



BGM Associates Healthcare Roundtable Report

Healthcare in the Next Ten Years: Challenges and Solutions

June 2014

At the beginning of the year a small group of high caliber experts met at the invitation of BGM Associates in Berlin for a Healthcare Roundtable. Under the headline “Healthcare in the Next Ten Years: Challenges and Solutions“ the participants discussed the fundamental technologies and institutional changes which will transform prevention, diagnosis and therapy in the coming ten years.

The following participants joined in the discussion:

- Prof. Jörg Debatin, Radiologist, CEO of amedes Holding AG, and former Medical Director of University Medical Center Hamburg-Eppendorf;
- Prof. Michael Forsting, Director of Radiology Department, Essen University Hospital;
- Dr. Michael Jung, Economist and Director emeritus of McKinsey & Company;
- Prof. Heinz-Otto Peitgen, Mathematician, Co-Founder of MeVis Medical Solutions AG, and former longstanding Head of Fraunhofer Institute for Medical Image Computing (MEVIS);
- Prof. Günter Stock, President of the Berlin-Brandenburg Academy of Sciences and Humanities, and former longstanding Board Member for Research & Development of Schering AG;
- Stefan Widensohler, President of KRAUTH medical group, Co-Founder of Invatec S.p.A., and Vice Chairman of the German Medical Technology Association (BVMed).

The Roundtable was moderated by the Managing Partners of BGM Associates Prof. Gert Bruche and Prof. Hans Maier.

Question 1 | What medical innovations do you expect to see over the next 10 years? What impact do you anticipate them having on medical care provision and cost-effectiveness?

There was general consensus among participants that the complementary innovations in genomics and information technology (see exhibits on the following page for more details) are the fundamental drivers for the future of medicine and healthcare, and will create the conditions for a much more personalized medicine. The speed of uptake of the latter in daily healthcare practice, however, was a matter of controversy. In the prevailing opinion it was rather seen as a long-term evolutionary process, which would bring about major changes in the next ten years in cancer therapy in particular.

The participants agreed that today's modern in-vivo and in-vitro diagnostics provide a large amount of diagnostic and therapy-relevant information which, due to various barriers, cannot be used to its full potential. In Germany, for example, such barriers include the divisions and rivalry between different medical specialities and departments, the lack of integration of in- and outpatient healthcare delivery, partially wrong incentives set by the reimbursement systems, and deficits in medical education and training.

“Genetic medicine will become reality, but not within the next ten years.”

Michael Forsting



Michael Forsting



Side note | Genomics

The origins of modern genomics go back to the discovery and decoding of a then little-known molecule called deoxyribonucleic acid, or DNA, by James Watson and Francis Crick in 1953. As Watson and Crick phrased it “DNA...holds the key to the very nature of living things”.¹

The decoding of DNA kicked off a completely new science - molecular biology. The progress of molecular biology during the subsequent 60 or so years has been astounding. Not only has it yielded a stunning array of insights into fundamental biological processes, but it is now having an ever more profound impact on medicine, on agriculture and even on law and the fight against crime.

Based on increasingly efficient sequencing machines and dramatic advances in bioinformatics it is now possible to sequence a complete human genome in a very short time and at reasonable cost. The US-based company Illumina has recently brought costs down to US\$1,000 with their HiSeq X Ten Sequencing System.²

More recent areas of research in molecular biology dubbed “omics” try to discover the complex interaction of DNA with proteins (proteomics), with microorganisms and viruses (metagenomics) and try to solve the puzzle of heredity not related to DNA sequence but environmental conditions (epigenomics).³

A broader utilization of genomics in medicine will depend on the extent to which genetic information in combination with other disease-specific knowhow will facilitate a diagnosis which can really guide therapy decisions. This requires a much more intensive cooperation between genomics and therapeutic medicine, and the recognition of disease patterns based on broad, long-term epidemiological studies. Such changes are more likely to extend over two to three decades, rather than yield significant results in the short-to medium term.

However, a much more immediate shift in the current healthcare systems will be brought about by the dramatic improvements in patient and consumer access to information. The improved availability of information about diseases, prevention, diagnosis and therapy through the internet, health apps, and the like has already created better-informed, more empowered patients.



Side note | Information technology in medicine

Today information technology is already influencing medicine in a profound way and its advances will activate tremendous change in healthcare over the next decade and beyond.

Sensors, such as those used for blood glucose levels, heart rate or body weight, allow for constant measurement of quantified vital and health data. Likewise, health and fitness apps allow users to collect and store various measurements to help monitor therapies with ease.

The collection, connection and centralized storage of digital patient data is a prerequisite for the application of “big data” in modern medicine. Big data describes the statistical analysis and detection of patterns in vast, complex and heterogeneous data. This allows for the stratification of patient populations in order to individualize therapy decisions and monitoring in the sense of personalized medicine. In time, big data will also contribute to the discovery and development of new therapies and facilitate the assessment of new treatments.

Many public and private organizations are working on frameworks and solutions to introduce electronic patient files that allow access to individual health records any time anywhere. Web-based platforms will not only revolutionize doctor-patient interactions, but will also greatly impact how doctors interact amongst themselves. This has a great potential to save time as well as costs.

The foundation of all these advances is the ever-increasing processing capacity of semiconductors and the proliferation of high-speed networks. These developments are also crucial for faster and more efficient gene sequencing, as well as automated and standardized medical image processing.

Question 2 | Elias Zerhouni's proposition⁴ that we diagnose too late and hence apply therapy too late with a lower chance for recovery and often at very high costs seems plausible. Do you believe that a targeted early diagnosis (e.g. through screening methods) would be appropriate, feasible, and could be funded? How will 'earlier' diagnosis evolve in the medium term?

In Germany, screening as a method for early diagnosis is mainly used in breast cancer diagnosis, and in the fields of colon and skin cancer. Beyond that a certain emphasis on prevention can be found in prostate cancer and cervical cancer diagnostics. Attempts to detect first clinical signs of the onset of a disease make sense if a reliable diagnosis is available, and ideally if there is a therapy for the disease. It is nevertheless still necessary to consider costs and benefits, and unwelcome complications (especially false diagnoses). As recent research and the controversial discussions which followed have revealed, the true value of screening can only be assessed in long-term and complex studies. Moreover, there are many diseases such as brain tumors for instance, which elude early diagnosis.

An example of the complex challenges related to early diagnosis is dementia, especially Alzheimer's disease, which has a growing incidence amongst aging populations worldwide. The development of novel diagnostic tools (e.g. PET-CT imaging with a radioactive tracer) could make reliable, differential diagnosis of Alzheimer's happen much earlier. However effective therapies are not (yet) available.⁵

“Patients will not only ask, ‘what’s my disease and how do I get rid of it’, but will also want to know ‘what disease could I get, and what can I do to prevent it’.” Jörg Debatin



Jörg Debatin

Question 3 | How realistic is the pursuit of tailor-made therapies and a more targeted use of drugs (especially in oncology) with personalized medicine. Would they become much more effective while saving costs at the same time?

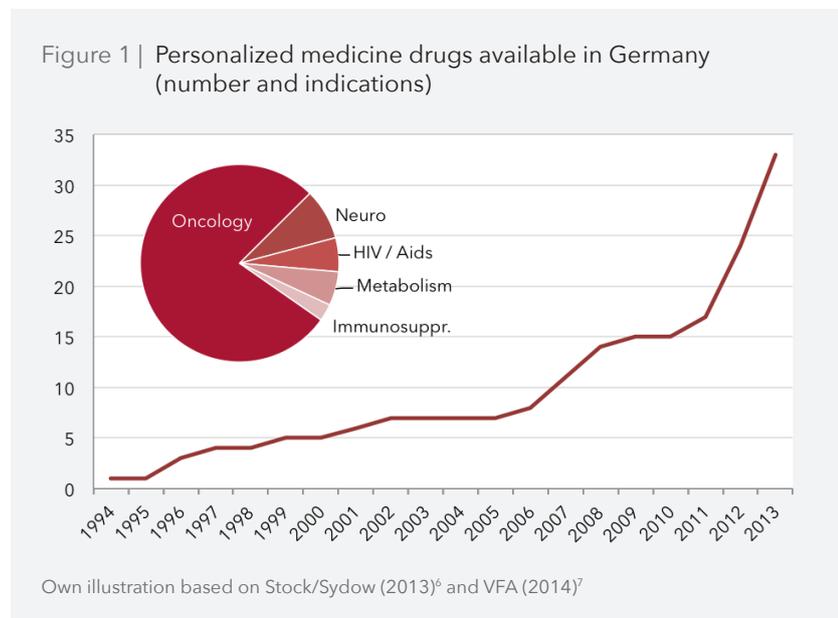


“Personalized Medicine will become reality, but it will arrive slowly and gradually.”

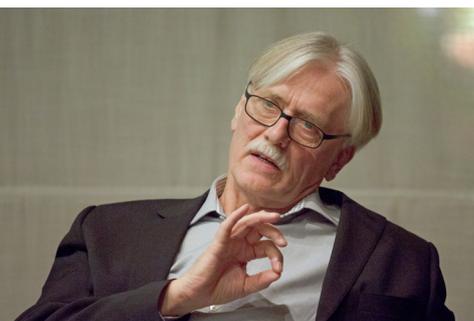
Günter Stock

Personalized medicine in the sense of diagnosis and therapy tailor-made to individual patients or special patient sub-groups is no longer just some future vision. Until today, however, the available tandems of drugs with a ‚companion-diagnostic‘ are limited to only a few indications.

All participants agreed that in this decade the spectrum of suitable indications for personalized medicine will continue to grow - a trend which is clearly visible in the actual drug approval statistics (see figure 1). A major driver, amongst others, is the rapid development in in-vitro diagnostics, where further breakthrough innovations are expected in the short to medium term.



Advances can be expected in avoidance of ineffective therapy, which spares patients of unwanted side effects and potentially decreases costs for healthcare systems. In indications where ‚companion-diagnostics‘ are not or not yet available, systematic therapy monitoring through (quantifiable) in-vivo



Heinz-Otto Peitgen

“Quantification can significantly improve diagnostic imaging, contribute to attain reproducibility and enhance quality and accuracy at a broader scale.” Heinz-Otto Peitgen

diagnostic methods such as computer-tomography, magnetic-resonance tomography and positron-emission-tomography gain in importance. In all these ways personalized medicine will contribute significantly to a more effective and

efficient medicine. Whether on balance there will be overall cost savings for healthcare systems is uncertain and difficult to assess from today’s perspective.

Question 4 | Which institutional, organizational and management changes would be sensible and realizable in order to simultaneously improve healthcare delivery and save costs?

All participants deplored the strong resistance to change which exists in the current healthcare systems of advanced economies, and saw this as the most important innovation barrier. Institutional inertia of these systems such as the separation of medical specialties from each other, growing problems of physicians as well as nursing staff to keep up with scientific-technical progress, demands by regulatory authorities which stifle innovation, lack of openness of many physicians to fully exploit the opportunities provided by information technology and genomics were some of the issues highlighted in the discussion.

Participants also called for a paradigm shift in the pharmaceutical industry: to give up useless ‚me-too-innovations‘ and the almost exclusive focus on healthcare professionals, to pursue a more patient-centered medicine, and to assume responsibility for the success of therapies (e.g.

readiness to accept outcome-related pricing, and a final pricing only after broad application and testing in practice). The current public debate about pricing and consequently breadth of ‚access‘ for a new hepatitis C therapy from US company Gilead demonstrates the growing pressure on the pharmaceutical and healthcare industries for justifiable pricing, and also indicates the request to not only rely on commercial criteria. Against this backdrop Health Technology Assessment will increase in importance.

The majority of the experts around the table pin their hopes for a reform of today’s healthcare systems on the well-informed, empowered patient who creates the required pressure for change. Based on the digital revolution and the concomitant knowledge transfer, it is predicted that well informed patients, patient self-help groups and new market participants in the healthcare sector will enforce the necessary changes toward a high-quality, personalized medicine. A short glance on the new health insurer Oscar from New York is worthwhile here. Oscar helps their members inter alia in self-diagnosis and in the search for suitable physicians. The trend for the empowered patient has also been picked up by various established market participants, like private hospital chains, which offer integrated support and insurance services (e.g. the partnership between Helios and the German Debeka), drug store and pharmacies which offer GP-like services (e.g. CVS Caremark in the US), and worldwide information providers such as Google. These new players will increasingly challenge established formations like professional medical associations and societies, regulatory bodies and healthcare payers.

“It is critical to identify the conditions under which the resistance to change of the system can be turned around.” Michael Jung



Michael Jung

“We need a framework which enables patients to really take sovereign decisions.” Jörg Debatin



Stefan Widensohler

“We need IT-solutions which help patients to carry their complete medical history with them being able to decide who can access it.”

Stefan Widensohler

In this way the prediction of the American physician and mastermind of a modern medical care, Eric Topol would come true, namely that healthcare will be revolutionized first and foremost by two factors, technology (information technology and genomics) and the empowered patient resp. consumer.

We express our heartfelt thanks to the participants at the roundtable for a very constructive and stimulating debate.

About BGM Associates Working Papers

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We kindly invite you to further discuss trends in the healthcare environment with us. Please do not hesitate to contact our Managing Partners by phone or by mail.

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Sources

1. Watson, J. & Berry, A. (2003) *DNA – The Secret of Life*. Random House, London.
2. Illumina, Inc. (2014) Illumina introduces the HiSeqX Ten Sequencing System. Press release, 14 January 2014.
<http://investor.illumina.com/phoenix.zhtml?c=121127&p=irol-newsArticle&ID=1890696>
(last accessed on 28 May 2014)
3. Topol, E. (2012) *The Creative Destruction of Medicine: How the Digital Revolution Will Create Better Health Care*. Basic Books, New York.
4. Zerhouni, E. A. (2008) Major Trends in the Imaging Sciences. *Radiology* (249) pp. 403-409.
5. Schipke C.G. et al. (2012) Impact of beta-amyloid-specific florbetaben PET imaging on confidence in early diagnosis of Alzheimer's disease. *Dement Geriatr Cogn Disord* (33) pp. 416–422.
6. Stock, G. & Sydow (2013) Personalisierte Medizin: Paradigmenwechsel in der Arzneimittelforschung und -therapie. *Bundesgesundheitsblatt* (56) pp. 1495–1501.
7. Verband Forschender Arzneimittelhersteller e.V. (2014) In Deutschland zugelassene Arzneimittel für die personalisierte Medizin. Web-based database.
<http://www.vfa.de/de/arzneimittel-forschung/datenbanken-zu-arzneimitteln/individualisierte-medizin.html> (last accessed on 28 May 2014)
8. Ward, A. (2014) Gilead pressed on hepatitis C drug cost. Newspaper article, *Financial Times*, 10 April 2014.
9. The Economist (2014) The geek guide to insurance – An attempt to change America's most arcane industry for the better. *The Economist*, 4 April 2014.
10. Reuters (2013) Fresenius stößt in Geschäft mit Krankenversicherung vor. Newspaper article, Reuters Website, 29 May 2013.
<http://de.reuters.com/article/companiesNews/idDEBEE94S03W20130529> (last accessed on 2 April 2014)
11. Raval, A. (2014) CVS takes steps towards walk-in clinic expansion. Newspaper article, *Financial Times*, 7 February 2014.

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