

Time to take gum disease seriously

A White Paper by the Economist Intelligence Unit (EIU) signposts a call to action on preventing gum disease due to huge economic and societal burden. By Iain L. C. Chapple¹

In 1990, oral diseases, principally dental caries and periodontitis, were the most common human diseases when 354 causes of disease and injury were analysed across 195 countries by the Global Burden of Diseases study. This alarming statistic remained unchanged in 2017, with 3.47 billion cases worldwide. Indeed, periodontal disease and caries were ranked 14th and 16th in their contribution to years lost to disability in women and men, respectively, being responsible for more years lost to disability than any other human disease.¹ Besides this human cost, there is also an enormous economic burden, with direct treatment costs for oral diseases estimated at \$356.8 billion in 2015, 4.6% of global health expenditure, and indirect costs associated with loss of economic productivity adding a further \$187.61 billion.² These costs are within the range of those incurred by the ten leading causes of death worldwide.³ In 2015, a comparative study of healthcare expenditures in 28 European countries reported dental diseases to be the third most costly (€90 billion per year), with diabetes (€119 billion per year) and cardiovascular diseases (€111 billion per year) the two most costly.⁴ Indirect costs for periodontitis such as lost productivity due to time away from work were estimated at \$54 billion per year.⁴

Periodontitis destroys the supporting tissues of the teeth, leading ultimately to tooth loss and negatively impacting speech, nutrition, self-confidence, quality of life, and systemic health due to its proven role as a risk factor for cardiovascular disease and diabetes.⁵ Indeed, by 2016, periodontitis had been independently associated with over 57 non-communicable human conditions⁶ and in its mild, moderate and severe forms, is estimated to affect 50% of adults.⁷ The Global Burden of Disease (GBD) 2010

study demonstrated an age-standardised prevalence (1990–2010) of 11.2% for severe periodontitis, being the sixth most prevalent human condition.⁸ Overall, periodontal diseases affect 796 million people worldwide.¹ In the 2015 GBD study, the age-standardised prevalence of severe periodontitis remained high at an estimated 7.4%.⁹

Despite improvements in oral care services across Europe from 1990 onwards, the prevalence of periodontitis per 100 population has hardly changed, and it was for this reason alongside the direct, indirect and intangible (eg quality of life) care costs that the EIU undertook their work. The analysis was undertaken in six European countries: France, Germany, Italy,

areas for policy change aimed at preventing periodontal diseases. Phase-3 involved a quantitative analysis of various costs for each intervention scenario in each of the six countries modelled. Phase-4 involved summarising findings and publishing a white paper after sense checking by the expert panel.

Stage II (moderate) periodontitis was chosen as the most prevalent type, and costs were modelled across a ten-year period for each country. The primary outcome measure was return on investment (ROI) from each of the five scenarios and secondary outcomes were: total healthy life years gained, total costs, cost per healthy life year, and incremental cost-effectiveness ratio. The five scenarios tested

'...from 1990, the prevalence of periodontitis per 100 population has hardly changed...'

Netherlands, Spain and the UK, where there was deemed to be sufficient data to permit a pragmatic modelling process.

The EIU work was commissioned by the European Federation of Periodontology (EFP), sponsored by P&G, and conducted independently of both. There were four phases to the process. Phase-1 involved a literature review to evaluate the prevalence and burden of periodontitis and to determine a clinical care pathway against which to assess the costs and return on investment of different intervention strategies along that pathway. Phase-2 involved convening an expert panel to drive dialogue and understanding of key

were: 1) 'Business as usual'; 2) reducing the management of gingivitis to 10% of cases; 3) eliminating gingivitis; 4) no management of periodontitis; and 5) diagnosing and managing 90% of periodontitis.

The costs of managing periodontitis under the business-as-usual scenario varied widely according to whether care was publicly or privately (out of pocket) funded, or a combination of both (France, UK), with private care in Italy the highest at €97 billion and France and the Netherlands at €19 billion over the ten-year period. Diagnosing and managing periodontitis increased costs 3–4-fold, but still delivered a positive ROI. By far the most

¹Professor of Periodontology, The University of Birmingham Periodontal Research Group, Birmingham, UK

◀ beneficial scenario was eliminating incident gingivitis through professionally administered training and home care. This reduced costs of care to 40–50% of business-as-usual costs, increased healthy life years and delivered a ROI between €15.2 (Italy) and €57.5 (Germany) for each Euro invested. Interestingly, reducing treatment of gingivitis to only 10% of cases (scenario 2) and neglecting to treat periodontitis (scenario 4) significantly increased costs and reduced healthy life years at a societal and an individual level.

Gingivitis is a necessary pre-requisite for periodontitis to develop,⁹ and managing gingivitis is a primary prevention strategy for periodontitis.⁵ However, gingivitis is generally regarded as a trivial condition as it is ubiquitous and does not directly lead to tooth loss, or indeed to periodontitis except in the 10–50% of people susceptible to periodontitis. Public and privately funded oral healthcare systems therefore focus remuneration on treating periodontitis rather than preventing it by treating gingivitis.

The EIU paper clearly articulates periodontitis as a ‘canary in the mine’ for broader health inequalities, largely due to the cost of accessing oral care being a barrier to low-income families. Indeed, even in healthcare systems where public funding is available for oral care, such as the UK and France, patients still contribute significantly to their care ‘out of pocket’. The white paper concludes that professional management of periodontitis is in fact cost-effective and that publicly covered dental care for periodontitis deserves a review by policymakers and commissioners Europe-wide. It also calls for public health campaigns targeted at individual and societal levels and points out that patient self-care through professionally coached oral hygiene practices is highly cost-effective and delivers large returns on investment. The adage ‘gum disease is conquered in the bathroom and not in the dental surgery’ appears to have credence.

If there is one take-home message from the EIU’s work, it is that the statement ‘It is time to take periodontitis seriously’¹⁰ should perhaps be modified to ‘It is time to take gingivitis seriously’. ■

References

1. GBD 2017 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet* 2018; **392**: 1789–1858.
2. Righolt A J, Jevdjevic M, Marcenés W, Listl S. Global-, Regional-, and Country-Level Economic Impacts of Dental Diseases in 2015. *J Dent Res* 2018; **97**: 501–507.
3. Listl S, Galloway J, Mossey P A, Marcenés W. Global Economic Impact of Dental Diseases. *J Dent Res* 2015; **94**: 1355–1361.
4. Peres K G, Thomson W M, Chaffee B W *et al*. Oral health birth cohort studies: achievements, challenges, and potential. *J Dent Res* 2020; **99**: 1321–1331.
5. Chapple I L, Van der Weijden F, Doerfer C *et al*. Primary prevention of periodontitis: managing gingivitis. *J Clin Periodontol* 2015; **42**: S71–S76.
6. Monsarrat P, Blaizot A, Kemoun P *et al*. Clinical research activity in periodontal medicine: a systematic mapping of trial registers. *J Clin Periodontol* 2016; **43**: 390–400.
7. Billings M, Holtfreter B, Papanou P N, Mitnik G L, Kocher T, Dye B A. Age-dependent distribution of periodontitis in two countries: Findings from NHANES 2009 to 2014 and SHIP-TREND 2008 to 2012. *J Periodontol* 2018; **89 Suppl 1**: S140–S158.
8. Kassebaum N J, Bernabé E, Dahiya M, Bhandari B, Murray C J, Marcenés W. Global burden of severe periodontitis in 1990–2010: a systematic review and meta-regression. *J Dent Res* 2014; **93**: 1045–1053.
9. Kinane D F, Attström R. Advances in the pathogenesis of periodontitis. Group B consensus report of the fifth European Workshop in Periodontology. *J Clin Periodontol* 2005; **32 Suppl 6**: 130–131.
10. Chapple I L C. Time to take periodontitis seriously. *BMJ* 2014; doi: 10.1136/bmj.g2645. ✦