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BIOTECHNOLOGY: A HEALTHY REVOLUTION

**The Amigo Society in the Stockholm Network
Conference, Brussels 24 May 2005**

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- 1. The Healthcare Trends towards 2015**
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1. The Healthcare Trends towards 2015

The application of modern approaches and technologies bring the potential to radically transform public health and healthcare for those who cannot now afford such care, while enabling unprecedented levels of care for those who can. We stand at the threshold of an exciting new era in healthcare. Innovators and entrepreneurs who come up with newer and better ways of providing care are likely to benefit substantially - and they stand to make a real and very substantial difference in the lives of millions.

1.1 Changing Demographics and Attitudes

1.1.1 Equal treatment for men and women

1.1.2 Increasing urbanisation

1.1.3 Greying of populations

1.1.4 Increasingly educated and affluent populations

1.1.5 Increased prosperity, so that an increasing amount can be spent on health care since spending power is growing.

1.1.6 Rising expectations that are strongly individually oriented. The overestimation of options and results in medicine is general among doctors and patients. People do not sufficiently realise that they were and are doing well when they apply healthcare in a critical manner.

1.1.7 Individualism in society: all patients want customised care. All patients are at the centre of their worlds and care provision will adapt to it.

1.1.8 Changed outlook on risks: what seemed a piece of cake yesterday, is getting very important today and will acquire a mythical meaning, removed from the actual risk. Let's just think of the dioxin crisis and mad cow's disease.

1.2 The Need to Manage Costs while Ensuring Best Possible Outcomes

1.2.1 From fee-for-service based healthcare to integrated healthcare management

1.2.2 Growing emphasis on cost-effectiveness and quality of care

1.3 Rethinking the Healthcare Paradigm responding to the Wellness Opportunity

1.3.1 A Move from disease management to wellness management (emphasising health promotion, disease prevention, and a focus on quality of life)

1.3.2 A shift toward personal responsibility for maintaining health versus state responsibility

1.2 The Need to Manage Costs while Ensuring best possible Outcomes

We are moving toward increasingly **integrated and more holistic perspectives** on health and disease where we focus more on wellness and disease management, and where we recognise that prevention and health promotion are not only more cost-effective, but are also more rational. In fact, it may already be too late when a patient develops symptoms and signs of disease - there is increasing focus, therefore, on working to ensure that the earliest manifestations are identified, and disease progression is halted and reversed before any long-term sequel occur.

Care providers are under pressure to provide high quality **healthcare that is affordable** to the consumer while still being able to generate profitability. All this has to be accomplished in a highly regulated healthcare environment.

1.3 Rethinking the Healthcare Paradigm responding to the Wellness Opportunity

There is growing interest and demand for wellness-orientated products, services and technologies. Arguably "lifestyle" products and services, the market for nutraceuticals, cosmeceuticals, and technology solutions for disease monitoring and management (including electronic medical monitoring devices) is growing at a rate that is at least twice that of pharmaceuticals.

The popularity of ginseng, green tea, and royal jelly based products as well as products that demonstrate high anti-oxidant and other functional benefits (including, increasing mental alertness, providing greater "vitality" - a common code word for sexual energy - and other benefits including improved skin complexion, and so on).

Additionally, health spas, massage therapy, beauty and "wellness" clinics (including those offering slimming services, plastic surgery, botox injections) and a host of new technology and service-based offerings are operating on the fringes of the healthcare industry.

2. The Technology Revolution

2.1 Revolution of Living Things

2.2 Revolution of Materials

2.3 Revolution of the Information Availability

Life in 2015 will be revolutionized by the growing effect of multidisciplinary technology across all dimensions of life: social, economic, political, and personal.

Biotechnology will enable us to identify, understand, manipulate, improve, and control living organisms (including ourselves).

2.1 The Revolution of Living Things

2.1.1 Genetic Profiling and DNA analysis

2.1.2 Cloning

2.1.3 Genetically Modified Organisms

Biotechnology will begin to revolutionise life itself. Disease, malnutrition, food production, pollution, life expectancy, quality of life, crime, and security will be significantly addressed, improved, or augmented. Better disease control, custom drugs, gene therapy, age mitigation and reversal, memory drugs, prosthetics, bionic implants, animal transplants, and many other advances may continue to increase human life span and improve the quality of life.

Some advances could be viewed as accelerations of human-engineered evolution of plants, animals, and in some ways even humans with accompanying changes in the ecosystem. Some advances may even improve human performance beyond current levels (e.g., through artificial sensors).

Research is also under way to create new, free-living organisms.

Increased quantity and quality of human life are the most significant effects

Biomedical advances (combined with other health improvements) will

continue to increase human life span in those countries where they are applied. Such advances are likely to lengthen individual productivity but also will accentuate such issues as shifts in population age, financial support for retired people, and increased health care costs for individuals.

ISSUES IN BIOTECHNOLOGY

Despite these potentials, we anticipate continuing controversy over issues as:

. **Eugenetics:** by 2015 we may have the capability to use genetic engineering techniques to "improve" the human species. These will be very controversial developments—among the most controversial in the entire history of mankind.

. **Cloning of humans,** including concerns over morality, errors, induced medical problems, gene ownership, and human breeding. Cloning, especially human cloning, has already generated significant controversies across the globe. Some believe, however, that human cloning may be accomplished soon if the research organisation accepts the high lethality rate for the embryo and the potential generation of developmental abnormalities.

. **Gene patents** and the potential for either excessive ownership rights of sequences or insufficient intellectual property protections to encourage investments;

- . **Privacy of genetic profiles** (e.g., nation-wide police databases of DNA profiles, denial of employment or insurance based on genetic predispositions). The ability to profile an individual's DNA is already raising concerns about privacy and excessive monitoring. Examples include databases of DNA signatures for use in criminal investigations, and the potential use of genetically based health predispositions by insurance companies or employers to deny coverage or to discriminate. The latter may raise policy issues regarding acceptable and unacceptable profiling for insurance or employment. This issue is further worrisome because the exact code-to-function mechanisms that trigger many disease predispositions are not well understood.
- . **The safety and ethics of genetically modified organisms**; The danger of environmental havoc from genetically modified organisms (perhaps balanced by increased knowledge and control of modification functions compared to more traditional manipulation mechanisms);
- . **The use of stem cells** (whose current principal source is human embryos) for tissue engineering;
- . **Concerns over animal rights** brought about by transplantation from animals as well as the risk of trans-species disease;
- . **An increased risk of engineered biological weapons** (perhaps balanced by an increased ability to engineer countermeasures and protections).

Some have likened the anti-biotechnology movement to the anti-nuclear-power movement in scope and tactics, although the low cost and wide availability of basic genomic equipment and know-how will likely allow practically any country, small business, or even individual to participate in genetic engineering. Such wide technology availability and low entry costs could make it impossible for any movement or government to control the spread and use of genomic technology.

At an extreme, successful protest pressures on big biotechnology companies together with wide technology availability could ultimately drive genomic engineering "underground" to groups outside such pressures and outside regulatory controls that help ensure safe and ethical uses. This could ironically facilitate the very problems that the anti-biotechnology movement is hoping to prevent. Advances in genomics could advance a race between threat engineering and countermeasures. Thus, although genetic manipulation is likely to result in medical advances, it is unclear whether we will be in a safer position in the future.

2.2 The Revolution of Materials

2.2.1 Smart Materials

2.2.2 Agile Manufacturing

2.2.3 Nanofabricated Semiconductors

2.2.4 Integrated Microsystems

2.3 The Revolution of the Information Availability

Smart materials, agile manufacturing, and nanotechnology will change the way we produce devices while expanding their capabilities.

Materials technology will produce products, components, and systems that are smaller, smarter, multi-functional, environmentally compatible, more survivable, and customisable.

These products will not only contribute to the growing revolutions of information and biology but will have additional effects on manufacturing, logistics and personal lifestyles.

The revolution of information availability and utility will continue to profoundly affect the world in all these dimensions.

ISSUES IN REVOLUTIONS OF MATERIALS

- . Accelerating pace of technological change
- . Increasingly multidisciplinary nature of technology
- . Competition for technology development leadership
- . Continued globalisation

Taken together, the revolution of information, biology, materials, devices, and manufacturing will create wide-ranging trends, concerns, and tensions across the globe by 2015.

Despite the inherent uncertainty in looking at future trends, a range of technological possibilities and impacts are foreseeable and will depend on various enablers and barriers

The figure [Range of Possible Future Developments and Effects from Genetically Modified Foods] shows the range of potential paths that genetically modified foods might take along with enablers, barriers, and effects. Investments and genome decoding are fuelling the ability to modify and engineer organisms to provide needed capabilities, but social concerns are already affecting the generation and use of GM foods, especially between the United States and European Union. In an optimistic 2015, GM foods will be widespread, resulting in significant benefits for food quality, global production, and the environment

Policy controls or lack of investments might moderate the production and use of GM foods, leading to increased reliance on traditional mechanisms for food productivity increases and pest control.

The interacting with various enablers and barriers are given by Philip S Anton in the Global technology Revolution , prepared for the National Intelligence Council of Canada:

smart materials,
integrated microsystems
information technology
genetic manipulation

BIOTECHNOLOGY: A Healthy Revolution ?

Concerns and Tensions

Concerns and tensions regarding the following issues already exist in many nations today and will grow over the next 15 years:

- **Class disparities.** As technology brings benefits and prosperity to its users, it may leave others behind and create new class disparities. Although technology will help alleviate some severe hardships (e.g., food shortages and nutritional problems in the developing world), it will create real economic disparities both between and within the developed and developing worlds. Those not willing or able to retrain and adapt to new business opportunities may fall further behind. Moreover, given the market weakness of poor populations in developing countries, economic incentives often will be insufficient to drive the acquisition of new technology artifacts or skills.
- **Reduced privacy.** Various threats to individual privacy include the construction of Internet-accessible databases, increased sensor capability, DNA testing, and genetic profiles that indicate disease predispositions. There is some ambivalence about privacy because of the potential benefits from these technologies (e.g., personalized products and services). Since legislation has often lagged behind the pace of technology, privacy may be addressed in reactive rather than proactive fashion with interleaving gaps in protection.
- **Cultural threats.** Many people feel that their culture's continued vitality and possibly even long-term existence may be threatened by new ways of living brought about by technology. As the benefits of technology are seen (especially by younger generations), it may be more difficult to prevent such changes even though some technologies can preserve certain cultural artifacts and values and cultural values can have an impact on guiding regulations and protections that affect technological development.

Technology's promise is here today and will march forward. It will have widespread effects across the globe. Yet, the effects of the technology revolution will not be uniform, playing out differently on the global stage depending on acceptance, investment, and a variety of other decisions. There will be no turning back, however, since some societies will avail themselves of the revolution, and globalisation will thus change the environment in which each society lives. The world is in for significant change as these advances play out on the global stage.

This is certainly also true for the healthcare.

Citizens and decisionmakers need to inform themselves about technology, assembling and analysing these complex interactions in order to truly understand the debates surrounding technology. Such steps will prevent naive decisions, maximise technology's benefit given personal values, and identify inflection points at which decisions can have the desired effect without being negated by an unanalysed issue.

3 Impact of the Technology Revolution in Healthcare

- 3.1 Biomedical Sciences : Diagnostics and Pharmaceuticals
- 3.2 Biomedical Engineering
- 3.3 Health-IT

3.1 Biomedical Sciences

It is generally thought that the biggest impact of the unravelling of the human genome will be in the biomedical sciences. The sequencing of genomes represents only the first step in translating the newly understood genetic data to practical application. The implications are far-reaching and will have a myriad of socio-economic effects ranging from better and faster disease diagnosis, to improved drugs, individually tailored medical treatments and more proactive disease prevention.

3.1 Biomedical Science

- 3.1.1 Diagnostics
- 3.1.2 Pharmaceuticals and drug development
- 3.1.3 Individually tailored medical treatments
- 3.1.4 More proactive disease prevention

3.1.1 Diagnostics

Key drivers of growth in the diagnostics sector in the future are expected to include molecular diagnostics, point-of-care diagnostics , and diabetes testing.

New developments in genomics and proteomics have fuelled rapid growth and interest in the development and marketing of molecular diagnostic tools and technologies for research and future clinical application - for gene-based diagnostics, pharmagenomic screening and diagnostics, and in high-throughput drug screening and discovery. Hence micro array-based diagnostic tools and DNA sequencers have witnessed growth in excess of 20% annually in recent years, while DNA synthesisers and nucleic acid amplification technologies have experienced growth exceeding 10%.

Concerning Point-of-care diagnostics, primary interest is expected to focus on rapid infections disease diagnostics, drug testing, as well as cancer and chronic disease screening.

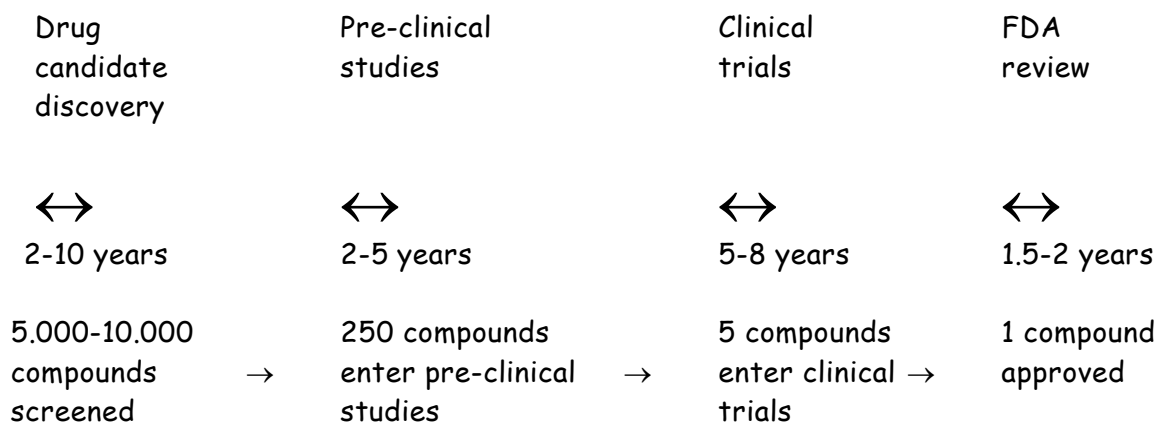
The importance of follow-up for diabetes is discussed later on this paper.

3.1.2 Pharmaceutical and Drug Development

It is generally estimated that only 1 in 10,000 drug candidates makes it through the developmental process to enter the market. Even when a drug gets to clinical trials, only 1 in 5 have historically made it to market.

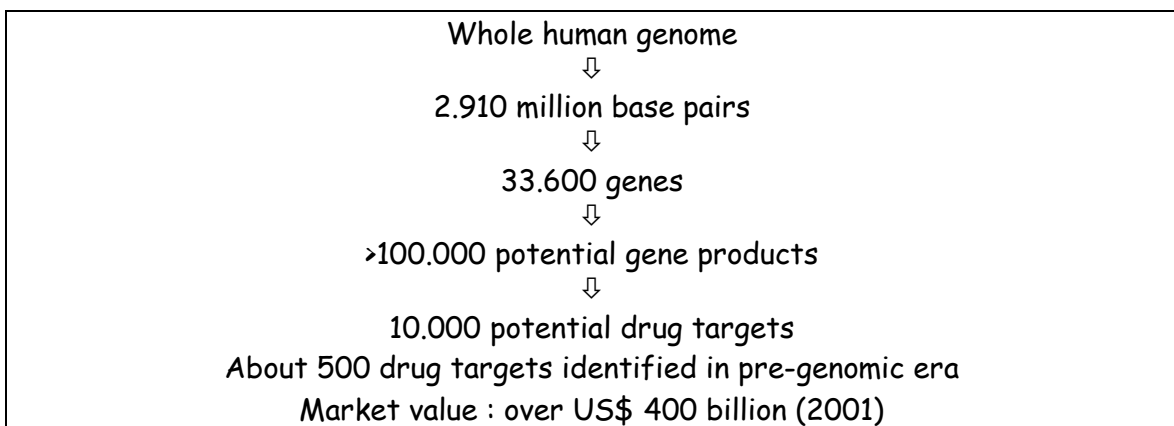
The high failure rate for drug candidates, the long drawn out process, and the expense involved in taking even a single drug to approval through the developmental process are further on unacceptable.

Fig 7.1 The traditional "Pre-Genomic" Drug Development Process



Source : Lynk Biotech, 2001

Fig. 7.2 Implications of New Findings in Genomic and Proteomics for Drug Discovery and Development



Source : Lynk Biotech, 2001

The traditional approach to drug discovery and development, including taking a drug candidate through pre-clinical testing and then the clinical trial and regulatory approval process, has been an inefficient. Long-drawn out process could take as much as 10 to 15 years or longer (see fig. 7.1), and cost as much as US\$ 800 million or more.

Our knowledge and understanding of structure and function to design molecules that would likely have the desired effect can predict and valid the effect through wet lab studies.

Rational drug design based on structure-function relationships between drug and receptor site - this approach has attracted increasing interest - growing potential and success arising from breakthroughs in genomics, proteomics, receptomics, bioinformatica and in silico drug design capabilities.

The biopharmaceuticals sector is generating growing interest in the development, testing and manufacturing of vaccines, recombinant protein drugs, and monoclonal antibodies.

Advances in biotech-based drug design and development technology in the post-genome era promise to lead tot increased success and efficiency, as well as lower development cost, for new drugs. The increasing availability of novel technologies developed by biotech players is helping to drive collaboration and strategic alliances between big pharma and biotech players internationally and in the region.

Computer simulations combined with proliferating trends for molecular imaging technologies (e.g., atomic-force microscopes, mass spectroscopy, and scanning probe microscopes) may continue to improve our ability to design molecules with desired functional properties that target specific receptors, binding sites, or markers, complementing combinatorial drug search with rational drug design. Simulations of drug interactions with target biological systems could become increasing useful in understanding drug efficacy and safety.

3.1.3 Individually tailored medical treatment.

Advances in pharmacogenomics and increasing understanding of how genetic variations can contribute to varying drug efficacy of the risk of adverse reactions are pushing us increasingly toward personalised medicine. While a move in this direction will undoubtedly benefit individual patients, it may spell, in time, a move away from "one-size-fits-all" mass manufactured blockbuster drugs to having small batches of customised drugs made to order at friendly neighbourhood pharmacies or laboratories. Such dynamics will inevitably alter the face of the pharmaceutical industry internationally.

3.1.4 More proactive disease prevention

New approaches might block a pathogen's ability to enter or travel in the body, leverage pathogen vulnerabilities, develop new countermeasure delivery mechanisms, or modulate or augment the immune response to recognising new pathogens. These therapies may counter the current trend of increasing resistance to extant antibiotics.

In addition to addressing traditional viral and bacterial problems, therapies are being developed for chemical imbalances and modulation of chemical stasis. For example, antibodies are being developed that attack cocaine in the body and may be used to control addiction. Such approaches could have a significant effect on modifying the economics of the global illegal drug trade while improving conditions for users.

Drug development will likely be aided by various technology trends and enablers.

Thus, the economics of the pharmaceutical and health industries will likely change significantly if these trends come to fruition. Note that patent protection is not uniformly enforced across the globe for the pharmaceutical industry. As a result, certain regions (e.g., Asia) may continue to focus on production of non-legacy (generic) drugs, and other regions (e.g., the United States, United Kingdom, and Europe) will likely continue to pursue new drugs in addition to such low-margin pharmaceuticals.

3.2 Biomedical Engineering

3.2.1 Organic Tissue and Organs

3.2.2 Artificial Material, Organs, Bionics

3.2.3 Biomimetics and Applied Biology

3.2.4 Surgical Biotechnology

By 2015, one can envision: effective localised, targeted, and controlled drug delivery systems; long-lived implants and prosthetics; and artificial skin, bone, and perhaps heart muscle or even nerve tissue.

Theological debates have raised concerns about the definition of what constitutes a human being, since animals are being modified to produce human organs for later xenotransplantation in humans. Genetic profiling may help to inform this debate, as we understand the genetic differences between humans and animals.

Improved understanding of human intelligence and cognitive function could have broader legal and social effects.

Understanding innate personal capabilities and job performance requirements could help us determine who would make better fighter pilots, who has an edge in analysing complex images, and what types of improved training could improve people's capabilities to meet the special demands of their chosen careers.

Ethical concerns could arise concerning discrimination against people who lack certain innate skills, requiring objective and careful measures for hiring and promotion.

Eventually, neural and sensory implants could radically change the way people sense, perceive, and interact with natural and artificial environments. Ultimately, these new

capabilities could create new jobs and functions for people in these environments. Such innovations may first develop for individuals with particularly challenging and critical functions (e.g., soldiers, pilots, and controllers), but innovations may first develop in other quarters (e.g., for entertainment or business functions), given recent trends.

3.3 Health I T

3.3.1 Wellness and Disease Management

3.3.2 Chips

3.3.3 Telemedicine

3.3.4 Information

3.3.1 Wellness and Disease Management

The opportunity and potential to apply new tools and technologies to facilitate non-invasive, ambulatory measurement and monitoring of biometric parameters for wellness and disease management is enormous. This is especially true in relation to chronic conditions such as diabetes mellitus (affecting as many as 10% or more of most adult populations), hypertension (affecting about 25% or more) and lipid/cholesterol abnormalities (affecting 17% or more). Substantial work in developing innovative diagnostic tools and devices in these areas is currently underway in major centres throughout the world.

A recent study in Germany, for example, showed that annual medical costs for a diabetic with no complications was about € 2000 a year, but exceeded € 5000 when complications developed.

The reality is that complications arising from deterioration of diseases such as diabetes and hypertension are essentially preventable, and patients can be maintained in good health with more effective control of disease. Such solution can be expected to bring savings of 50% or more in direct and indirect healthcare costs, while maximising patient well-being and improving patient-provider interaction.

We are still in the very early days of developing and implementing bio measurement and bio monitoring tools and devices, and of translating research and development findings into practical application.

3.3.2 Chips

The deepening relationship between the electronics and life science sectors is responsible for creating a growing range of novel technologies such as gene and protein chips. Varied potential uses including rapid disease diagnosis and management, and "high-throughput" natural product screening, as well as cutting-edge medical devices for patient monitoring and management.

3.3.3 Telemedicine refers to the electronic transfer of patient-specific medical information from one location to another for the purpose of improving patient care. This broad definition encompasses any technology used for the delivery of healthcare

services and medical education over a distance, including teleconsultation and remote monitoring of patient vital signs for disease management, teleconsultation and telesurgery.

3.3.4 Information

New developments in information and communication technology and in medical devices for disease and wellness monitoring, create the opportunity to establish innovative service delivery approaches that are more cost-effective and can result in great improvements in health outcome.

The field of Bio-IT represents a marriage of cutting edge information technology with frontier science to enable scientists to make better sense of the data and information glut arising from various fields of biomedical research, and will facilitate testing and evaluation of biotech products and their subsequent registration and marketing.

4. Personal Propositions

4.1 E-Health

4.2 Innovative medicines

4.3 Care programs for chronic diseases

4.4 Patient-driven medicine

4.1 E-Health

Medical monitoring is an option that should be further developed.

The entire offer of new technological services lowers health care cost for both individuals and society. It lowers the individual expenses of users, who for example are able to stay home longer without being forced to go to a nursing home. It also lowers health insurance costs since fewer fixed care costs must be paid. In addition chronic illnesses may be better monitored at a lower cost, while complications and hence also admission to hospital may be prevented more efficiently.

The government and health insurance is able to support the organisation of new initiatives in this matter. In the first place an experiment can be set up. As is the case for other aspects of the service sector there is pressure for savings on all costs that are not useful to patients.

Doctors are at the source of many databases that support policy measures that are known not to always be favourable to patients. But how can doctors sound believable without a minimum knowledge of results from their own experience? If a single collective effort must be made by individual decision-makers, it is the collection of a minimum of useful details about their own experience. Doctors are free, independent, and responsible, in one word, ethical. What are they waiting for to register their data?

Connecting everyone and everything wirelessly where necessary is the future. Innovation in telecommunications and IT can contribute to increased prosperity, improved wellness and better health.

4.2 Innovative medicines

Facts show that an annual excess of healthcare budget is observed, as a result of ageing, innovation and the increase in wealth of our society.

That is why the following strategic changes are essential in the pharmaceutical market:

- It is up to the government to create an environment that stimulates the pharmaceutical industry instead of stifling it. This environment is made up of a set of fiscal, economic and social regulations.
- For patients the government guarantees rapid access to innovation. It has to be proven how and how much costs can be saved through innovation vis-à-vis existing products.
- The government takes responsibility for open communication, for example a website with official information: "This is what we think".
- Publications and advertising of registered medicines remain strictly subject to regulations. The source of information must be clearly mentioned always and everywhere.

How can patients quickly have access to reimbursement of innovative medicines, without disrupting the health insurance budget?

To this end a separate "innovation fund" should be set up, co-managed by the innovative industry and patient associations. Within this fund innovative products can be quickly reimbursed while awaiting structural compensation by the health insurance.

In addition further European initiatives in the area of recognition and price-fixing of medicines and equipment must be encouraged. Currently each country invests a lot in this recognition and price-fixing, which obviously leads to the wasting of means. In addition a European system would result in fewer problems with purchasing medicines and equipment abroad.

4.3 Care Programs for chronic diseases

How can we follow the patient all through the development of his disease, through all the stages in its evolution and for all caregivers in their co-ordinated activities?

Concerning networks

Care programs require an adapted organisation, not new buildings. They require networks which, on the basis of free participation of informed patients regulate the medical, nursing and supporting tasks. These networks integrate prevention, diagnosis, treatment, control and follow-up of a disease and its costs, including the high demands concerning useful, reliable and exhaustive information which is to be at the disposal of all concerned. The well-informed patient is a strong partner for a sensible and economical use of the health services.

Concerning consultation and practice

Setting specific objectives in health care comes about on the basis of the population's needs (see health inquiries), the priorities supplied by groups of patients, the scientific input (supplied by experts), the financial possibilities.

The networks of co-operation can be gradually developed in a flexible way. In these networks the general practitioner can be given an attendant and remunerated task. To the patient they can guarantee a larger degree of freedom with regard to the choice of caregivers and in care programs than the rigid regulation of a strict evidence-based medicine and than the rigid structures of institutions imposed by the government.

Concerning the budget

In the framework of care programs for homogeneous groups of patients standard procedures can serve as a basis to establish the sum total of expenses with a view on specific objectives in accordance with the stated needs. These health objectives can be elaborated according to the SMART-principle: specific, measurable, realisable, result-oriented, time-bound.

4.4 Patient-driven medicine

Here the problem of lack of means is posed—a structural shortage—to relieve all medical costs. Where do you put priorities?

The first ethical standard ought to be giving preference to matters that have a great positive impact on many people, and removing those items from health insurance whose usefulness is not proven.

Based on the same standard it would also be wrong to concede *something* to each requesting group for the sake of peace and quiet. This way of spending money creates an illusion of balance, but *is* not balanced since it does not take into account actual needs. These needs can only be brought to light through scientific research.

In setting priorities in health care the government shall see to it that scientific criteria are followed that focus on the parties most involved, namely patients.

This state of affairs has alarming consequences for the affordability of health care. On the one hand patients and their families want "the most advanced treatment methods, affordable or not". On the other hand we want the latest technological options to be "available to everyone". This tension--the best for everyone--puts such a strain on joint-liability health insurance that we have to improve this system in order to save it.

Free choice is an essential feature of our health care. It explains to a large extent the attractiveness of our care system.

It therefore goes without saying that patients are able to choose their own insurer. They are also able to choose between a high-risk lifestyle and an average-risk lifestyle. Reimbursement of specific services can be modulated depending on the patient's

lifestyle. For it is reasonable to consider that the reimbursement of medication for lung and blood vessels disorders is also determined by whether the patient smokes or not.

With the rational and more functional use of medical services personal prevention of adverse factors could become a *conditio sine qua non* for bearing medical expenses in mandatory insurance based on joint liability. Patients, however, maintain free choice. They could (or would have to) enrol in additional insurance, of their choice, but where they bear the consequences of variable premiums. A financial bonus will be an incentive for people to take their own responsibility for a healthy lifestyle.

Political discussions can be conducted as to whether this additional insurance will remain optional or become mandatory. The political discussion must be conducted to the same degree and at the same time as to whether additional insurance has an acknowledgement obligation. This acknowledgement obligation may be worked out in the same way, as is the case for the acknowledgement of special risks in private car insurance.

If we are to manage health care from this patient point of view, it is crucial that patients get their own unregulated representation in the consultation model with the government, insurance companies, care institutions, caregivers. Patient groups are able to structure themselves with experts in their disorders and with subsidies from the government. In this way patients take on increased responsibility for an optimal health care system for everyone. In the transition from passive risk insurance to active risk management patients will increasingly take over the reins. Through their own free choice health insurance will remain affordable.

Two main themes can then be developed, namely from essential care to customised care and from mandatory health insurance to customised insurance. Where are the boundaries of said individual model? These are established in a continuous social and political debate by society itself.

Earlier attempts to set priorities in the area of health care, derailed primarily in two aspects. On the one hand they had insufficient insight into the actual difficulties in reconciling efficiency and equality. On the other hand the problem did not appear solvable based on sheer justice considerations, since many sources of inequality, also in terms of education, housing and way of life, run through the debate. That is also the reason why we had better focus the dynamics of health standards on the wishes and needs of the sick.

This is in fact a matter of health democracy.