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Evidence-Based Medicine, Media, and Manipulation.

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Evidence-Based Medicine, Media, and Manipulation

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Over the past 5 decades, the speed of innovation in spine surgery has been nothing short of mindboggling in all arenas, including surgical techniques, implants, biologics, robotics, imaging, analytics, and perhaps most important, global high-quality education. With globally tightening health care budgets, the utilization and cost of care relative to return on investment has become a necessity. In developed countries, spine care has become a popular target of concern due to its increasing apportionment of general health care expenditures.¹ In the United States, spine care has ascended to the number 3 position in general health care spending behind diabetes and cancer, ahead of cardiovascular disease.²

One popular talking point to curb medical spending is to hold our medical community increasingly accountable through application of “evidence-based medicine,” a concept coined by Haynes and Guyatt in 1992, which is based on the integrated trifecta of research, patient preferences, and clinical experience.³ The increasing availability of increasingly larger data repositories and registries has made it tempting for some to perform something far simpler and readily available—analytics involving data mining and statistical modulations, usually to prove a point. There are, of course, many commonly known limitations to registry-based investigations, but such concerns are usually not well known outside the academic community and are certainly not part of the general public awareness, thus leading to a real potential for manipulation.⁴

An interesting case study for the impact of a well-publicized data mining expedition surfaced prominently in Germany in 2017 when a think tank endowed by a media giant trust fund presented its long anticipated *Fact check spine (Faktencheck Rücken)*.⁵ The basic premise of their health care series sounds very common-sensical and includes phrases like “... not all diagnostic tests and treatments are medically necessary...” and “... contribute to match health care utilization with the actual patient needs...” and perhaps more ominously to “... foster a stronger discourse of the public with their health system to better understand necessary reforms...” Their 2017 report on spine surgery followed a succession of previous spine-related projects concerning popular (mis)conceptions on back pain and spine imaging, so this surgery-related project

could be considered to be the latest iteration of a larger agenda driven campaign in the context of German spine care in general.^{6,7} By all means, Germany seems to be the ideal testing ground for such an investigation as it offers not only access to some of most advanced health care technologies in the world but also features the arguably most comprehensive medical utilization data capture for a country of its size with its highly regulated public/private mix of insurance carriers.

The key findings of a calculated 71% increase in spine surgery in Germany over a time period from 2007 to 2015 were projected through this media giant’s portals and predictably resonated vociferously in the other German mainstream media—with the theme that Germans better beware of the intentions of their spine surgeons, fueled by headlines like “Operate and cash in” (*Süddeutsche Zeitung*, June 19, 2017), “90,000 unnecessary spine surgeries in Bavaria” (*Wochenblatt*, July 18, 2017), and even “Crime scene spinal column” (*Die Zeit Online*, May 18, 2016) and similar postings in many if not most other conventional, online and television portals.⁸⁻¹⁹

The 2 investigators, who are listed as employees of a private health care data analytics company (IGES Germany), and as far as published are nonphysicians and without specialty qualifications in spine care, identified the need for their project in a 2001 quote by a German government health care committee, which identified “overutilization of spine procedures, unclear procedural indications” and “introduction of novel, poorly evaluated and especially minimally invasive surgeries.” From a scientific process standpoint, a formal hypothesis was not presented. The methodology involved a data query to the German diagnosis-related group (DRG) inpatient hospital discharge database for inpatient spine care of patients with 1 of 4 most prevalent diagnosis codes: “back pain,” “disc related,” “general spondylarthropathies,” “spondylosis.” Furthermore, the 3 most commonly used procedure codes were selected by the authors to study surgical utilization: “discectomies,” “arthrodesis,” “bony decompression.” Inclusion and exclusion criteria among other common features of a proper scientific publication were not listed in their report. They analyzed the 4 selected DRG discharge and procedure utilizations for the 402 health regions and its 16 states in Germany together with basic age-related



demographics and specialties responsible for the discharges with help of the national department of statistics and respective state offices (Statistisches Bundesamt).²⁰

The real coup of their report was perhaps that the “low back pain”-related inpatient discharge cohort in their investigation had risen dramatically by 73% during their observation window from 2007 to 2015. This is a very surprising trend, probably counter to the experiences in most other parts of the world and in the eyes of a spine practitioner would have likely been a reason for a deeper dive into nonsurgical care as the authors themselves acknowledged that probably less than 2% of this cohort actually had back surgery. From a methodologic perspective, it is important to note that this cohort on “low back pain” that the authors had selected represented more than 33% of the overall analyzed discharges and was likely *not associated with any spine surgical care*. This fact was mentioned in rather marginal fashion toward the end of the 113-page report.^{5(p91)} The conclusion that the major cohort of their investigation had nothing to do with their initially stated intent of looking into spine surgery utilization, however, did not enter their analysis.

Another relatively surprising finding of many was that the number of hospital-based discharges for discectomies had risen by only 9% despite a repeatedly stated concern that there might be overutilization of such procedures through the advent of less invasive procedures. The authors did, however, acknowledge that the growth of this procedure was attributable to the group of patients of age 70 years and older, not surprising, given the shifting age demographic of Germany. A more detailed exploration of the interesting and socially pressing topic of utilization of spine surgery in the elderly, despite similar findings for the procedure groups of fusion (+171% in the 85+-year-old group) and “bony decompression” (+130% in the group of 64- to 84-year-old subcohort), was unfortunately not undertaken.

There were many other interesting findings, which should have raised serious methodologic questions, such as the reporting that neurological and orthopedic surgeons actually had recorded declining case numbers in disc, spondylarthropathy, and neurosurgery in the spondylosis-related discharges during the years 2007-2015, while the specialty designated as “general surgery” had robust increases in all these domains. This perplexing finding would likely have raised significant questions to an enlightened investigator about the validity of the discharge codes in representing actual patient disease and surgeries performed, the capture rate of outpatient surgery centers, and specialty designations, which had changed for general and orthopedic surgery during the observation period as well as the nature of spine surgery training in Germany.

Perhaps the most remarkable omission of the authors was that they apparently collected their data from a national German procedure-based data (OPS) system. Not only had this coding system changed in 2013 during their observation window, they also apparently were unaware that the German procedure coding system allowed for unbundling of procedures—meaning that the number of procedures as reported by them and the number of actual surgeries performed was not equal and

that they therefore had consistently reported inflated numbers, perhaps due to ignorance, perhaps to bolster an agenda.

Furthermore, the authors very heavily emphasized regional variations in their gathering of spine discharge with a finding of 13-fold regional variations. However, the utilization of regional variations reporting has, since its inception by Wennberg et al in 1973, been fraught with controversy as it does not take into consideration complexities of population-based demand and the influence of supraregional care facilities, which may lead to cross-over of patients from other regions.²¹ In a geographically relatively confined country like Germany, these and other considerations did not enter into deliberations by the authors.

The actual reason for our elaboration on this misguided German data mining enterprise is not to criticize the 2 authors of this report and their agenda-driven, nonspine surgeon-advised, and methodologically flawed foray. It is to point out to our readership that as large-scale databases are becoming increasingly available around the world, there is a real potential for abuse of these valuable resources by interested parties. Once data mining expeditions commissioned by interested entities, which would obviously have not undergone stringent peer review offered by credentialed scientific publications, become operationalized by powerful platforms such as mass media, governmental agencies, and large insurance carriers, they can get rapidly propagated as reality and take a life of their own, and ultimately may deprive patients of actually very beneficial spine surgery. Of course, any expectation of a retraction of propagated poor data is not realistic. Indeed, the asymmetry of the projection power of a media giant compared with that of specialty organizations is illustrated in this German case with a very limited exposure given to the formal counterpoint to the *Faktencheck Rücken* as presented on a specialty website.²²

This example from Germany also presents a lesson in a missed opportunity. Undoubtedly, this was a very expensive investigation funded by a well-endowed major foundation. Sadly, this “investigation” was quite evidently not performed in conjunction with real content experts in the field of spine surgery. The risk of bias of such content experts like spine surgeons is a frequently held argument against such a collaboration, but it is essentially invalid if the investigators themselves are a priori biased. As most specialty societies are struggling to budget their operations, a true collaboration between a well-heeled outfit such as the foundation in question and a respected specialty society under the guidance of the principles of the evidence-based medicine movement could unlock a treasure trove of important insights that could reach well beyond Germany and help us all understand spine patients’ needs and demands better rather than to frighten the public unnecessarily. And more important, unjustifiably

Finally, it is up to us as spine surgeons around the world to be better custodians of our craft, critically evaluate newer and allegedly better procedures under scientific standards and contribute to the common good through our continued investigations into the patient and societal impact of spinal disorders and

our available remedies. And that accomplishment, perhaps, might be noteworthy to the media.

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