

Impact of cancelled General Anaesthetic dental extraction appointments on children due to the COVID-19 pandemic

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Background: COVID-19 has resulted in the cancellation of general anaesthetic procedures including dental extractions (GAX) for children in the UK, exacerbating existing inequalities. There is robust evidence that children from deprived and some ethnic backgrounds are at greater risk of caries and are, therefore, more likely to be affected by cancellations. **Aim:** To identify the impact of, and possible mitigations for, cancelled general anaesthetic procedures on children in the South East of England. **Design:** Data were collected from service providers on the number of children who had their appointments cancelled during the first lockdown. Paediatric dentists and clinical leads contributed views on the likely impact of these cancellations on the affected children. **Results:** 1,456 children had their appointments cancelled in the six weeks between 20th March and 30th June 2020. The key themes identified from providers included lengthening waiting lists, challenges of swab testing and self-isolation and the need to re-orientate dental services to increase prevention. **Conclusion:** COVID-19 has exacerbated existing health inequalities within our communities. Different parts of the NHS must work together to ensure that all children have access to services to treat and improve oral health.

Keywords: Dental Public Health, Oral health inequalities, Prevention, Paediatric extractions

Introduction

The true impact of COVID-19 on population oral health is now emerging (Daly and Black, 2020). In addition to any direct effects, the response to the pandemic resulted in the NHS halting routine care, including dental extractions under general anaesthetic (GAX) and shifting all resources to managing the pandemic. On the 25th March, NHS England and the Chief Dental Officer advised that all non-urgent dental care should be stopped and deferred until advised otherwise. Dental practices were advised to establish a remote urgent care service offering Advice, Analgesia and Antimicrobial means where appropriate and Urgent Dental Care Hubs were established to see patients who could not be managed by these means (NHS England and Office of The Chief Dental Officer). From the 20th March 2020, all GAX sessions were stopped, with some limited access to emergency lists for the most urgent procedures. GAX plays an important role in the management of dental caries in children unable to cope with treatment under local anaesthesia. Dental caries remains the most common reason for a child to be admitted into hospital for a General Anaesthetic (GA) (NHS digital, 2019). In 2018-2019, 42,755 children under the age of 18 were admitted with a primary diagnosis of caries and most of these were for extraction of multiple teeth (NHS Digital, 2019). Dental caries is also the most common chronic disease in the country with dental services costing the NHS on average £30 million a year (Lawson *et al.*, 2017). It has a direct impact on the quality of life of children and is associated with pain, difficulty eating and impaired function (Abanto *et al.*, 2014; Gilchrist *et al.*, 2015; Baghdadi, 2015; Alsumait *et al.*, 2015). As

a result of the impact on quality of life, in otherwise healthy pre-school children, severe dental caries can contribute to failure to thrive with impairment of growth (Sheiham, 2006; Elice and Fields, 1990). Children in pain from dental caries also miss school days and an increased number of missed school sessions can impact on a child's education and further contributes to inequalities in educational achievements, particularly related to Key Stage 2 examinations (aged 10-11 years) (Doughty *et al.*, 2016; Mortimore *et al.*, 2017). There are immediate improvements in the quality of life of both the children and their families following GAX (Anderson *et al.*, 2004; Knapp *et al.*, 2017). Cancellation of GAX lists leaves children in pain and requiring analgesics and antibiotics, sometimes repeatedly (Pine *et al.*, 2006).

There is strong evidence that dental caries is more prevalent in children from deprived backgrounds and ethnic minority groups (Olley *et al.*, 2011; Dugmore and Rock, 2005; Rouxel and Chandola, 2018; Masood *et al.*, 2019; Office for National Statistics, 2013). Caries prevalence and severity increases with increased deprivation (Office for National Statistics, 2013; Sofi-Mahmudi *et al.*, 2020). Small studies have shown that children with unemployed or non-professional parents are at increased risk of referral for GAX (Olley *et al.*, 2011). Single parenthood has also been associated with increased caries rate; although this may relate to lower income (Salomon-Ibarra *et al.*, 2020). A UK-based study in Southampton highlighted the relationship between deprivation and referral for GAX with children from the most deprived quintile most likely to experience a GAX procedure (Mortimore *et al.*, 2017). The literature also indicates that there is a link between ethnicity and

oral health, after taking account of the confounding effects of deprivation (Public Health England, 2015). The published literature indicates that those from Eastern European, Pakistani and Bangladeshi backgrounds are at an increased risk of dental caries when compared with those from White British backgrounds (Rouxel and Chandola, 2018; Masood *et al.*, 2019; Office for National Statistics, 2013; Marcenés *et al.*, 2013). Limited data are available on children from traveller communities, but small studies have indicated a higher dental caries rate (Doughty *et al.*, 2016; Edwards and Warr, 1997). Delays in GAX care, therefore, impact most on these children.

The South East includes some of the most affluent areas in England. However, there are pockets of deprivation (Appleby *et al.*, 2017). This is represented by the South East having the widest level of variation in caries experience between health authorities. The local authorities with highest caries experience in the South East are Slough, East Hampshire and Gravesham; all areas of worse deprivation (Public Health England, 2018).

GAX services began to resume in July 2020 across the South East, however, some services only resumed in October 2020. Additionally, this was with reduced capacity to accommodate COVID-secure procedures and this continued to be the case throughout 2020. Following the recent surge of COVID-19 cases, dental extraction lists were once again affected and stopped in January and February 2021. Dental services were already facing competing pressures from other services for limited hospital theatre space. The pandemic has exacerbated that situation and the NHS is likely to remain under pressure for the foreseeable future.

In order to assist commissioners in the South East to plan future services, we aimed to identify the impact of the cancellation of GAX appointments on children in the South East of England during the COVID-19 pandemic and possible future mitigations. The Health Research Authority online decision tool was used and no further approvals were required (Health Research Authority, 2020).

The objectives were to:

- Collate data on numbers of children in the South East of England who had their GAX appointments cancelled during the first lockdown.
- Consult local providers in the South East of England regarding possible short and long-term actions to mitigate the impact on children.

Material and Methods

The following data sources were used in this mixed-methods study:

- Data related to the number of children (0-18 years old) who were affected by the cancellation of GAX services in the South East on England from Community Dental Services (CDS).
- Interviews with staff members from CDS services in the South East of England carried out in July 2020.

Quantitative data were collected from the following areas through email correspondence with service providers: Surrey, Kent and Medway, Berkshire, Buckinghamshire, Oxfordshire and Hampshire & Isle of Wight (includes

cities of Southampton and Portsmouth). Data were not available from Sussex and from some services in West Surrey and East Kent. The data collected were the number of children planned to be seen on each cancelled GA session between 20th March and 30th June 2020. The anonymised data were collated and analysed by one investigator in a password encrypted Microsoft Excel Version 16.43.

Contact with all CDS providers in the South East was made through email with clinical leads who offered staff for interviews. The interviews were carried out in July 2020 and were semi-structured, focussing on the following questions:

1. What impact has the cancelled GA lists had on children in your service and have any particular groups been more impacted?
2. Can you share case studies to highlight the impact?
3. What changes have/will be made to address waiting lists and prioritising patients?

Interviewees were also invited to share any other comments or issues throughout the interview. The qualitative data from the interviews was collated in Microsoft Word and key themes were identified. Consent was given by interviewees for their titles and views to be shared.

Results

The available data indicate that an estimated 1,456 children were affected by the cancellation of all GAX appointments between 20th March and 30th June 2020 due to the impact of the COVID-19 pandemic (Table 1). GAX lists were not running during this period and only limited access was available for children to be seen on emergency theatre lists, primarily by Oral and Maxillofacial Surgery Departments. The data do not include children referred but yet to be clinically assessed or those who were on a GAX waiting list.

Table 1. Numbers of children affected by cancellations in the South East of England.

<i>Area</i>	<i>Number of children affected by cancellation of GAX sessions (20th March to 30th June)</i>
Berkshire	252
Buckinghamshire	56
Oxfordshire	168
Hampshire and Isle of Wight	490
Kent and Medway	238†
Surrey	252††
Sussex	No quantitative data
Total	1,456

† Does not include East Kent

†† Does not include West Surrey. GA lists in East Surrey include comprehensive care lists and are not limited to GAX

All services who contributed quantitative data were contacted by email for their views based on the questions above. The areas with the highest GA activity were contacted for further contribution by telephone or video interviews. Berkshire offered a telephone interview

with the Clinical lead and Hampshire & Isle of Wight offered two members of staff who lead the GA service for a video interview carried out on Microsoft Teams. Further email responses were received from the service providers in Kent & Medway and Surrey. At the time of the interviews in July 2020, Hampshire and Isle of Wight had recommenced some GA extraction lists in July with limited capacity to maintain COVID-secure procedures. Services in Berkshire had not recommenced.

Staff members who contributed are all directly involved in the delivery of the GAX services including Clinical Leads and GA Governance leads. (Table 2). The following key issues were highlighted during the interviews.

Table 2. Details of staff interviewed

<i>Area</i>	<i>Staff members and role within service</i>	<i>Interview format</i>
Berkshire	Head of Community Dental Service and Specialist in Special Care Dentistry.	Telephone interview
Hampshire & Isle of Wight	Specialist and Clinical Lead in Paediatric Dentistry	Video interview
	Governance lead for General Anaesthetic services	Video interview
Kent and Medway	Clinical lead	Email
Surrey	Consultant in Paediatric Dentistry	Email

Children experiencing lengthening waiting times

Interviewees highlighted their concerns about the large numbers of children who were already on waiting lists for GAX before the pandemic and the continued increase in waiting times due to the continued effect of the pandemic on GA services. Interviewees felt that ongoing re-prioritisation for the re-commencement of services resulted in some children experiencing even longer waiting times as they were deemed to be a lesser priority than other children who need care more urgently. The interviewees highlighted that “these children are, therefore, more likely to have episodes of pain and need repeated antibiotic prescriptions”.

Challenge of self-isolation and COVID swab testing

Following commencement of some GA services, interviewees emphasised that the most vulnerable families had difficulty complying with the requirement to self-isolate for 10 days to 2 weeks before their child’s GAX procedure. Staff highlighted the observations that the families experiencing the greatest difficulties with compliance were from some minority ethnic and more deprived groups. Many of these children’s parents or guardians had jobs that could not be performed from home and non-attendance would result in loss of income or their jobs. This resulted in the working parent sometimes having to live separately from the household for the duration of the self-isolation. Children whose families could not self-isolate, could not be offered an appointment. Figure 1 describes a case study from an interviewee which highlights these issues.

The need for a COVID-19 swab test before admission also proved challenging. Interviewees discussed how their organisations allowed swab-testing of the caregivers as an alternative to ensure these children could be treated.

One suggestion to overcome these barriers was the creation of designated areas for patients whose COVID-19 status could not be established. This was based on the “Unknown COVID status” areas created for admissions where swab-testing is not possible, for example for patients involved in road traffic accidents. This would ensure children unable to self-isolate or swab-test could still be admitted for their GAX procedure.

Increasing the use of cariostatic strategies, particularly Silver Diamine Fluoride

Interviewees recognised the continued impact of limited GAX capacity and the need to identify alternative treatments for children with dental caries. The evidence to support use of Silver Diamine Fluoride (SDF) as a cariostatic measure was raised as a treatment option. Interviewees highlighted that as SDF did not involve any tooth preparation, and therefore not an aerosol-generating procedure, it was particularly useful in the context of enhanced infection control.

Reorientation of paediatric NHS treatment pathways

Interviewees suggested several solutions to reduce the need for GAX services in the future. Further increasing the use of sedation within the specialist Paediatric and Special Care services could help with the treatment of some children. Training and supporting General Dental Practitioners (GDPs) to manage more complex paediatric dental procedures was also suggested. The need to shift to “prevention from an early age” was mentioned repeatedly. Interviewees reported that they already provided preventive advice sessions for families of children referred to their service. These were delivered virtually by dental nurses. Furthermore, since the start of the pandemic CDS providers have been continuously re-assessing the dental needs of patients on waiting lists who are not likely to have access to GA lists for a number of weeks or months. This resulted in a shift towards treatment of the most problematic teeth for some children under local anaesthetic or sedation as well as liaising with the GDP to stabilise the other carious teeth; hoping to avoid the need for a GA due to the limited capacity available.

Discussion

Our work highlights the potential impact of the COVID-19 pandemic on children who have had their GAX appointment cancelled. Although a limited amount of GAX activity resumed in 2020, it was insufficient to manage the increasing numbers of children on waiting lists and with restrictions continuing this is likely to be an issue for the foreseeable future. As a result of cancellations, children are left with untreated caries, increasing the risk of dentofacial infections, as well as the need for analgesia and repeated antibiotics, all of which are undesirable, particularly in a young child (Pine *et al.*, 2006).

Interviews with local dental staff highlighted the added inequalities caused by the self-isolation requirements with children from more deprived and some minority ethnic

A healthy 3-year-old child was referred for urgent dental care after multiple facial swellings and repeated courses of antibiotics. The child had been shielding at home as their younger sibling had a heart condition. The father had to live separately from the rest of the family so that he could continue to attend work. He was the sole breadwinner and could not work from home. Several hospitals had been contacted to try and secure an appointment for the child. The sibling's cardiologist was also consulted regarding the potential impact of a family member attending for a hospital procedure. An assessment-only appointment was eventually scheduled at a London hospital but unfortunately, the child's oral health deteriorated while waiting for the appointment. The child had to be admitted acutely through A&E and subsequently, had multiple dental extractions under GA on an emergency hospital operating list.

Figure 1. Case Study

groups facing the greatest difficulty in complying. These children were less likely to attend their GAX appointment and, therefore, more likely to need emergency care, exacerbating inequalities (Grund *et al.*, 2015; Naidu *et al.*, 2005). Designating an area for children and families who are unable to adhere to the self-isolation requirements was one suggestion to improve equity of access. Since the interviews took place, guidelines have changed, reducing isolation periods to 3 days in some trusts, however, COVID swab testing continues. The evidence for the higher risk and poorer prognosis for those from Black and Minority Ethnic (BAME) groups from COVID-19 has been much-publicised (Public Health England, 2020). It is essential that this does not deter families from these groups from bringing children in for their appointments. Recognition of this issue and proactively discussing it with families may help mitigate this. COVID-19 has not necessarily created health inequalities, but exacerbated inequalities for this group. Upstream interventions need to address these inequalities, starting from change to societal environments including to stable housing, neighbourhoods and work places as well as reducing concerns about lack of diversity in the NHS resulting in lack of trust. Work is underway in local, regional and national environments to address this by rebuilding trust in the NHS, improving diversity within the workforce and reducing fear of accessing health services for BAME (Public Health England, 2020).

Dental care should be accessible for everyone, including those communities known to be at higher risk of dental caries. Future service development could prioritise deprived and ethnic groups at more risk of dental disease. This would be commensurate with "Proportionate Universalism", where interventions are delivered in accordance with the level of need, which is useful in deploying limited resources to effectively support all patients (Marmot, 2010)." Consulting the local population, including patients and service providers, is essential to understanding local needs and experiences. This allows identification of barriers to accessing care and possible facilitators to overcome these (NICE, 2014). Importantly, the NHS also has a legal duty to properly involve patients and the public in commissioning processes and decisions (NHS England, 2017).

Re-establishing the GAX lists to pre-pandemic capacity is unlikely to happen in the near future, thus waiting lists will continue to grow unless alternative treatments are identified. Interviewees highlighted the growing evidence for the efficacy of SDF in the management of

dental caries (Timms *et al.*, 2020). Promoting its use, as part of a strategy to improve management of children with dental caries in primary care, could reduce referrals for GAX sessions in the longer term. SDF has gained popularity across the world recently as a cariostatic and preventive agent. However, it has not been widely adopted in the UK, primarily due to potential parental concern regarding its staining effect on the teeth as well as soft tissue or clothes if touched; which may persist for some time. Additionally, SDF is expensive and a cost-benefit analysis has yet to be performed (Timms *et al.*, 2020). Indeed, the COVID-19 pandemic provides an opportunity to re-evaluate paediatric dental services to help reduce the numbers requiring GAX (Mallineni *et al.*, 2020).

Up to two-thirds of children attending for GAX are likely to need a repeat GAX or have a sibling attend for the same procedure (Goodwin *et al.* 2015). This highlights the need to address causative factors within families, and communities, which perpetuate inequalities. Integrating dental with other general health interventions may provide opportunities for oral and general health improvement messages to be disseminated through all sectors of the health community, including general dental practices, general medical practices and health visitors. Primary Care Networks within Integrated Care Systems and "Devolved" areas may be opportunities for this. A key consideration is for healthy dietary habits to be started at an early age to inculcate good habits for life. Diet is a shared risk factor for dental caries and many other chronic diseases, including diabetes, heart disease and chronic lung disease, all of which are more common in deprived and BAME groups; underlining the need to promote a holistic approach to reducing health inequalities (Public Health England, 2018 and 2020). Evidence-based interventions to reduce sugar intake include a traffic-light labelling system on sugary food and drinks, price increases and promotion of low-sugar alternatives (Public Health England, 2014). There is also evidence that government food benefit programmes with incentives to purchase fruit and vegetables and restriction on sugary drinks reduces the consumption and purchase of sugary drinks (Von Philipsborn *et al.*, 2019). Several upstream interventions are in place to reduce sugar intake and these include the Soft Drinks Industry Levy and Sugar reduction: achieving the 20% with an aim to reduce sugar content in food and drinks (Public Health England, 2020).

There are some limitations to our work. Firstly, the number of children affected by GAX cancellations in the first lockdown is likely to be much higher than the gathered data indicate, therefore, the extent of the impact is likely to be significantly underestimated. We did not record the demographics of the children in the data, however, our knowledge of local referral patterns suggests that the characteristics of the children in our data are likely to match those highlighted in the literature. Finally, our study only covers the South East of England with the experiences of 5 members of staff, a larger scale study may provide greater insight and further suggestions for service development across England.

In conclusion, COVID-19 has been shown to exacerbate existing health inequalities in children within our communities. Our study has highlighted the added inequalities associated with cancelled GAX appointments. As services restart, there are opportunities for different parts of the system to work together to address these inequalities and ensure that all children, regardless of their background, are supported and enabled to achieve and maintain good health, including good oral health.

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