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A report about the experience of COVID-19 active surveillance of homeless, undocumented people, and shelter staff in two cities of Lazio, Italy

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Abstract. – OBJECTIVE: This study aimed to investigate COVID-19 spread among people experiencing homelessness (PEH), undocumented migrants (UMs), and shelter staff of homeless service sites. Another aim has been to prevent an outbreak among these populations. A San Gallicano Institute's initiative to sustain the health system in helping hard-to-reach populations, very often with no community medical care coverage.

SUBJECTS AND METHODS: The San Gallicano Dermatological Institute performed active surveillance for COVID-19 on PEH and UMs living in Rome and Latina, Italy. The screening was performed with two swabs: real-time polymerase chain reaction (RT-PCR) and antigen rapid tests.

RESULTS: From June 2020 to January 2022, we performed 10,651 tests: 5,442 molecular swabs and 5,209 antigen rapid tests. A total of 3,503 individuals were screened. The prevalence of SARS-CoV-2 infection was 2.9% among the health and social workers and 5.7% among PEH and UMs. None of the people positive for COVID-19 had symptoms or signs of several illnesses. PEH and UMs who tested positive for COVID-19, asymptomatic or pauci-symptomatic, were transferred to a COVID Hotel or dedicated apartment for further clinical monitoring.

CONCLUSIONS: People experiencing homelessness and undocumented migrants are often not registered in the National Health Service and, therefore, difficult to trace. These data could aid in estimating the spread of SARS-CoV-2 among people experiencing homelessness, undocumented migrants, and shelter staff in two Italian cities.

Key Words:
Homeless, Undocumented migrant, COVID-19, Surveillance, Health equality.

Abbreviations
PHE: people experiencing homelessness, UMs: undocumented migrants.

Introduction

The pandemic emergency due to COVID-19 quickly caused a severe worldwide health crisis. Several preventive measures were adopted to preserve the healthcare system's capacity and protect healthcare workers and patients against SARS-CoV-2 infection. Access to hospitals for non-urgent cases was severely reduced. Reducing the accessibility of non-COVID patients to healthcare services was a side effect of the COVID-19 outbreak. It could potentially impact the population's health in the short and long term[1], particularly for the people experiencing homelessness and undocumented migrants.

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The COVID-19 pandemic disproportionately affects vulnerable populations, such as people experiencing homelessness (PEH) and undocumented migrants (UMs), due to their unique challenges. Homeless populations might be more transient and geographically mobile than the general population, making it difficult to track and prevent transmission and treat those who need care[2].

Conditions that might contribute to SARS-CoV-2 transmission in this community include the mobile nature and use of multiple homeless service sites, crowding and congregate sleeping arrangements, unavailability of face coverings, and potential hurdles to accessing care. These challenges make it problematic for all individuals to comply with social distancing, hand washing, and quarantine recommendations.

These populations also have a high prevalence of co-morbidities that increase the risk of severe disease and mortality due to SARS-CoV-2[3,4].

While the COVID-19 pandemic creates a substantial burden on existing public health infrastructure worldwide, there are additional concerns for hard-to-reach populations (such as homeless and undocumented migrants), who may face challenges accessing testing services and clinical care[5].

As reported in several previous studies[6,7], few activities were planned to contrast COVID-19 spread among people experiencing homelessness and undocumented migrants in Italy. Our last scoping review[7] performed a map to describe strategies and interventions adopted to protect the homeless population during the COVID-19 pandemic in Italy. All selected studies were conducted in Rome; no other Italian city would seem to have been involved. Furthermore, all shelters involved were managed by religious organizations in Italy and the Vatican State. Unfortunately, public health departments did not seem to implement dedicated measures for this population.

In another study, we registered a high prevalence of anti-spike antibodies (50.31%) among homeless and undocumented people. Probably it is due to their higher vulnerability to SARS-CoV2, or because they were reached later in the vaccination campaign than the rest of the population. This is more evident when compared to the elderly population and healthcare workers, who were the first to be vaccinated against SARS-CoV-2, in line with government regulations[8].

To reduce the risk of COVID-19 spread and to offer a suitable shelter for positive cases of COVID-19, from June 2020 to January 2022, the San Gallicano Dermatological Institute has launched an active screening program for people experiencing homelessness, undocumented migrants in the shelters, on the streets and in two reception centers. The staff of homeless service sites and reception centers for migrants underwent screening as well. This initiative was made to sustain the health system in helping the hard-to-reach populations and give a more truthful landscape of COVID-19 spread in this community.

Subjects and Methods

We performed active surveillance for COVID-19 between people experiencing homelessness and undocumented migrants who turn to voluntary health services in Rome. We also screened people living in two reception centers (Italian CAS). The initiative involved all the staff of services, and the healthcare staff consisted of 5 physicians and 6 nurses, who rotated to carry out the screening at three locations, three times a week.

Screenings took place at 5 sites: the CARITAS outpatients' facility, the Apostolic Charity outpatient clinic, managed by Medicina Solidale, a nongovernmental organization at the Vatican State, the reception center of the not-for-profit organization Binario95-Europeconsulting, an Italian CAS for foreigners without a residence permit in a peripheric area of Rome, Lazio; and another extraordinary reception center for UMs in Latina, Lazio. Access to the service in the first three centers was on a walk-in basis. While in the CASs, the screening was carried out on first access and in case of contact with a positive test or suspected positive person. The screening service was entirely free for all and no binding.

The San Gallicano Institute provided all the medical supplies necessary to execute the screening and the personal protective equipment (PEE) for the staff and people performing the screening.

The screening was carried out with two swabs: one for real-time polymerase chain reaction and the other one for rapid antigen test. The antigen rapid tests were performed with Antigen Rapid Test Device COV-S23 ECOTEST® (Aidian Oy, Espoo, Finland) and COVID-19 Ag Test (test cassette - REF 243103N-20) NADAL® (Nal Von Minden GmbH, Moers, Germany), molecular tests with FLOQSwabs COPAN® (Copan Italia S.p.a., Brescia, Italy).

We did rapid antigen tests and molecular swabs for each person and communicated to the individual the outcomes of the antigen nasopharyngeal swab after around 20 minutes. Instead, the PCR swans were transported to the San Gallicano Dermatological Institute and analyzed at the Virology Department. Results of RT-PCR were emailed to the social workers of organized shelters (according to privacy regulations) or delivered directly to the person at the test site after 24-48 hours. All the phases were accompanied by informative counseling pre and post-test. Informed and specific consent was obtained from all participants included in the study. At the same time, people experiencing homelessness (PEH) and undocumented migrants (UMs) can dispose of face masks and hand sanitizer gel.

The test-positive people were examined and transferred to a prepared isolation center (COVID Hotel) if they were asymptomatic or pauci-symptomatic. The results of positive swabs were reported to the local health authority, and any severe cases would be transported to the hospital for admission to the COVID ward.

Staff who tested positive were banned from work and provided specific self-isolation and symptom-monitoring information. Furthermore, all positive results were reported to the local public health unit for appropriate case management and contact tracing.

The study has been authorized with the approval of the ethical committee of the National Institute for Infectious Diseases Lazzaro Spallanzani (approval No. 134/2020).

This study can be considered as an observational descriptive design, hence made according to STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines.

Statistical Analysis

Only descriptive analyses (frequencies, percentages, means and medians) were conducted; Statistical Package for Social Science 26.0 SPSS® (IBM Corp., Armonk, NY, USA) was used to perform it.

Results

From June 2020 to January 2022, our group actively surveilled homeless people and undocumented migrants living in Rome, the foreign guests of two reception centers (one in Rome and another in Latina, Lazio), and staff of shelters and reception centers. The ongoing surveillance consists of screening using rapid antigenic swabs and nucleic acid amplification tests.

We performed 10,651 tests: 5,442 molecular swabs and 5,209 antigenic rapid tests. In particular, 2,803 swabs at the reception center of the not-for-profit organization Binario95-Europeconsulting, 2,661 swabs at the Apostolic Charity outpatient clinic, 1,236 swabs at the CARITAS outpatients' facility, 1,016 swabs at the two extraordinary reception centers for UMs of Rome and Latina, Lazio, and 2,935 to the health and social workers.

A total of 3,503 persons achieved the screening, of whom 3,061 (87,3%) people experiencing homelessness and/or undocumented migrants: 711 at the reception center of Binario95, 1,176 at Apostolic Charity, 858 at the CARITAS outpatients' facility, 316 at the two Italian CAS and 442 (12.7%) persons of staff (nurses, doctors and shelters staff). Henceforth, we denote people experiencing homelessness and undocumented migrants as group A, and the personal staff as group B.

In group A, some people experiencing homelessness and undocumented people lived on the streets, and others used occasional shelters. Others turned to organized shelters and dorms. We also examined minors and guests in family homes or reception shelters for unaccompanied foreign minors. The median age was 44.6 years, ranging from 5 to 86 years. 9% (275) of persons were minors (aged below 18 years old), 4% (123) were over-65, 28% (857) were young adults between 18 and 34 years old, 33% (1,010) were aged between 35 and 49 years old, and 26% (796) were aged between 50 and 65 years old. 43% (1,317) were cisgender women, 56% (1,714) were cisgender men. Information was not disposable for 1% (31) of the users.

The nationality of the people examined was Italian for 22.8% (699), whereas 7.1% (168) were EU citizens, and 35.6% (1,089) were non-EU nationals. Table I shows all the characteristics of screened persons.

Each person was screened on average twice, with rapid tests and molecular swabs, during the study period. Some people were screened up to 10 times for entry to dormitories or shelters. In addition, the managers of homes for minors often requested screening, as they didn't always use the PEE correctly.

In group A, we revealed a total of positive tested person of 168 (5.4%): 22 (13%) at the reception center of the not-for-profit organization Binario95-Europeconsulting; 73 (43.5%) at Apostolic Charity in Vatican State; 54 (32.2%) at CARITAS outpatients' facility and 19 (11.3%) at the two Italian CAS (Figure 1).

Table I. Demographic characteristics of Group A (PEH/UMs) screened from June 2020 until January 2022 in three voluntary health services and in two reception centers in Italy.

Characteristics of Group A		N (%)
	PEH and UMs	3061 87.3% of total screened people
Age	<18	275 (9%)
	18-34	857 (28%)
(median 44.6; range 5-86)	35-49	1,010 (33%)
	50-65	795 (26%)
	>65	123 (4%)
Gender	female	1,316 (43%)
	male	1,714 (57%)
	not reported	31 (1%)
Country of origin	Italy	699 (22.8%)
	EU Member State	168 (7.1%)
	Non-EU Country	1,089 (35.6%)

Considering each site where we performed the screening for COVID-19, the prevalence of positive tests was: 22/671 (3.2%) at the reception center of the not-for-profit organization Binario95-Europeconsulting; 73/1,136 (6.4%) at Apostolic Charity in Vatican State; 54/818 (6.6%) at CARITAS outpatients' facility and 19/275 (6.9%) at the two Italian CAS (Figure 2).

The nationality of people with positive results was Italian for 50%, EU citizens for 15.7%, whereas 34.3% came from non-EU countries: 48.4% from Sub-Saharan Africa, 34.9% from North Africa, 13.7% from Afghanistan and Syria, and 3.5% from Latin America (Figures 3 and 4).

Group B consisted of 422 health and social workers. 98.5% were Italian, and 1.5% foreigners. These last were intercultural mediators. Most staff were cisgender women (389, 97.5%), and 53 (11.9%) were cisgender men (Table II).

As the directives of the Ministry of Health established when to screen health and social workers for COVID-19 for several months, it was requested to repeat the screening fortnight. Therefore, the group B swabbed for SARS-CoV-2 on average 6.6 times in the study period. Overall, we performed 2,900 swabs to health and social workers. We registered 13 (2.9%) positive antigenic and molecular swabs in this group.

In summary, we recorded 188 positive cases of COVID-19: 175 (93%) among people experiencing homelessness and undocumented migrants and 13 (7%) among health and social workers.

Staff who tested positive were banned from work and provided specific self-isolation and

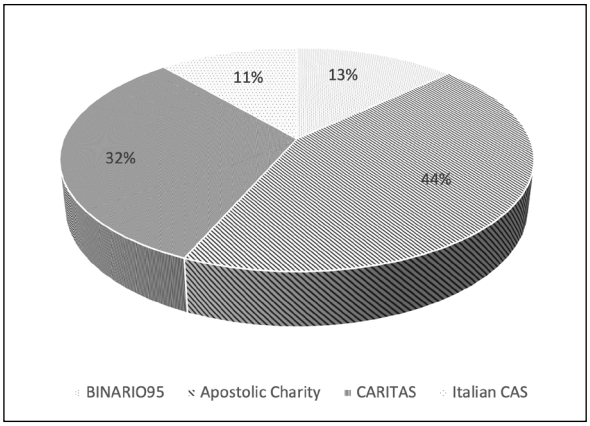

Figure 1. Percentage of the positive-tested people for screening for SARS-CoV2 in the five centers' study.

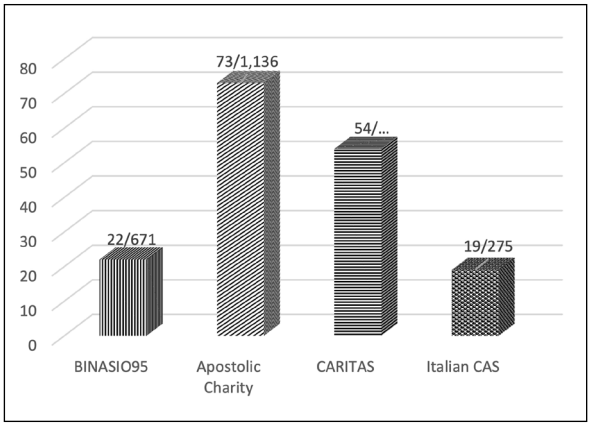

Figure 2. Distribution of positive-tested PEH/UMs among the five centers' study.

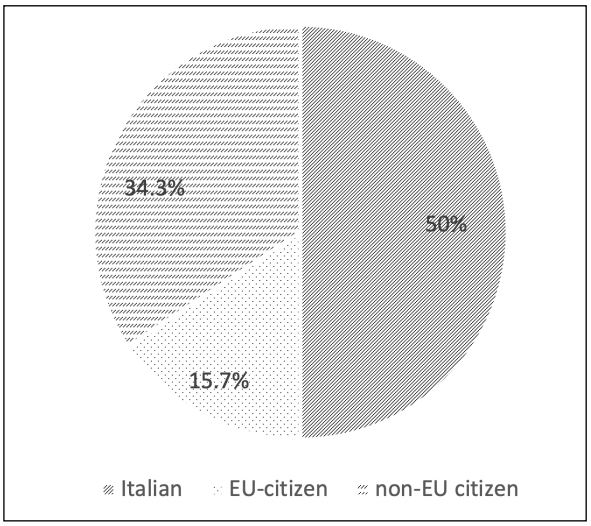

Figure 3. Nationality of the PEH/UMs with positive results in the screening for COVID, performed from June 2020 until January 2022 in three voluntary health services and in two reception centers in Italy.

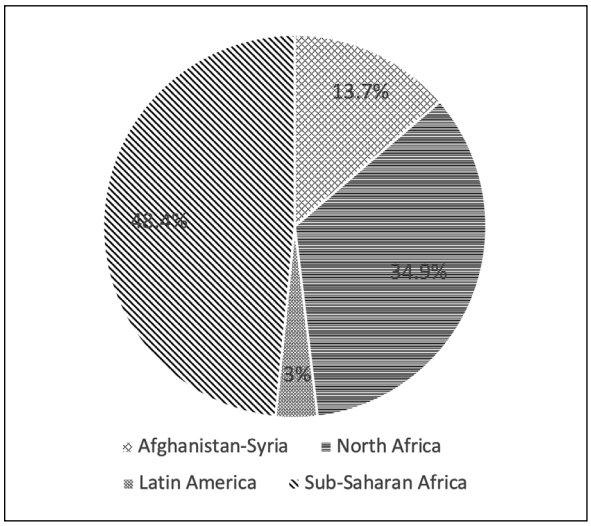

Figure 4. Positive non-EU citizens to the screening for COVID performed from June 2020 until January 2022 in three voluntary health services and in two reception centers in Italy

symptom-monitoring information. Furthermore, all positive results were reported to the local public health unit for appropriate case management and contact tracing.

The people experiencing homelessness and undocumented people who tested positive for SARS-CoV-2 were asymptomatic or pauci-symptomatic for illness, and they were transferred to the COVID Hotel for clinical monitoring. No person showed signs or symptoms of severe disease during isolation in the COVID Hotel. There were no outbreaks among people screened during the study period.

Discussion

This study allowed us to investigate COVID-19 spread among people experiencing homelessness and undocumented migrants living in three homeless service sites in Rome, Italy, and two extraordinary reception centers for foreigners without residency permits in Rome and Latina, Italy.

Centers for Disease Control and Prevention (CDC) has published interim guidance for homeless service providers to plan and respond to COVID-19. CDC recommends the tracing of people who have tested positive: work with homeless service providers to use Homeless Management Information Systems and other homeless service data collection systems to identify where the person with a COVID-19 positive test checked in during the time they were infectious[13]. However, typical methods to control SARS-CoV-2 spread (e.g., testing, contact tracing, physical distancing, and restricting movement/isolation) are hard to do and implement among people who are experiencing homelessness; stay-at-home recommendations are impractical[12].

For these reasons, our group has decided to carry out active surveillance against COVID-19 among people experiencing homelessness and un-

Table II. Demographic characteristics of Group B (shelter staff) screened from June 2020 until January 2022 in three voluntary health services and in two reception centers in Italy.

Characteristics of Group B		N (%)
	Shelters staff	442 (12.7% of total screened people)
Gender	female	389 (88.1%)
	male	53 (11.9%)
Country of origin	Italy	435 (98.5%)
	Non-EU Country	7 (1.5%)

documented migrants in shelters and also on the streets. In the two reception centers, we screened all persons living there. We offered COVID-19 screening to PEH and UMs at three centers where the access was on a walk-in basis and free for all. The high turnout of people – we screened overall 3,061 persons - resulted from word of mouth between associations and non-profit organizations about the existence of screening.

This San Gallicano Institute's initiative was to sustain the National Health System in helping these hard-to-reach populations, very often with no community medical care coverage. In 2019, the Citizen Observatory on Social Marginalization estimated that at least 21,000 people had received support related to immigration and homelessness from the Social Policy Department of the Municipality of Rome[14]. Although homeless and undocumented populations are massive in Rome, the Italian state does not have adequate public health measures for them[6]. Diagnosis, traceability, assistance, and isolation are extremely difficult, with effects on these people and the general population relating to the containment of the pandemic.

An essential goal of our work was to try to prevent an outbreak among PEH/UMs. For this purpose, we followed a post-test organizational path for screened people. In the Italian CAS in Rome, a periodic check made it possible to isolate positive people and prevent an outbreak in the center. In the other Italian CAS in Latina, the positive tested persons were isolated in a dedicated apartment managed by the staff of reception service for undocumented migrants for further clinical monitoring. For PEH/UMs living in the street, a negative result of screening gave free access to shelter services such as dormitories, showering facilities, and canteens. Indeed, each positive-tested person, who did not need to be hospitalized, was transferred to a dedicated COVID hotel in Rome. Isolation continued for a total duration of a fortnight, with the ultimate decision to end isolation made in conjunction with the local public health unit under national guidelines.

Homeless and undocumented migrants have been considered particularly vulnerable to COVID-19: many PEH are old adults with underlying medical conditions that put them at higher risk for severe COVID-19 illness[9]. Also, the lack of shelters, precarious hygienic-sanitary conditions, and irregular and incorrect nutrition increases the risk of severe COVID-19[3,10,113,10,11]. Furthermore, as underlined, they have limited or difficult access to health care because they are often not registered with the National Health Service. The pandemic has increased health inequalities.

We screened 3,061 persons living in shelters, on the street, or in reception centers in two Italian cities: Rome and Latina. We performed 10,651 tests for SARS-CoV-2: 5,442 molecular swabs and 5,209 antigenic rapid tests. To our knowledge, no other initiative with so many undocumented migrants and people experiencing homelessness has been conducted in Italy. Our scoping review[7] performed a map to describe strategies and interventions adopted to protect the homeless population during the COVID-19 pandemic in Italy. All selected studies were conducted in Rome. Furthermore, all shelters involved were managed by religious organizations in Italy and the Vatican State. Unfortunately, we showed that no dedicated measures by public health departments seem to be applied to this population[7].

This study shows a rate of positivity for SARS-CoV2 of 5.7% among people experiencing homelessness and undocumented migrants. In other studies[9-11] that investigated SARS-CoV-2 among the homeless living in shelters, the rate of positive results was about 2%: an overall prevalence of 2% of 1,434 people in 5/14 homeless shelters in King County, Washington[9], again in Atlanta, Georgia, a prevalence of 2.1% of 1,684 residents in 24 shelters[10] while, in a shelter in Hamilton, Canada, were reported a lower prevalence of 1% (104 homeless persons), even if in a smaller sample[11]. Although other previous studies[15] do not agree on the increased risk for this population, our work supports active surveillance in a specific community that we believe is at a high risk of infection and severe disease, like people experiencing homelessness and undocumented migrants staying in vulnerable conditions.

In a context where dedicated measures by the public health departments seem to be seldom applied in this population, our initiative was one of the first to offer active surveillance of these communities in shelters and on the street. Our method could give a more truthful landscape of the COVID-19 spread in this community.

The study design also included screening for SARS-CoV-2 of the five service sites' health workers and shelter staff. With this strategy, we could define the real spread of the virus in these communities. We showed a greater diffusion of SARS-CoV-2 among undocumented migrants and the homeless than among health and social workers (5.4% *vs.* 2.9%).

Limitations

The limitation of this study is that the number of people who performed the screening for SARS-CoV-2 is relatively low compared to the homeless population in Rome. Moreover, for undocumented migrants, it is impossible to know if the number studied is representative of the local community because they are not registered.

Conclusions

In the literature, it was extensively documented the spread of SARS-CoV-2 and its impact on the Italian region.

Although the contagion affected all population groups, several studies[6,7] underline that COVID-19 consequences were worse in socially fragile subjects such as migrants (especially undocumented), asylum seekers, and the homeless. It is undoubtedly difficult for these people to comply with the standard rules to defend themselves from the virus.

Several authors[2,13] showed that COVID-19 could spread quickly in homeless shelters. Therefore, prevention and enforcement interventions are needed to identify cases and minimize transmission.

The data that emerged from our screening could contribute to estimating the real spread of SARS-CoV-2 among this vulnerable population and the shelter staff.

Protecting homeless populations has to be part of a comprehensive strategy to contain COVID-19 in any city. Our active surveillance may have contributed to avoiding outbreaks in this community. People who tested positive were cared for and not left on the street without care or assistance.

The COVID-19 pandemic risks further slowing down the "Leaving no one behind" objectives promoted in the United Nations 2030 Agenda for Sustainable Development[12-16].

Therefore, further and similar health strategies are desirable to guarantee health inclusion, which has become even more urgent and necessary in this pandemic, and to discover an otherwise undetectable underground.

Availability Data and Materials

Data described in the manuscript, including all relevant raw data, will be freely available to any scientist wishing to use them for non-commercial purposes without breaching participants' confidentially.

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Authors' Contributors

Aldo Morrone: supervision, conceptualisation, project administration. Di Simone Emanuele: data collection, investigation, writing original draft. Anna Rita Buonomini: data collection, investigation, writing original draft. Nicolò Panattoni: data collection, investigation, writing original draft. Fulvia Pimpinelli: investigation, data curation. Martina Pontone: investigation, data curation. Pierluigi Saraceni: data collection, editing. Lucia Ercoli: review and editing. Massimo Ralli: investigation, data collection. Francesco Petrone: supervision, project administration. Antonio Cristaudo: supervision, project administration.

Ethics Approval

The study has been authorized with the approval of the Ethical Committee of the National Institute for Infectious Diseases Lazzaro Spallanzani (committee approval n. 134/2020).

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Informed Consent

Informed and specific consent was obtained from all participants included in the study.

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