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A Local Dental Network approach to COVID-19 pandemic: innovation through collaboration

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Learning objectives are below:

1. To understand how Donabedians' model can be adapted to evaluate urgent dental care services.
2. To explore how various sources of clinical activity data could be used together with local intelligence in setting up clusters of urgent care services
3. To understand the application of the principles of system leadership in facilitating intersectoral collaboration across different organisations
4. To reflect on opportunities provided by developing systems that encourage collaborative work across the entire spectrum of dental care services.

Abstract

The coronavirus pandemic has had significant effects on individuals, healthcare systems and governments. In the UK, whilst routine dentistry was suspended an urgent dental care system was required to support urgent patient need.

Using an adapted model of Donabedians' Framework a critical evaluation of the services developed and implemented is provided and the various innovative approaches involved in this work are discussed.

The three domains of the Framework are structure, process and outcome.

Structure: we present the principles for selecting and initiating hubs, the integration with secondary care services and the supply of personal protective equipment.

Process: the main elements are communication, the development of referral processes to manage complex cases and data collection.

Outcome: through work with local dental stakeholders 23 clusters and 36 hubs were set up covering a large geographical area.

The integrated network of hubs and clusters has strengthened collaboration between providers and policy makers. Various leadership approaches facilitated the readiness for the transition to recovery. The new local collaborative structures could be used to support local programmes such as flexible commissioning, peer-led learning and integration with Primary Care Networks.

Introduction

The coronavirus pandemic had a significant impact on people's lives across the globe. To date, the United Kingdom (UK) is one of the most affected countries in Europe with over 45,000 deaths (within 28 days of positive test of a positive test) registered by the end of October 2020 (1, 2). The UK government introduced a set of lockdown regulations which came into effect at the end of March 2020. These regulations included the suspension of all routine dental care in England together with a set of restrictive measures which affected both individuals and the society at large (3, 4). The intention behind these restrictions was to reduce the spread of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), to prevent healthcare services from being overwhelmed with patients who require intensive care beds and ultimately to protect lives (5).

Whilst routine dentistry was suspended, emergency dental services still needed to be delivered, and NHS England set-up guidance for delivering these services (6). The first line of action consisted of providing remote "AAA" - Advice, Analgesics and Antibiotics – as clinically required. If the problem was not solved with AAA or if AAA was inappropriate and the patient required a face to face appointment with a dentist, a safe approach was

necessary to address patients' needs. It soon became apparent that a "one size fits all approach" was not possible considering the demographic diversity and the heterogeneity of dental service provision across England. For example, within the NHS England region of London, dental commissioning teams developed a centralised system using large secondary care providers which were better suited for an area with high population density. This model would have been difficult to implement in areas like North Yorkshire and the Humber (NY&H) where the population density is significantly lower with several rural communities spread across large geographical areas (INSERT FIGURE 1). The NY&H commissioning area serves a population of around 1.4 million people and includes large and very different cities such as Hull and York and less densely populated rural areas like the national parks and coastal areas of the region. The area has pockets of serious deprivation with associated inequalities and high burden of dental disease. The latest epidemiological data on caries prevalence in 5 year old children shows variations from 31.4% in Hull to 11.3% in Ryedale (7). Similar inequalities can be seen in the prevalence of caries in adults with 37.5% of adults in East Riding of Yorkshire presenting active decay compared with only 7.9% in York (8). The aim of this study is to describe the establishment of an integrated urgent dental care network based on a hubs and clusters model in North Yorkshire and the Humber.

Methods

Using an adapted model of Donabedian's conceptual model for evaluating health services we describe the methodology for developing a network of integrated urgent dental care hubs and clusters in North Yorkshire and the Humber (9). A nested critical evaluation of this process is presented, highlighting the potential of using the established networks for facilitating transition to recovery. Quantitative data is provided about the type and amount of urgent dental care activity delivered in primary care between May and July 2020 in The North Yorkshire and the Humber commissioning area.

Results

The main considerations behind setting up a network of urgent dental care hubs and clusters in North Yorkshire and the Humber were based on the principles of protecting both patients and members of the dental team. In order to achieve this, a close cooperation between various organisations was necessary: NHS England local area team, the Local Dental Network, Public Health England, Local Dental Committees and Health Education England. The collaboration between these diverse stakeholders was based on the principles of system leadership where organisations that work independently are able to successfully cooperate under a shared vision and help each other to deliver their own objectives for the benefit of the population they serve (10). In addition to this all members of the team,

regardless of their experience were encouraged to contribute to the decision-making process and development of solutions. This collective leadership approach has been shown to improve motivation and engagement and assist with achieving shared goals. This led to rapid decision making, planning and implementation (11).

Based on Donabedian's conceptual model, the results section is structured in line with the three main dimensions of care: structure, process and outcome.

Structure

The general principles for developing a network of urgent dental care hubs and clusters were based around establishing an integrated system that ensured a widespread geographical coverage and prioritised care to ensure that those patients who absolutely required face to face care were able to receive it in a safe and timely manner.

The UDC system needed to be:

- Aligned to the principles of the delay phase set up by the UK Government, in order to minimise unnecessary travel and exposure/transmission risk (5);
- Able to triage COVID-19 positive or suspicious cases;
- Able to triage and manage vulnerable and shielded groups;
- Accessible to all patients including irregular attenders and private patients;
- Able to prioritise urgent dental care (UDC) to manage capacity;
- Integrated in terms of urgent dental care hub (UDCH) delivery and UDC provided by secondary care and the community dental service (CDS);
- Able to use simple, responsive and standardised systems;
- Compliant with the national standard operating procedure and guidance;
- Using open channels of communication to enable reporting and highlighting pressure points in a rapidly changing environment;
- Available to support structures for practices.

A small working group was formed with stakeholders covering the North Yorkshire and Humber area. These were the Chair Local Dental Network (LDN), officers of the Local Dental Committee (LDC), NHSE dental practice advisor, Public Health England (PHE) dental public health consultant and registrar with input from the NHSE commissioning team. The group served as a strategic and operational team to support the practices and to report into the wider Yorkshire and the Humber COVID-19 Operational Dental Cell which had overall oversight of the operation. The command and control functions of the Yorkshire and the Humber Operational Dental Cell ensured the consistency of the work across the commissioning area and an integrated approach within the wider structures of NHS England and NHS Improvement.

Clusters and Hubs

The hub and cluster selection utilised the PHE Shape Mapping Tool to identify practice location (12) and local intelligence in terms of physical practice set-up and number of surgeries available, including accessibility.

The hubs ideally needed to be larger practices located within each cluster with multiple surgeries, separate entrances and exits, central locations and where possible parking facilities. The members of the working group identified potential sites to serve as hubs and practices around them to form a cluster.

In line with national guidance (13), a network of red, amber and blue sites was set-up in each cluster:

- Red sites were for patients who were possible or confirmed COVID-19 patients, including patients with symptoms, or those living in their household;
- Amber sites were for patients who were shielded, those who were at most significant risk from COVID-19;
- Blue sites were for patients who did not fit in one of the above categories;
- Combined amber/blue sites allocated strategically based on a variety of different factors including dental practice size and layout. Appointments were allocated in such way that patients remained separated from each other in terms of scheduling and surgery/waiting room allocation.

The clusters were set up consisting of 4 to 12 sites in each cluster depending on density of population and geography. Each cluster had one or two designated receiving treatment hubs for face to face care. This networked system lent itself to the management of urgent dental care (UDC) through a two-stage triage system with triage 1 being conducted by the cluster sites and triage 2 being delivered at the hubs. This double triage system ensured that in most cases only those patients requiring face to face care received urgent treatment. Additionally, the system had the advantage of sharing workforce, personal protective equipment (PPE) and information through the cluster groups with associated wider understanding of the protocols.

Community Dental Services (CDS) and Secondary Care

To ensure that the system could support effective management of patients requiring UDC in an integrated way, dental commissioners and the LDN chair worked with CDS providers and secondary care providers to develop effective referral process into these services. A detailed directory of services was supplied to all hubs with the email address and phone numbers for advice and, where necessary, onward referral of more complex cases. The new system allowed the hubs to access specialist advice and care quickly. Urgent minor oral surgery was added as an additional service based on hub feedback.

Personal Protective Equipment (PPE)

Initially, the availability of PPE represented a significant challenge for urgent dental care providers.

A modelling tool developed by PHE was utilised to estimate the weekly demand for FFP3 respirators for urgent dental care sites providing aerosol generating procedures (AGPs). The model used NHS data for band 1 urgent courses of treatment (all ages) derived from FP17 data in 2018/19 (14). Assumptions were applied to the data to arrive at an estimate of demand for PPE. Variables in the model for triage and the pandemic converted to 15% of urgent cases likely to require an appointment. As AGPs were to be avoided unless necessary and not all urgent appointments would require one, this number was further adjusted to 25%. The figure was then doubled to allow for the number of staff requiring level 3 PPE (dentist plus one nurse).

This modelling was then confirmed as reasonably valid based on the overall activity data: 24% of patients calling at triage one required face to face care. Of these patients only 14% required AGP.

The commissioning team developed and strengthened relationships with the local resilience forums to overcome initial problems with dental access to PPE and to enable supply and weekly re-supply of PPE to urgent dental care hubs. A standard re-supply order was calculated with drops to 8 strategic centres from which the PPE was distributed to all hubs. Resilience plans were developed with the aim of ensuring two weeks supply of PPE for each hub in case that they would resume as central providers of care in the event of a local lockdown.

PHE initially organised fit test training of a small group of volunteer dentists to enable fit testing of FFP3 respirators for practices providing aerosol generating procedures. The fit testing team has provided testing and re-testing for staff in multiple practices over a wide geographical area. Initially, this work was further challenged by inconsistent supply of respirator models requiring re-fit testing. Later on, fit testing kits were made available nationally via the NHS supply chain and have been distributed strategically to support this function. In addition, HEE have organised a series of fit test training courses for dental practices, to increase the number of trained individuals to support the return to providing AGP care safely.

Process

A single standardised referral proforma was developed to be used throughout the urgent dental care system for all referrals into hubs and any onward referrals to more specialist services. Hubs were allocated an NHS email address to facilitate secure information and

referral details exchange between providers. Private practices were also able to obtain an NHS email address to aid communication and referrals into the system facilitating the delivery of urgent dental care across NHS and non-NHS sectors.

A standardised discharge proforma was also used, to allow hubs to outline the follow-up care required. This was emailed back to the referring cluster practice with handover information.

Communication

Developing new systems requires excellent communication if systems are to be effective in meeting their objectives (15). Communication was via a series of methods. More formal communication was undertaken through the hubs bespoke NHS.net email platform. Providers were aware that any communication to these addresses would be related to urgent dental care (UDC). In addition, an encrypted messaging service using WhatsApp® groups was used for rapid communication between hubs and clusters for discussing any issues around new guidance and to answer questions immediately. During this period, it was not unusual to have several guidance documents published weekly. Dental practices could use this as an important resource and for rapid peer advice.

The effective communication in the system enabled dynamic problem solving and rapid adaptation of the UDC response. At times there were also challenges as misunderstanding could also be disseminated and so oversight by the LDN chair and HEE leadership fellow was needed to moderate information and signpost to resources. The LDN chair hosted weekly Zoom® meetings for UDC hub teams to address potential problems with collective solutions and to share latest resources.

Data Collection

The purpose for data collection was to gather information about service demand, availability, provision, challenges and quickly identify potential hot spots and trends. It was important to collect only the data that was essential to avoid unnecessary work for providers. The decision was made to only collect data on:

1. Numbers of referrals
2. Numbers of face to face appointments both for aerosol generating procedures (AGP) and non-AGP
3. RAG (Red-Amber-Green) rating of the service limiting factors, including PPE, workforce and capacity of appointments to enable flagging of pressure points in the system.

A data collection tool was piloted and distributed to all hubs. The final version was used to collect weekly activity data via secure NHS.net email over a period of 11 weeks. The

administration was undertaken by two foundation dentists who completed an audit report. The overall return rate was over 90%.

Support Structures

Changes in practice require support in order to deliver effective outcomes (15, 16). It was important to ensure that the communication was bidirectional between the strategic oversight group and providers.

Based on feedback from hubs and clusters the working group established a single point of access as a website for all the relevant guidance, information and support around the development of local standard operating procedures (SOPs) hosted by Health Education England (HEE) Yorkshire and the Humber (17). Besides the documents, a peer led video presenting a step by step approach on how to set up an urgent dental care hub was presented. This video was widely shared and was referenced in the National Urgent Dental Care SOP (18). As of 27th of July it was viewed by 19,500 people.

The resources were regularly updated. As national guidance was published, the new sections were added and updated with changes highlighted.

Webinars are an effective way of communicating with large numbers of people (19). To support the educational element for the pandemic response, HEE locally along with LDN representation and local practitioners worked closely with a private company (Pro DentalCPD) to rapidly develop an online education module (20). The module provided up to date guidance about: surgery set-up, patient and staff flow, infection control and decontamination. This was launched with a webinar attended by over 1,300 participants. The webinar was recorded and later viewed by over 3,000 people (21). Initially, the production expenses of the module were funded by local LDCs but following crowd funding through LDCs this course is now free to access (20). To date over 55,000 people have completed the online education module (22).

Feedback from providers highlighted that peer led learning has been an essential part of the UDC response. To support the development of local standard operating procedures (SOPs), practices were invited to share details about their individual procedures and patient pathways using short videos. Effective communication between members of the clusters enabled a new collaborative approach to dental care by allowing the dental practices within a locality to connect in a constructive way, share best practice and support each other. Peer led learning has been recognised as an effective quality improvement tool (23, 24). It also enabled practical support for cluster practices as they transitioned to recovery of provision of clinical services (18).

Outcome

The North Yorkshire and the Humber urgent dental care network was designed around 23 clusters and 36 hubs (INSERT FIGURE 1).

In the 11 weeks between 4th of May and 19th of July 2020, the clusters triaged 5,474 patients and the hubs provided face to face care for 7,257 patients, of which 1,027 (14%) required aerosol generating procedures (INSERT FIGURE 2).

The potential reason for the larger number of face to face appointments compared with the number of triaged patients could be due to the fact that practices recorded non-AGP and AGP activity related to non-urgent care delivery post 8th of June 8, when dental practices were permitted to gradually reopen.

In the same time frame, there were 31,412 telephone triage appointments delivered in North Yorkshire commissioning area (INSERT FIGURE 3).

The data suggests that urgent dental care referrals peaked in week 3, followed by a drop in the numbers of patients and then followed by a steady increase up to week 9. Week 6 corresponds to the beginning of reopening of dental practices.

With regards to transition to recovery by the 21st of July, 96% of all practices from the region were opened for face to face appointments and 67% had capacity to deliver aerosol generating procedures.

Discussion

The North Yorkshire urgent dental care system based on a cluster/hub model was set-up to meet the needs of the local population during the COVID-19 pandemic. The guiding principle was to provide a safe system both for patients and staff that meets clinical needs in line with national guidance. It has fostered collaboration between various organisations and encouraged the co-design of new, creative ways of working. Before the pandemic, communication between practices in a geographical area was often limited and they generally considered themselves as individual treatment providers and not a collective local treatment system.

The pandemic highlighted that national guidance is required around managing scenarios where provision of dental care is restricted. As a consequence, the urgent dental care commissioning standard is currently being revised as a response.

The Flexible Commissioning approach developed in 2019 to an extent began a process of increased communication between the LDN and practices. In addition the NY&H LDN has worked on innovative collaborative commissioning programmes such as the In Practice Prevention Programme (25). This pre-existing relationship building may have facilitated the rapid set up of the UDC systems. Anecdotal evidence suggests that, the networked UDC

model appears to have led to a faster transition to recovery compared to other models nationally.

Local LDC leadership was a strong factor in urgent dental care rollout with many key members actively becoming involved as innovators and early adopters championing the model of care amongst peers (26).

Going forward, it has been recognised by both commissioners and providers that it will take some time before returning to the levels of activity seen before COVID-19 lockdown in England in March 2020. The additional requirements around fallow time between patients and the use of additional pieces of protective equipment means that there is going to be a drop in the number of patients that could be seen per day. In order to adapt to these new realities, commissioners and policy makers will have to ensure new, creative ways of measuring and remunerating dental activity (27).

Certain areas, including Yorkshire and the Humber have attempted to support a flexible commissioning approach by “flexing” a certain percentage of the contract value away from units of dental activity (UDA’s) towards other activities that are more prevention focused. Collaboration between dental commissioning teams and local authorities helped to identify local priority groups which could benefit from targeted prevention and treatment using flexible commissioning (28).

Additionally, an integrated approach between dental care providers, general practitioners, pharmacy teams and local authority public health teams could provide opportunities for more integrated ways of working to meet local healthcare needs.

Further examples of opportunities of a cluster/hub model might suggest:

- The development of targeted pathways for vulnerable groups, delivered by specific practices in the cluster for example for homeless people or people requiring domiciliary care;
- Enabling shared learning and peer review between dental practices;
- Utilising shared learning from existing medical and dental Primary Care Networks (PCNs) to enable greater collaborative working;
- Maximising on the broader public health skillset of the dental profession. This would be in line with the high level ambitions for further intergration of medical and dental systems as suggested by the Chief Dental Officer for England (29). Examples could include:
    - Contribution to screening and immunisation programmes. To reduce the numbers of interactions between patients and healthcare workers by providing opportunities for dentists to deliver other healthcare services such

as blood pressure checks or routine vaccinations (subject to training, commissioning and regulatory approvals) (30, 31).

- Support and signposting into public health services commissioned by local authorities such as advice for healthy weight programmes and signposting to smoking cessation services (32).

Conclusion

In a rapidly changing environment stakeholders in North Yorkshire and the Humber have been working collaboratively to create a network of hubs and clusters in challenging circumstances within a short period of time. Working closely with service providers, LDCs Commissioning Teams, LDNs , PHE and HEE have developed and supported a network of practices delivering urgent dental care services that were able to adapt quickly in a dynamic environment with significant fluctuations in demand. This was possible through applying a variety of leadership strategies and providing opportunities for communication and support between stakeholders. Practices within the cluster groups formed functional triage and face to face referral networks. The collaborative networks forged for urgent dental care arrangements might present opportunities for building a community of care model in the transition to recovery of dental services.

Acknowledgements

It must be recognised that at the point in time when the hubs and clusters were delivering their peak levels of activity, abatement was not yet confirmed and there was no financial incentive. Cooperation was based on good will and good relationships between stakeholders.

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References

1. UK Government. Coronavirus (COVID-19) in the UK 2020 [Available from: https://coronavirus.data.gov.uk/. Accessed October 2020
2. European Centre for Disease Prevention and Control. COVID-19 situation update for the EU/EEA and the UK, as of 28 October 2020 [Available from: https://www.ecdc.europa.eu/en/cases-2019-ncov-eueea. Accessed October 2020
3. Griffith R. Using public health law to contain the spread of COVID-19. British Journal of Nursing. 2020;29(5):326-7.

4. UK Government. UK Statutory Instruments 2020 No. 350, The Health Protection (Coronavirus, Restrictions) (England) Regulations 2020 2020 [Available from: https://www.legislation.gov.uk/uksi/2020/350/made. Accessed July 2020
5. Department of Health and Social Care. [Withdrawn] Coronavirus: stay at home, protect the NHS, save lives - web version 2020 [Available from: https://www.gov.uk/government/publications/coronavirus-covid-19-information-leaflet/coronavirus-stay-at-home-protect-the-nhs-save-lives-web-version. Accessed July 2020
6. NHS England and NHS Improvement. Office of the Chief Dental Officer (OCDO). Letters, updates and additional guidance for dental teams 2020 [Available from: https://www.england.nhs.uk/coronavirus/publication/preparedness-letters-for-dental-care/. Accessed July 2020
7. Public Health England. National Dental Epidemiology Programme for England: oral health survey of 5-year-olds 2019 2020 [Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/873492/NDEP_for_England_OH_Survey_5yr_2019_v1.0.pdf. Accessed July 2020
8. Public Health England. National Dental Epidemiology Programme for England, Oral health survey of adults attending general dental practices 2020 [Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/891208/AiP_survey_for_England_2018.pdf. Accessed August 2020
9. Donabedian A. The quality of care. How can it be assessed? JAMA. 1988;260(12):1743-8.
10. Edmonstone J. Systems Leadership in Health and Social Care: Routledge; 2019.
11. West MA, Lyubovnikova J, Eckert R, Denis J-L. Collective leadership for cultures of high quality health care. Journal of Organizational Effectiveness: People and Performance. 2014.
12. Public Health England. Strategic Health Asset Planning and Evaluation (SHAPE) [Available from: https://shapeatlas.net/. Accessed July 2020
13. NHS England – Yorkshire and the Humber. Local Delivery Model – Covid-19 Urgent Dental Care (UDC) System Version 2 – Friday 24 April 2020 2020 [Available from: https://www.yorksandhumberdeanery.nhs.uk/sites/default/files/yh_local_delivery_model_v2_-_240420.pdf. Accessed July 2020
14. NHS Digital. NHS Dental Statistics for England 2018-19, Annual Report [PAS] 2019 [Available from: https://digital.nhs.uk/data-and-information/publications/statistical/nhs-dental-statistics/2018-19-annual-report-pas. Accessed August 2020
15. Moulding NT, Silagy C, Weller D. A framework for effective management of change in clinical practice: dissemination and implementation of clinical practice guidelines. BMJ Quality & Safety. 1999;8(3):177-83.
16. McGlone P, Watt R, Sheiham A. Evidence-based dentistry: an overview of the challenges in changing professional practice. British dental journal. 2001;190(12):636-9.
17. Humber HEYat. COVID-19 Dental Education Resources 2020 [Available from: https://www.yorksandhumberdeanery.nhs.uk/dentistry/covid-19-dental-education-resources. Accessed July 2020
18. Office of the Chief Dental Officer (OCDO) England. Standard operating procedure: Transition to recovery 2020 [Available from: https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/06/C0575-dental-transition-to-recovery-SOP-4June.pdf. Accessed July 2020
19. Harrison JP, Administration AoUPiH. Essentials of strategic planning in healthcare: Health Administration Press Chicago, IL; 2016.
20. ProDental CPD. COVID-19 and UDC 2020 [Available from: https://www.prodentalcpd.com/webinars/1210/covid-19-and-udc. Accessed July 2020
21. ProDental CPD. Yorkshire and Humber COVID-19 UDC Overview 23/04/20 2020 [Available from: https://youtu.be/cXkfv1uz_xk. Accessed July 2020

22. ProDental CPD. Covid-19 and Urgent Dental Care 2020 [Available from: https://www.prodentalcpd.com/module1205/covid-19-and-urgent-dental-care. Accessed July 2020
23. Kaplan HC, Provost LP, Froehle CM, Margolis PA. The Model for Understanding Success in Quality (MUSIQ): building a theory of context in healthcare quality improvement. BMJ quality & safety. 2012;21(1):13-20.
24. Esain AE, Williams SJ, Gakhal S, Caley L, Cooke MW. Healthcare quality improvement–policy implications and practicalities. International Journal of Health Care Quality Assurance. 2012.
25. North Yorkshire & Humber Local Dental Network. The In Practice Prevention Programme [Available from: http://inpracticeprevention.org.uk/ipp/. Accessed July 2020
26. Rogers EM. Diffusion of innovations: Simon and Schuster; 2010.
27. Hurley S. Why re-invent the wheel if you've run out of road? Br Dent J. 2020;228(10):755-6.
28. Mustufvi Z, Douglas G, Serban S, Barraclough O, Hearnshaw S, Whiston S, et al. Flexible Commissioning: A prevention and access focused approach in Yorkshire and the Humber. BDJ In Practice. 2020;33(2):20-2.
29. Hurley S. Enhanced role for oral health in imminent NHS long-term plan. BDJ. 2018;225:689-.
30. Yonel Z, Sharma P, Yahyouche A, Jalal Z, Dietrich T, Chapple IL. Patients' attendance patterns to different healthcare settings and perceptions of stakeholders regarding screening for chronic, non-communicable diseases in high street dental practices and community pharmacy: a cross-sectional study. BMJ Open. 2018;8(11):e024503.
31. Serban S, Eapen-Simon S, Grant S. Dental team immunisation. Br Dent J. 2020;229(4):209.
32. Watt RG, Serban S. Multimorbidity: a challenge and opportunity for the dental profession. Br Dent J. 2020;229(5):282-6.