjavanjem online upitnika tokom anketiranja osoba od strane operatera kol-centra.

Rezultati: U periodu od 20.03. do 18.05.2020. godine realizovano je 27.380 poziva, od čega 16.130 dolaznih, uz prisutne dnevne varijacije (u odnosu na dnevni broj novoregistrovanih slučajeva, kao i u odnosu na to da li je riječ o radnim danima ili danima vikenda i državnih praznika). Takođe, u istom periodu je, zbog sumnje na COVID-19, anketirano je 2.288 osoba, od čega neznatno više muškaraca (50,5%). Najveći broj anketiranih lica bio je iz Podgorice (59,8%), a najzastupljenija uzrasna grupa bila je 60 ili više godina (24,9%). Od ukupnog broja registrovanih slučajeva SARS-CoV-2 infekcija u Crnoj Gori, tokom perioda obuhvaćenog studijom, njih 40,4% bilo je neposredno ili posredno povezano sa kol-centrom.

Zaključak: Nacionalna linija u koordinisanju brzog odgovora na COVID-19 ispunila je prvenstveni cilj, da bude brana dok se zdravstveni sistem ne konsoliduje i omogući smanjivanje pritiska na ograničene ljudske kapacitete, a znatan procenat detektovanih slučajeva putem linije pripomogao je brzom otkrivanju kontakata inficiranih osoba i njihovom stavljanju u karantin, što je u značajnoj mjeri doprinijelo sprečavanju širenja infekcije, pa i njenom potpunom suzbijanju.

Ključne reči: kol-centar, telefonska trijaža, COVID-19, SARS-CoV-2

Uvod

Sami kraj 2019. godine označio je ujedno i početak kraja jedne ere koju smo poznavali. Naime, godinama su vodeći zdravstveni autoriteti upozoravali na neminovnost izbijanja pandemije zaraznih bolesti dalekosežnih posljedica, a 31.12.2019. godine, kada je iz Vuhana (Kina), izviješteno o klasteru slučajeva pneumonije nepoznate etiologije, postalo je jasno da se strepnje ostvaruju (1).

Nepunih mjesec dana kasnije, 24. januara 2020. godine, Francuska je prijavila 3 slučaja kod kojih je detektovan SARS-CoV-2, u tom momentu poznat kao *Novel Coronavirus* (2019-nCoV). Sva 3 lica bila su neposredno prije obolijevanja u Vuhanu i to su ujedno bili prvi zabilježeni slučajevi COVID-19 u Evropi (2). Dan za danom slučajevi su nastavili da se detektuju i u ostalim evropskim zemljama.

Najprije zbog male populacije, a potom i zbog manje frekventnosti putnog saobraćaja van ljetnje sezone, Crna Gora je na svoj prvi detektovani slučaj čekala do 17. marta 2020. godine (posljednja zemlja u Evropi sa registrovanim slučajem SARS-CoV-2). Uprkos tadašnjim definicijama SZO za suspektni slučaj, koje su u početku bile više specifične nego senzitivne, u Crnoj Gori, u namjeri da se što prije

ORIGINAL PAPER

UDK NUMBERS:
616.98:578.834(497.16)
DOI: https://doi.org/ 10.5937/zdravzast50-33907

THE IMPORTANCE OF NATIONAL COORDINATION FOR A QUICK RESPONSE TO COVID-19 IN MONTENEGRO DURING THE FIRST WAVE OF THE PANDEMIC

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SUMMARY

Introduction/Aim: The first detected case of SARS-CoV-2 infection in Montenegro was reported on March 17th, 2020. On March 20th, the National call center for COVID-19 started operating, with the main purpose to timely respond to the suspicion of COVID-19, as well as to provide support to local epidemiological services by involving a large number of previously trained volunteers as call center operators. The aim of this descriptive study was to present the results of the national coordination for a quick response to COVID-19 in Montenegro during the first wave of the pandemic.
Methods: The data about the number of calls were taken from the contact application which enables detailed reporting on the status of calls, while data of interviewed people were taken from the database created by filling out an online questionnaire during the interview.
Results: In period from March 20th to May 18th, 2020, 27,380 calls were realized, 16.130 of which were incoming calls, with daily variations (in relation to the daily number of reported cases, as well as in relation to whether it was a working day or weekend/state holiday). Also, in the same period, due to suspicion of COVID-19, 2,288 persons were interviewed and slightly more were men (50.5%). The largest number of respondents were from Podgorica (59.8%), and from the age group 60 or older (24.9%). During the study period, 40.4% of the total number of reported cases of SARS-CoV-2 infections in Montenegro were directly or indirectly related to the Call center.
Conclusion: The national phone-line in coordinating for a quick response to COVID-19 met the primary goal, to be a „dam" until the health system consolidates, and to reduce pressure on limited human capacities. A notable percentage of detected cases through the line contributed to quicker detection of contacts of infected persons and helped quarantine them, which significantly contributed to the control of infection spreading.

Keywords: call center, phone triage, COVID-19, SARS-CoV-2

Introduction

The very end of the year 2019 was also marked as the beginning of the end of an era we knew. For years, leading health authorities have been warning about the inevitability of infectious diseases pandemic with far-reaching consequences, and on December 31st 2019, when a cluster of pneumonia cases with unknown etiology was reported in Wuhan (China), it became clear that the predictions were accurate (1).

Less than a month later, on January 24th, 2020, France reported 3 cases of SARS-CoV-2, at that time known as Novel Coronavirus (2019-nCoV). All three were travelers who arrived from Wuhan just before the disease onset and these were the first reported cases of COVID-19 in Europe (2). Day after day, cases continued to be detected in other European countries as well.

Mainly due to the small population and lower international traffic frequency outside the summer season, Montenegro waited for its first detected case until March 17th, 2020 (the last country in Europe with a detected case of SARS-CoV-2). Despite the WHO definitions of a suspected case from that period of time, which were initially more specific than sensitive (included recent history of traveling to China), in Montenegro, in order to identify a possible imported case as soon as possible, every case of hospital pneumonia with

identifikuje mogući importovani slučaj, testirao se i svaki slučaj hospitalne pneumonije nerazjašnjene etiologije. Međutim, sve do 17. marta nije detektovan nijedan slučaj SARS-CoV-2 u Crnoj Gori (3).

Kako je postajalo jasno da je pitanje dana kada će se otkriti prvi slučaj COVID-19, Institut za javno zdravlje Crne Gore (IJZCG) je 12. marta 2020. godine, shodno instrukcijama tima koji je kreirao Komunikacionu strategiju COVID-19, započeo rad na uspostavljanju jedinstvene nacionalne linije za koordinaciju brzim odgovorom na COVID-19 (4). U narednim danima, napravljena je infrastruktura, instalirana oprema, kreirani trijažni upitnik i detaljni algoritam o postupanju u slučaju sumnje na COVID-19. Nakon izrade navedenog, sprovedena je edukacija o postupanju po kreiranom algoritmu, kojoj su prisustvovali predstavnici IJZCG, Kliničkog centra Crne Gore, lokalnih Higijensko-epidemioloških službi i timova izabranih doktora domova zdravlja, kao i Zavoda za hitnu medicinsku pomoć iz čitave Crne Gore.

Nacionalni kol-centar za COVID-19 (SOS linija 1616) počeo je sa radom 20.03.2020. godine (radno vrijeme od 08.00 do 23.00, svakog dana, uključujući dane vikenda i državne praznike). U centru su zajedno radili operateri i dežurni epidemiolozi/ljekari iz IJZCG.

Obuku za operaterski rad u kol-centru prošlo je četrdeset devet studenta Medicinskog fakulteta u Podgorici. Rad operatera bio je organizovan u 3 smjene po 5 sati, a rad dva epidemiologa i pet ljekara drugih javnozdravstvenih specijalnosti bio je organizovan u 2 smjene.

Ovako osmišljena SOS linija 1616 imala je više ciljeva. Jedan od prvih ciljeva bio je da se povratnici u zemlju, koji su stigli prije stupanja na snagu mjera obaveznog stavljanja pod zdravstveno-sanitarni nadzor, ukoliko dolaze iz zemalja gdje su registrovani slučajevi SARS-CoV-2, usmjere na jedinstveni broj gdje će dobiti potrebne instrukcije, a ukoliko razviju simptome koji bude sumnju na COVID-19 da se organizuje i testiranje. Osobe koje su pozivale iz nekog od sljedećih razloga: a) povratnici iz inostranstva unazad 2 do 4 sedmice i tom prilikom su posjetili neku od zemalja sa uspostavljenom lokalnom transmisijom (operateri su imali pred sobom listu zemalja ažuriranu u realnom vremenu), b) osobe koje sumnjaju ili znaju da su bile u kontaktu sa SARS-CoV-2 pozitivnom osobom, a od momenta uspostavljanja lokalne transmisije i c) sve osobe sa simptomima COVID-19, bivale su anketirane korišćenjem trijažnog upitnika sa setom skorovanih pitanja koji je omogućavao da se kreira lista prioriteta za povratne pozive od strane ljekara angažovanih na liniji.

Prilikom povratnog poziva ljekari su uzimali detaljnu anamnezu i spisak kontaka koje je osoba ostvarila 48 do 72 časa prije nastanka simptoma ili dobijanja pozitivnog nalaza kod asimptomatskih lica. Po zaključenom razgovoru ljekari bi, shodno situaciji, osobi saopštavali šta su sljedeći postupci po predviđenom algoritmu, a onda bi kontaktirali zdravstveno-sanitarnu inspekciju sa ciljem da je informišu da je licu neophodno izdati rješnje o izolaciji odnosno karantinu, ali i lokalnu epidemiološku službu sa ciljem da prenesu instrukcije o daljem postupanju sa licem (testiranju, neophodnosti zdravstvenog pregleda, transprorta u bolnicu i sl).

Osim centralne koordinacije na državnom nivou i blagovremene reakcije usljed sumnje na COVID-19, na ovaj način se postigla i velika ušteda kadra. Upotrebom trijažnog upitnika od strane studenata volontera značajno se smanjio pritisak na ljekarski kadar, što je imalo posebnu važnost jer su kolege iz lokalnih epidemioloških službi, tokom prva dva mjeseca, za svaki sumnjivi slučaj, u pratnji tehničara izlazili na teren.

Takođe, sistem je od samog početka, zbog svjesnosti da će od momenta detektovanja prvog slučaja do uspostavljanja lokalne transmisije proći najviše dvije sedmice, bio uspostavljen tako da ga je lako moguće transformisati davanjem prioriteta simptomima u odnosu na pozitivnu epidemiološku anamnezu (putovanje u inostranstvo ili kontakt sa licem koje se nedavno vratilo iz inostranstva), o čemu se vodilo računa prilikom kreiranja upitnika i algoritma o postupanju.

Cilj ove deskriptivne studije bio je prikazivanje rezultata nacionalne koordinacije za brzi odgovor na COVID-19 u Crnoj Gori tokom prvog talasa COVID-19 pandemije.

Metod

U ovoj deskriptivnoj studiji opisan je rad nacionalne telefonske linije 1616 za SARS-CoV-2 tokom perioda od 20.03. do 18.05.2020. godine, odnosno tokom prvog talasa novog korona virusa u Crnoj Gori.

Podaci o broju realizovanih i primljenih poziva preuzeti su iz komercijalne kontakt aplikacije koja se koristila u radu i koja je omogućavala detaljno izvještavanje o statusu poziva po danima i operateri-

unexplained etiology was tested. However, no SARS-CoV-2 cases were detected in Montenegro until March 17th (3).

As it became clear that it is a matter of days when the first case of COVID-19 will be discovered, on March 12th, 2020 the Institute for Public Health of Montenegro (IPH), in accordance with the instructions from COVID-19 Communication Strategy team, began working on the establishment of a unique national coordination line in a quick response to COVID-19 (4). In the following days, the infrastructure was built, the equipment was installed, a triage questionnaire was created and a detailed algorithm was developed on how to act in the event of suspicion of COVID-19. In addition, training on how to act according to the developed algorithm was conducted. That training was attended by representatives of IPH, Clinical Center of Montenegro, local Epidemiological Services and teams of general practitioners from primary health centers, as well as emergency medicine doctors from Montenegro.

The National Call Center for COVID-19 (CC 1616) started operating on March 20th, 2020 (working hours from 08:00 to 23:00, every day, including weekends and state holidays). Operators and on-duty epidemiologists/medical doctors from IPH worked together at the CC 1616.

Forty-nine students from the Medical Faculty in Podgorica were trained for operator work in the CC 1616. The operators were organized in 3 shifts per 5 hours, and two epidemiologists and five doctors of other public health specialties were organized in 2 shifts.

The CC 1616 work designed in this way had several goals. One of the main objectives was to direct returnees from countries with reported SARS-CoV-2, that arrived in Montenegro before health surveillance measures became mandatory, to a unique phone number where they could receive the necessary instructions, and, if they develop symptoms that are suspected of COVID-19 to organize testing. Persons who made calls for any of the following reasons: a) returnees from abroad in the past 2 to 4 weeks and who visited one of the countries with established local transmission (operators had a list of countries updated in real time), b) persons who suspect or know that they have been in contact with a SARS-CoV-2 positive person, and, since the moment of established local transmission c) all persons with COVID-19 symptoms have been interviewed using a triage questionnaire with a set of scoring questions that allowed to create a priority list for callbacks by physicians engaged on the line.

During the call back, the physicians took a detailed anamnesis and a list of contacts that the person had 48 to 72 hours before the onset of symptoms or before a positive test in asymptomatic individuals. After the conversation, the physicians would, according to the situation, tell the person what the next procedures are according to the algorithm, and then they would contact the Health and Sanitary Inspection in order to inform them that the person needs to be mandatory isolated or quarantined, but also they would contact the local epidemiological service to give instructions on further treatment of the person (testing, necessity of medical examination, transport to the hospital, etc.).

Apart from the central coordination at the state level and the prompt reaction in the event of COVID-19 suspicion, in this way of work organization great staff savings were achieved. The usage of the triage questionnaire by student volunteers significantly reduced the pressure on and need for the medical staff, which was especially important because colleagues from local epidemiological services, during the first two months of outbreak, went out to the field accompanied by technicians, in every case of COVID-19 suspicion.

Also, from the very beginning, due to the awareness that a maximum of two weeks will pass from the moment of detection of the first case to the established local transmission, the system was designed so it can be easily transformed by prioritizing symptoms over positive epidemiological history (travel abroad or contact with a person who has recently returned from abroad), which was taken into account when creating the questionnaire and the algorithm on the procedure.

The objective of this descriptive study was to present the results of national coordination in quick response to COVID-19 in Montenegro during the first wave of the COVID-19 pandemic.

Methods

This descriptive study describes the operation of the national phone line 1616 for SARS-CoV-2 in the period from March 20th to May 18th, 2020.

Numbers of realized and received calls were taken from the commercial contact application

ma (propušteni i realizovani dolazni i odlazni pozivi). Anketiranje osoba sprovodilo se tako što je operater tokom razgovora popunjavao online upitnik kreiran u javno dostupnom servisu *Google Forms*, a rezultati iz uptinika bili su vidljivi korišćenjem, takođe javno dostupnog servisa, *Google Sheets*.

Podaci o pojedinačnim novoregistrovanim slučajevima dostavljani su ljekarima angažovanim u kol-centru koji su svakog dana vršili provjere da li među njima ima onih koji su inicijalno kontaktirali liniju 1616 ili su navedeni kao kontakti od strane onih koji su se javili, pa su zbog toga bili naknadno kontaktirani. Takođe, prilikom povratnih razgovora ljekara sa osobama kod kojih je upitnik pokazao da postoji sumnja na COVID-19, popunjavan je zaseban upitnik (koji nije bio trijažnog karaktera već je više bio vodič kroz ranije osmišljeni algoritam) gdje su, između ostalih, unošeni i podaci o ostvarenim kontaktima u vremenu za koje se smatralo da su te osobe mogle biti rizične po okolinu.

Za izradu grafikona korišćen je *Excel* iz paketa *Microsoft Office* 2016, dok je za statističku obradu podataka, prije svega za izračunavanje koeficijenta korelacije, korišćen *EZR* (*Easy R*) *plugin* (verzija 1.42) na *R Commander*-u (verzija 2.6-2).

Rezultati

Od pokretanja SOS linije 1616, 20.3.2020. godine, zaključno sa 18.05.2020. godine (60 dana), ostvareno je 27.380 poziva (dolazni+odlazni).

Dnevno je bilo prosječno 456 poziva, uz prisutne varijacije, najmanje 91 (nedelja 17.05.2020. godine), a najviše 1.400 (srijeda 25.03.2020. godine). Broj poziva varirao je od dana do dana, tj. ako se nešto aktuelno dešavalo (npr. objavljivanje većeg broja osoba koje su pozitivne) rastao je i broj poziva i suprotno (Grafikon 1). Pokazalo se da je postojala jaka pozitivna korelacija između broja realizovanih poziva i broja novoregistrovanih slučajeva po danima (r_s = 0,73, p < 0,01) (Tabela 1).

Takođe, evidentan je i pad broja poziva tokom vikenda i državnih praznika, pa tako ako posmatramo dane vikenda i državne praznike, prosječan broj poziva je 345, dok je tokom radnih dana prosječan broj poziva 516.

U periodu od 20.03. do 18.05.2020. godine u Crnoj Gori registrovano je ukupno 311 slučajeva SARS-CoV-2 infekcije, od čega je njih 126 (40,4%) detektovano ili navedeno kao kontakt inficiranih lica inicijalno detektovanih preko linije 1616 (Grafikon 2).

U naznačenom periodu primljeno je 16.130 poziva, prosječno 269 dolaznih poziva dnevno, uz prisutne varijacije u broju primljenih poziva, najmanje 54 (nedelja 17.05.2020. godine), a najviše 774 (srijeda 25.3.2020. godine) (Grafikon 3).

Broj osoba za koje su operateri procijenili da je neophodno da ih provedu kroz upitnik, tj. broj anketiranih osoba bio je 2.288, odnosno prosječno 38 anketiranih osoba dnevno, uz prisutne varijacije, najmanje 6 (nedelja 10.05.2020. godine), a najviše 133 (petak 20.03.2020. godine) (Grafikon 3).

Procenat trijažiranih osoba bio je 14,2% (procenat ukupno anketiranih osoba u odnosu na ukupan broj primljenih poziva), najmanje 5,2% (subota 09.05.2020. godine), a najviše 27,6% (petak 20.03.2020. godine).

Pokazalo se da ne postoji koorelacija između procenta trijažiranih osoba i broja dolaznih poziva (p > 0,05) (Tabela 1).

Od momenta kada je uspostavljena lokalna transmisija u Crnoj Gori (negdje početkom druge sedmice rada nacionalne linije), sve osobe, nezavisno od težine simptoma, a koje su anketirane od strane operatera, bile su i pozvane od strane epidemiologa/ljekara iz kol-centra, i to unutar sat vremena od njihovog poziva SOS liniji 1616.

Daleko najveći procenat anketiranih osoba bio je iz Podgorice (59,8%), slijede Nikšić, Herceg Novi, Bar, Danilovgrad, Budva i Tuzi (Grafikon 4).

Od ukupnog broja anketiranih osoba, neznatno je više bilo muškaraca 1.156 (50,5%) (Grafikon 5).

Prosječan uzrast anketiranih osoba iznosio je 44 godine. Najveći procenat anketiranih osoba,

Tabela 1. Uporedni prikaz koeficijenata korelacije

Korelacije	r_s* (broj novoregistrovanih slučajeva)	r_s* (procenat trijažiranih osoba)
Realizovani pozivi po danu	0,73 (p<0,01)	0,23 (p>0,05)

*Spirmanov koeficijent korelacije sa p vrijednošću

which was used in the work and which enabled detailed reporting on call status by days and operators (missed and realized incoming and outgoing calls). Interviews of persons were conducted by the operator filling out an online questionnaire created in the publicly available Google Forms service, and the results from the questionnaires were visible in also publicly available service, Google Sheets.

Data on individual newly reported cases per day were provided to epidemiologists from CC 1616 who checked daily for those who had initially contacted the 1616 line or were listed as contacts by those who called and were subsequently contacted. Also, during the physician's callback to persons for whom the questionnaire showed a suspicion of COVID-19, a separate questionnaire was filled out (which did not have a triage character, but was more of a guide through a previously designed algorithm) where, among other information, data about contacts, made during the period of time when these persons could be considered as risky for the environment, were entered.

Excel from Microsoft Office 2016 was used to create charts, while the EZR (Easy R) plugin (version 1.42) on R Commander (version 2.6-2) was used for statistical data processing, primarily for calculating the correlation coefficient.

Results

Since the launch of the CC 1616, on March 20th, 2020, ending on May 18th, 2020 (60 days), 27.380 calls were made (incoming and outgoing).

In average, there were 456 calls per day, with variations present, a minimum of 91 (Sunday, May 17th, 2020) and a maximum of 1,400 (Wednesday, March 25th, 2020). The number of calls varied from day to day, i.e. if something currently happened (e.g. publishing a higher number of cases), the number of calls increased and vice versa (Figure 1). It was shown that there was a strong positive correlation between the number of realized calls and the number of reported cases per day (r_s = 0.73, p <0.01) (Table 1).

Also, there was an evident decrease in the number of calls during weekends and state holidays, so if we observe weekends and state holidays, the average number of calls is 345 per day, while during working days the average number of calls is 516.

During the period from March 20th to May 18th, 2020, a total of 311 cases of SARS-CoV-2 infection were reported in Montenegro, of which 126 (40,4%) were detected or listed as contacts of cases initially detected via phone-line 1616 (Figure 2).

In the indicated period, 16,130 calls were received, 269 incoming calls per day in average, with present variations in the number of received calls, minimum 54 (Sunday, May 17th, 2020), and maximum 774 (Wednesday, March 25th, 2020) (Figure 3).

The number of persons for whom operators estimated that it was necessary to lead them through the questionnaire, i.e. the number of interviewed persons was 2,288 or 38 persons per day in average, with variations present, minimum 6 (Sunday, May 10th, 2020) and maximum 133 (Friday, March 20th, 2020) (Figure 3).

The percentage of triaged persons was 14.2% (percentage of total number of interviewed persons in relation to the total number of received calls), minimum 5.2% (Saturday, May 9th, 2020), maximum 27.6% (Friday, March 20th, 2020).

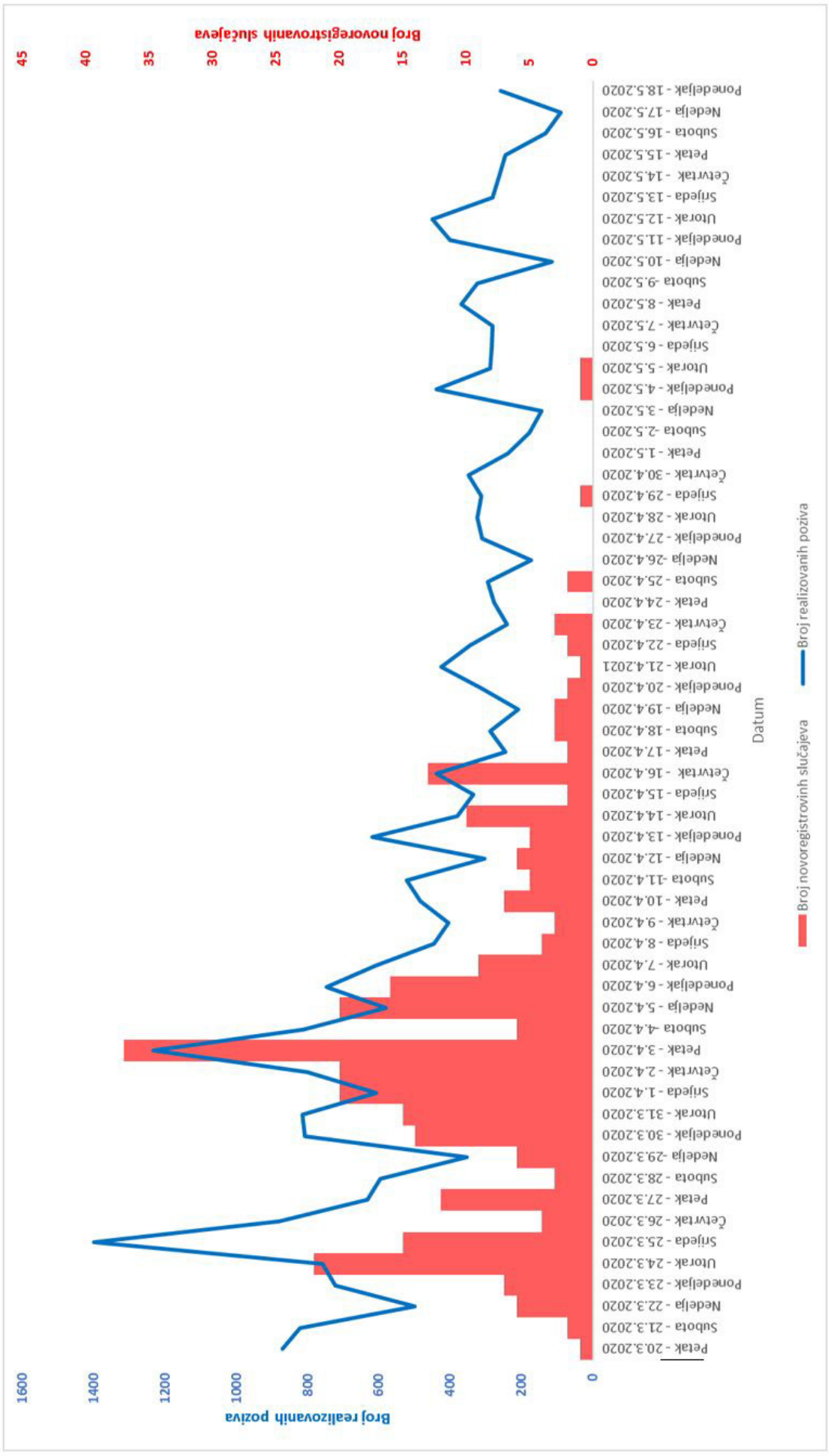
There was no correlation between the percentage of triaged persons and the number of incoming calls (p > 0.05) (Table 1).

From the moment when local transmission was established in Montenegro (somewhere in the beginning of the CC 1616 second week of work), all persons, regardless of the severity of symptoms, who were interviewed by the operator, were also called by an epidemiologist/medical doctor from CC 1616, within an hour.

Table 1. Comparative view of correlation coefficients

Correlation	r_s* (daily reported cases)	r_s* (percentage of triaged persons per day)
Realized calls per day	0.73 (p<0,01)	0.23 (p>0,05)

*Spearman correlation coefficient with p value



Grafikon 1. Uporedni prikaz broja realizovanih poziva (dolazni i odlazni) i broja novoregistrovanih slučajeva COVID-19 u Crnoj Gori, period 20.03-18.05.2020. godine

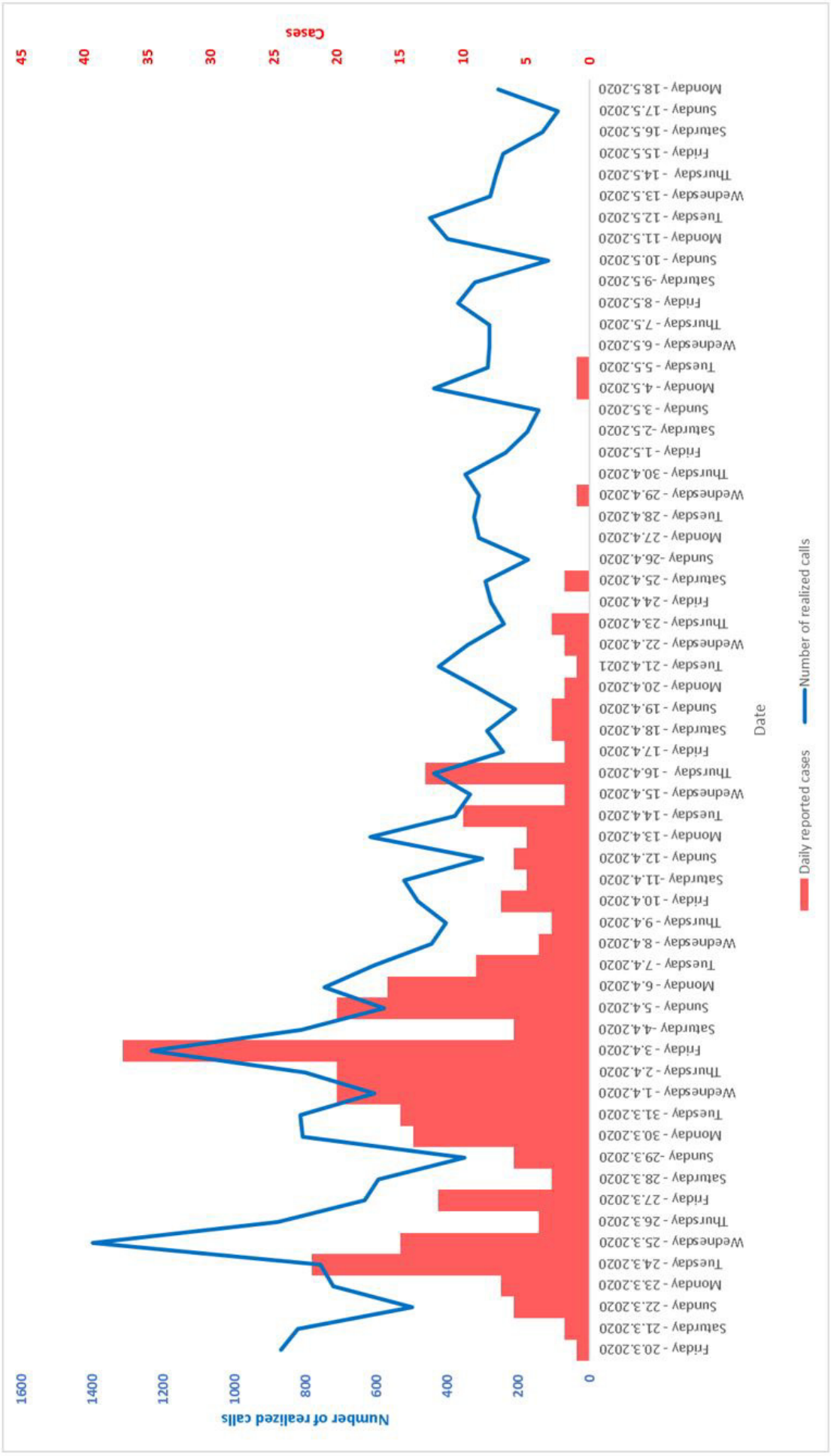
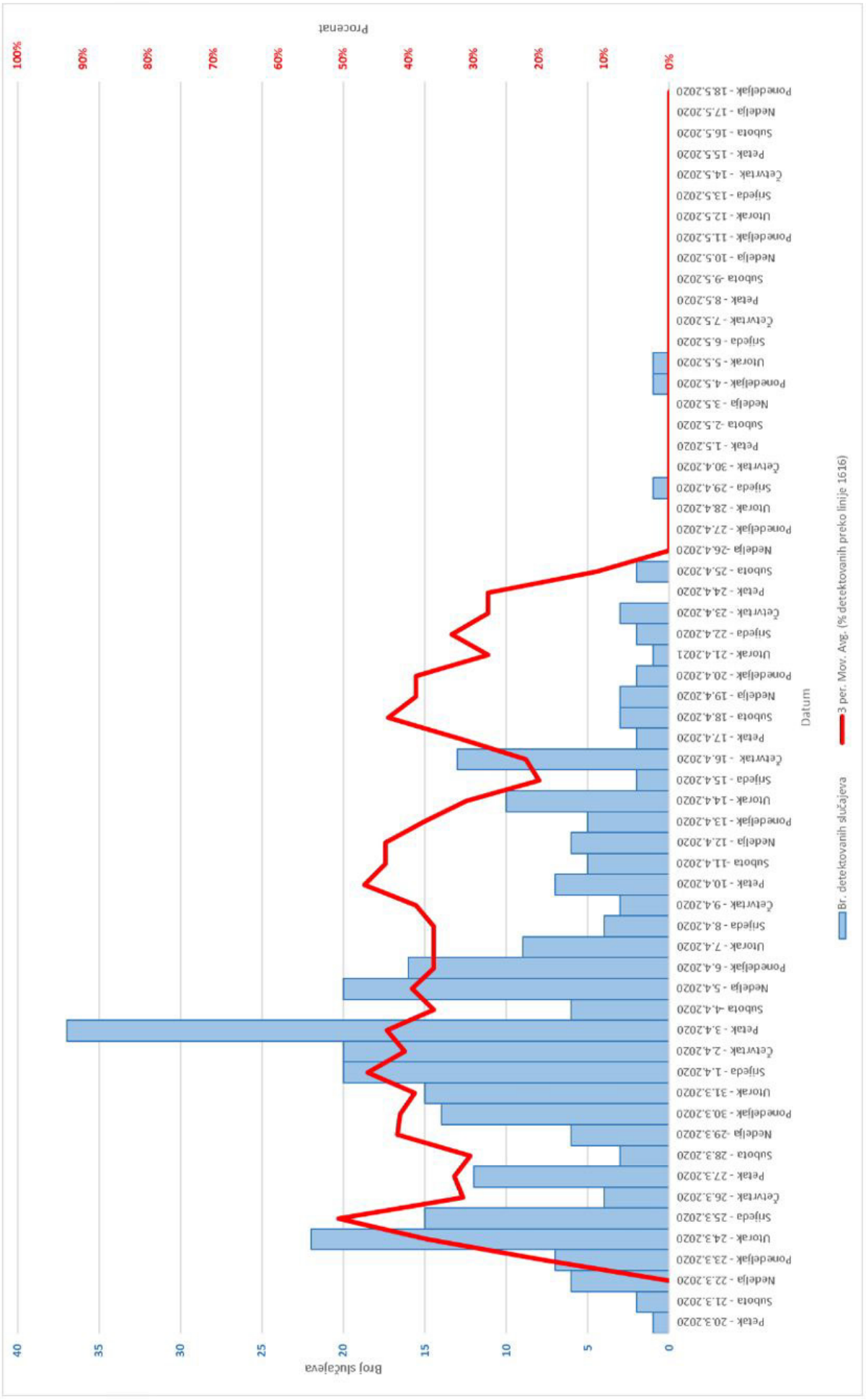


Figure 1. Comparative view of number of realized calls (incoming and outgoing) and number of daily reported cases of COVID-19 in Montenegro, 20 March-18 May 2020.



Grafikon 2. Uporedni prikaz novoregistrovanih slučajeva i procentualnog udjela onih koji su inicijalno kontaktirali SOS liniju 1616, period 20.03-18.05.2020. godine

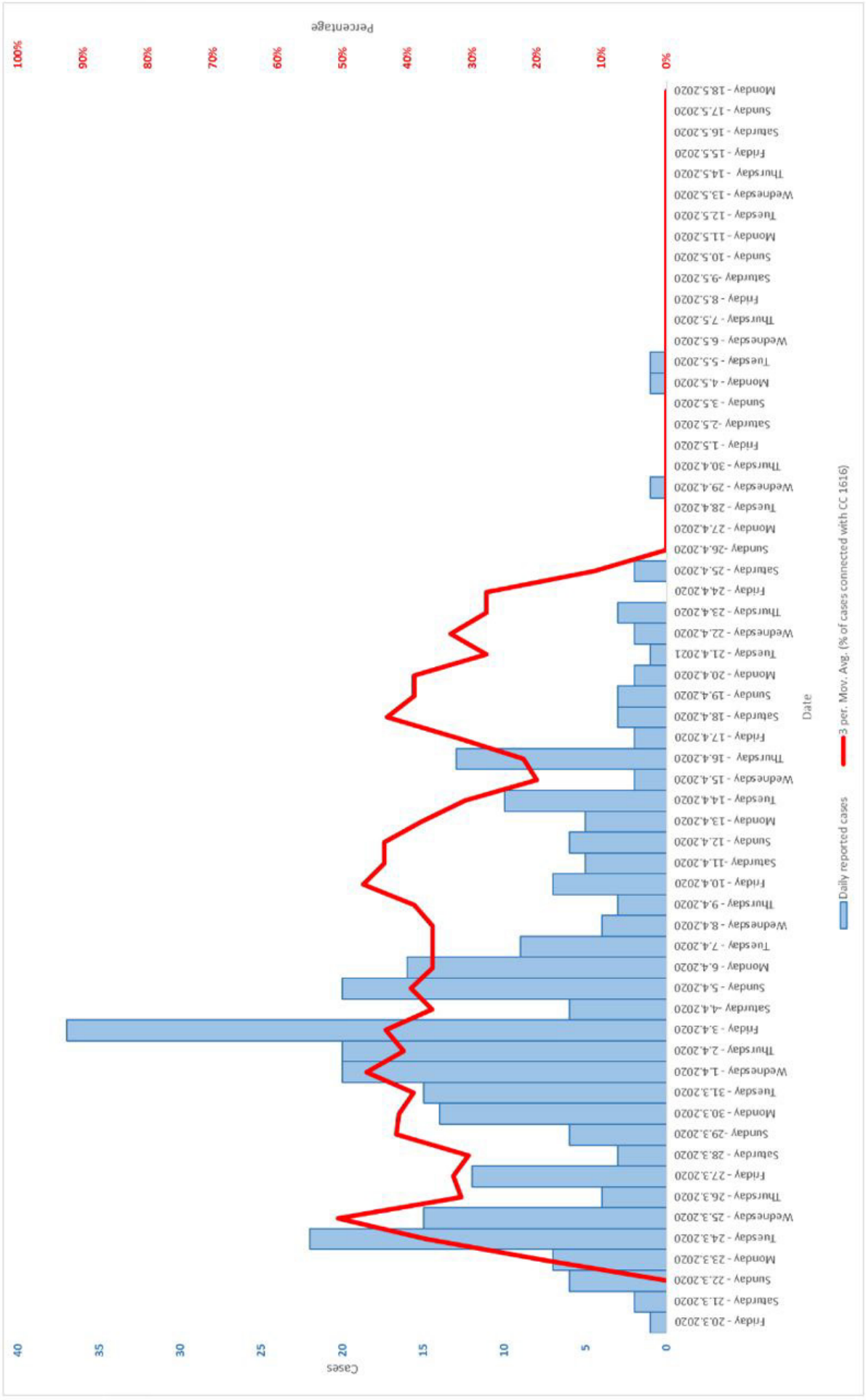
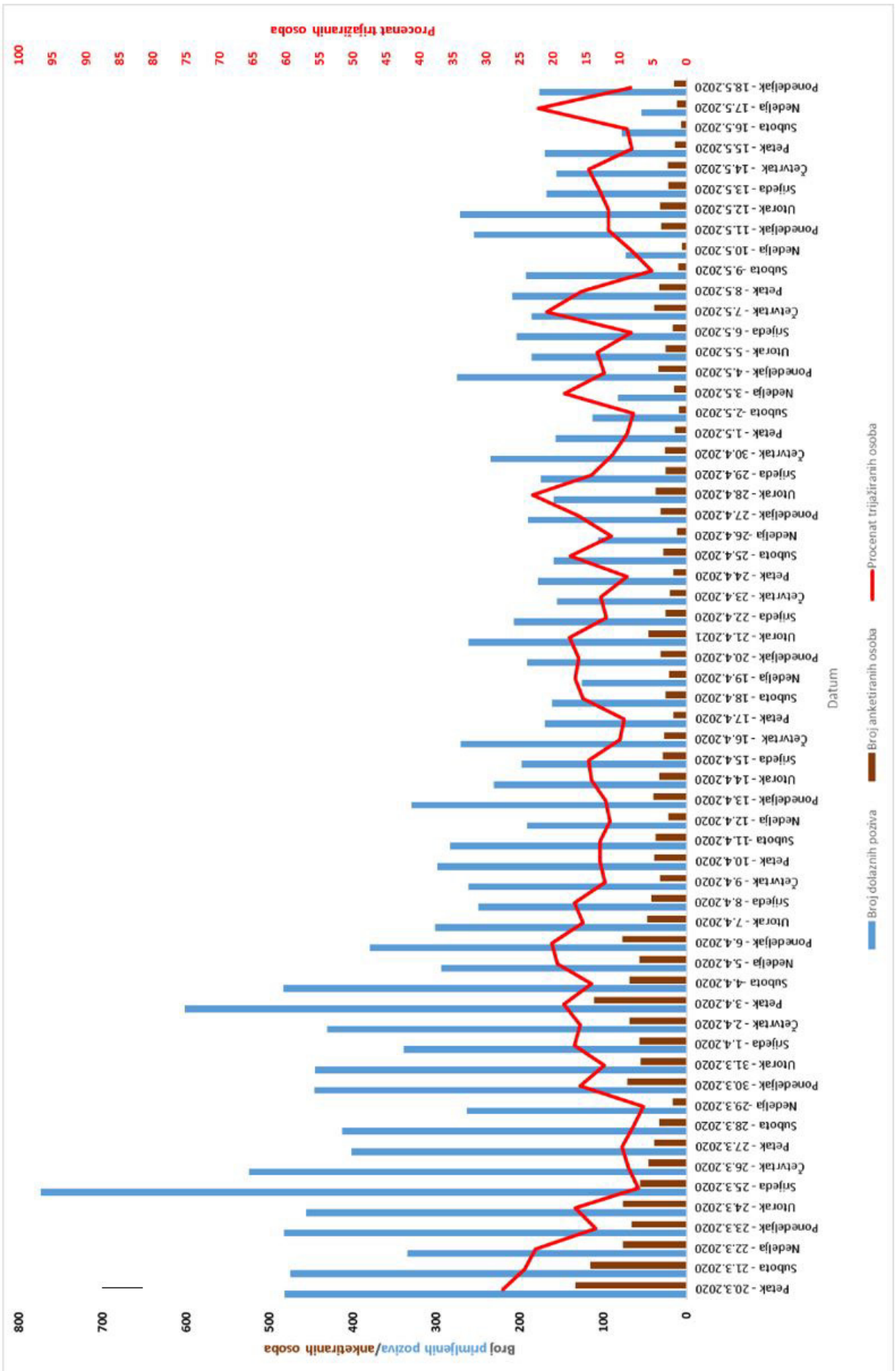


Figure 2. Comparative view of daily reported cases and percentage of cases connected with CC 1616, 20 March-18 May 2020.



Grafikon 3. Uporedni prikaz broja dolaznih poziva, anketiranih osoba i procenat trijažiranih osoba po danima (procenat anketiranih osoba u odnosu na broj primljenih poziva po danima), period 20.03-18.05.2020. god

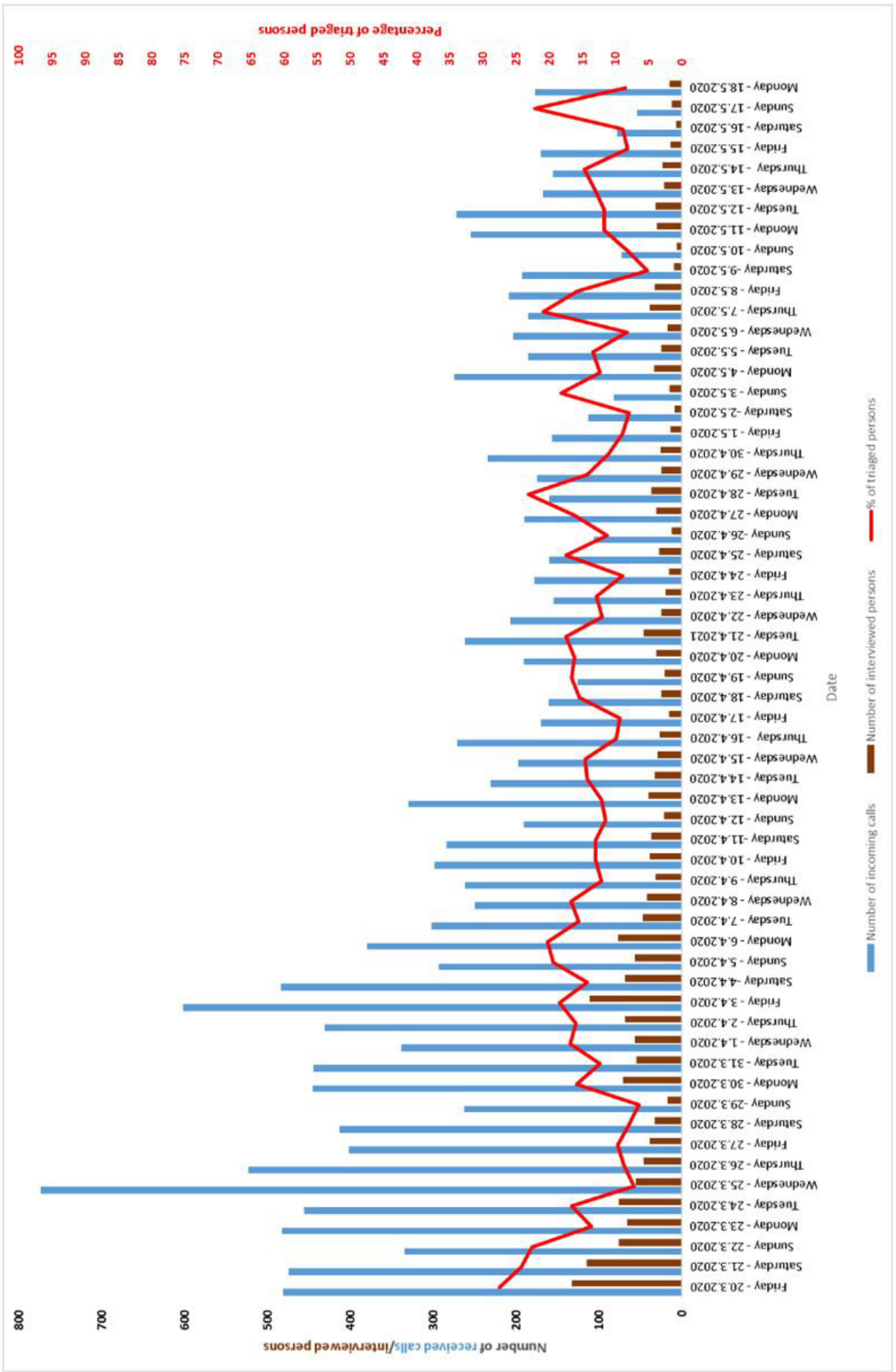
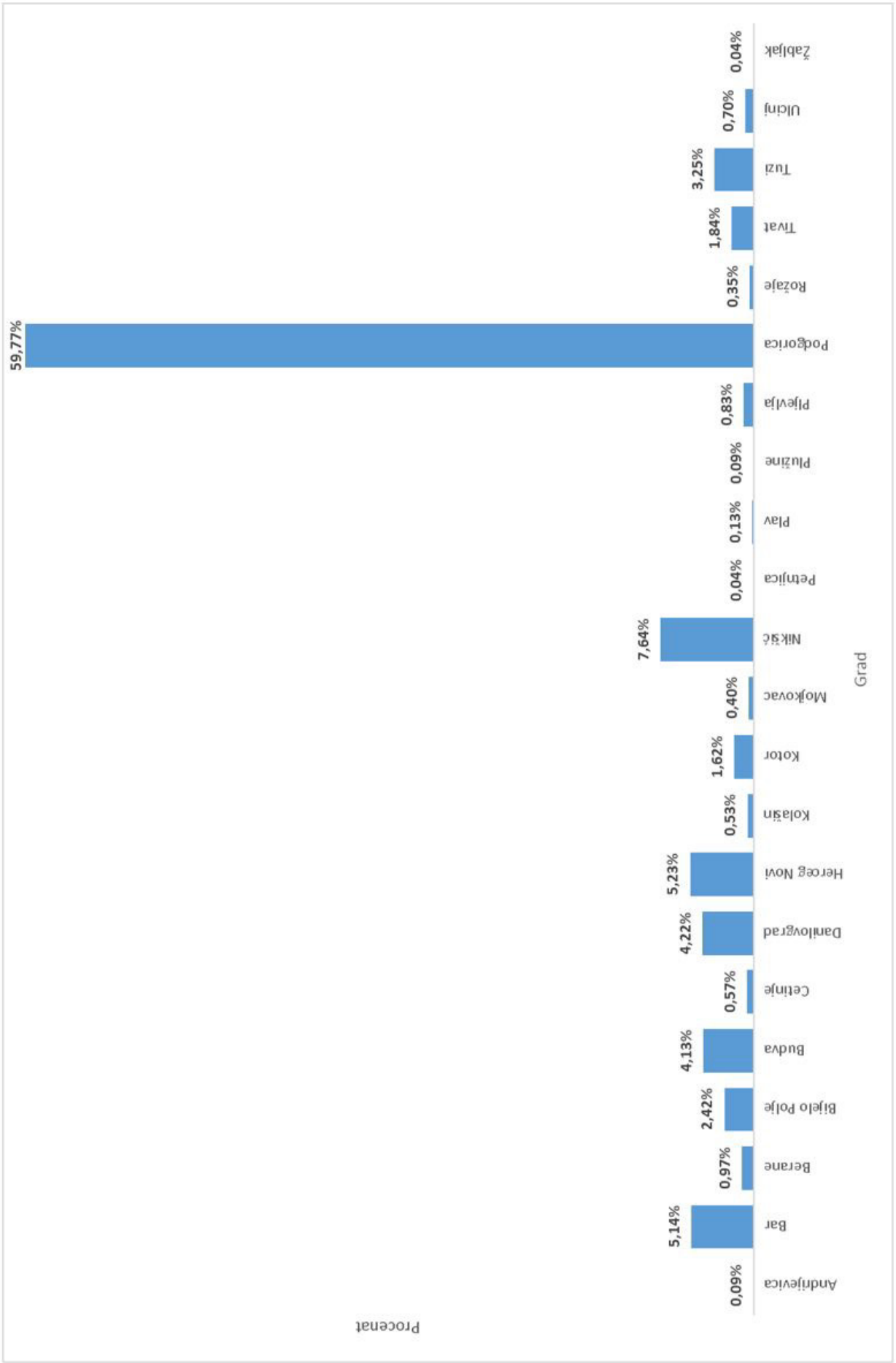


Figure 3. Comparative view of number of incoming calls, number of interviewed persons and percentage of triaged persons per day (percentage of number of interviewed persons per day in relation to the number of received calls per day), 20 March-18 May 2020.



Grafikon 4. Procentualna zastupljenost anketiranih osoba u odnosu na opštine iz kojih su pozivali, period 20.03-18.05.2020. godine

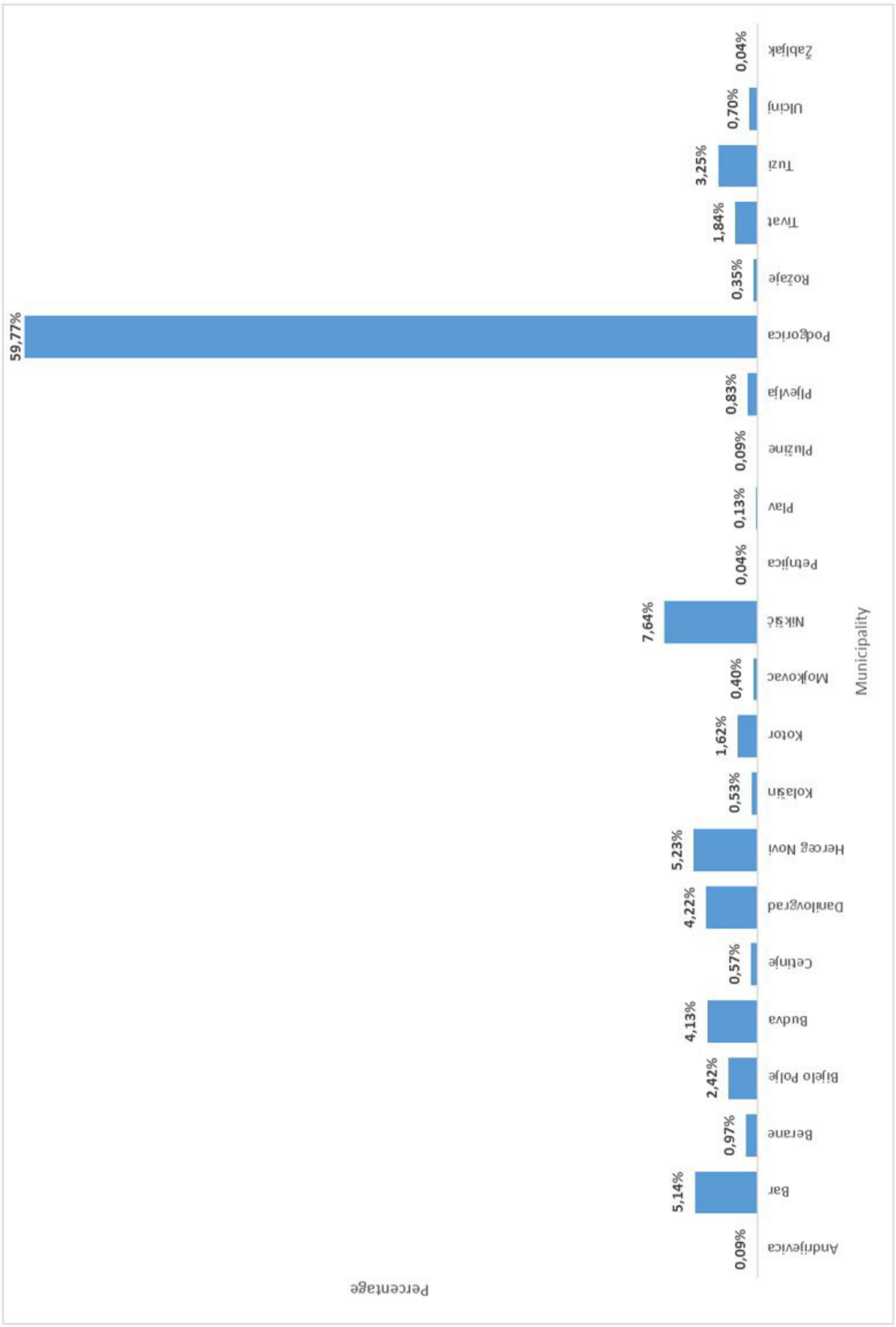
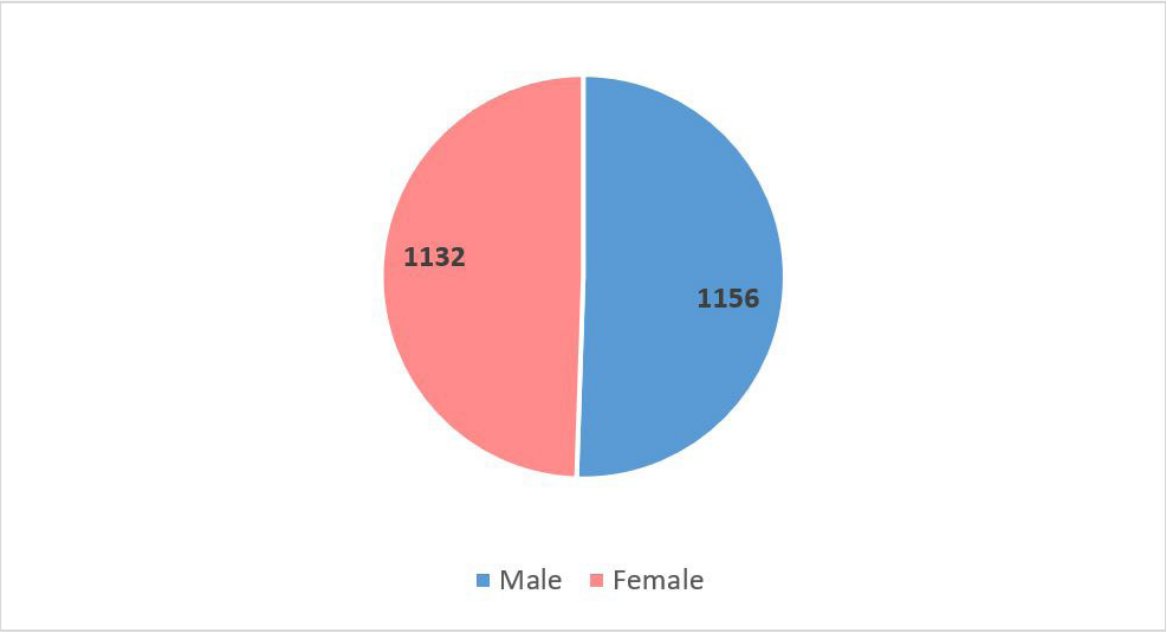
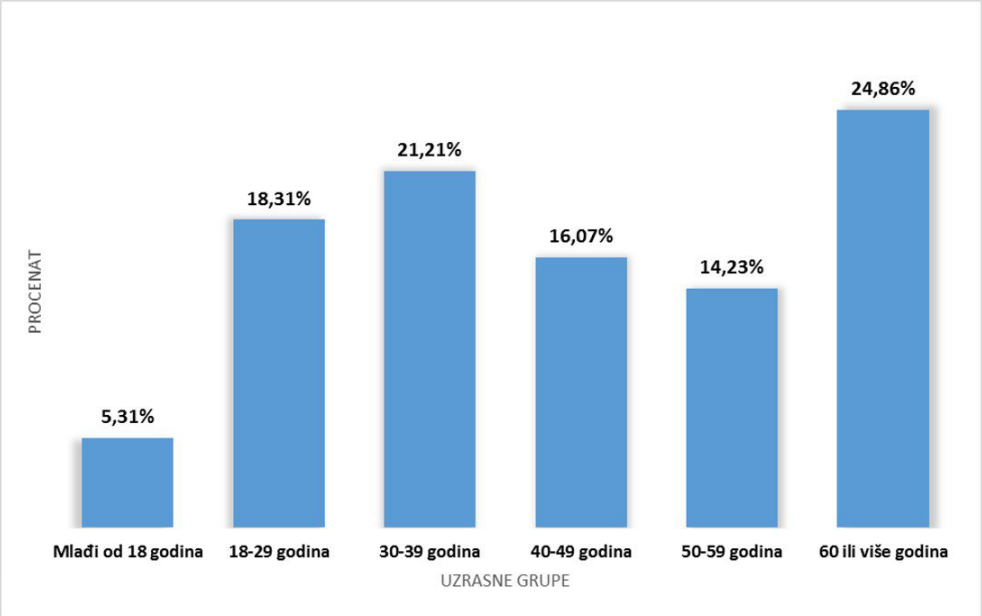


Figure 4. Distribution among interviewed people according to municipality, 20 March-18 May 2020.



Grafikon 5. Polna struktura anketiranih osoba, period 20.03-18.05.2020. godine



Grafikon 6. Uzrasna distribucija anketiranih osoba, period 20.03-18.05.2020. godine

24,9%, bio je iz uzrasne grupe 60 ili više godina starosti, a najmanji, 5,3%, iz uzrasne grupe mlađi od 18 godina (Grafikon 6).

Diskusija

Po izbijanju COVID-19 pandemije, prije ili kasnije, većina zemalja uspostavila je sisteme za samoprijavljivanje sumnje na COVID-19. Ti sistemi varirali su od online trijažnih upitnika, preko linija nalik opisanoj, ali autorima ovog članka nije poznato da je, u tom trenutku, postojao sistem sa sličnim povratnim mehanizmom reakcije, odnosno centralna, nacionalna, koordinacija lokalnih epidemioloških službi. Naravno, to je u Crnoj Gori bilo moguće i smisleno jer, u momentu započinjanja rada SOS linije 1616, nije bila uspostavljena lokalna transmisija, a po uspostavljanju iste, između ostalog i korišćenjem ove linije, spriječena je širokopojasna transmisija (5).

Navedena linija inicirala je opsežna i pravovremena istraživanja kontakata, gdje su se zbog malog broja detektovanih slučajeva, pod zdravstveno-sanitarni nadzor i u karantin stavljala i ona lica čiji je ostvareni konakt sa SARS-CoV-2 pozitivnim

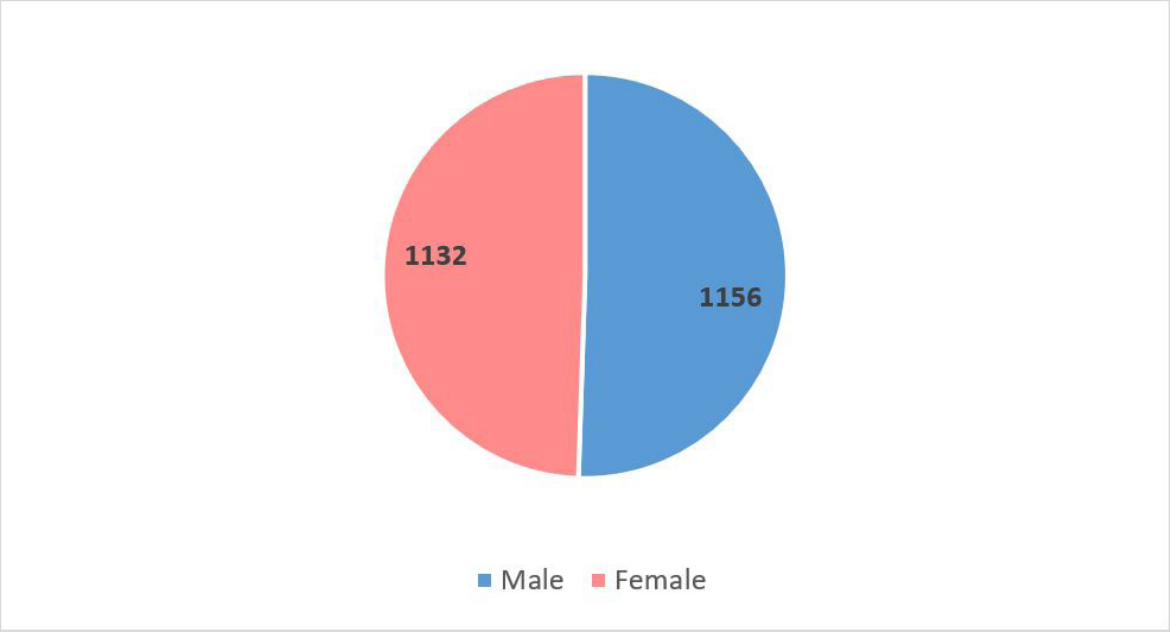


Figure 5. Sex distribution among interviewed persons, 20 March-18 May 2020.

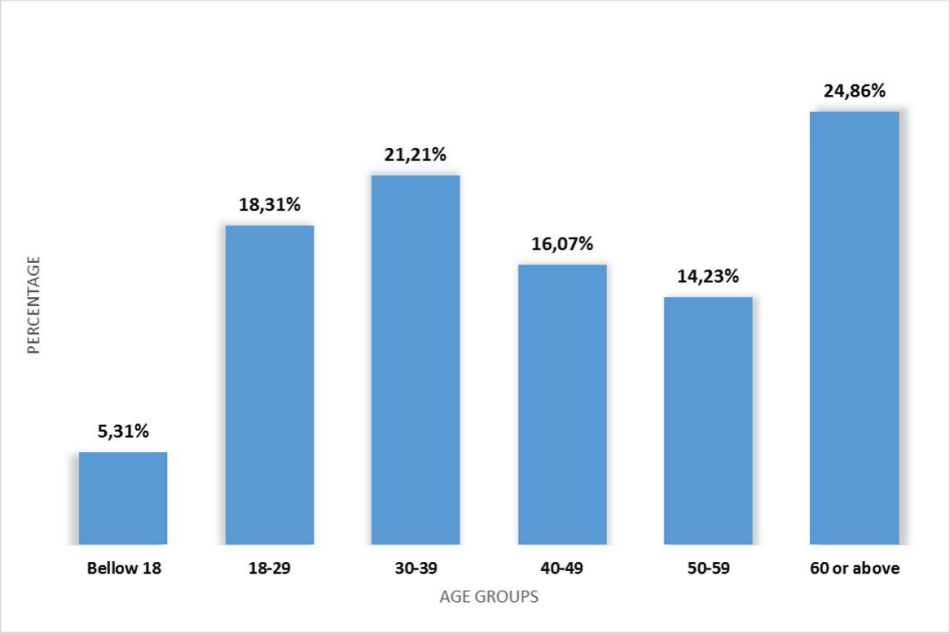


Figure 6. Age distribution among interviewed persons, 20 March-18 May 2020.

The largest percentage of interviewed persons were from Podgorica (59.8%), followed by Niksic, Herceg Novi, Bar, Danilovgrad, Budva and Tuzi (Figure 4).

From total number of interviewed persons, slightly more were men, 1,156 (50.5%) (Figure 5).

The average age of the interviewed persons was 44. The highest percentage of interviewed persons, 24.9%, was from the age group 60 or older, and the lowest, 5.3%, from the age group younger than 18 (Figure 6).

Discussion

Following the beginning of COVID-19 pandemic, sooner or later, most countries established systems for self-reporting suspicions of COVID-19. These systems ranged from online triage questionnaires to phone-lines similar to the one described in this article, but the authors of this article are not aware that, at the time covered by this study, there was a system with a similar feedback mechanism, i.e. central national coordination of local epidemiological services.

licima bio manjeg do umjerenog rizika (6).

Aktuelna epidemiološka situacija diktirala je i prirodu rada SOS linije 1616, pa se tako već u drugoj sedmici utvrdio „proboj“ inicijalnog algoritma jer je pronađena osoba sa negativnom anamnezom putovanja u zemlje gdje je uspostavljena lokalna transmisija i koja je negirala kontakte sa licima koja su se nedavno vratila iz takvih zemalja. Ta osoba inicijalno je kontaktirala nacionalnu liniju zbog simptoma sumnjivih na COVID-19, ali je zbog negativne epidemiološke anamneze upućena na pregled umjesto na dalju epidemiološku obradu. U daljem toku bolesti ispostavilo se da je lice pozitivno na SARS-CoV-2, te je time dokazan prvi slučaj lokalne transmije nepoznatog porijekla. To je iniciralo momentalnu promjenu protokola i od tog dana su sva lica koja su kontaktirala SOS liniju 1616 i požalila se na simptome koji su budili sumnju na COVID-19 bila kontaktirana od strane ljekara sa linije, gdje se u opsežnom razgovoru procjenjivao rizik da li se radi o realnoj sumnji ili je veća vjerovatnoća da je riječ o nekom drugom uzročniku. Ne treba gubiti iz vida činjenicu da su u tom momentu laboratorijski kapaciteti za obradu PCR testova na SARS-CoV-2 u Crnoj Gori bili veličine više desetina obrađenih testova dnevno.

Naravno, bilo je jasno od samog početka da će, ako dođe do uspostavljanja širokopojasne transmisije, telefonska trijaža izgubiti svaki značaj i sistem morati u nastavku da se bazira na kliničkoj trijaži na nivou primarne zdravstvene zaštite, to jest u takozvanim COVID ambulantama. Međutim, prije svega zbog dobre komplijanse opšte populacije, ali i zbog izuzetno strogih mjera, nije došlo do razbuktavanja epidemije u Crnoj Gori i 04.05.2020. godine, 49 dana od prvog, detektovan je posljednji slučaj COVID-19 u prvom talasu (7).

Interesovanje za SOS liniju 1616 i njena uloga bili su značajniji na samom početku njenog funkcionisanja što se može vidjeti i po značajnom broju realizovanih poziva dok je kasnije, što zbog potencijalnog smirivanja situacije, što zbog dodatnog uključivanja lokalnih epidemioloških službi, došlo do pada interesovanja. Takođe, linija je uprkos svom inicijalnoj postavci imala i značajnu dozu informativno-edukativnog karaktera, jer je od starta bila zamišljena i kao dodatni komunikacioni kanal IJZCG (4).

Kapacitet linije od maksimalno 20 poziva u svakom trenutku i bilježenje propuštenih poziva, učinili su da se operateri odazovu na apsolutno svaki poziv upućen liniji.

Najveći izazov SOS linije 1616 ogledao se u manjem broju ljekara koji je svakodnevno radio iscrpljujući i odgovoran posao, obavljajući više desetina zahtjevnih telefonskih poziva, posebno imajući u vidu da je anksioznost osoba koje su sumnjale da su bile izložene uzročniku COVID-19 u prvim danima bila značajno pojačana usljed opšteg straha od nepoznatog. Nije bilo posebnih priprema ljekara za ovaj posao, tako da su se ovi izazovi savladavali u hodu (8,9).

Takozvani „efekat vikenda“, tj, smanjenje, kako broja realizovanih poziva, tako i detektovanih slučajeva, primjetno je bio izražen uprkos tome što je linija svakog dana radila od 8-23 časa (10). Sa druge strane, postojanje jake pozitivne korelacije između broja ostvarenih poziva i novoregistrovanih slučajeva ne čudi jer je povećanjem broja slučajeva rastao i rizik po okruženje, a shodno tim i broj osoba koje su potencijalno bile u kontaktu sa SARS-CoV-2 pozitivnim licima.

Visok procenat osoba detektovanih preko SOS linije 1616 odraz je više stvari. Naime, usljed straha od nepoznatog, opšta populacija je u IJZCG prepoznala zdravstveni autoritet na koji se mogu osloniti, a sa druge strane zabrana putovanja i stroge opšte mjere koje su uslovile i manju mobilnost ljudi unutar zemlje, olakšale su ljekarima proces telefonske trijaže i procjenu rizika osoba da li imaju COVID-19 ili su mogle biti izložene SARS-CoV-2. Takođe, tim koji je kreirao komunikacionu strategiju IJZCG izvršio je i brendiranje SOS linije 1616 i učinio je vidljivom opštoj populaciji.

Uzrasna distribucija anketiranih osoba bila je u skladu sa očekivanom u odnosu na rizik od komplikacija usljed COVID-19, tj. najviše su se javljali ljudi uzrasta 60 ili više godina, a potom oni najmobilniji, lica uzrasta 18 do 39 godina (11-13). Takođe, i procentualna zastupljenost anketiranih lica u odnosu na opštine iz kojih se pozivali bila je u skladu sa distribucijom detektovanih slučajeva po opštinama i posljedičnom postojanju klastera u istima (14).

Zaključak

Korišćenje nacionalne telefonske linije u koordinisanju odgovorom na COVID-19 pokazalo se u potpunosti opravdanim jer je linija omogućila ono šta joj je bio prvenstveni cilj, da bude „brana“ dok se zdravstveni sistem ne konsoliduje i omogući smanjivanje pritiska na ograničene ljudske

Of course, this was possible and meaningful in Montenegro because, at the time of introducing CC 1616, there was no local transmission established, and after its establishment, using this phone-line, among other things, widespread community transmission was prevented (5).

CC 1616 initiated extensive and timely contact tracing where, due to the small number of detected cases, those persons whose contact with SARS-CoV-2 cases was defined as low to moderate risk were also placed under health and sanitary supervision and quarantine. (6).

The current epidemiological situation dictated the nature of the CC 1616 work, so in the second week the "breakthrough" of the initial algorithm was registered because a person with a negative history of traveling to countries where local transmission was established and who denied contact with persons who had recently returned from abroad was found. That person initially contacted the CC 1616 because of symptoms suspected to be of COVID-19, but due to a negative epidemiological history was referred for clinical examination instead of further epidemiological processing. In the further course of the disease, it turned out that the person was positive for SARS-CoV-2, thus proving the first case of local transmission of unknown origin. This initiated an immediate change in protocol and from that day on, all persons who contacted the 1616 line and complained of symptoms that raised suspicion of COVID-19 were contacted by physicians from the line, who, through an extensive interview, assessed the risk of whether it was a real suspicion of COVID-19 or it was more probable that it is some other cause. It should be noted that, at that time, the laboratory capacities for processing PCR tests on SARS-CoV-2 in Montenegro were the size of dozens processed tests per day.

Of course, it was clear from the very beginning that, if wider community transmission is established, telephone triage will lose all significance and the system will have to be based on clinical triage at the primary health care level, i.e. in the so-called COVID ambulances. However, primarily due to the good compliance of the general population, but also due to extremely strict public health measures, there was no outbreak escalation, and in Montenegro on May 4th 2020, 49 days from the first, the last case of COVID-19 was detected in the first wave (7).

Interest in the CC 1616 and its role were more significant at the very beginning of its functioning, which can be seen in a high number of realized calls, while later, due to the potential calming of the situation and additional involvement of local epidemiological services, interest decreased. Also, the CC 1616, despite its initial set-up, had a significant dose of informative and educational character, because from the start it was conceived as an additional communication channel of the IPH (4).

The line capacity of a maximum of 20 calls at once and the recordings of missed calls, made the operators able to answer absolutely every call made to the line.

The main challenge for the CC 1616 was reflected in the small number of medical doctors engaged in exhausting and responsible work every day, making dozens of demanding phone calls, especially bearing in mind that the anxiety of people who suspected of being exposed to COVID-19 was significantly increased in the first days, due to a general fear of the unknown. There were no special preparations of medical doctors for this job, so these challenges were overcome in time (8,9).

The so-called "weekend effect", i.e. the reduction of both the number of realized calls per day and the number of daily reported cases, was noticeably pronounced despite the fact that the line worked from 8 am to 11 pm every day (10). On the other hand, the existence of a strong positive correlation between the number of realized calls and daily reported cases is not surprising because the higher number of cases increased the risk to the environment, and consequently there was a rise in number of people who were potentially in contact with SARS-CoV-2 cases.

High percentage of people detected by CC 1616 is a reflection of several things. Namely, due to the fear of the unknown, the general population have recognized the IPH as the health authority they can rely on, and on the other hand, travel bans and strict public health measures that caused less mobility within the country, facilitated the process of telephone triage and risk assessment of persons, in terms of whether they have COVID-19 or may have been exposed to SARS-CoV-2. Also, the team that created the communication strategy of the IPH branded the CC 1616 and made it visible to the general population.

Age distribution among interviewed persons was in accordance with expectations in relation

kapacitete, gdje se trijažnim upitnikom kroz koje su osobe provodili obučeni operateri, jasno definisalo dalje postupanje sa osobama. Zahvaljujući korišćenju adaptabilnog skorovanog upitnika, ljekari angažovani na SOS liniji 1616 su mogli promtno da reaguju na svaki slučaj sumnje jer su pred sobom, u realnom vremenu, imali hijerarhiju prioriteta.

Takođe, značajan procenat detektovanih slučajeva nakon što su ostvarili kontakt putem SOS linije 1616 pripomogao je brzom otkrivanju kontakata inficiranih osoba i njihovom stavljanju u karantin, što je u značajnoj mjeri doprinijelo sprečavanju širenja infekcije pa i njenom potpunom suzbijanju. Ovo ukazuje da opisani način funkcionisanja kol-centra treba uvijek imati na umu za slučaj ponovljanja situacija velikog epidemiološkog rizika usljed importacije određenih potencijalnih uzročnika epidemijskog javljanja zaraznih bolesti. Naravno, ne treba gubiti iz vida da je sve to bilo moguće jer su najsnažnije epidemiološke mjere bile na snazi (zatvorene granice, kafići, tržni centri itd) i da je u tom periodu postojala velika komplijansa od strane opšte populacije.

Zbog svega navedenog, treba u kontinuitetu komunicirati sa opštom populacijom kako jedini razlog za visoku komplijansu, u narednim izazovima, ne bi bio strah koji se u jednom momentu uvijek nadvlada, već visok stepen prosvijećenosti i povjerenja u krovne javnozdravstvene ustanove.

Literatura

1. WHO Timeline - COVID-19. Available from: https://www.who.int/news/item/27-04-2020-who-timeline---covid-19 [cited 2021 July 16]
2. 2019-nCoV outbreak: first cases confirmed in Europe. Available from: https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/news/news/2020/01/2019-ncov-outbreak-first-cases-confirmed-in-europe [cited 2021 July 16]
3. Sekularac I. Montenegro reports first case of corona virus infection 2020. Available from: https://www.reuters.com/article/us-health-coronavirus-montenegro/montenegro-reports-first-case-of-corona-virus-infection-idUSKBN2143SY [cited 2021 July 16]
4. Cerović R, Redžepagić N, Strugar M, Boljević N. Komunikaciona strategija: COVID-19 faza II. Podgorica [Internet]. Available from: https://www.ijzcg.me/me/publikacije/komunikaciona-strategija-covid-19-faza-ii [cited 2021 July 16]
5. Digital solutions to fight COVID-19. Council of Europe [Internet]. Available from: https://rm.coe.int/prems-120820-gbr-2051-digital-solutions-to-fight-covid-19-text-a4-web-/16809fe49c [cited 2021 July 16]
6. Resource estimation for contact tracing, quarantine and monitoring activities for COVID-19 cases in the EU/EEA. Available from: https://www.ecdc.europa.eu/sites/default/files/documents/COVID-19-resources-for-contact-tracing-2-March-2020.pdf [cited 2021 July 16]
7. Daily new confirmed COVD-19 cases in Montenegro. COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University. Available from: https://ourworldindata.org/explorers/coronavirus-data-explorer?zoomToSelection=true&time=2020-03-20..2020-05-18&pickerSort=desc&pickerMetric=new_cases_smoothed_per_
8. Roy D, Tripathy S, Kar SK, Sharma N, Verma SK, Kaushal V. Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. Asian J Psychiatr. 2020
9. Harlianty RA, Widyastuti T, Mukhlis H, Susanti S. Study on Awareness of Covid-19, Anxiety and Compliance on Social Distancing in Indonesia During Coronavirus Disease 2019 (COVID-19) Pandemic. Research Square 2020, [Preprints]. DOI: 10.21203/rs.3.rs-44598/v1.
10. Becker IR, Tarrasch R, Blinder P, Ben-Eliyahu S. A seven-day cycle in COVID-19 infection, hospitalization, and mortality rates: Do weekend social interactions kill susceptible people? BMH Yale [Preprints], 2020.
11. Risk factors and risk groups. Available from: https://www.ecdc.europa.eu/en/covid-19/latest-evidence/risk-factors-risk-groups [cited 2021 July 16]
12. Yanez ND, Weiss NS, Romand JA, Treggiari MM. COVID-19 mortality risk for older men and women. BMC Public Health 2020; 20(1):1742.
13. Yechezkel M, Weiss A, Rejwan I, Shahmoon E, Ben-Gal S, Yamin D. Human mobility and poverty as key drivers of COVID-19 transmission and control. BMC Public Health 2021; 21(1):596.
14. Presjek situacije u Crnoj Gori u utorak, 05.05. u 08:45. Available from: https://www.ijzcg.me/me/novosti/presjek-situacije-u-crnoj-gori-u-utorak-0505-u-0845 [cited 2021 July 16]

to the risk of complications due to COVID-19, i.e. most calls were made from people aged 60 or more, followed by the most mobile people, aged 18 to 39 (11-13). Also, the distribution among interviewed persons by municipalities was in line with the distribution among reported cases by municipalities and consequent existence of clusters in those municipalities (14).

Conclusion

Using the national phone line in coordinating COVID-19 response proved to be fully justified because the line made possible what was its primary goal, to be a "dam" until the health system consolidates and to reduce the pressure on limited human capacities, where the triage questionnaire through which persons were led by trained operators, clearly defined their further treatment. Thanks to the use of an adaptive scoring questionnaire, CC 1616 medical doctors were able to respond promptly to any case of suspicion because they had a hierarchy of priorities in front of them, in real time.

Also, a notable percentage of cases detected after making contact through this phone line has helped to quickly detect contacts of infected people and put them in quarantine, which significantly contributed to controlling the spread of infection and to its complete suppression. This indicates that the described way of functioning of the CC 1616 should always be kept in mind in case of recurrence of high epidemiological risk situations due to the importation of certain potential causes of infectious diseases outbreaks. Of course, all of this was possible because the strongest epidemiological public measures were in force (sealed country borders, closed schools, restaurants, shopping malls, etc.) and because in that period there was great compliance by the general population.

Given such experience, it is important to have continuous communication with the general population so that the only reason for high compliance, in the next challenges, would not be fear that is always overcome at some point, but a high degree of enlightenment and trust in the main public health institutions.

Literature

1. WHO Timeline - COVID-19. Available from: https://www.who.int/news/item/27-04-2020-who-timeline---covid-19 [cited 2021 July 16]
2. 2019-nCoV outbreak: first cases confirmed in Europe. Available from: https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/news/news/2020/01/2019-ncov-outbreak-first-cases-confirmed-in-europe [cited 2021 July 16]
3. Sekularac I. Montenegro reports first case of corona virus infection. 2020. Available from: https://www.reuters.com/article/us-health-coronavirus-montenegro/montenegro-reports-first-case-of-corona-virus-infection-idUSKBN2143SY [cited 2021 July 16]
4. Cerović R, Redžepagić N, Strugar M, Boljević N. Komunikaciona strategija: COVID-19 faza II. Podgorica [Internet]. Available from: https://www.ijzcg.me/me/publikacije/komunikaciona-strategija-covid-19-faza-ii [cited 2021 July 16]
5. Digital solutions to fight COVID-19. Council of Europe [Internet]. Available from: https://rm.coe.int/prems-120820-gbr-2051-digital-solutions-to-fight-covid-19-text-a4-web-/16809fe49c [cited 2021 July 16]
6. Resource estimation for contact tracing, quarantine and monitoring activities for COVID-19 cases in the EU/EEA. Available from: https://www.ecdc.europa.eu/sites/default/files/documents/COVID-19-resources-for-contact-tracing-2-March-2020.pdf [cited 2021 July 16]
7. Daily new confirmed COVD-19 cases in Montenegro. COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University. Available from: https://ourworldindata.org/explorers/coronavirus-data-explorer?zoomToSelection=true&time=2020-03-20..2020-05-18&pickerSort=desc&pickerMetric=new_cases_smoothed_per_
8. Roy D, Tripathy S, Kar SK, Sharma N, Verma SK, Kaushal V. Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. Asian J Psychiatr. 2020
9. Harlianty RA, Widyastuti T, Mukhlis H, Susanti S. Study on Awareness of Covid-19, Anxiety and Compliance on Social Distancing in Indonesia During Coronavirus Disease 2019 (COVID-19) Pandemic. Research Square 2020, [Preprints]. DOI: 10.21203/rs.3.rs-44598/v1.
10. Becker IR, Tarrasch R, Blinder P, Ben-Eliyahu S. A seven-day cycle in COVID-19 infection, hospitalization, and mortality rates: Do weekend social interactions kill susceptible people? BMH Yale [Preprints], 2020.
11. Risk factors and risk groups. Available from: https://www.ecdc.europa.eu/en/covid-19/latest-evidence/risk-factors-risk-groups [cited 2021 July 16]
12. Yanez ND, Weiss NS, Romand JA, Treggiari MM. COVID-19 mortality risk for older men and women. BMC Public Health 2020; 20(1):1742.
13. Yechezkel M, Weiss A, Rejwan I, Shahmoon E, Ben-Gal S, Yamin D. Human mobility and poverty as key drivers of

Sukob interesa: Nije prijavljen.
Primljen: 12.09.2021.
Revizija: 28.09.2021.
Prihvaćen: 02.10.2021.

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COVID-19 transmission and control. BMC Public Health 2021; 21(1):596.

14. Cross-section of the situation in Montenegro on Tuesday, 05.05. at 08:45. Available from: https://www.ijzcg.me/me/novosti/presjek-situacije-u-crnoj-gori-u-utorak-0505-u-0845 [cited 2021 July 16]

Conflict of interest: None declared.
Received: 09/02/2021
Revised: 09/28/2021
Accepted: 10/02/2021

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