



An unprecedented and large-scale support mission to assist residential care facilities during the COVID-19 pandemic

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SUMMARY

Background: In March 2020, COVID-19 cases occurred in residential care facilities. To assist these facilities, the regional health agency of the *Meurthe-et-Moselle* administrative district ordered a support mission.

Methods: Infection prevention and control mobile teams were formed under the coordination of the infection prevention and control department (IPCD) of a university hospital. Teams went to residential care facilities for the elderly, to facilities for people with disabilities (FPD) and independent living communities (ILC). They visited the facilities and met with the management and the ward staff to assess the situation and to identify any potential support needs.

Results: Over two non-consecutive weeks, 104 residential care facilities were visited (9025 residents). If urgent needs were identified, the IPCD was directly informed by the teams to initiate an extensive assistance operation. Thereby, additional staff and equipment were provided for every facility in need. Although most of them had implemented good management to face the pandemic, four emergency field support operations took place in facilities with uncontrolled outbreaks.

Conclusions: This is the first reported support action for residential care facilities during the pandemic in France. As no major outbreaks were noticed later, this mission was deemed a success and met the residential care facilities' needs for support. Many facilities have expressed the need to cooperate with infection prevention and control specialists in the future, both during outbreaks, also in routine daily practice. This report highlights the need to maintain support for residential care facilities and to implement a permanent collaboration between hospitals and residential care facilities.

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Introduction

In France as in the rest of the world, the number of elderly people living in nursing homes (NH) is constantly increasing every year. To address the increase in life expectancy, alternative housing solutions for the elderly have emerged in recent years such as independent living communities (ILC). These residential communities are built near shops, public transport and services and are intended for independent seniors. In France in 2017, over 750 000 and 100 000 people lived in NH and in ILC respectively, and most of the residents were over 80 years' old [1,2]. Accommodation capacity for people with intellectual or physical disabilities is also rising. In 2018, 9 000 facilities for people with disabilities (FPD) offered residential care for 300 000 adults and 100 000 children [3].

In March 2020, the COVID-19 pandemic reached France and the fast spread of the virus significantly affected the health system. A large number of patients were hospitalised in intensive care units (ICU) and all resources were redirected to COVID-19 support. Older adults were one of the most at-risk groups, as they are immune-compromised and have comorbidities [4]. The elderly were particularly affected by COVID-19 with a death rate five times higher than the average in people over 80 years' old [5].

A notable proportion of COVID-19 cases occurred in residential care facilities, mostly in NH [6] but also in FPD and ILC [7,8]. About 54 500 COVID-19 cases and more than 6 500 COVID-19 deaths were reported in these residential care facilities in France from March to early April 2020 (6 528 cases and 790 deaths in the *Grand-Est* region of France) [9]. *Belmin and al.* reported 62 629 cases and 8011 deaths in French residential care facilities between March 1 and June 30, 2020 [10].

These facilities were already facing shortages of staff and material resources. Therefore, the COVID-19 pandemic increased the difficulties to adequately support patients. As the virus was spreading and the healthcare system was overwhelmed, the threat of reaching higher death rates in these vulnerable populations was real [11,12].

By Mid-April, the *Grand-Est* region (one of the 22 administrative regions of France with a population of 5 550 000) was the second most affected French region by the pandemic: more than 70 000 people had been hospitalised and 10 000 had died [9]. 8 918 cases and 1 179 deaths were reported in residential facilities [13]. Early outbreaks among residential care facilities

had been recorded in the *Meurthe-et-Moselle* district (one of the 9 administrative districts of the *Grand-Est* region) with a population of 730 000. Prior to the pandemic, few of these facilities had infection prevention and control specialist support, and only a few were attached to hospitals. In France, 17 infection prevention and control regional support centres were created in 2017 to assist healthcare providers in the management of infectious adverse events. Given the rapid spread of COVID-19, our regional centre did not have the resources to assist all the facilities in need of support.

In this regard, the *Grand-Est* regional health agency ordered on 10 April 2020 an unprecedented and large-scale departmental support mission to first assist NH, then FPD and ILC at this very critical time in the *Meurthe-et-Moselle* district. The aim of this study was to report the support mission with particular focus on the situation assessments, the immediate corrective actions taken and of the strengths and limitations of the report.

Materials and methods

Mobile units of infection prevention and control (IPC) – called IPC mobile teams (IPCMT) – were formed under the coordination of the IPC and the Quality departments of Nancy University Hospital (CHRUN) in collaboration with the departmental fire station and the *Meurthe-et-Moselle* departmental council. The IPCMT consisted of three members: a nurse (CHRUN) for IPC observations and field experience, a firefighter for the security of premises and technical support (provision of vehicles) and a healthcare administrator of the *Meurthe-et-Moselle* district council for the equipment inventory and human resource management assessment. Eight IPCMTs were formed and a field visit had been scheduled for each residential care facility of the *Meurthe-et-Moselle* district.

Each IPCMT went to the facility to meet the management and the nursing staff in order to assess the situation and to identify any support needs (from April 15 to 23 for NH and from 24 to 28 April for ILC and FDP). Prior to the visits, two morning training sessions were performed with the IPCMT members in order to explain the purpose and the schedule of this support mission. The first training session took place on 15 April 2020 (before the NH visits) and the second training took place on 23 April 2020 (before the ILC and FPD visits) (Figure 1).

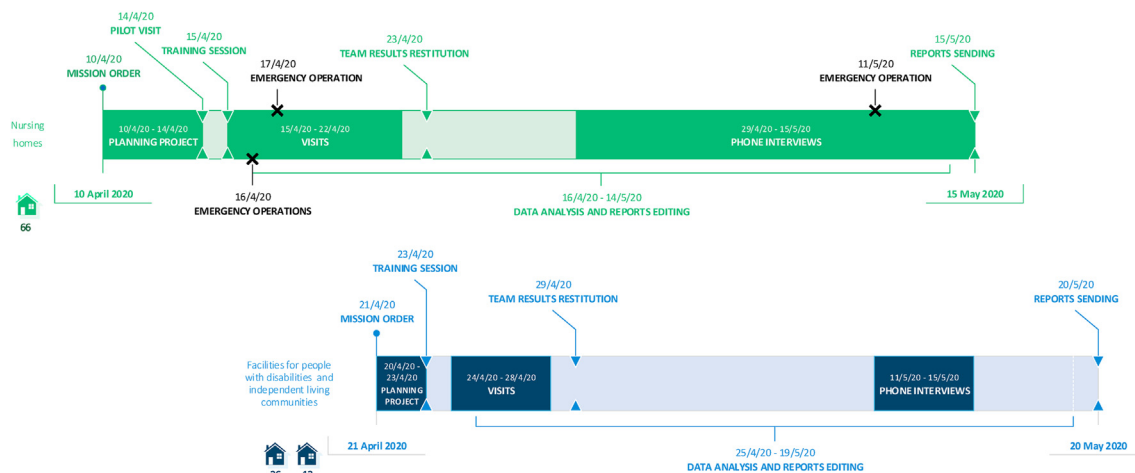


Figure 1. Mission planning.

Each IPCMT received a mobile phone and a touch pad to collect information. A questionnaire was used to evaluate the situation of each type of facility. The French high council of public health and the French hospital hygiene society's guidelines were used to construct the questionnaire [13,14]. This questionnaire, which consisted of two parts, was completed by IPCMT during each visit. The first part included management-reported data about the general characteristics of the residential care facility. The second part consisted of observational data regarding the care and maintenance of the premises (Supplementary Material). The questionnaire was pre-tested during a pilot visit on 14 April. Each residential facility was informed of the content and dates of visits of the by the regional health agency.

At the end of the visit, IPCMT did a brief review on site to highlight any obvious concerns including patient care and environmental cleaning. Immediate measures were advised by the IPCMT taking the specificities of each facility into account. To update the hospital IPC department, a daily IPCMT report was made by telephone at the end of the day. If urgent needs were identified, the hospital IPC department was immediately informed by the IPCMT to initiate supportive actions such as the provision of materials or equipment, human resources or specialist IPC interventions in the facilities.

Data analysis was performed using Excel® software by the hospital IPC department. Questionnaires were analysed using descriptive statistics. Then, based on reported and observational data, an expert assessment was given by the hospital IPC department for each residential care facility. Observational data were analysed by an IPC specialist according to the infectious status of the resident. A report describing strengths, limitations and the corrective measures required was electronically sent to the facilities and to the regional health agency. To continue the support, each residential care facility was contacted two weeks after the initial visits.

All the NH (n=66, with an accommodation capacity of 6029 residents), the FPD (n=26, with an accommodation capacity of 2391 residents including 631 daycare placements in 16 FDP) and the ILC (n=12, with an accommodation capacity of 605 residents) of the *Meurthe-et-Moselle* district were visited over two periods each of one week (Figure 1). NH, FDP and ILC accommodated 5413, 1252 and 525 residents respectively (occupation rates of 89.8%, 52.4% and 86.8%).

Results

Situation assessments

Regarding the COVID-19 status of residents in April 2020, 4.1% were laboratory-confirmed cases (0–26 cases depending on the residential care facility), 1.3% were hospitalised and 1.3% had died of COVID-19 (Table 1). No confirmed case was identified in 53.8% of residential care facilities, but they had not all been tested (screening was in progress at the time). Regarding FPD residential capacity, daycare placement was disrupted except in two out of sixteen facilities.

Overall, 82.7% of the residential care facilities had sufficient human resources but 60.2% had requested and obtained staff reinforcement. A small proportion of NH and FPD had no coordinating practitioner (10.8% and 26.9%, respectively) or no health manager (6.2% and 30.8%).

Real-time inventory tracking was used in 93.3% of the residential care facilities for personal protective equipment (PPE) and cleaning products. Very few facilities did not have eye protection (8.7%) and respirators (FFP2) (7.7%) when medical masks were recommended for healthcare professionals in contact with patients with suspected or confirmed COVID-19 infection. The use of respirators was limited to aerosol-generating procedures [15]. During patient care, PPE was reused for different residents with same/different infectious status in 68.2%/22.7% of NH and in 60.0%/4.0% of FPD (including gloves). Single-use medical devices were mostly used (83.3% of NH and 69.6% of FPD) and medical devices were mostly dedicated to a single resident (84.8% of NH and 72.7% of FPD). Medical device decontamination failures between two residents were observed in 6.1% of NH and 8.7% of FPD.

Almost all facilities (98.1%) had implemented an enhanced environmental cleaning protocol. Environmental cleaning was performed daily in 91.2% of the facilities, mainly by internal staff (71.9%). On average, resident rooms were cleaned 6.6 times a week with prior ventilation (opening windows) in 87.6% of cases. Disinfectant/detergents with virucidal activity or hypochlorite (bleach) (3-step protocol) were the most widely used products (95.2%).

Actions to inform and educate ward staff by facilities' health executives had been put in place in more than 80% of NH and FPD and in 58.3% of ILC. These included incident meetings, provision of educational documents and training sessions. Continuous surgical mask wear was effective in more than 95% of NH and FPD but only in 83.3% of ILC. All NH and FPD had set up regulation of entrances, but only 83.3% of ILC. Non-healthcare activities such as hairdressing, musical activities and non-essential healthcare activities such as physiotherapy, were often suspended (89.2%). Only half of NH and FPD maintained general practitioner visits. Regarding the residents, group activities were mostly suspended in NH and ILC but only in 42.3% of cases in FPD. In NH and ILC, residents were isolated in their rooms in most of the cases, but only in 48.0% of cases in FPD.

Visits took place during the first French lockdown. Up to date communication methods such as video calls and emails were used to maintain social cohesion between residents and their relatives in all NH and FPD and in most of ILC (66.7%).

To prevent outbreaks, different IPC strategies were implemented or planned in NH and FPD. These comprised cohort units for cases both with dedicated staff (63.6% and 72.3% for NH and FPD respectively) and without dedicated staff (21.9% and 16.0% for NH and FPD respectively); dedicated staff for cases without cohorting (25.8% and 32.0% for NH and FDP respectively); the isolation of asymptomatic residents (70.3% and 64.0% for NH and FDP respectively); cohorting units of wandering residents (47.7% and 22.7% for NH and FDP respectively).

Immediate corrective actions

For each residential care facility requiring additional staff, these were provided by the regional health agency and the CHRUN, and were mostly night staff and management staff. The staff comprised seconded staff and retired health managers who had been invited to return to work. Additional equipment was also provided, mostly single-use gowns, respirators (FFP2) and Eye protections.

Table 1
Situation assessments of residential care facilities

	NH (%) N = 66 facilities, 5413 residents	FPD (%) N = 26 facilities, 1252 residents	ILC (%) N = 12 facilities, 252 residents	Total (%) N = 104 facilities, 7190 residents
COVID-19 status				
Laboratory-confirmed cases	4.2	2.0	8.2	4.1
Hospitalised	1.2	0.5	3.8	1.3
Deceased	1.5	0.2	1.3	1.3
Recovered cases	1.6	0.3	3.4	1.5
Contact cases	11.4	1.7	10.3	9.7
Establishment with no confirmed case	51.5	73.1	25.0	53.8
Human resources				
Sufficient human resources	78.8	100.0	66.7	82.7
Staff reinforcement	63.6	48.0	66.7	60.2
No coordinating practitioner	10.8	26.9	-	15.2
No health manager	6.2	30.8	-	13.0
Security of premises				
Obstructed emergency exits	7.7	0.0	0.0	4.9
Locked emergency exits	33.8	24.0	8.3	28.4
Updated mapping of residents	51.6	50.0	45.5	50.5
At least one resident secured in room for medical reasons	28.1	24.0	-	27.0
Logistic				
Real-time inventory tracking	92.4	96.2	91.7	93.3
Masks in entrance hall	83.1	53.8	50.0	71.8
Alcohol-based hand rub in entrance hall	92.4	92.3	91.7	92.3
Masks in changing room	97.0	96.0	33.3	89.3
Alcohol-based hand rub in changing room	97.0	88.5	100.0	95.1
Masks in units	90.9	96.2	91.7	93.2
Alcohol-based hand rub in units	97.0	100.0	91.7	97.1
Respirators (FFP2)	98.5	84.6	75.0	92.3
Eye protection	95.5	88.5	75.0	91.3
Virucidal products	95.3	96.1	66.7	90.4
Personal protective equipment				
Conserved for different residents with same infectious status	68.2	60.0	-	65.9
Conserved for different residents with different infectious status	22.7	4.0	-	17.6
Medical devices				
Single-use medical devices	83.3	69.6	-	79.8
Dedicated medical devices	84.8	72.7	-	81.8
Medical device decontamination between two residents	93.9	91.3	-	93.3
Environmental cleaning/decontamination				
Written COVID-19 protocol	87.7	92.3	75.0	87.3
Reinforced environmental cleaning /decontamination protocol	97.0	100.0	100.0	98.1
Performed by internal staff	81.0	61.5	83.3	71.9
Performed daily	93.9	88.0	83.3	91.2
Use of disinfectant-detergents with virucidal activity	97.0	96.2	83.3	95.2
Risk management				
Staff information and education action	81.8	84.6	58.3	79.8
Training for reinforced staff	84.8	76.0	58.3	79.6
Continuous surgical mask wear	97.0	96.2	83.3	95.2
Entrance regulation	100.0	100.0	83.3	98.1
Non-healthcare activities suspended	86.4	100.0	75.0	89.2
Non-essential healthcare activities suspended	81.8	53.8	-	73.9

Table I (continued)

	NH (%) N = 66 facilities, 5413 residents	FPD (%) N = 26 facilities, 1252 residents	ILC (%) N = 12 facilities, 252 residents	Total (%) N = 104 facilities, 7190 residents
General practitioner visits suspended (unless medical emergency)	50.0	53.8	-	51.1
Provided personal protective equipment	75.0	83.3	-	77.3
Dedicated professional attire to the facility	28.1	50.0	-	34.1
Relatives information of visits restriction	98.5	96.2	83.3	94.2
Collective activities suspended	89.4	42.3	100.0	78.8
Room isolation	81.8	48.0	83.3	73.8
If not, physical distancing and advice for preventing virus spread	75.0	75.0	50.0	73.1
Maintained social cohesion between residents and their relatives	100.0	100.0	66.7	96.1
Suspended laundry care by relatives	81.8	7.7	66.7	61.0
Noticed room of cases	84.6	88.5	-	85.7
Cases submitted to the authorities	89.1	-	-	89.1
Cohort units for cases with dedicated staff	63.6	42.3	-	57.6
Cohort units for cases without dedicated staff	21.9	16.0	-	20.2
Dedicated staff for cases without cohorting	25.8	32.0	-	27.6
Isolation of asymptomatic residents	70.3	64.0	-	68.5
Cohort units for wandering residents	47.7	22.7	-	41.4

NH=nursing homes. FPD=facilities for people with disabilities. ILC=independent living communities. -=data not collected.

The hospital IPC department conducted emergency field support operations in NH with uncontrolled outbreaks to implement corrective actions. Three of them took place immediately after the visit and another two weeks later. These operations consisted of a field intervention of IPC specialists (CHRUN or nearer partner hospital), an outbreak incident meeting with management, COVID-19 information and training session for staff. A written report of these operations was sent to the residential care facilities and to the regional health agency.

Reports and follow-up

Two weeks after the visits, no further need for additional resources or interventions was observed and only one facility reported an uncontrolled outbreak. As feedback of the results to those involved in an incident is known to improve the safety culture [16], reports describing strengths, limitations and corrective measures to implement were electronically sent to the facilities and to the regional health agency. The main strengths and limitations were respectively enhanced environmental cleaning and supply difficulties. Regarding corrective measures to implement, the facilities needed to optimise the correct use of PPE, predominantly in NH. Some FPD and ILC also needed to provide masks and alcohol-based hand rub in the entrance halls. Training for reinforced and new staff needed to be implemented and developed in about a third of the facilities.

The large-scale departmental support mission ended on 15th May for NH and on 20th May for ILC and FPD.

To maintain support, an on-call telephone help line was set up by the hospital IPC department to respond to any requests regarding IPC measures. No major outbreaks (more than two cases in two weeks) were later noticed. This on-call help line was maintained until summer 2020, then the regional prevention centre for healthcare-associated infections took over the support mission of the residential care facilities.

Discussion

The combined teamwork of the IPC and the quality departments of the CHRUN in collaboration with the local fire service and the local council enabled the setting up of an unprecedented and large-scale departmental support mission in a short time.

This mission was implemented quickly and required a significant human and material investment (eight IPCMT of three members for two weeks field visits, a data analyst and a quality engineer assigned for one-month full time and two IPC specialists for supervision and then on-call line until summer 2020). Further improvements were identified, especially regarding the organisation of the mission. Computerised forms were not operational and this may have resulted in errors from manual data input or interpretation errors from manual data collection. Furthermore, the IPCMT were trained in data collection very quickly (in just a few hours) and no specific IPC training had been set up. To address these issues in the future, a longer planning phase would be necessary to test the computerised forms and to set up more developed IPCMT training.

In this study, most of the residential care facilities had sufficient human resources and had applied preventative measures, such as enhanced environmental cleaning, in accordance with national recommendations [17]. In some residential care facilities, thefts of masks were observed explaining the absence of masks and alcohol-based hand rub in the entrance halls. NH had more supply difficulties than the other residential care facilities, especially single-use gowns which resulted from supply difficulties due to global manufacturing disruption [18].

Poor compliance with social distancing and other protective behaviours and as well as IPC measures was higher in FPD and ILC than in NH. The ability to perceive risks associated with the COVID-19 differed from one individual to another. NH staff appeared more aware of the risks of this inappropriate

behaviour and were therefore more compliant. Alternative measures to promote protective behaviour should be considered in FPD and ILC according to the characteristics of the population [19]. In our study, the highest number of laboratory-confirmed cases were in ILC but other reports showed that the burden was higher in NH than in other residential care facilities during the first wave [10]. This observation could be explained by a possible underestimation of the number of cases in NH at the beginning of the mission when screening for COVID-19 was being developed.

Field visits also identified areas for improvement, especially regarding workforce training and the correct use of PPE. PPE plays a fundamental role in the prevention of spread of infection to healthcare professionals [20] but the incorrect use or overuse of PPE can also present a risk of cross transmission and self-inoculation, especially during PPE removal [21]. Some residential care facilities used the same PPE for patients with different infectious status (more than 20% in NH). This inappropriate practice was related to the staff anxiety and the fear of running out of PPE more than an actual shortage of PPE and demonstrated low preparedness for infection prevention and control. Lack of experience of residential care facilities and weak knowledge in dealing with a new viral infection have already been described in other studies and are real concerns [22,23]. As adverse events due to PPE use are frequent [24], prevention and management strategies should be implemented [22,23]. In view of these issues, the hospital IPC department provided educational documents and specific protocols to optimise the correct use of PPE. A few training sessions on the field were also organised during the emergency operations. New digital resources were developed to reach as many facilities as possible and to comply with social distancing. Educational videos on PPE use and healthcare practice were produced by the IPC department and sent to the facilities. During the pandemic, other training modalities have emerged [25] but the relevance and the impact of e-learning tools on specific topics like PPE use need to be further evaluated and compared to face-to-face teaching [26].

The challenges faced by residential care facilities during the COVID-19 pandemic have been described worldwide: lack of material resources [18], human resources [27], and lack of consistent guidelines. [28] Moreover, our results showed that these facilities need appropriate IPC support. An American study, conducted in Massachusetts NH, made the same observation and reported that adherence to infection prevention and control protocols was significantly associated with lower infection and mortality rates [29]. Another French study reported a lower death rate in hospital-dependent-NH than in NH with no direct connection with a general hospital [30]. The coordination between hospitals and residential facilities needs to be reinforced [31].

The involvement of other specialties and support services made it possible to give expert advice and recommendations which considered the quality of life of residents and the risk of psychological suffering. The protection of the elderly is a real challenge. As the most vulnerable group, older people should apply social distancing and other protective behaviours to minimise the spread and the impact of COVID-19. Nonetheless, isolation has been linked to negative outcomes such as depression and anxiety [32] but also to cardiovascular diseases and high blood pressure [33]. Loneliness and social isolation should be

managed effectively to prevent any adverse event on mental and physical health [34,35].

To our knowledge, this mission was the first support action for residential care facilities during the COVID-19 pandemic in France. Later actions took place during summer 2020, including a national survey to assess risk management in NH on a larger scale. During the follow-up period, no major outbreak was noticed. By mid-April, the number of COVID-19 cases among the residents of residential care facilities in the *Meurthe-et-Moselle* district represented 8.7% of those of the Grand-Est Region. Six weeks later, this number was significantly reduced (6.3 %, $p = <0.001$). The proportion of cases in the *Meurthe-et-Moselle* district compared with the rest of the region was significantly lower after the support mission than before. In comparison, these numbers were respectively 15.0% and 16.5% in the adjoining *Moselle* administrative district (1 000 000 inhabitants), and were significantly higher after six weeks ($P=0.005$) [13,36].

The results highlight the valuable contribution of IPCMT in outbreak management [37]. Numerous studies have reported that team-based healthcare and practices improve the efficiency and quality of care [38,39]. Although, there is limited evidence on the effectiveness of IPCMT [40], the aims of these teams are to develop and to put IPC programs into practice.

Like other mobile teams which were already established such as geriatric and palliative care teams [41,42], the development of an IPCMT should be considered. Indeed, through this support mission, many residential care facilities have expressed the need to cooperate with IPC specialists not only during outbreaks, but also in daily practice. Furthermore, as enshrined in French legislation (Health System Modernisation Act) [43], new regional hospital groups have been created to develop a common local strategy for patient care in all the member establishments. The achievement of this support mission has triggered a reflection on the implementation of a permanent territorial collaboration between hospitals and residential care facilities. As the World Health Organization warns of possible new pandemics, the entire healthcare system must be prepared to respond to future outbreaks [44]. The creation of designated regional support reference centres and IPCMTs could meet these expectations.

Conclusions

This support mission was a success and met the residential care facilities' needs for support at this critical time during the COVID-19 pandemic. In total, 104 residential care facilities received support from IPCMT and most of them had implemented effective management to face the pandemic. A small proportion needed immediate extensive support from IPC specialists during this time and a large number of residential care facilities expressed the desire to continue collaboration with the IPC specialists. The experience of this support mission indicated that ongoing support should be maintained. To this end, a designated IPC department within the regional hospital group led by the CHRUN has been created and has been operational since summer 2021.

Conflict of interest statement

The authors have no relevant financial or non-financial interests to disclose.

Author contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Anaïs COLAS, Alexandre BAUDET, Marie REGAD, Elodie CONRATH and Arnaud FLORENTIN. The first draft of the manuscript was written by Anaïs COLAS and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Ethics statement

This study did not require ethical approval.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.infpip.2022.100234>.

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