

## WITSIE AT THE CUTTING EDGE: Researcher Profile

**Dr Steffen Mickenautsch**

**Co-Director: Systematic Review Initiative for Evidence-based Minimum Intervention in Dentistry**



### **Who are you and what is your academic/scientific training and background?**

I was born and bred in Germany and came to South Africa in 1994. In Germany, I completed my training as a dentist at the University of Leipzig. In the Netherlands, I was awarded my PhD in 2007 by the University of Nijmegen. In addition, I completed training in Evidence-based dentistry at the University of Oxford. Since 1994, I have been working with the Wits Department of Community Dentistry (during an interim-period the Division of Public Oral Health), first as dentist in the Department's mobile dental service and then as its manager until 2004. In 2005, I started working with Professor Yengopal on a systematic review programme, the "SYSTEM Initiative",

concerning minimum intervention in dentistry, which was recognized as a research programme by our Faculty in 2012. Since then I have been SYSTEM's research programme leader.

### **Explain the nature of the research that you are currently undertaking.**

In SYSTEM we are concerned with building an evidence-based body of clinical knowledge in Minimum Intervention (MI) dentistry. Minimum Intervention (MI) is a philosophy of health care consisting of:

- Disease risk assessment
- Earliest disease detection
- Minimally-invasive treatment

MI is valid for any type of oral disease and incorporates aspects of prevention and appropriate technologies. MI is patient centered and through its minimally-invasive focus, more patient-friendly than conventional oral health care. In addition, MI focuses on disease causes and not on its mere symptoms.

Despite the benefits which MI has, like any innovative concept, a difficulty lies in the process of dissemination. During dissemination of innovation, responses by potential adopters can vary between adoption, non-adoption or rejection. Responses are governed by insecurity concerning uncertainties about the advantages of new ideas as compared to those of current ones. Doubts regarding claims of superiority are justified if these are based on studies containing high degrees of bias. Bias has been defined as any process at any stage of inference tending to produce results that differ systematically from true values.

The problem of bias in studies concerning MI related topics is best addressed through the conduct of systematic reviews. Systematic reviews in health care have been described as providing objective overviews of all the evidence currently available on a particular topic of interest. Such overviews cover clinical trials in order to establish where effects of health care are consistent and where they may vary. This is achieved through the use of

explicit, systematic methods aimed at limiting bias and reducing the chance of effect. Systematic reviews have been recommended as providing the best source of evidence to guide clinical decisions and health care policy, and they receive twice as many citations as non-systematic reviews in peer-reviewed journals. Furthermore, systematic reviews are increasingly utilized in appraising the evidence regarding the cost-effectiveness of interventions, the costs of guideline dissemination and implementation or evidence from qualitative studies. For these reasons, SYSTEM has adopted the use of systematic reviews in order to achieve its stated aim.

**What do you think is the most pertinent/relevant/significant contribution you have made to research/science/your field?**

Through painstaking work we at SYSTEM were privileged to discover that glass-ionomer cements (GICs), a dental material that was developed for placing tooth restorations and for sealing pits and fissures, has better clinical efficacy than traditionally believed within the dental profession and dental academia.

In addition, I am very happy to have been involved in establishing the Berger-Exner test (a statistical test to identify 3rd order selection bias in clinical randomised control trials - RCTs) as a useful and accurate adjunct to the general RCT methodology in health care research.

**Did you have a particular mentor or supervisor who inspired you in research?**

Yes. I remain very grateful to Professor Jo Frencken at the University of Nijmegen for all his past guidance in dental research.

**Tell us about what you do when you're not busy at work and carrying out cutting-edge research.**

I attend to my garden.

**Read one of Steffen's papers:** Mickenautsch S, Yengopal V. Direct contra naïve-indirect comparison of clinical failure rates between high-viscosity GIC and conventional amalgam restorations. An empirical study. [PLOS One](#) 2013; 8: e78397.

