



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

# Rapid response: activity from a hospital based Urgent Dental Care Centre during the COVID-19 pandemic

M. Pajpani\*, K. Patel, A. Bendkowski, P. Stenhouse

*Oral and Maxillofacial Surgery Department, King's College Hospital NHS Foundation Trust, Queen Mary's Hospital, Froggnal Avenue, Sidcup, Kent, DA14 6LT*

Accepted 2 July 2020

Available online 9 July 2020

## Abstract

On 23rd March, the UK Government announced a nationwide lockdown in response to the COVID-19 pandemic, resulting in the unequivocal and absolute cessation of all elective dental treatment. With much conflicting evidence on best practice to deliver safe treatment comprising of emergency dento-alveolar surgery, this paper describes the protocols which were undertaken to successfully set up a novel Urgent Dental Care Centre (UDCC) service within a short timeframe. We present patient data from referral through to treatment for the entire ten-week period of operation. A UDCC was established at Queen Mary's Hospital, Sidcup within 10 days of this announcement. Through an iterative process with minor stakeholders and in collaboration with our Local Dental Committee, a comprehensive urgent dental service was established. Our UDCC received 1,311 referrals within a 10-week period, with 884 patients being accepted for treatment. The majority of treatment delivered in this emergency setting was surgical dento-alveolar procedures (84%). Sixteen per cent of patients attended for trauma, first stage restorative treatment for teeth and postoperative complications. Both aerosol and non-aerosol generating procedures were available to patients. Preventing acute hospital admissions relies on the ability to provide safe dento-alveolar surgery. Our results advocate that our unique UDCC is efficient and provides appropriate patient access and outcomes for those most in need of urgent dental treatment in the face of a pandemic. Crown Copyright © 2020 Published by Elsevier Ltd on behalf of The British Association of Oral and Maxillofacial Surgeons. All rights reserved.

**Keywords:** COVID-19; dento-alveolar surgery; emergency; dental; coronavirus

## Introduction

On 23rd March 2020, a nationwide lockdown was announced in the United Kingdom resulting in the cessation of *all* primary, secondary, and tertiary dental care due to the coronavirus pandemic. Failure to successfully manage patients using the 'AAA' protocol (advice, analgesia, and antimicrobial prescription) resulted in the need for General Dental Practitioners (GDPs) to refer to an established Urgent Dental

Care Centre (UDCC) for appropriate face-to-face assessment and treatment. The situations which comprised emergency or urgent dental care followed the Scottish Dental Clinical Effectiveness Programme criteria established in the document Emergency Dental Care.[1]

A UDCC independent of the NHS-111 triage service was established within 10 days of the lockdown announcement (3rd April 2020) within the Oral and Maxillofacial Surgery (OMFS) department at Queen Mary's Hospital in Sidcup, London. This was done using advice released through joint statements by the British Association of Oral and Maxillofacial Surgery (BAOMS) and the British Association of Oral Surgery (BAOS)[2] along with Public Health England (PHE) guidance on use of Personal Protective Equipment (PPE) for

\* Corresponding author. Tel.: +44 020 3960 5501.

E-mail addresses: [meera.pajpani@nhs.net](mailto:meera.pajpani@nhs.net) (M. Pajpani), [kishan.patel@nhs.net](mailto:kishan.patel@nhs.net) (K. Patel), [anthony.bendowski@nhs.net](mailto:anthony.bendowski@nhs.net) (A. Bendkowski), [philip.stenhouse1@nhs.net](mailto:philip.stenhouse1@nhs.net) (P. Stenhouse).

aerosol and non-aerosol generating procedures[3] and hospital trust protocols in place for dental and surgical specialties. Our UDCC formed one of the five UDCCs initially set up within the London region providing care.

On the week commencing 20th April, the government announced the phased opening of UDCCs in community care settings with referrals via the NHS-111 team. On 28th of April, the government announced that primary care dental practices could re-open with appropriate risk assessments, protocols and PPE for non-aerosol generating procedures within the London region and for all procedures nationally.

Given the proximity that dental and oral surgeons operate to the mucosal membranes of the mouth, nose and eyes, as well as the use of droplet and aerosol generating procedures makes the provision of dento-alveolar surgery a potential risk for the transmission of the coronavirus. However, it must be emphasised that current evidence is equivocal on whether AGPs may produce aerosol particles capable of holding and suspending the coronavirus in the air in a clinical setting.[4]

This article describes our UDCC and presents patient referral and outcome data for much of the period where all elective dental procedures throughout the country were prohibited in light of the COVID-19 pandemic (3rd April 2020 to 12th June 2020).

## Method

Through liaising with the chair of the Local Dental Committee (LDC) of Bexley, Bromley and Greenwich (London), a pathway was established between local GDPs and our UDCC, following referral guidance as established by Office of the Chief Dental Officer.[5] No specific tariffs for payment were set for the UDCC; this allowed prompt delivery of emergency care to fulfil the needs of the local population. A trust-wide hospital response to the coronavirus pandemic included a reversion to a block contract for payment as opposed to a “payment by results” system. This was established from April–October 2020 with the aim of review after this time. The service was staffed by Dental Core Trainees (DCTs) and staff grade surgeons (SGs) working within the OMFS Department. Orthodontic Consultants and Registrars were recruited on a voluntary basis to work within their skill set. Fast-track honorary Trust contracts were obtained for GDPs from a practice with which a working relationship was established to provide surplus clinical staff. DCTs were supervised by an experienced SG and OMFS Consultant. The ethos of the department focusses on open and dialogic interaction: a team based approach to patient care.

The aim of the service was to make every contact count, with patients being advised at triage that their visit will provide definitive treatment for their condition to prevent re-attendance and inevitable re-exposure for all parties. For those patients with life-threatening dento-alveolar infection, referral was made to our OMFS team at a different trust site with in-patient admission rights and access to an emergency

### Box 1: List of oro-facial and dento-alveolar conditions accepted for treatment at our UDCC.

- Life-threatening spreading head and neck infection which is dento-alveolar in origin, e.g. airway restriction or breathing/swallowing difficulties due to facial swelling
- Trauma including facial/oral soft tissues injuries, and/or dento-alveolar injuries, e.g. avulsion of permanent tooth
- Oro-facial swelling which is significant and worsening
- Post-extraction bleeding which is uncontrollable with local measures
- Oro-facial infection which has resulted in acute, systemic illness
- Severe oro-facial and dento-alveolar pain which cannot be controlled with routine self-administered analgesia
- Fractured teeth, or teeth with pulpal exposure
- Oro-facial and dento-alveolar conditions that are likely to exacerbate systemic medical conditions

CEPOD theatre list. This on-call service provided emergency provision on weekends and outside of our operating hours.

Each patient referred was triaged via phone and booked in for treatment either on the day of referral or the next working day, if their presenting condition truly warranted treatment in a UDCC (Box 1). Early intervention through definitive dento-alveolar surgery was imperative to prevent attendances to Emergency Departments and minimise hospital admissions for dental sepsis and thereby reducing the burden on in-patient hospital care.

Treatment slots were booked for 45 minutes, followed by a 30-minute fallow period and subsequent 60-minute surgery disinfection. This was based on 11–12 air changes per hour (ACH), per surgery, with the 30-minute fallow period considered pragmatic given the ACH. Through a rotation of 5 teams working across 12 individual surgeries, a daily capacity of 32 treatment slots were available. Specific slots were reserved for patients who were deemed vulnerable in relation to the coronavirus virus at the beginning of the day to prevent unnecessary waiting in the reception.

Table 1 indicates the minor oral surgery (MOS) and dental procedures (DPs) which were offered to patients depending on their presentation categorised as either an aerosol generating procedure (AGP) or a non-aerosol generating procedure (nAGP). DPs include the management of acute dental trauma and tooth extirpation. All treatment provided was under local anaesthetic only. Follow-up care for MOS procedures was organised as a telephone review, whilst follow-up care for DPs was delegated to the patient's GDP with an appropriate discharge letter.

Table 1

The range and number of minor oral surgery and dental procedures carried out at our UDCC, divided into AGP and nAGP.

Aerosol generating procedure	Non-aerosol generating procedure
Extraction of tooth with soft-tissue reflection and alveolar bone removal (XLA AGP) N = 80	Simple extraction of tooth (XLA) N = 595
Extraction of tooth necessitating management of fixed dental prosthesis with a dental drill (XLAdent) N = 6	Simple extraction of tooth with soft-tissue reflection (XLASR) N = 21
Extirpation of tooth (Extirp) N = 49	Extraction with incise and drain of abscess via an intraoral approach (XLA I + D) N = 19
Dental trauma necessitating AGP (AGPTr) N = 7	STAT Intravenous antibiotic administration (STATAb) N = 2 Assessment of spreading head and neck infection requiring in-patient treatment and appropriate referral (Ref) N = 4 Management of facial soft tissue injury (OMFSIac) N = 7

## Results

This section discusses the results of the referral and triage process, as well as service delivery from 3rd April–12th June 2020. This includes the initial period of government enforced lockdown, when the key message was for the public to “stay home” and then to “stay alert” when lockdown restrictions

began to ease. The last week of data presented saw GDPs resuming activity on 8th June.

### Referrals data

Within this ten-week period, a total of 1,311 referrals were received. Of these, 884 were accepted for treatment, with 438 being rejected. The acceptance rate of referrals received increased from an average of 32% in the first full week of opening the UDCC, to 63% by the end of the ten-week period, as a running average from inception (Fig. 1).

Of the patients referred into the service:

- 1,075 (70%) patients were referred with “Pain” as the primary indicator for referral. Of these, 65% were seen by our service.
- 285 (18%) patients were referred with “Swelling” as the primary indicator for referral. Of these, 75% were seen by our service.
- 9% of patients were referred with “Dental trauma” as the primary indicator. Of these, 55% were seen by our service.
- 2% of patients were referred with “Trauma” as the primary indicator. Of these, 43% were seen by our service.
- <1% of patients were referred with “Bleeding” as the primary indication of referral. Of these, 50% were seen by our service.

Of the referrals sent to our service, 47% of patients had pre-existing medical conditions. Fig. 2 shows the distribution of patients’ postcodes who were referred into the service.

### Treatment data

Of the patient cohort treated within our service:

- 56% were female and 44% were male.
- A range of age groups were treated, including:

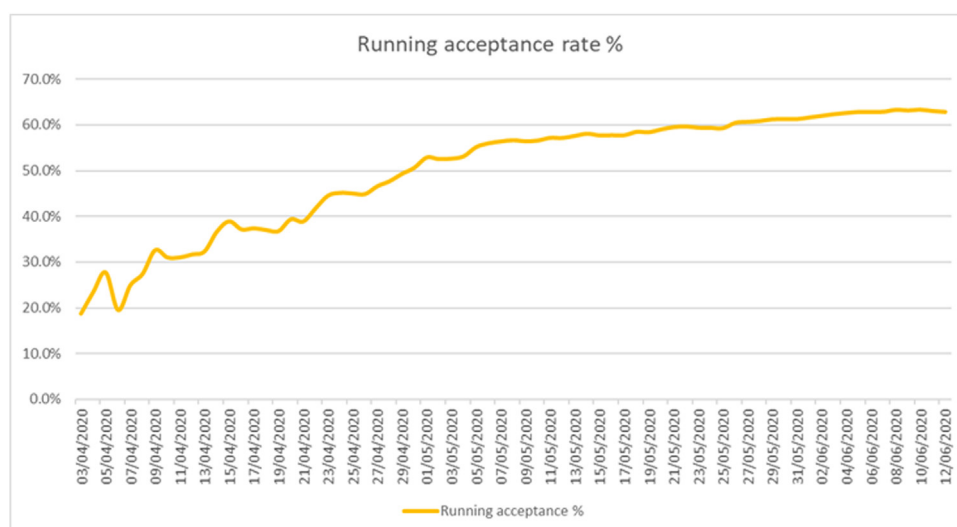


Fig. 1. A graph to show the running acceptance rate of referrals.

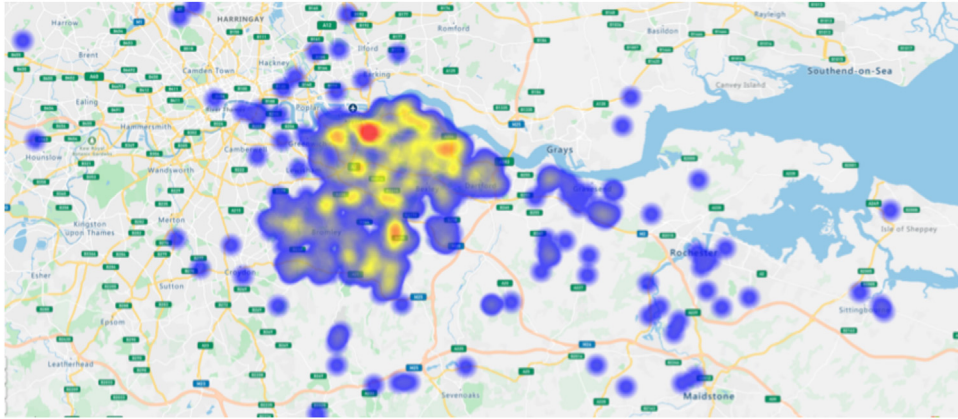


Fig. 2. Heat map demonstrating the remit of the UDCC in London/Kent.

- 5% under 20
- 61% aged 21–50
- 26% aged 51–70
- 8% over 71
- 98% of all patients treated were asymptomatic with regards to coronavirus
- 2% were symptomatic (but not confirmed with having coronavirus)
- 81% were not considered to be vulnerable
- 17% were considered to be vulnerable
- 2% were considered to be extremely vulnerable

Of the 884 patients accepted for treatment, 96% attended, 3% did not attend, and 1% cancelled their appointment. Of those who attended our service, 82% had dental extractions and 18% had other treatments carried out, including 8% having only an assessment, 5% having extirpations, 2% with trauma, 2% having restorations (including those related to dental trauma) and 1% with postoperative pain.

#### AGP vs nAGP

Eighty-four per cent of all procedures carried out within the UDCC were nAGPs, whilst 16% were AGPs. Table 1 shows the type of procedure performed in respect of aerosol production and their count value. A total of 61% of cases were treated by OMFS DCTs and SGs, 31% by Orthodontic staff and 6% by GDPs, with the remaining 2% being joint cases shared by different specialties. Fig. 3 shows the level of treating clinician by grade. A total of 6% of patients were sent home with oral antibiotics, whilst 3% had an incision and drainage performed. Ten per cent of these patients were given a “Stat” dose of intravenous antibiotics.

Fig. 4 shows utilisation of services over the ten-week period has significantly improved with time, with the final week of activity showing an average of 62% utilisation of capacity. This is compared to 6% in the first week of operation.

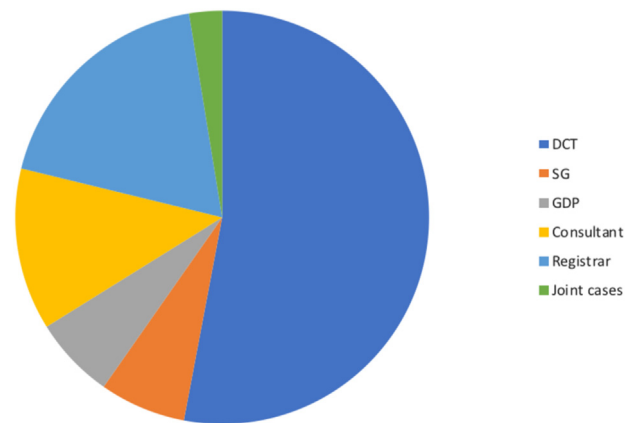


Fig. 3. A chart to show the grade of treating clinician.

## Discussion

### Referral data

The continued increase in referral acceptance rate (Fig. 1) is a reflection of an effective communication channel between the UDCC and our liaison with the LDC. This allows the direct and immediate delivery of pertinent service information to practitioners and facilitates a better understanding of the process indicated by an increase in both the appropriateness and quality of referral received. Referrals were rejected for a number of reasons and have been divided into two sub-sections (Box 2).

This collaborative service between primary and secondary care supports the notion of a continued journey; a path was established from the referring GDP who undertakes regular patient care to the triaging clinician and finally the operating clinical team within the UDCC. This alliance facilitated numerous patient-clinician conversations relating to the delivery of care, minimising the likelihood of incorrect treatment being undertaken, as well as the provision of patient care rapidly within an appropriate setting. The utilisation of a secondary triaging team within a local practice for patients



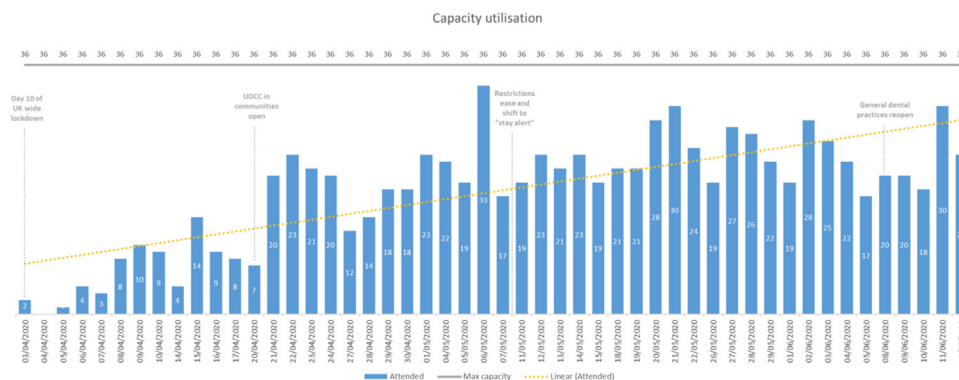


Fig. 4. A chart demonstrating capacity versus utilisation at key COVID-19 time points.

## Box 2: Reasons for rejection of referrals.

### Clinician-led reasons:

- Inadequate referral from practitioner lacking enough detail to process
- Patient not in pain: either through effective AAA or inappropriate referral from GDP
- Patient not on routine analgesia, even if in pain
- Patient not had a course of antimicrobials and is clinically indicated
- Unable to offer paediatric patient treatment without sedation: poor patient compliance
- Any dental condition that does not meet our acceptance criteria: e.g. lost crown, non-suspicious oral lesions

### Patient led reasons:

- Patient declined two appointment slots
- Patient unwilling to accept that dental extraction may be the only suitable treatment option pending a clinical assessment
- Patient unwilling to have treatment without sedation or GA

without a GDP to carry out ‘AAA’ also functioned effectively and served to take pressure away from the UDCC to allow focus on service delivery. This also allowed the UDCC to maintain a rapid response time: patients were contacted the same day or the next working day of referral receipt.

The highest acceptance rate for patients triaged was for those with swelling, where 75% of patients were accepted. This reflects the fact that a swelling is likely to be easier to objectively assess by the GDP, with many using photographs to aid in diagnosis, as well as its ability to cause rapid and significant threat to life if left untreated. Pain is highly subjective and this is reflected by the lower acceptance rate of 65% for those patients referred with pain. A patients’ medical status did not preclude them having treatment with us, with almost half of our patient cohort reporting pre-existing medical con-

ditions. A secondary care setting is well equipped and has active communication channels to liaise with other medical specialties which was extremely useful for a small number of compromised patients.

### Treatment data

Attendance rates were generally high, with an average “failure-to-attend” rate of 3% in ten weeks. This may be reflective of the anxiety response associated with dental procedures for some patients, especially in a climate with no provision for adjunctive sedation facilities.

Eight per cent of patients attended and were examined only with no treatment provided. Reasons for this included the need to be admitted for intravenous antibiotics with onwards referral to our sister OMFS site, the patient deciding that they did not want treatment, or there not being a clear cause for the pain. This only represents a small number of patients however, and reinforces the notion that pain is subjective.

The majority of patients attending for exodontia had nAGP XLAs (89%). Although well over half of all treatment provided in the UDCC was carried out by DCT or specialty doctors in OMFS, the low level for MOS AGPs was due to a high supervision rate of an experienced oral surgical team who could prevent the procedure from becoming an AGP where possible. By providing patients with incision and drainage and a “stat” dose of intravenous antibiotics where necessary, progressive infection requiring inpatient care was prevented.

Patients were assessed and offered the most predictable outcome to resolve their symptoms. Extirpations of teeth were offered to the patients where teeth were considered reliably restorable, as per British Endodontic Society COVID-19 guidelines.<sup>6</sup> Most patients were in pain for a considerable amount of time with no access to primary care facilities and often the added time line for response to ‘AAA’, by which point they opted for extraction. We found that traumatised anterior teeth and those with historical restorations in patients with otherwise low treatment need were deemed more suitable for extirpation.

Fig. 4 demonstrates that utilisation of capacity gradually increased over the period that the UDCC was operational. This continued to follow the trend irrespective of the different sanctions enforced by the Government on peoples' movement. This trend continued even once general dental services resumed face-to-face activity. This was highly publicised on national news platforms and may have created a surge of people contacting their own GPs, resulting in increased referrals to our UDCC. However, limitations on individual practices' ability to provide AGPs in primary care was still restricted and the need for existing UDCCs to maintain operational standards was imperative in continuing the timely delivery of care. Access to our UDCC was maintained throughout the duration of the COVID-19 UK wide lockdown restrictions. Fig. 2, which shows that our service has catered for patients as far reaching as from Oxford to Folkestone. These patients were accepted as their clinical need dictated urgent treatment and patients stated they were unable to access UDCCs in their area.

#### *A model for future care*

The coronavirus pandemic has changed the landscape of dentistry for the foreseeable future and UDCCs such as this one may still need to be operational in some capacity. Although the maximum capacity of this UDCC was based on 12 self-contained surgeries where procedures could be performed, this does not necessarily translate to similar OMFS units around the country, especially those based in teaching hospitals. The basic principles and tenets used to establish this UDCC however, can be translated into other settings. This could be especially important to consider as hospital services re-establish themselves as providers of specialist care and this model can be considered when paving the way for primary care services, either in selected dental surgeries or within Community Dental Service settings.

#### **Conclusion**

Dento-alveolar surgery demonstrates a potential risk of coronavirus transmission due to the nature of its aerosol generation. With the potential of causing life threatening illness requiring emergency hospital admission, the early and appropriate management of acute dental infections is imperative and this relies on the ability to provide safe dento-alveolar surgery in the face of a pandemic. By working in collaboration with our neighbouring LDCs, we established a service which has demonstrated a successful ten-week period of urgent dental care delivery for a large volume of our local patient population. Our results indicate an effective use of resources

for the patient group in need of access to emergency dental services.

#### **Conflict of interest**

We have no conflicts of interest.

#### **Ethics statement/confirmation of patients' permission**

Not applicable.

#### **Funding**

None.

#### **Acknowledgements**

The authors would like to acknowledge Rupert Jefferson for his hard work and dedication of the IT support during the establishment and operation of this UDCC.

#### **References**

1. Scottish Dental Clinical Effectiveness Programme. Emergency Dental Care, Dental Clinical Guidance November 2007. Online information available at: <https://www.sdcep.org.uk/wp-content/uploads/2013/03/EDC+Guidance.pdf> (accessed May 2020).
2. British Association of Oral Surgeons. Covid-19 Updates, online information available at: <https://www.baos.org.uk/covid-19-updates/> (accessed May 2020).
3. GOV.UK. Guidance: Covid-19 Personal Protective Equipment (PPE), online information available at: <https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control/covid-19-personal-protective-equipment-ppe> (accessed May 2020).
4. World Health Organisation. Modes of transmission of virus causing COVID-19: Implications for IPC precaution recommendations, 29th March 2020, online information available at: <https://www.who.int/publications-detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations> (accessed May 2020).
5. NHS England. Issue 3, Preparedness letter for primary dental care – 25 March 2020, online information available at: <https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/03/issue-3-preparedness-letter-for-primary-dental-care-25-march-2020.pdf> (accessed May 2020).
6. British Endodontic Society. Diagnosis and Management of Endodontic Emergencies, a British Endodontic Society Position Paper for Primary Dental Care and other healthcare providers during the COVID-19 pandemic, online information available at: <https://britishendodonticsociety.org.uk/wp-content/uploads/2020/04/BES-Emergency-Protocol-v3-April-23-1.pdf> (accessed May 2020).