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# Business Case Dossier 2

An Economic View on  
Implant Health in 2020



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The Institute of Empirical Health Economics is an extra-universitary research unit for the areas of medical and pharmaceutical research. The assignments involved aspects of medicine, clinical research, marketing and controlling.

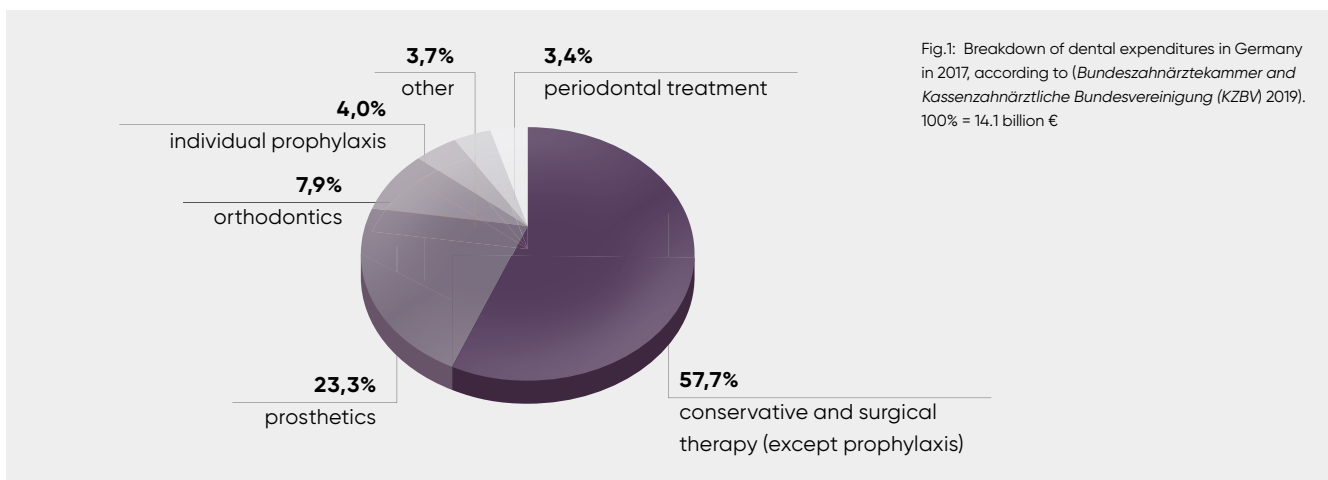
IfEG has been working for national and international companies for over 20 years and supports them in the areas of reimbursement and health services research.

The clientele includes the areas of the pharmaceutical industry, medical technology and pharmaceutical manufacturers, hospitals, health insurance companies, ministries and health policy institutions, as well as the professional organization of the medical and pharmacy community and organizations in the medical assistance and nursing professions.

# REAL-WORLD DENTAL EXPENDITURES

Take a minute to think about which field is the main profit center in your practice. Do you put a focus on conservative, surgical or prosthetic treatment?

Figure 1 shows a breakdown of dental expenditures in Germany in 2017. We notice that prophylaxis plays a subordinate role; secondary prevention is not mentioned at all. What if you could expand those fields to create an additional profit center in your practice which remains unexploited so far?



## CHECK-UP & SERVICE: THE PROFIT ENGINE

Dental hygienists play a huge role in dental practice as the hygiene department should be the second largest profit center. In fact, most patients see their dental hygienist more frequently than their dentist (*Seidel-Bittke 2013*). It has been shown, that annual net income is about 31% greater in dental practices that employ dental hygienists (*Lazar, Guay et al. 2012*). Based on the needs of existing patients, this profitable segment has the potential to double or triple.

A dental hygienist can serve 800 patients in a 6-month period (1 hour appointments assumed). If two rooms are simultaneously available for hygiene this number increases to 1200 (*McManus 2001*). Services offered can include whitening, nonsurgical periodontal therapy and implant maintenance therapy. According to registered dental hygienist Vicki McManus, the typical hygiene department produces \$8,000 per month / \$96,000 per year and this can rise up to \$1,000,000 a year (*McManus 2001*). McManus even suggests a “recipe” for creating a \$300,000 hygiene department: you need 1,000 active patients of record, an active new-patient flow of about 20 patients per month, an average recare fee of \$130 (including exam, x-rays, prophylaxis, fluoride), a strong non-surgical periodontal program and some additional service (e.g. whitening).

She assumes that every of the 1,000 active patients has a hygiene appointment every six months, creating a revenue of  $1000 \times 2 \times \$130 = \$260,000$  per year plus 20 new patients per month yielding  $20 \times 12 \times \$130 = \$31,200$ . Further, she expects 50% of the new patients to have some form of periodontal disease with additional need of scaling and root planing in at least two quadrants, generating  $20 \times 12 \times \$155 = \$37,200$  per year. With some whitening (\$299 per unit) and additional services another \$33,672 can be generated, all summing up to yearly revenue of \$362,072. Taking into account salaries, supplies and equipment depreciation the net profit remains at \$126,725 per year from the hygiene department only (*McManus 2001*).

# THE CURRENT MODEL: A ONE-SIDED APPROACH

Each year, an estimated number of 12-18 million dental implants are sold worldwide. Accumulating, over the past decades, several hundred million implants have been placed (*Klinge, Lundstrom et al. 2018*).

In 2018, Prof. Dr. Frank Schwarz, president of the DGI, announced that annual numbers of dental implants placed in Germany increased to 1.3 million. Analogically, numbers of dentists offering dental implant services in their practice are increasing. More than 8500 dentists are member of the German Association of Oral Implantology (DGI) (*DGI - Deutsche Gesellschaft für Implantologie im Zahn- Mund- und Kieferbereich e. V. 2018*).

Peri-implant maintenance therapy has been shown to improve long-term success rates of dental implants and should be an important part of therapy after placement and restoration of dental implants (*Monje, Aranda et al. 2016*). It is important that this is communicated to the patient prior to implant placement.

If implantologists only focus on the implant placement procedure and advertisement for new patients, they will lose the opportunity of hundreds of millions of patients needing implant maintenance for their already existing implants. Due to the immense numbers of patients, the potential revenue gained from maintenance and after-care procedures may be not as low as presumed compared to the revenue of surgical procedures.

## VALUE CALCULATION: SURGICAL PLACEMENT vs AFTER-SALES SERVICE

Due to the high level of competition, the dental implant market has reached the point of becoming a price sensitive commodity market. Three quarters of the dental implant market are controlled by the leading six companies, the remainder is divided among hundreds of manufacturers who mainly operate in the non-premium segment (*Straumann Group 2018*). The lower price segment reduces the earning capacity of surgeons and the industry as a whole.

According to the DGI, dental implants result in costs of €1,250 to €3,000 for the patient (including material costs and dentist fees) (*DGI - Deutsche Gesellschaft für Implantologie im Zahn- Mund- und Kieferbereich e. V.*). Depending on severity and effort, dentist fees can amount to more than €1,000 (*Bundeszahnärztekammer 2011*). But the final net profit of implant placement is decreased by high educational costs and advertising costs to recruit new patients (*DGI - Deutsche Gesellschaft für Implantologie im Zahn- Mund- und Kieferbereich e. V.*).

Revenues could be increased if clinicians accessed the currently underdeveloped peri-implant maintenance market focusing on prophylaxis of peri-implantitis. As described above, the global size of this market is estimated at 100 million existing implants and more than 10 million new ones placed every year (*Klinge, Lundstrom et al. 2018*).

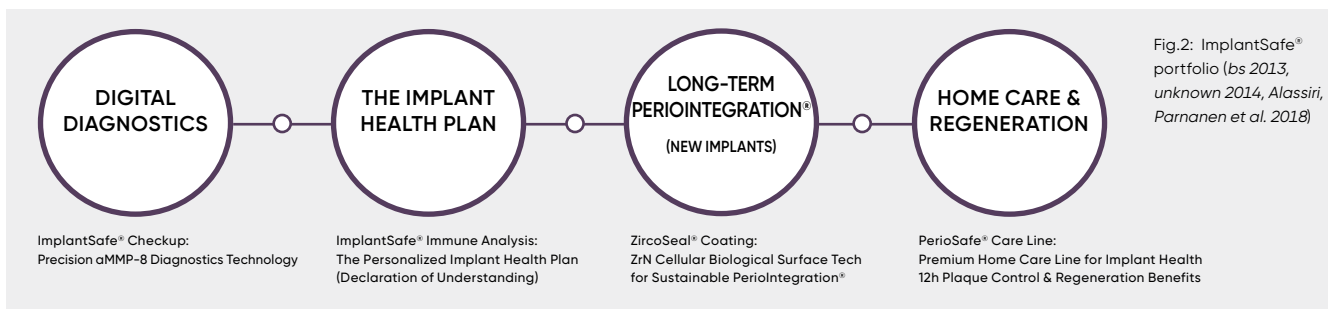
In the automotive industry the after-sale market generates 24% of revenues and 54.4% of profit (*Dombrowski, Engel et al. 2011*). The potential of the after-implant market in dentistry has not yet been fairly valued and is underestimated.

## IDENTIFYING AND TREATING THE UNMET NEED FOR PREVENTION

The key to accessing this profitable service growth is to identify the patients who need it and motivate them to accept the services.

Until now, neither the implant industry nor individual implantologists could take full advantage of this market segment due to the lack of accurate and predictive diagnostic check-up technologies, implant health concepts, and the means to perform personalized oral medicine (*Cafiero and Matarasso 2013, Alassiri, Parnanen et al. 2018*).

The ImplantSafe® portfolio opens this market with a full set of patented and evidence-based technologies and conceptual tools for the implant professional (*Sorsa, Gieselmann et al. 2017, Sorsa, Heikkinen et al. 2018*):\*



The ImplantSafe® Health Program available from Dentognostics has been assembled to provide clinicians with driving technologies to access this implant after-care market through:

1. Precise identification and assessment of patient need and
2. Creation of adherence through personalized implant health planning and visualization of the process (*Alassiri, Parnanen et al. 2018*) (A numeric and color coded risk stratification can increase patient adherence and encourage motivation.)

### THE KEY REASONS FOR THE HIGH PERI-IMPLANTITIS PREVALENCE ARE DUE TO:

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| <p><b>a) the relatively low rate of hygiene &amp; recall compliance</b><br/>(average rate of ~1 visit per year) (<i>van der Schoor 2018</i>),</p> <p><b>b) the low accuracy and predictive ability of current diagnostic tools</b><br/>to identify patients with peri-implantitis progression<br/>(<i>Sorsa, Gieselmann et al. 2017, Alassiri, Parnanen et al. 2018</i>),</p> <p><b>c) poor practice capacity, i.e.:</b></p> <ol style="list-style-type: none"> <li>i.) insufficient personnel for hygiene and maintenance care<br/>(<i>Lazar, Guay et al. 2012</i>)</li> <li>ii. no management focus on growing a sustainable business model for the practice with recurring revenue from existing customers<br/>(<i>Lazar, Guay et al. 2012</i>)</li> <li>iii. a lack of high-sensitivity implant check-up methods and effective implant health care programs (<i>Sorsa, Gieselmann et al. 2017</i>),</li> </ol> | <p><b>d) clinical reasons such as</b></p> <ol style="list-style-type: none"> <li>i.) the systemic inflammatory effect of chronic diseases (<i>Fuggle, Smith et al. 2016</i>)</li> <li>ii.) prosthetic design access<br/>(<i>Wittneben, Joda et al. 2017, Schwarz, Derks et al. 2018</i>)</li> <li>iii. history of or the high risk for periodontitis (found in 23% of implant patients)<br/>(<i>Derks, Hakansson et al. 2015</i>),</li> </ol> <p><b>e) patient-level behavioral factors like</b></p> <ol style="list-style-type: none"> <li>i.) smoking habits<br/>(<i>Chapple, Bouchard et al. 2017</i>)</li> <li>ii. level of daily oral hygiene<br/>(<i>Kracher and Smith 2010</i>)</li> <li>iii. nutritional choices<br/>(<i>Chapple, Bouchard et al. 2017</i>)</li> </ol> |
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### IMPLANT HEALTH vs DISEASE

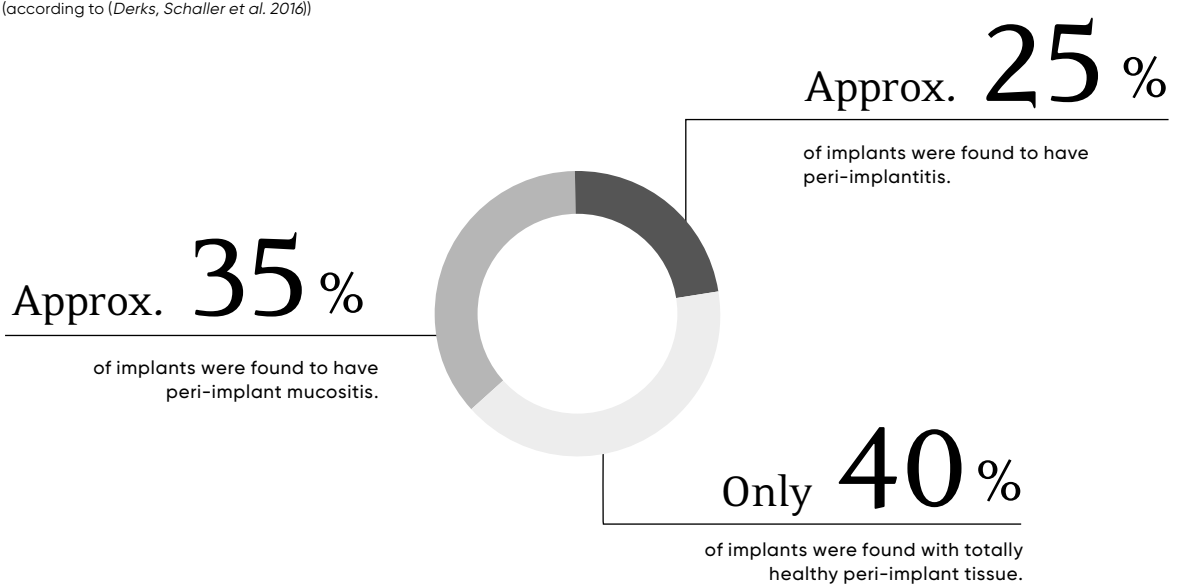
To keep the implant healthy from the day of placement, the potential check-up and service period should cover the life span of the implant which is estimated at 16-22 or even 25 years (*Dierens, De Bruyn et al. 2016, Horikawa, Odatsu et al. 2017*). Recommended recall hygiene intervals are 3-6 months which have been shown to favor teeth and implant retention (*Farooqi, Wehler et al. 2015*). Hygiene intervals of 3 months have been shown to reduce 95% of collagen degradation over 30 years (*Axelsson, Nystrom et al. 2004*).

This would mean every implant patient should have a hygiene appointment 2-4 times per year. Unfortunately, this does not reflect reality as a recent study from the Netherlands has shown - most implant patients only visit about 1.4 times per year (*van der Schoor 2018*).

As most implants replace teeth that have been lost due to periodontal disease therefore most implant patients have a significant risk for developing peri-implantitis and should follow strict and short recall intervals.

Derks et al. showed that at the 9-year examination only 23% of patients had healthy implants, which by implication means 77% of implant patients had developed a peri-implant mucositis or peri-implantitis after 9 years (*Derks, Schaller et al. 2016*). It can thus be estimated, that 77% of all implant patients need shorter hygiene intervals and more effective hygiene services to maintain a healthy implant status.

Fig.3: Prevalence of Peri-implant Disease on the Implant Level at 9 year examination (according to (*Derks, Schaller et al. 2016*))



Studies by Dr. Peter van der Schoor show that adherence and periodontal progression both improve with early diagnosis and personalized prophylaxis intervals (*van der Schoor 2018*).

Patients participating in the ImplantSafe® Check-up Program were tested for progression of active periodontal degeneration with ImplantSafe®. About 80% of patients with a positive test opted for more frequent personalized hygiene intervals. The visiting frequencies of those patients doubled from 1.4 visits per year to 2.8 visits per year (*van der Schoor 2018*). This increased adherence not only led to improved implant health with stable or slow progression of collagen degradation (*see Fig.4*) but generated a major increase of service and regeneration revenues for each implant or dental office. After analyzing the spending of over hundreds of individual patients over the course of 6 years, *van der Schoor et al.* found that those taking part in the ImplantSafe® Check-up Program spent 250% more each year in the practice (*van der Schoor 2018*).

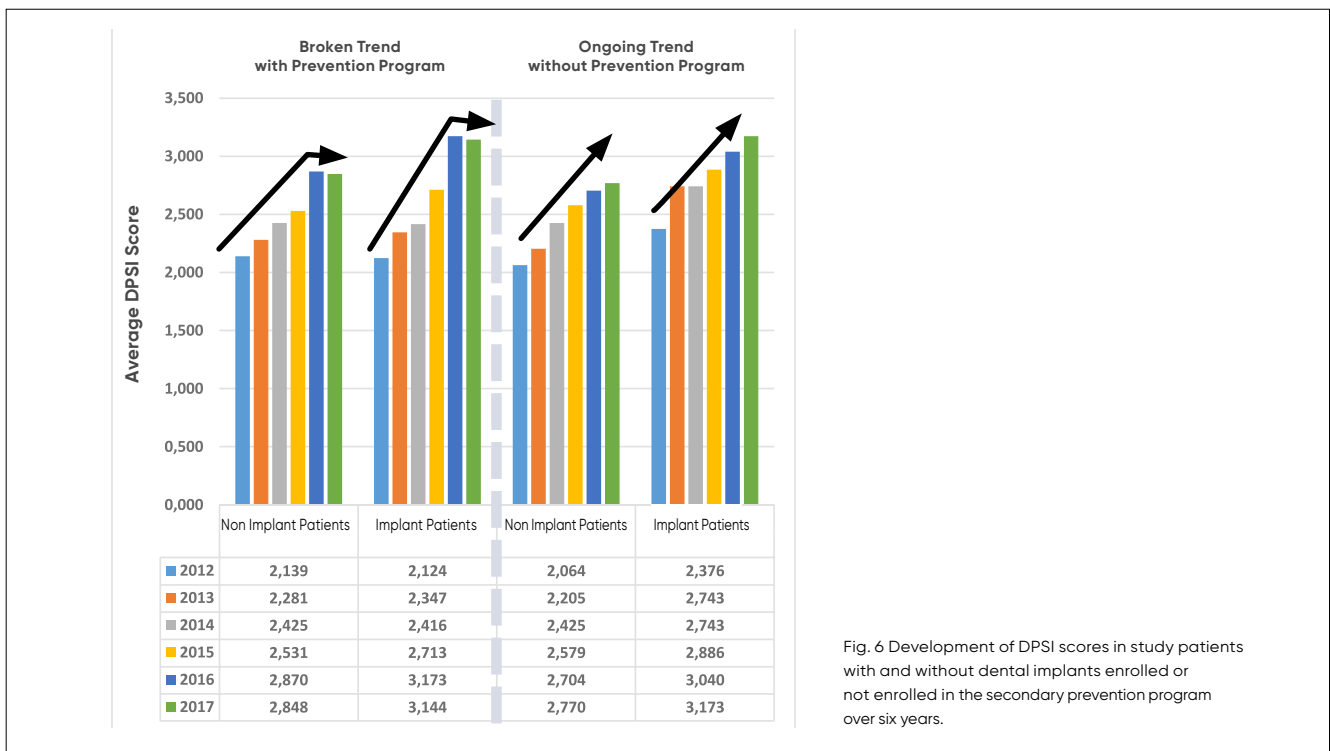


Fig. 6 Development of DPSI scores in study patients with and without dental implants enrolled or not enrolled in the secondary prevention program over six years.

## CONCLUSION

From the dentist’s point of view, implant maintenance and focus on prophylaxis of peri-implantitis can be a profitable business leading to a considerable increase in patient adherence, satisfaction and practice revenue. The ImplantSafe® Program is an effective tool to simplify integration into daily practice routine, screen patients in need and monitor progression and treatment effects.

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