

## Commentary

**\*Corresponding author**  
**Lakshman Samaranayake, DSc,**  
 DDS (Glas), FRCPath, FDSRCS (Edin),  
 FRACDS, FDS RCPS, FHKCPath,  
 FCDSHK, FICD  
 Head, School of Dentistry  
 The University of Queensland  
 Level 7, UQ Oral Health Centre 288  
 Herston Road, Brisbane, QLD 4006  
 Australia  
 Tel. +61 7 3365 8062  
 Fax: +61 7 3365 8118  
 E-mail: [lsamaranayake@uq.edu.au](mailto:lsamaranayake@uq.edu.au)

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# Oral Health, Dental Education and Research: A Commentary

**Lakshman Samaranayake\***

*Head, School of Dentistry, The University of Queensland, Level 7, UQ Oral Health Centre 288, Herston Road, Brisbane, QLD 4006, Australia*

### ABSTRACT

Despite major advances in oral health in some communities there is rampant dental and oral disease worldwide. Indeed dental caries and periodontal disease still top the league table as the commonest infections in humans. Though more research is needed there is evidence to indicate that oral disease is linked to systemic disease. Despite these revelations and the high prevalence of oral disease, the dental education systems worldwide are facing fundamental challenges due to social, economic and technological reasons. These challenges will not be adequately addressed with anything less than a concerted response from the government, community, alumni, and industry. Only then can the faculties or schools of Dentistry flourish and provide a stimulating and quality environment for graduates to develop their full potential and to hone their competitive advantage for a challenging career in a fast-changing world. In this article the author describes the current dental landscape globally, and then addresses the multifarious challenges in education, research, and resource support that constantly challenges the delivery of dental pedagogy worldwide.

### ORAL HEALTH AND THE DISEASE BURDEN: THE CURRENT LANDSCAPE

Dentistry has made great strides over the last century since the days of the Barber Surgeons. One of the major changes that led, for example, to the reduction in caries is the discovery of the properties of fluoride, and the observation that people who lived in communities with naturally fluoridated drinking water had far less dental caries than people in comparable communities without fluoride in their water supply. Community water fluoridation is arguably one of the great achievements of public health in the twentieth century, and the most far reaching of all in dentistry.

Although we have come very far from the times when old age was equated with edentulism there are significant disparities in global oral health. Indeed, there is a silent epidemic of dental and oral diseases in many underserved populations worldwide. This disease burden restricts activities in school, work, and home, and often significantly diminishes the quality of life. Those who suffer the worst oral health are found among the poor of all ages, with poor children and poor older citizens particularly vulnerable. Members of racial and ethnic minority groups also experience a disproportionate level of oral health problems as seen in US Native Indians and Australians aboriginal populations - even in so-called developed countries. The situation in the developing world is far from satisfactory as the consumption of sugary diets is increasing disproportionately without dental care and proper oral hygiene. Other smaller communities that are so disadvantaged include the medically compromised or who have disabilities.

The reasons for disparities in oral health are complex because of socioeconomic factors, as well as apathy in ignorance in poorer communities. In many situations such disparities are exacerbated by the lack of community programs such as fluoridated water supplies.

It has been said that the mouth is mirror of general health and well-being. General

health risk factors common to many diseases, including diabetes, tobacco use and poor dietary practices, also affect oral and craniofacial health. The almost direct association between tobacco use and oral diseases has been well established for some decades now. Recent research findings have also pointed to possible associations between periodontal disease and oral inflammation and diabetes, atherosclerotic vascular disease, low-birth-weight and premature births, and lung disease in the hospitalised, kidney disease and pancreatic cancer. It should, however be stressed that these are associations only, and more work needs to be done to elucidate further the oral-systemic disease axis.

#### DENTAL EDUCATION

Dental education is the fountain from which all dentistry flows. It is the framework on which scientific findings and advancements in oral care are discovered and implemented. A strong dental education system produces a strong dental profession, resulting in the highest level of oral health care for the public.

The strong association between dental education and improved public oral health is well known. But in order for dental education to continue to play its vital role, it is important to ensure a strong supply of qualified, diverse dental students and faculty who have access to state-of-the-art teaching and research facilities.

Owing to the one-on-one teaching and very close supervision necessary, dental education is among the most costly professional training programmes worldwide. While costs continue to grow, government support has gradually declined over the years. The other aligned challenge is the worldwide shortage of dental educators. A scholarly and adequate, full-time dental faculty is essential to appropriately train future generations of students. This is also necessary in order to sustain the current level of research, so that the faculty maintains its scientific standing and credibility in the university community both at local and international levels.

There are several reasons for the widespread shortage of dental educators. University salaries and benefits are not keeping pace with those in industry and private practice, and the gap is ever-widening. Hence, young graduates are attracted to the lucrative arena of general practice rather than face the challenges of academia. These challenges include competing for research grants, an ever-increasing administrative burden, and having to complete more and more training pathways prior to gaining specialist status. All of these activities restrict the time that can be devoted to scholarship. In the West, the shortfall in faculty personnel is further exacerbated by graduates leaving dental school with a heavy burden of student debt that they want to discharge by joining a financially rewarding private practice. Furthermore, attracting potentially high-earning dental specialists to a career in dental education continues to

be an issue. Well-trained, scholarly dental specialists will be increasingly crucial to help dental schools maintain first-class teaching facilities.

Furthermore, keeping pace with today's escalating technological advancements is a major challenge for most dental schools worldwide. The new technologies produce new contraptions such as lasers and modern imaging machines (e.g. cone-beam radiology) that provide precise images of hard and soft tissues. Yet, these are beyond access to resource starved dental schools. However, it behooves us to ensure that our dental students graduate with knowledge of and skills in using technology and equipment that are not already obsolete in the field.

#### DENTAL RESEARCH

In the 21<sup>st</sup> century, dental schools must have the capacity to conduct collaborative research, and equal participants in medical research programmes. Dental academics, in alliance with industry and research grant councils (eg the National Institutes of Health in the United States), have developed new and innovative products and equipment, such as fluorides and implants. Research has also led to advances in orthodontics and oro-facial reconstruction that improve a patient's self-esteem and daily functioning. Dental schools provide the greatest potential to turn clinical findings into practical applications through their connections with students, practising dentists, industry, community clinics, and public-policy advocates. In addition, dental schools play a crucial role in provision of life long learning as Continuing Professional Education courses to graduates and alumni in an increasingly fast pace world with explosive technological developments.

If inadequate resources are provided for dental research, then advances looming on the horizon might never come to fruition. Imagine the impact on the oral and general health of the public if dental researchers developed a vaccine to prevent periodontal (gum) diseases or discovered gene therapies to prevent oral cancers. Furthermore, if dental schools were to survive within a university environment it is imperative that they pursue quality research that compete with various other research programmes in other allied faculties. The research that is so pursued should be aligned to Nuffield principles of scholarship of discovery, scholarship of integration, scholarship of application, scholarship of translation and scholarship of teaching. The latter translational research and the interface between laboratory research and public understanding of research are key areas that need to be addressed if we need to sustain the momentum in dental research. Otherwise dental schools in the universities will face an existential threat of being relegated to mere technical schools.

#### CONCLUSION

It is clear that the challenges facing dental education

worldwide are very similar. These challenges will not be adequately addressed with anything less than a concerted response from the government, community, alumni, and industry. Only then can the Faculties or Schools of Dentistry continue to provide a stimulating and quality environment for graduates to develop their capabilities and to hone their competitive advantage for a challenging career in a fast-changing world, and contribute to the frontiers of dental discovery.