



# SLDA News

SRI LANKA DENTAL ASSOCIATION

275/75, Prof. Stanley Wijesundara Mw., Colombo 7, Sri Lanka.

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SLDA/2021/2022/11/05 | Monthly News Bulletin | Nov/Dec 2021- For circulation among SLDA members

## CEREMONIAL INDUCTION OF THE NEW PRESIDENT



The Ceremonial Induction of Prof. Manil Fonseka as the 89<sup>th</sup> year President of the Sri Lanka Dental Association for the year 2021 / 2022 was held on 22<sup>nd</sup> December 2021 at Malima Club House, Uswetakeiyawa.

Prof. Manjula Attygala, Dean - Faculty of Dental Sciences, University of Peradeniya graced the ceremony as the Chief Guest and Prof. Lakshman Wijeyeweera, former Deputy Vice Chancellor - University of Peradeniya, was the Guest of Honor for the occasion.

Immediate Past President Dr A Sundar inducted Prof. Manil Fonseka and garlanded with the Presidents medal as the 89<sup>th</sup> year President of SLDA.

Badges and tokens of appreciation were awarded to Past Presidents, Past Secretaries and Past Treasurers of SLDA served after 2009 for their dedicated service at this occasion, as the ceremony was not held during the 42<sup>nd</sup> APDC, as scheduled.

## SLDA MARKS 89 YEARS AMIDST PANDEMIC CHALLENGES (SUNDAY TIMES ARTICLE ON 05/12/2021)

It is amidst many challenges particularly in the unprecedeted times of a pandemic that the Sri Lanka Dental Association (SLDA) celebrates its 89<sup>th</sup> birthday December 6.

Before dealing with how the SLDA armed its members against the new coronavirus to best serve their patients, its President Prof. Manil Fonseka says it plays a three-prong role.



Founder-Members of the CDA: Dr. E. Abeyesundara, Dr. V. Sinnetamby, Dr. C.A.R. Goonewardene, Dr. A.E. Daviot, Dr. M. Brito-Mutunayagam, Dr. W. Balendra, Dr. J.S.R. Goonewardene, Dr. A.A. Gomes, Dr. S.W. Garne, Dr. H.E. Swan, Dr. H.S. Christofflesz and Dr. S.L. Cramer.

With a membership of around 1,900, the SLDA's role includes educating the people on the prevention of oral diseases; professional development of its members; and being the 'link' not only among the other major stakeholders such as the Health Ministry, especially in the formulation of policy but also international organizations. It is a member of the World Dental Federation, headquartered in Switzerland, with over 200 members from more than 130 countries.

Sri Lanka has around 3,500 dental surgeons, a majority in the state hospitals; 300-400 working exclusively in the private sector; 70-80 in the university system; and 50-60 in the security forces.

Further Reading: <https://tinyurl.com/SLDA-News-Downloads>



### **SLDA - CDA CONTINUING EDUCATION PROGRAMM “Veneers”**

Sri Lanka Dental Association & Commonwealth Dental Association organized end of the month virtual clinical meeting on Sunday, 28<sup>th</sup> of November 2021 on “Veneers”

The speaker was Dr Ali Nankali PhD (Prosth.), Clinical Senior Lecturer in Teaching and Innovation at Centre for Adult Oral Health, Barts and the London School of Medicine & dentistry, Queen Mary University of London.



### **‘Time it or Blame it - The unruly canine’**

Another Virtual Clinical Meeting was held on, 12<sup>th</sup> of November, 2021 on ‘Time it or Blame it - The unruly canine’ by Dr (Mrs) Sheevani Wijeratne, Consultant Orthodontist, Kings Hospital, Colombo 05.

View presentation: <https://tinyurl.com/SLDA-News-Downloads>

## PROF. LAKSHMAN SAMARANAYAKE APPOINTED AS THE NEW EDITOR IN CHIEF INTERNATIONAL DENTAL JOURNAL



We are happy to inform that Prof. Lakshman Samaranayake has been appointed as the Editor in Chief of the *International Dental Journal* from 1 January 2022. Prof Samaranayake is a renowned scholar with expertise in clinical microbiology, research and academic publishing, dental pedagogy, and executive level administration. Graduating with a BDS from Sri Lanka he specialized in clinical microbiology and served as a Consultant Microbiologist in UK after which he joined the academia.

He is the first Asian to be selected to this post of Editor in Chief of the 70-year-old highly regarded and widely read 'International Dental Journal'.

Since then, working in universities in UK, Canada, Hong Kong, Australia and UAE, he has authored over 450 articles, cited over 28,500 occasions (h-index 93). He is the Founding EIC of the *Journal of Investigative and Clinical Dentistry*. He has also served as the Executive Dean of dental schools in Hong Kong and Australia at the Universities of Hong Kong and Queensland, respectively. He was also a FDI Councillor, and the Chair of its Science Committee.

A highly sought-after speaker, Professor Samaranayake has addressed professional bodies in over 40 countries, and received numerous accolades for his outstanding contributions to dentistry, including the King James IV Professorship of the Royal College of Surgeons (Edinburgh), and the Distinguished Scientist Award of IADR. He holds many visiting/adjunct professoriate appointments in the universities of Australia, Thailand, Indonesia, UAE, and China.

### CALL FOR ABSTRACTS - ASIA PACIFIC DENTAL CONGRESS - PAKISTAN

Pakistan Dental Association (PDA), organizers of APDC 2022 are calling for Abstracts with profiles and Photographs from interested members of SLDA, for the virtual congress to be held in Pakistan in May 18 - 22, 2022. SLDA members who wish to submit abstracts are kindly requested to communicate with SLDA office through email - contact@slda.lk as early as possible.

**SRI LANKA DENTAL ASSOCIATION**  
**SOUTHERN BRANCH REGIONAL SCIENTIFIC SESSIONS 2022**  
28<sup>th</sup> & 29<sup>th</sup> January, 2022@ Hotel Amari, Gintota, Galle

**“Herald the new normal in Dentistry”**

28<sup>th</sup> (Friday) January 2022

8.30am to 2.00pm      **Conference Workshop**

## **“An Introduction to Implant Treatment”**

By: Dr Sirimewan Samarakoon,

Consultant in Restorative Dentistry, TH - Ratnapura

(Will be held at GMA Auditorium, TH Karapitiya, Limited to 30 participants)

**6.00pm to 11.00 pm      Inauguration Ceremony**

## Inauguration Ceremony

**Guest Speeches**      **Chief Guest -**      **Dr Ramesh Pathirana**  
**Hon. Minister of Plantation**

Guest of Honor - Emeritus Professor Ganananda Nanayakkara  
Past President - SLDA

**Keynote Address**      Keynote address on “Future with COVID”  
                                  by Dr Ananda Wijewickrama  
                                  Consultant Physician  
                                  Infectious Diseases Hospital  
                                  Colombo.

## Inauguration Dinner

29<sup>th</sup> (Saturday) January 2022

8.00am - 4.00pm	<b>Scientific Sessions</b>
	<b>Full Day Trade Exhibition</b>
	<b>Free Paper Presentation</b>
	<b>E-Poster Presentation</b>

Click <https://tinyurl.com/Southern-Scientific-Sessions> to Download Registration Form/Call for Abstracts/SLDA Membership Application Form and more Details.

Accommodation available at Hotel Amari, Ginthota, Galle. <https://www.amari.com>

**SRI LANKA DENTAL ASSOCIATION**  
**SOUTHERN BRANCH REGIONAL SCIENTIFIC SESSIONS 2022**  
 28th & 29th January, 2022@ Hotel Amari, Gintota, Galle  
**Scientific Programme**

28/01/2022 08.30am – 01.30pm	<b>Conference Workshop</b> <b>“An Introduction to Implant Treatment”</b> @ GMA Auditorium, Karapitiya,Galle	Dr Sirimewan Samarakoon Consultant in Restorative Dentistry TH- Ratnapura.
29/01/2022 08.00 – 08.30	Registration	
08.30 – 10.00	<b>Symposium on ‘Dental Management of the Elderly’</b> Moderator Dr Lasantha Liyanapathirana (Consultant OMF Surgeon, DGH Hambantota)	Prof. Dileep de Silva Professor of Community Dentistry, Faculty of Dental Sciences, University of Peradeniya
		Dr (Mrs) Nilmini Abegunawardhana Consultant in Restorative Dentistry, TH- Karapitiya
		Dr Kamila Wijayalathge Consultant OMF Surgeon BH Kuliyapitiya
		Dr (Mrs) W K L Perera Consultant in Orthodontics BHT Theldeniya
10.00 – 10.40	<b>Effective Radiologic Interpretation</b>	Prof. Ruwan D Jayasinghe Professor of Oral Medicine & Radiology, Faculty of Dental Sciences, University of Peradeniya
10.40 - 11.00	Morning Tea	
11.00 - 11.40	<b>Outline of endodontic treatment within the new normal</b>	Dr. Pubudu C Perera Consultant in Restorative Dentistry Military Hospital, Colombo
11.40 - 01.00	<b>Free Papers</b>	
PM		
01.00 - 01.40	Lunch	
	<b>E-Poster Presentation</b>	
01.40 - 02.20	<b>Ergonomics and its impact on Musculoskeletal Disorder among Dental Surgeons during Covid-19 pandemic</b>	Dr Himan De Silva Olympic Sports Physician
02.20 - 03.00	<b>COVID 19 and the Dental Professional: The art of co-existing</b>	Dr Prasantha Atapattu Consultant OMF Surgeon BHEmbilipitiya
03.00 - 03.10	Evening Tea	
03.10 - 03.50	<b>Role of Maxillofacial pathology in Clinical Dentistry</b>	Dr (Mrs) Rasika Ekanayake Consultant Oral Pathologist TH- Karapitiya
8.00am – 4.00pm	<b>Trade Exhibition</b>	

Click <https://tinyurl.com/Southern-Scientific-Sessions> to Download Registration Form/Call for Abstracts/SLDA Membership Application Form and more information.

Accommodation is available at Hotel Amari, Ginthota, Galle. <https://www.amari.com>

## SRI LANKA DENTAL ASSOCIATION - SOUTHERN BRANCH REGIONAL SCIENTIFIC SESSIONS 2022

28<sup>th</sup> & 29<sup>th</sup> January 2022

Hotel Amari, Colombo Road, Ginthota, Galle

*"Herald the new normal in dentistry"*

### CALL FOR ABSTRACTS

Members who are interested in presenting Scientific Papers for SLDA Southern Branch Regional Scientific Sessions are invited to forward their abstracts (approximately 250 words) of their proposed presentations. The abstract should be completed strictly in conformity with the instructions given below

#### Instructions to Presenters / Authors

- 1 Abstracts should be type setted on a “A 4” size paper according to the following criteria.

Font Type	-	Times New Roman
Font size	-	12
Line Spacing	-	Single
Paper size	-	A 4
Margins	-	at least 2.5 cm (all sides)

1. Title of the paper / presentation should be in BLOCK CAPITAL and BOLD PRINT.
2. Names of Authors should be in Bold Print with the presenting author's name first and underlined.
3. Authors' affiliations must be type in Times New Roman italic print

Example: **PATTERN OF RECURRENCE IN ORAL CANCER IN SRI LANKA**

**B.C Fernando\*, C.D. Perera \*\*\*& E F Peiris \*\*\***

*\*Faculty of Dental Sciences, University of Peradeniya, \*\* Faculty of Medicine, University of Ruhuna, \*\*\* Faculty of Medicine University of Colombo*

4. Abstract should include objectives, materials and methods, results and discussion and should not include references and acknowledgments.
5. Abstract should be submitted along with the completed ‘**ABSTRACT SUBMISSION FORM**’ to the SLDA office by email (as an attached MS Word file) to [contact@slda.lk](mailto:contact@slda.lk) on or before 24<sup>th</sup> January, 2022. Subject of the email should be “**Submission of Abstracts – SLDA Southern Regional Scientific sessions**”
6. A certificate of acknowledgement will be issued **only for those authors who are registered** for the scientific sessions.
7. Any abstract which fails to fulfill the stipulated requirements will be rejected.
8. If you intend using multimedia for your presentation you may be requested to bring your own computer (Laptop/Notebook) or may be asked to install your presentation to the SLDA’s computer one week before the Annual Scientific Sessions. This is to ensure that scientific programme will run punctually on schedule.

#### E-Poster presentation

Poster presentations are visual display of research projects and special cases. The e-poster presentation is an integral part of the congress and will be projected in an area accessible to all delegates. E-posters should be submitted in **PowerPoint/Publisher/PDF or JPG format** with Height 10 inches, Width 17.78 inches, Margins 0.25 inches all around. Pictures, illustrations, graphs can be included in the poster. The poster presentation **MUST contain only one slide** without animations or videos.

Full details and instructions of the format for e-posters will be communicated to the primary author/presenter after acceptance of the abstract.

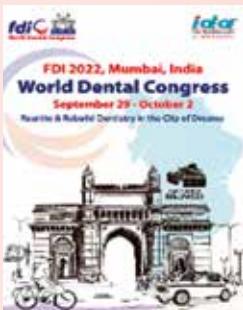
#### Free Paper presentation

Free Papers will be judged and certificates will be awarded for the **first three** papers. Criteria for selection would be: Content, Topic relevance and importance, technical and logical validity, Innovation and Presentation skills.

**CLOSING DATE FOR SUBMISSION OF ABSTRACTS – 24<sup>TH</sup> JANUARY, 2022**

*(Abstract Form is attached)*

## FDI WORLD DENTAL CONGRESS (WDC) 2022 MUMBAI, INDIA



FDI World Dental Federation (FDI) looks forward welcoming all attendees to Mumbai, India, for the 2022 FDI World Dental Congress (WDC) from 29<sup>th</sup> September - 2<sup>nd</sup> October. FDI is delighted to co-host this meeting jointly with, its member, the Indian Dental Association.

## WORLD ORAL HEALTH DAY - 20<sup>TH</sup> MARCH 2022

**BE PROUD  
OF YOUR MOUTH**

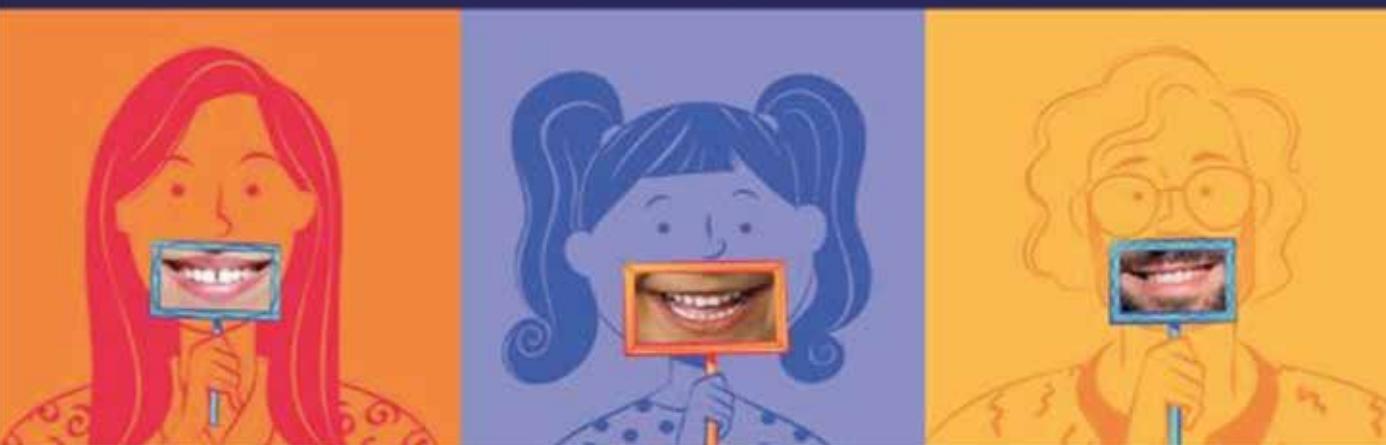


**World Oral  
Health Day**  
20 March



**Look after your oral health for  
your happiness and well-being**

[worldoralhealthday.org](http://worldoralhealthday.org)



## “BE PROUD OF YOUR MOUTH”

FDI World Oral Health Day campaign is underway and SLDA encourages all of you to get involved in activities to mark the day. SLDA will organize activities to celebrate WOHD 2022 in Sri Lanka which will be communicated with you soon. SLDA is asking everyone to take meaningful action to uplift oral health and to start planning to engage local communities to raise awareness, improve education and spur personal and collective action on the importance of oral health and also to spread the word to encourage as many people as possible to look after their mouth and protect their quality of life. Because an unhealthy mouth not only impacts general health but it can have a severe impact on people's emotional, social, mental, and overall physical well-being; and that's why it's important to call on people to Be Proud of their Mouth for their happiness and well-being.

More Information: [www.worldoralhealthday.org](http://www.worldoralhealthday.org)



### SLDA MEMBERS CONTACT DETAILS UPDATE

The following link can be used to send data to update your contact details at SLDA database.

<https://tinyurl.com/SLDA-Contact-Update>

Members also can text

**SLMC Reg. No, Email and Name to 076 563 9899**  
to update your contact details.



### SLDA MEMBERSHIP APPLICATION FORM

SLDA membership application can be downloaded from the below link for new members.

<https://tinyurl.com/SLDA-Membership-Application>



Date	Event	More Information
28 <sup>th</sup> & 29 <sup>th</sup> Jan 2022	SLDA Southern Branch Regional Scientific Sessions	Galle
01 <sup>st</sup> - 03 <sup>rd</sup> Feb 2022	AEEDC - International Dental Conference & Dental Exhibition - Dubai	<a href="https://aeedc.com/">https://aeedc.com/</a>
20 <sup>th</sup> March 2022	World Oral Health Day - 2022	<a href="http://www.worldoralhealthday.org/">http://www.worldoralhealthday.org/</a>
08 <sup>th</sup> - 22 <sup>nd</sup> May 2022	Asia Pacific Dental Congress - 2022 Pakistan	Pakistan
29 <sup>th</sup> Sept - 02 <sup>nd</sup> Oct 2022	FDI World Dental Congress - 2022 Mumbai, India	Mumbai, India

**Dr Chandima Weerasinghe**  
Hony. General Secretary  
Sri Lanka Dental Association



### SRI LANKA DENTAL ASSOCIATION

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Lakshman Samaranayake

# Current COVID-19 Vaccine Epidemiology and Dentistry

**Abstract:** The coronavirus disease 2019 (COVID-19) vaccine story is continuously unfolding. Since our previous COVID-19 commentaries, much new information has transpired on the subject, and here we revisit this topic, which has practical implications for all stakeholders in dentistry, as well as the public. This article, on current vaccine epidemiology, provides an account of why vaccines fail in general, and the particular concerns in relation to the new Delta variant of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and related 'variants of concern'. Issues related to vaccine failure are fundamentally dichotomous in nature, appertaining either to the vaccine strain (type) *per se*, and/or the numerous endogenous factors of the vaccine recipient/vaccinee. Societal factors such as vaccine hesitancy and its impact on herd immunity appear to overarch the long-term goal of total or partial global suppression of SARS-CoV-2, and its eventual endemicity.

**CPD/Clinical Relevance:** To describe the reasons for the failure of currently administered COVID-19 vaccines, particularly in relation to the advent of the SARS-CoV-2 'variants of concern', and discuss implications for clinical dental practice.

**Dent Update 2021; 48: 881–886**

The biggest vaccination campaign in human history is ongoing. The battle against coronavirus disease 2019 (COVID-19) is virtually halfway through, with an armamentarium of vaccines, antivirals and other drugs, and an array of societal preventive measures. These have led to a global decrease in the COVID-19 numbers with a few pockets of higher morbidity and mortality. COVID-19 vaccines continue to lower the risk for severe COVID-19 disease, hospitalization and death, even against the more virulent Delta variant.<sup>1</sup> Efficacious deployment of COVID-19 vaccines has offered humanity quick access to its endemicity. Since the first vaccine was administered in December 2020 in the

UK, some 3.9 billion people have at least had a single shot, and 2.9 billion are fully vaccinated worldwide (as of 23 October 2021).<sup>2</sup> This, together with those who have survived the infection, implies that about half of all people worldwide are likely to be immune to the disease today. Dental care workers, as frontline health professionals, were the earliest recipients of the vaccine, and some, in certain jurisdictions, were actively involved in the administration of vaccines as well. It is now highly likely that the annual vaccination schedule for dental healthcare workers (DHCW) will incorporate a compulsory COVID-19 vaccine.

Currently, there are eight different approved COVID-19 vaccines and a further 14 are authorized for limited use, while 32 have undergone Phase 3 trials and are awaiting approval by health authorities.<sup>3</sup> Despite the availability of vaccines, their delivery and uptake is totally skewed depending on geographic region, with some poorer countries having less than 5% vaccinated in contrast to some regions

where almost the whole population has been vaccinated, such as UAE.<sup>2</sup> Hence, we are not out of the woods yet. There are several pitfalls ahead prior to reaching the end goal, now considered to be the global endemicity of the virus into the foreseeable future.

The waning immunity of the vaccinees, and the consequent need for booster doses, the reported vagaries of the increasing number of brand-name vaccines, the purported or real, vaccine adverse effects, the possible emergence of vaccine-resistant viral variants (so-called 'variants of concern', in contrast to the 'variants of interest'), the adverse publicity in mass media on the unfounded perils of the vaccines, and low uptake are all contributing to this phenomenon. This COVID Commentary addresses some of these issues, particularly why the vaccines differ in their efficacy, and provides an update (Table 1) on the current vaccine recommendations by the World Health Organization (WHO) and the US Centres for Disease Control and Prevention (CDC).

**Lakshman Samaranayake, DDS (Glas), DSc(h.c.), FRCPath, FRACDS, FDS RCS (Edin), FDS RCPS, Professor Emeritus and Immediate Past Dean, Faculty of Dentistry, University of Hong Kong, Hong Kong.**  
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	<b>Pfizer</b>	<b>Moderna</b>	<b>AstraZeneca</b>	<b>Johnson &amp; Johnson</b>
Vaccine platform	mRNA in lipid nano-particles	mRNA in lipid nano-particles	Non-replicating human adenovirus-based	Non-replicating human adenovirus-based
Required doses	Two doses, 3 weeks apart	Two doses, 4 weeks apart	Two doses, 1 month apart	One dose; two doses desirable (pending formal approval)
Approval date/ pending approval	Given full FDA approval 23 August 2021	18 December 2020 <sup>1</sup>	WHO approval on 21 February 2021	Approval on 27 February 2021 for emergency use
Efficacy (percentage protected after full dosage)	95% in adults; 93% in 12–18 year olds in US vaccinees; 90% effective in 5–11 year olds	94.1% adults	70% adults	66.1% globally; 72% in the US; 86% effective against severe disease
Recommended age group	12 years and older	18 years and older	Pending	18 years and older
Eligibility for a booster shot	8 months after second dose	8 months after second dose; approved by FDA (October 2020)	To be determined	Approved by FDA (October 2020). Heterologous booster preferred >65 years
Common side-effects	Fatigue, headache, chills, muscle pain, especially after the second dose	Fever, muscle aches, headaches lasting a few days. Effects worse after second dose	Pain in vaccine site, fever, muscle aches, headache	Pain in vaccine site, headache, fatigue, muscle pain
FDA warnings of adverse side-effects	Cardiomyopathy, especially in children (over 1000 cases reported)	Cardiomyopathy, especially in children (over 1000 cases reported)	–	Increased risk for developing Guillain–Barré syndrome
Extremely rare side-effects	Anaphylaxis, Bell's palsy	Anaphylaxis, Bell's palsy	Transverse myelitis (two cases thus far); VITT or blood clotting in combination with/without a low platelet count (1:100,000)	VITT or blood clotting in combination with/without a low platelet count (1:100,000)

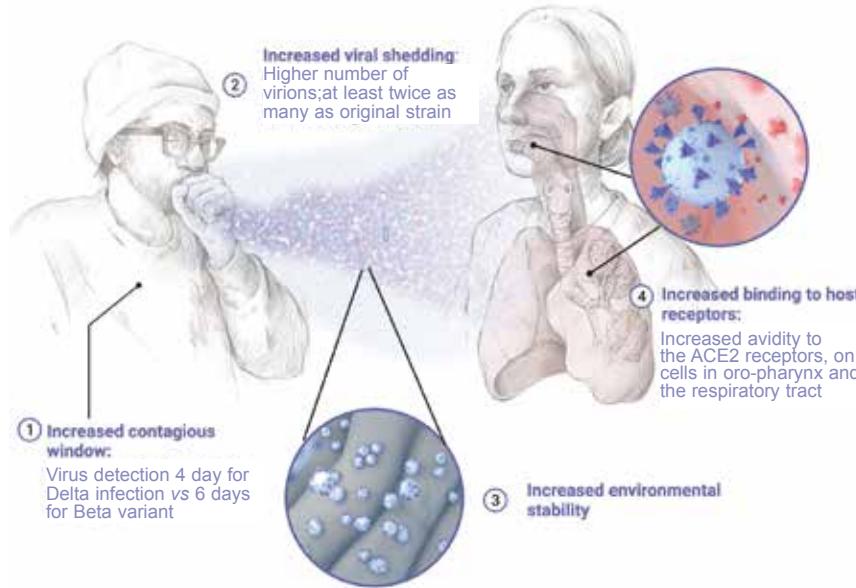
**Table 1.** A synopsis of the current data on the properties, including the efficacy and rare adverse effects, of COVID-19 vaccines used in the UK. Note: all of the current vaccines prevent hospitalization from the disease (except in rare cases); none of the vaccines interacts with recipients cellular DNA. VITT: vaccine-induced thrombotic thrombocytopenia. Data from various sources (as of 25 October 2021).

## Current vaccine epidemiology

The recurrent waves of COVID infections we are witnessing now, particularly in the developed world where vaccines are readily available, have been termed the 'pandemic of the unvaccinated' because it is estimated that the unvaccinated are 11 times more likely to die than those fully vaccinated.<sup>4</sup> Additionally, the new viral variants of concern, such as the Delta variant of SARS-CoV-2 and its subvariant AY strain, have caused renewed outbreaks even among the vaccinated cohorts.

It has been estimated that people who are infected with the Delta variant can spread the virus to between 5 and 9.5 other people. This number, termed the basic reproductive number, called R<sub>0</sub> or R nought, is the average number of susceptible people that each infected person is expected to infect. R<sub>0</sub> of the Delta variant is higher than the original virus identified in Wuhan, China, which had an R<sub>0</sub> of between 2.3 and 2.7, and the Alpha variant (previously, the UK variant), which had an R<sub>0</sub> of between 4 and 5. The Delta variant can be as infectious as chicken pox, which has an R<sub>0</sub> between 9 and 10.<sup>5</sup>

In brief, the reasons for the rapid spread of the new delta variant are four-fold: (i) the increased contagious window; (ii) increased viral shedding, at least twice as many virions as the original strain; (iii) increased environmental stability; and lastly, (iv) the increased avidity (binding) of the variant to the host receptor cells in the oropharynx and the lungs (Figure 1).<sup>5</sup> Consequently, the Delta variant is the predominant strain in most of the West, including UK and US, and in other regions such as India and South East Asia.<sup>6</sup> Unfortunately, even among the fully vaccinated for COVID-19, this variant



**Figure 1.** Four major reasons for the rapid global spread of the Delta variant of COVID-19 in comparison to its parental strain; ACE 2, angiotensin converting enzyme 2. (Figure created using Biorender.com software)

may cause asymptomatic or mild illness, thus creating vicious cycles of covert disease spread to others. Nonetheless, almost all of the current COVID-19 vaccines appear effective at preventing hospitalization and death among even those who contract the variant-induced disease (Table 1).

In general, the vaccine efficacy varies from one vaccine to another, ranging from approximately 50% to 95% for the widely available strains of COVID-19 vaccines and depends on a variety of factors.<sup>7</sup> Vaccine efficacy is simply defined as the percentage reduction of disease in a vaccinated group of individuals compared with an unvaccinated group under similar conditions in a vaccine trial ecosystem.<sup>8</sup> The term is often confused with vaccine effectiveness (formerly called 'field efficacy'), which is used to describe how a vaccine reduces the disease in a vaccinated population over a substantive period, given the constraints associated with vaccine delivery such as cold chain logistics, access to healthcare and the vaccine cost.<sup>9</sup> This said, the two terms, vaccine efficacy, and vaccine effectiveness are synonymously, and interchangeably used in numerous contemporary reports and in the media.

Vaccine efficacy can never be 100% in a given population. Hence, it is clear that

a significant proportion of the COVID-19 vaccinees will not fully seroconvert, meaning that the required level of antibody needed for protection is not reached after the two-dose regimen, a phenomenon called poor or suboptimal seroconversion. Hence, for all practical purposes, especially for clinical professionals, such as dental practitioners, who work in a hazardous environment, there may be a need to establish and ascertain seroconversion status after the standard vaccine by measuring the antibody titre with a serology test, after a specific post-vaccination period.<sup>10</sup> One good example of this is the evaluation of antibody levels after receiving all three doses of the hepatitis B surface antigen (HBs) vaccine. If, in the event, antibody levels to HBs are suboptimal (<12 mIU /mL), then the usual practice is to offer an additional dose of the vaccine.<sup>11</sup>

The latter titre of antibody beyond which the protection against the disease is conferred is called the immune 'correlate of protection'. Having a correlate of protection would help determine whether protection has been conferred by the vaccination procedure, and allow further actions that could then trigger interventions. Unfortunately, an immunological correlate for COVID-19 has not yet been determined,

but is eagerly awaited because this 'magic number' will provide a precise cut-off point for the booster dosing, as well as its frequency. This will also help determine the need for booster vaccination programmes on a population-wide basis. A need for such a correlate of protection for COVID-19 and the level of immunity is dictated by the general factors associated with the vaccination procedures, as well as the vaccinees innate response to the vaccine. These are described below (Figure 2).

## General factors

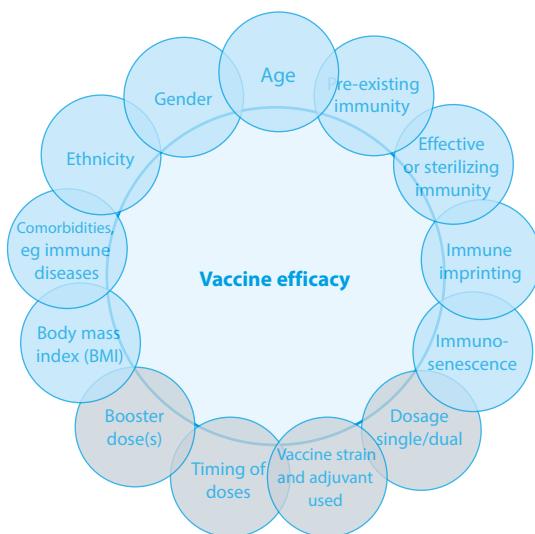
### Vaccine choice (strain selection)

As frontline healthcare workers, dentists are likely to be key decision-makers and opinion leaders on the choice of a vaccine strain (platform), offering advice to their team members and their patients, and the public. The availability of different vaccines on various platforms, with mRNA or dead and attenuated viruses, and traditional or modern technology, in itself, will pose issues in terms of the preferred vaccine for an individual.<sup>12</sup> Nevertheless, in the shorter term, due to the current, limited availability of vaccines, this choice is likely to have already been made by the local health or federal health authorities.

However, when different vaccine types are available, it may be incumbent upon the principal employee of a dental practice not only to ensure that all staff members of the practice are successfully vaccinated but also to obtain the necessary information on the available vaccines in the locale and provide specifications and data on the currently offered vaccine strain, its side effects, and other relevant details to his/her employees. Such advocacy should ideally be performed in consultation with the local medical care provider/s and public health consultants depending on the extant policies and procedures of the local dental and health authorities.

### Heterologous or mixed-mode vaccination

In this context, mixed-mode or heterologous vaccination of two different strains of vaccines for the primary and the second dose, as well as the booster dose (the third dose, in most vaccine strains) has been widely discussed. Several studies have now confirmed that people who receive two different COVID-19 vaccines belonging



**Figure 2.** Factors impacting the efficacy of a vaccine and the depth of the seroconversion; Factors related to the vaccine recipient (vaccinee) are in blue, and those related to the administered vaccine are in grey.

to disparate platforms, generate potent, synergistic immune responses, with side effects no worse than those caused by the standard regimens.<sup>13</sup> Indeed, heterologous booster dose regimens are highly effective at preventing infection with the Delta strain of the SARS-CoV-2 infection, and exceed the performance of homologous vaccination.<sup>13</sup> Although the heterologous vaccination process has passed the efficacy test, questions yet remain, such as the durability of the immune response. (An added advantage of such mixed-mode vaccination is that it supports immunization programmes in lower-income countries, where there might be shortages of vaccines due to disruption of supply chain logistics, for instance).

#### Vaccine hesitancy

Vaccine hesitancy by the community, in general, has been a subject of much controversy and debate since the introduction of the first vaccine in the UK for small pox, by Edward Jenner, over two centuries ago.<sup>14</sup> Vaccine hesitancy is explained as a delay in acceptance or refusal of vaccination by the community despite the availability of vaccination services.<sup>15</sup> The phenomenon is a complex and chronic societal issue, depending on the vaccines in question, and is fuelled by factors such

as complacency, and numerous myths, rumours, and fears in the mass media on the disadvantages of the vaccines.<sup>15</sup> Additionally, the declarations by a number of religious and political groups devoted to this cause in different parts of the world have not helped popularization of the COVID-19 vaccines and vaccination, in general.

As a key community healthcare provider and the trusted 'go-to' person for healthcare information, dental practitioners are in a leadership position to impact the views of their patients and educate and reassure them about the safety of the COVID-19 vaccines and their efficacy, in order to dispel the various myths and fallacies surrounding this critical issue.

#### Non-responders

The question of the small minority of non-responders to COVID-19 vaccines and how these individuals are managed is another issue that should be addressed according to the extant policies of local jurisdictions. The signs are that the COVID-19 will be a persistent, endemic disease in most regions of the world until the foreseeable future. Hence, the necessity for such measures to protect all stakeholders in dental care-delivery clinics/institutions needs to be resolved and guidelines formulated by the local/ federal dental authorities in earnest.

#### Innate factors related to the vaccinee

A number of innate factors of the vaccinees themselves may lead to an idiosyncratic response to a vaccine, and impact the quality and the durability of the seroconversion. These include general factors such as age, gender, body mass index along with others, such as immune imprinting and immunosenescence, discussed below (Figure 2).

#### Immune imprinting

Immune imprinting is a phenomenon whereby initial exposure to one virus strain effectively primes the antibody producing, B cell memory and restricts the development of memory B cells and neutralizing antibodies against new minor variant strains of the virus.<sup>16</sup> A classic example of this phenomenon is seen in seasonal influenza exposure and the associated vaccine response. This phenomenon is also termed the 'original antigenic sin'. For instance, childhood influenza exposures leave an immunological imprint, which has a lifelong impact on immune memory cells.<sup>16</sup> The fact that elderly people show relatively weak immune protection against influenza, despite seasonal exposure to vaccination against the disease, is indicative of the insufficiency of the antibody responses in adulthood (either through vaccination or exposure to the organism), which do not provide the same strength or durability as the immune response in childhood.

The reasons for the immune imprinting phenomenon are speculative and unclear, as yet. Whether the immune imprinting phenomenon will adversely impact the serological response to COVID-19 vaccines is yet to be determined.

#### Immune senescence, or immunosenescence

Another reason for waning antibody levels is the age-related disparity in immune response due to so-called immune senescence or immunosenescence,<sup>17</sup> which is defined as the gradual weakening of the immune system due to the natural ageing process of an individual. This is exemplified yet again by influenza vaccines, which are less effective in older than in the younger populations. Similarly, older individuals tend to get herpes zoster despite having had childhood chickenpox.<sup>18</sup>

Active haematological malignancies
Non-haematological malignancies with current active treatment, including chemotherapy, radiotherapy and/or hormonal therapy
Solid organ transplant with immunosuppressive therapy
Haematopoietic stem cell transplants (within 2 years of transplantation)
Immunosuppressive therapies
Primary immunodeficiencies
Advanced or untreated HIV infection (those with low CD4 cell counts)
Long-term haemodialysis or peritoneal dialysis

**Table 2.** Immunocompromised individuals who mount a poor response to COVID-19 vaccines, and require booster or third primary dose of the vaccine. This is not an exhaustive list; data from reference 19.

#### Systemic diseases and other factors

A number of systemic diseases or conditions may affect the efficacy of vaccines and poor seroconversion after a vaccination program (Table 2). It is now clear that these individuals require a third primary dose (a booster) due to the possibility of breakthrough infections. Additionally they need to continually abide by risk mitigation strategies such as mask wearing and social distancing even after the receipt of a third dose.<sup>19</sup> (Note: the issue of booster doses and the frequency of their administration for the general population is still being debated, and not addressed here).

#### A note on societal factors impacting covid-19 vaccination and its success

Finally, highlighted are two inter-related critical societal and geopolitical issues, vaccine hesitancy (discussed above) and herd immunity, which dictate the success of a global vaccination programs for COVID-19.

As mentioned, vaccine hesitancy is a complex societal problem, fuelled by numerous myths, rumours and fears related to the disadvantages of vaccines. Maintaining public confidence in COVID-19 vaccines, and minimizing vaccine hesitancy

will be crucial to eradicate the disease and dental practitioners can play a key contributory role here by educating their patients and the public on the myths and the truths of COVID-19 vaccines. Indeed, WHO has classified vaccine hesitancy as one of top 10 major threats to global health,<sup>20</sup> and a critical impediment obstructing the end goal of herd or population immunity.

Herd or population immunity, also known as population immunity, is defined as the indirect protection from an infectious disease that ensues when a population is immune either through vaccination or previous asymptomatic or symptomatic infection.<sup>21</sup> The level of vaccination needed to achieve herd immunity varies by disease. It is generally accepted that to reach herd immunity and suppress community transmission of a virus, about 70% of the population would have to be immune. For example, herd immunity against measles needs about 95% of a population to be vaccinated, while the threshold for polio is lower, approximately 80%.<sup>22</sup> The proportion of the populace that must be vaccinated against SARS-CoV-2 to induce herd immunity is unknown, as yet. However, experts opine that a 70–80% immune population will abort the disease transmission in the community.<sup>21</sup>

Only a relatively small proportion of the population has received the full COVID-19 vaccinations currently, which is geographically skewed in any case, and we have a fair way to travel before reaching the goal of global herd immunity for COVID-19. Considering the scientific, societal, and political barriers that must be overcome to achieve this figure of 80% community vaccination, it is dawning on the scientific community that COVID-19 vaccines may not be the panacea for this dreaded disease.<sup>23</sup> Hence, at least in the shorter term, continuing to resort to other ancillary mitigating measures, such as mask-wearing, hand hygiene, social distancing, as well as the infection control measures in the clinical ecosystems where DHCWs operate are likely to be critical for COVID-19 prevention.

#### Conclusions

It is highly likely that a worldwide endemicity of COVID-19 will usher in an era of 'new normal' in dentistry. There are a number of critical facets that will mould

such modified clinical practice regimens, and a glimmer of this new scenario is emerging with the wide availability of efficacious COVID-19 vaccines. Nevertheless, the dental community need to comprehend that COVID-19 vaccines are but a single device in the overall public health response to the pandemic, and continue to abide by other crucial infection control measures to mitigate SARS-CoV-2 spread, and initiate appropriate administrative and engineering controls in clinical settings, as dictated by either the national or local authorities.

#### Compliance with Ethical Standards

**Conflict of Interest:** The authors declare that they have no conflict of interest.

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