

Charité Berlin

# World Health Summit

The Evolution of Medicine

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## Preface

The world is in a worrisome state of health. Climate change and the world economic crisis are sources of considerable stress. With the World Health Summit we set ourselves the task of responding to the most important global medical challenges, such as pandemics, barriers to access to effective healthcare and epidemiological change, with a more intensive and solution-oriented social involvement. At the same time, we have to find ways that can rapidly be implemented to bring the results of medical advances more quickly to the people waiting for them.

The first World Health Summit took place from 14 to 18 October 2009 at the Charité University, Berlin. Leading representatives of science, economics, industry, politics and civil society came together for five days to discuss these central questions in global healthcare and medical research. Under the patronage of the German Chancellor, Angela Merkel, and Nicolas Sarkozy, President of France, 700 prominent thought-leaders worked on concrete recommendations for dealing with pandemic planning, effective prevention strategies and climate change-related diseases.

Themes relating to research strategies were also at the forefront of interest. What are the prerequisites for maintaining innovative biomedical capacity in our societies despite increasingly constrained financial conditions while translating research results into medical action as rapidly as possible?

The need for close international exchange of success factors in designing health systems was repeatedly called for at the World Health Summit. This applies not only to health systems that are establishing themselves in developing and transitional countries but to western societies as well. We need well functioning forums for innovative healthcare models in low-waged countries. This is the only way to stimulate the development and diffusion of good healthcare and to ensure, by means of a two-way process, innovative approaches in the industrialised nations as well.

On the occasion of its 300th birthday, the Charité has been successful in uniting major scientific institutions from inside and outside Germany behind the World Health Summit, including the Helmholtz Association, Max Planck Society, Fraunhofer Society, US National Institutes of Health (NIH), Institute of Medicine, Collège de France, the European Space Agency (ESA), funding institutions from various countries and, by no means least, a high number of renowned medical universities. With the foundation of the M8 Alliance of Academic Health Centers and Medical Universities a western milestone in international cooperation in academic medicine has been reached. With the foundation of the M8 Alliance came the creation of a unique global network of outstanding academic institutions. It is the main force behind the World Health Summit.

We have made a start in uniting the forces of politics, research, economics and civil society into one voice. Academic medicine must take on a leading role. Academic independence and the capacity for critical scientific reflection on medical problems and their authenticity bestow on us a very privileged position which we must occupy with a high degree of responsibility. Academic medicine thus acquires a critical moderating function. It has to reconcile the highly divergent positions taken by political, economic and regional interests in such a way that coordinated action is possible. The World Health Summit has taken a decisive step towards its aim of establishing health as a human right. This can only be achieved together with all the other parties involved.

Naturally, we need to be aware that an initial meeting cannot result in improved global health and that this is an ambitious aim. But it is an aim that can be achieved in the long term when the global actors work together more effectively. The World Health Summit must prepare the way for this. We face enormous medical and structural challenges to which there are no simple solutions. The World Health Summit and M8 Alliance lead the way by setting a good example.

The 2<sup>nd</sup> World Health Summit will take place from 10 to 13 October 2010 in Berlin.



Prof. Dr. Detlev Ganten, World Health Summit President 2009 & 2010



Prof. Dr. Axel Kahn, World Health Summit President 2009

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# Infectious Diseases

The background is a deep blue gradient. A series of thin, white, curved lines sweep across the frame from the bottom left towards the top right. In the center of this sweep, there is a bright, multi-pointed starburst or lens flare effect, suggesting a light source or a point of focus.

## Working Session:

### International Cooperation Is Decisive in Protecting the Population Against Pandemics

Infectious diseases are one of the greatest threats to humankind. One quarter to one third of the earth's population dies prematurely of a communicable disease. The most common fatal infectious diseases are AIDS, tuberculosis, malaria and measles. Although the means of controlling communicable diseases are constantly improving in the industrialised nations, the threat caused by disease pathogens is increasing worldwide – not only in economically weak regions but in the industrialised nations as well.

- ▲ Population growth (high density of people),
- ▲ demographic change and
- ▲ the selective pressure of anti-infective agents on pathogens in human and veterinary medicine, combined to intensive livestock farming, make Western Europe, the North-eastern United States, Australia and Japan into hot spots, regions from which new variants of disease pathogens rapidly spread. A current analysis of epidemiological studies (Nature 451; 2009: 990-3) confirming this, also yielded the following results:



- ▲ Zoonoses account for approximately two thirds of new emerging infectious diseases.
- ▲ The majority of these zoonoses have their origin in animals living in the wild such as HIV, Ebola and Marburg virus, SARS virus (severe acute respiratory virus) and bird flu (H5N1).
- ▲ Close contact between humans and wild animals and the consumption of bush meat caused the change of host from animal to human and thus made certain regions in Africa, Asia and Latin America into “hot spots” for the spread of pathogens of animal origin unknown to date was the message at the symposium.

Nowadays, a new infectious disease can be spread across the globe by travellers within 24 hours and substantially weaken not just human health but also the economy. The new influenza, H1N1, which

in 2009 rapidly spread from Mexico all over the world, is an example, said Professor Angus Nicoll, Director of the Scientific Advice Unit at the European Centre for Disease Prevention and Control (ECDC in Stockholm).

When the disease began to spread, there were many open questions concerning the transmission of the virus and the causes and risks of a severe course of H1N1 flu.



“For states, the only way to overcome the problem presented by the high degree of uncertainty about the characteristics of a new pathogen is to make the information about the infection available to supra-regional and politically independent institutions such as the WHO or the ECDC. This requires the equivalent political will. At the beginning of the new influenza outbreak, some European countries did not make their information about the infection as accessible to the degree that would have been desirable,” said Nicoll.

A well established national and international surveillance of pathogens and of the diseases they cause is decisive in preventing local diseases from becoming epidemics or pandemics, was the theme of the Berlin symposium. Finally, it is important to adapt strategies to fight infec-

tion, such as the national pandemic plans recommended by WHO, to the situation obtaining at the time. A short-term decision in one country could have long-term results for the rest of the world. Risk communication from authorities to the public is naturally difficult with a new epidemic, as comprehensible anxieties could turn into popular hysteria.

Participants were in agreement that efforts must be stepped up world-wide to prepare for new pandemics and to stem them when they do break out. Developing new vaccines and constituting the private-public cooperation that is essential for the development and manufacture of new vaccines present a great challenge. Overall, better co-ordination of the international community is needed on questions as:

- ▲ what new scientific problems should be researched and what methods applied,
- ▲ how research can be financed,



- ▲ how data (incidence, severe course of the disease, therapies, infection-specific mortality) can be more reliably collected and made transparent, so that all countries can benefit from this knowledge.



"In the reaction to a new epidemic, acting globally is different from acting in political isolation – this is the most important lesson we have learnt from the HIV pandemic," said Professor Peter Piot, Director of the Global Health Institute at Imperial College in London.

The following are required:

- ▲ new scientific approaches to research into pandemics and diseases at high risk of spreading world-wide,
- ▲ more private-public partnerships to provide finance,
- ▲ national monitoring with international connections and networking,
- ▲ producing recommendations for changes in human behaviour,
- ▲ preparing for potential new epidemics on the national level, for example by pandemic planning and constant willingness to adapt these plans to the current situation,
- ▲ more awareness and political support,
- ▲ more mutual trust in dealing with information on the spread of disease pathogens.

## Working Session:

### Climate Change: a Challenge for Healthcare

#### Current Situation

Global warming could have a devastating impact on health with effects on a world-wide scale. Some experts even think that climate change is the greatest global threat to health in the 21st century (Lancet 2009; 373: 1693-733). Scientists view the main dangers as heat waves, floods, food and water shortages and the spread of tropical diseases. Some effects are direct, others indirect. In the case of floods, for example, there is the risk of people drowning in the deluge on the one hand. On the other, there is the subsequent threat of epidemics of diarrhoea. At particular risk are countries and regions where standards of water supply and effluent disposal are low. The worse hygiene, general living conditions and public health are, the more problems people will experience

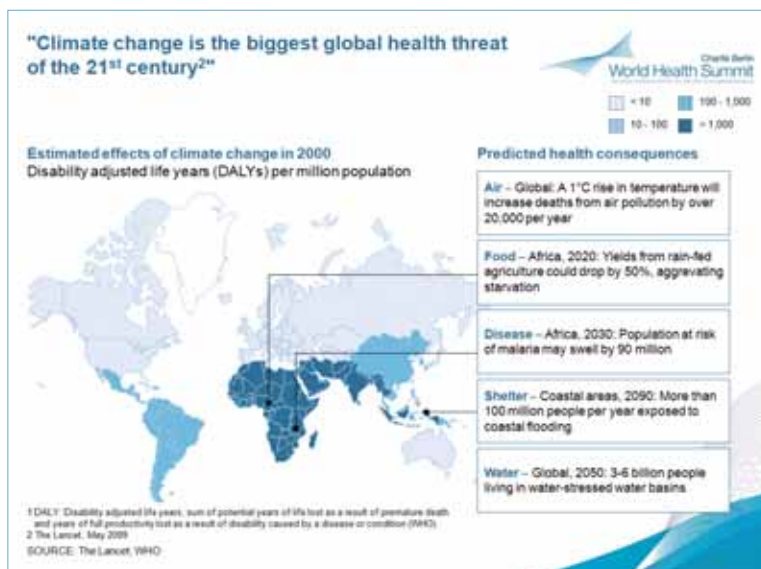


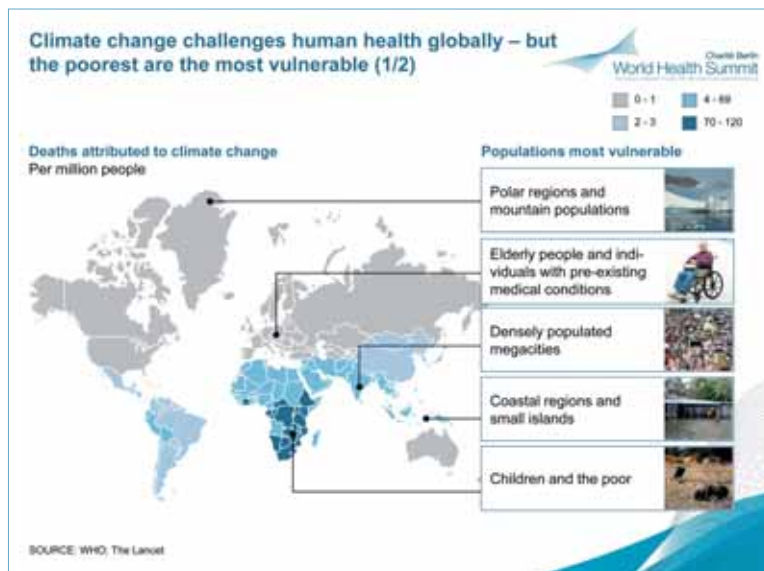
in successfully overcoming the challenges of climate change. Developing countries will be the ones most affected by the impact of the global rise in temperature. They are both more vulnerable, as regards to the status quo, and also have fewer resources to help them adapt to changes. This applies both to extreme weather events and to continuous climate changes.

## Challenges

However, industrialised nations will feel the impact of global warming as well. For example, thousands of people were victims of the heat wave in Europe in 2003 as Dr. Kristie Ebi from the Intergovernmental Panel on Climate Change emphasized. A further problem in the northern latitudes is that vector borne infectious diseases, which have not been endemic in Europe to date, could occur more frequently here. Professor Dr. Jörg Hacker from the Robert Koch-Institut referred in this connection to the outbreak of Chikungunya fever in Italy. In summer 2007, about 200 people in Ravenna in Northern Italy were infected. Ongoing local transmission of the disease, which had been introduced by a long-distance traveller, was made possible by the presence of a suitable vector (Asian tiger mosquito, *Aedes albopictus*). In addition, there had been a global increase in diarrheic diseases, reported Hacker.

Tropical diseases are not only spreading in northern latitudes because of climate change; they are also increasing in the developing countries. Experts work on the assumption that as temperatures rise vectors will also spread in higher situated zones. This means that, in future, infectious diseases such as malaria will also occur more frequently in mountainous regions





where no *Anopheles* mosquitoes or only low numbers of them have been present to date.

Among the health-related consequences of climate change the issue of “water stress” is a crucial point. Droughts and floods make clean drinking water a scarce commodity. Rising sea levels may lead to salinization of the ground water in coastal regions. Heavy rain and drought also have negative effects on agriculture and can result in lack of food or exacerbate those food shortages that already exist. The protein content of plants may also decrease because of climate change, pointed out Ebi.

Climate change is a global challenge. The inhabitants of coastal regions, big cities and polar regions, the elderly, the chronically ill and children as well as the poor are at particular risk.

## Discussion

To date, global warming has been perceived primarily as an ecological threat. But the examples given above demonstrate that medical care of the population is also impacted by the changes. However, the awareness that climate problems are also health problems has not yet sunk in everywhere, as Dr. Maria Neira, Director Public Health and Environment, World Health Organization, clarified. “The polar bear has long been the face of climate change in the media,” she said. It is important to ensure that this becomes the human face.

There are shortcomings still in academic circles as well on the subject of climate change and health, warned Ebi. In her opinion therefore, it is the duty of universities to create awareness of the problem. In addition, research in this area must be intensified. Neira also agreed that there was a need to generate more evidence. We should focus less on the question of what we should be concerned about and more on what measures are the most effective.

Professor Vyacheslav Novitskiy from the Siberian State Medical University also sees a need for more research. Among other issues, the question of how much human beings have contributed to climate change needs further clarification. Scientists also point out that the warming of seas and rivers may cause a decrease in the fish population and thus affect human food resources.

There is no doubt that more research is urgently needed. However, as Neira explained, it is relatively clear that important points have already emerged which could form part of a useful adaptation strategy. Healthcare systems and the public health sector should be made stronger. If water supply and effluent disposal were improved for example, then people would be enjoying the benefits of this today. In addition, these measures would make the system less vulnerable to the effects of climate change. As concrete steps, Neira also named the installation of heat wave warning systems, vaccination programs and measures to control the spread of vectors and air pollution. Finally, Neira also gave the following warning: “The more we reduce green house gas emissions, the better it is for health.”

Dr. Wolfgang Plischke from Bayer AG regarded industry as an important partner both in research and in developing adaptation strategies. As relevant examples, he named the development of vaccines and vector control (through mosquito nets and insecticides for example). For Plischke, the concept of public-private partnerships is a starting position that promises success. Climate change is a great opportunity for innovation – for example in the fight against malaria. Measures are urgently required here, as the rise in temperature could mean that in Africa alone the disease could affect several million additional people every year.

The issue of healthcare cannot be considered in isolation from its social context. The impact of the changes on mental health should not be overlooked. This was referred to by Professor Margaret Alston from Monash University. Gender aspects and the issue of education must also be taken into account. It had been observed that, in African countries, many girls could no longer attend school because they had further and further to go to obtain clean water for themselves and their families. “It is poor women who are most affected by climate change,” stated Alston. Climate change would also be the trigger for migration movements.

## Key Challenges

The following are the main factors to be identified in connection with the impact of climate change on health:

- ▲ Extreme weather events – such as storms, heavy rain, floods and heat waves – cause direct fatalities, destroy houses and infrastructure and are an indirect cause of the outbreak of disease.
- ▲ Periods of drought and excessive rainfall have negative effects on agriculture and thus exacerbate malnutrition.
- ▲ Lack of clean drinking water because of drought and floods.
- ▲ Heat waves have negative effects on people with pre-existing disease, ozone values rise, the pollen season grows longer.
- ▲ The spread of infectious diseases that are transmitted by vectors (for example mosquitoes or ticks).



## Key Messages

- ▲ Global warming will impact negatively on human health. For this reason, this issue should be at the top of the agenda when activities that affect climate change are discussed. It was essential to create the awareness needed to achieve this.
- ▲ More research: in particular, the effects of climate change on infectious diseases must be better investigated, as well as the connection between environmental changes and public health.
- ▲ Develop adaptation strategies: only in this way can the impact of climate change on health be attenuated.
- ▲ Creating networks between the public and private sector and other relevant institutions.
- ▲ Prevention is effective across the life span up to old ages. We need a life course of age- and disease-specific prevention with a mix of environmental, medical, social and regulatory measures.

## Partner Symposium: Berlin Declaration on Tuberculosis: High Level Follow-up of High Priority Countries for TB Control in the WHO-Euro Region

### "Double Trouble or Double Success? Bringing Together Diseases and Programs"

Even in the 21st century, tuberculosis remains one of the three big killers worldwide – together with HIV/AIDS and malaria. Tuberculosis is still the bacterial disease caused by a single pathogen responsible for the highest number of deaths. It threatens the socioeconomic basis of many high-burden countries. In Sub-Saharan Africa, the tuberculosis problem is aggravated by HIV coinfection. In Central Asia and Eastern Europe, tuberculosis becomes more and more difficult to treat because of the emergence of multidrug resistance. On October 22, 2007, a WHO European Ministerial Forum "All against Tuberculosis" was organized by the WHO Regional Office for Europe (WHO/Europe) in collaboration with the German Federal Ministry of Health in Berlin. The delegates and ministers from the 49 countries of the WHO European Region (WHO-Euro) (ranging from Portugal to Kamtchatka, including Central Asia; the area is depicted in Fig. 2) adopted the



so-called Berlin Declaration on Tuberculosis. This declaration identifies the most imminent problems of tuberculosis control in WHO-Euro and puts forward strategic solutions. At the end of the Declaration it is stated that two years after its adoption, the progress and efforts of the member states of WHO-Euro to fight tuberculosis should be evaluated. Thus, the German Federal Ministry of Health organized a satellite symposium to the World Health Summit entitled "Berlin Declaration on



## Key Challenges

The key challenges of tuberculosis control in the WHO-Euro region are as follows:

- ▲ Economic recession, poverty and socially vulnerable groups (homeless, unemployed, alcohol-dependent)
- ▲ Health systems: poorly developed or under reform, leading to ineffective TB control and to uncertainties if TB control systems exist in parallel
- ▲ M/XDR-TB: the highest rates in the world in EUR (14 out of 19 regional TB settings are situated in the 18 high priority countries of the WHO-Euro region; Fig. 1)
- ▲ HIV epidemic: growing (initially spread through injecting drugs users) and reaching the general population (Fig. 2)
- ▲ TB in prisons: penitentiary system very large with poor TB services; insufficient follow-up of released ex-prison inmates
- ▲ Migration (East to West, South to North, internal migration)
- ▲ Stigmatization

Tuberculosis: High Level Follow-up of High Priority Countries for TB Control in the WHO-Euro Region". Since in the recent years the problem of multidrug resistance is accompanied by an increasing rate of HIV-TB coinfections ("double trouble") even in the WHO-Euro region, the focus of the symposium was on the rising problem of virtually untreatable forms of tuberculosis.

## Current Situation and Challenges

The 18 priority countries for TB control in the Region are: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, the Republic of Moldova, the Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan in the Eastern part of the Region, and Bulgaria, Romania and Turkey in Central Europe (Fig. 1).

Tuberculosis control in the Russian Federation and in other successor states of the former Soviet Union faces several specific problems requiring adapted approaches in the fields of diagnosis and treatment, infection epidemiology and public health. Prevalence and incidence of tuberculosis strongly increased in the years after the disintegration of the former Soviet Union into the Russian Federation and the other successor states and now stabilize at a high level (Fig. 1). The percentage of multidrug resistant strains of *Mycobacterium tuberculosis* is increasing dramatically; the number of resistances per clinical isolate is also increasing. After introduction of the WHO-recommended tuberculosis control program (DOTS, directly observed therapy, short-course), several forms of tuberculosis control in some countries exist in parallel in their public health systems. Thus, the quality of epidemiological data concerning prevalence and incidence of tuberculosis and concerning microbiological data and public health issues are insecure and heterogeneous.

## Discussion

As pointed out by representatives of WHO/Europe, the Berlin Declaration on Tuberculosis forms an adequate basis for approaching the above mentioned problems in TB control. Dr. Marc Danzon, Director, WHO/Europe, states that a general collaboration between governmental and non-governmental institutions, between scientific and patient care approaches was urgently needed. A key role for an efficient TB control is played by the civil societies of both the high priority as well as the collaborating low-burden partner countries.

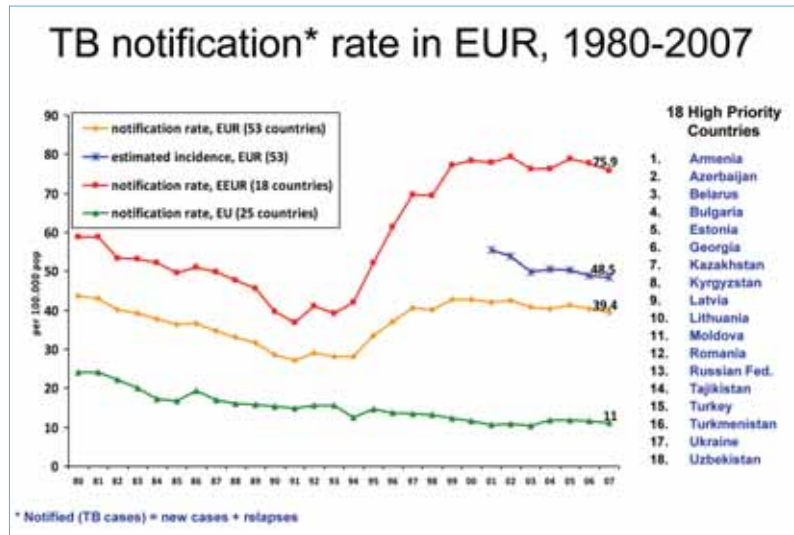
To overcome problems caused by stigmatization, Paul Sommerfeld (TB Alert) favors peer-to-peer approaches (to inform HIV-TB coinfecting patients that TB may be cured) as

an important tool to increase willingness to get tested and properly treated. Community-based information campaigns and follow-up programs might support this approach.

Despite successful programs of the Health in Prison Project (HIPP), Peter Gondrie (KNCV) estimates prisons in the successor countries of the former Soviet Union still as major source for generation and spread of multiresistant strains. More efforts are needed to strengthen TB control in both the prison and the civil sector.

Efficient TB control is complicated by various migration processes both internally and cross-borders. Even in low-burden countries with good capacities in health care, approaching immigrant populations can be difficult. Countries like Moldova whose population partly works in other high priority countries like the Russian Federation or Ukraine, in addition suffer from spread of imported multidrug resistant TB strains. The problem of "TB and migration" can only be addressed by international collaboration efforts of all affected countries.

The European Commission will use the results of the satellite symposium to compile priorities in fighting HIV/TB within the next 5 years. The Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) covers two thirds of the global financing of TB control. One of its directors, Dr. Rifat Atun, announced that financial support might be decreased for some of the Eastern European countries in the near future, depending on the particular socioeconomic situation which forms the basis for GFATM's engagement in these countries (more than their particular epidemiological situation). Dr. Atun proposed that the EU should assist high priority countries in fulfilling the socioeconomic criteria and in submitting grant applications.



## Key Messages

Participants of the satellite symposium agreed that the contents of the Berlin Declaration on Tuberculosis and their implementation remain of highest importance. The following aspects of the declaration were highlighted:

### General statements:

- ▲ The aims of the declaration can only be reached if national and international collaboration, support of basic and applied research, transfer of knowledge and financial support including capacity building are ensured. The European Commission and the GFATM play a crucial role in supporting these efforts.
- ▲ Criteria of GFATM to financially support the efforts of high priority countries to fight TB (and TB-HIV-coinfections) should not only include the socioeconomic but also the epidemiological situation to ensure the most-efficient use of the available financial resources.

### Statements on TB-comorbidity

- ▲ HIV-TB-comorbidity are an increasing problem in high priority countries of the WHO-Euro region and are currently addressed by their governments and health care institutions. Only collaboration between HIV/AIDS institutions and TB control programs will allow efficient use of available resources to fight this rising problem.
- ▲ Efficient control of TB-HIV-comorbidity has to include social and psychological approaches to increase the willingness of the patients to get tested and to seek treatment. In this context, the problem of stigmatization by both infectious diseases (HIV/AIDS and tuberculosis) has to be addressed.
- ▲ Another requirement for an efficient control of TB-HIV-comorbidity is HIV-testing of TB patients, allowing adequate therapy of the tested individuals as well as reliable surveillance of the coinfection.
- ▲ Political engagement to fight TB-HIV-comorbidity should also include collaboration with non-governmental organizations, civil society and patient organizations and address social aspects like migration, living conditions, gender, access to health care.

## Partner Symposium: Humanitarian Medicine

### Current Situation

Health is a human right. But in many countries on Earth the population has no access to suitable health care; often basic care is not even guaranteed. The United Nations have therefore made health the focus of their development goals in this millennium.

This is not just about a shortage of medicines. There are also too few hospitals, treatment rooms, trained personnel and healthcare information. In the health sector in Africa alone, there is a shortfall of about four million qualified personnel, according to WHO estimates.

The universities in the industrialised nations which are well endowed compared to those of the poor countries of the world have a moral responsibility to make a useful contribution to the humanitarian duty of improving healthcare in less developed regions, stated Professor Detlev Ganten (Charité Berlin).



### The Focus Must Be on the Autonomy of the Countries Receiving Assistance

The different forms of humanitarian action in the realm of medical care can be divided into:

- ▲ Short-term assistance as acute aid in an emergency situation and
- ▲ effective long-term aid to strengthen the autonomy of the country in question and to make it into an equal partner in dialogue.

The universities' potential for contributing to humanitarian projects lies primarily in their expertise in training the next generation of scientists,

- ▲ their traditionally established role in technology transfer and
- ▲ their knowledge of how to guarantee the quality of training and technical and methodological excellence.

In concrete terms, the universities should

- ▲ develop international exchange programs or take part in existing programs,



- ▲ actively campaign for the exchange of medical students and physicians so that they participate in the programs,
- ▲ prepare exchange candidates in practical terms in the university hospital in question for their employment in the partner countries, open further and continuing education at their own university hospital to students and physicians from the partner country so that, after the study period, the guests return to their country of origin and apply their knowledge there,
- ▲ participate in raising appropriate funding with which to finance permanent co-operations.

Non-governmental organizations (NGO) play a significant role within international partnerships which are vital if this duty is to be translated into practice: "They identify, in a region-specific way, the need for humanitarian assistance," explained Professor Alain

Deloche de Moyelle from the Université Descartes, president of the French medical aid organization La Chaîne de l'Espoir. The contribution of academic medicine is also designed to meet specific needs, which can naturally change during a project. In international cooperation, academic medicine must be both capable of making adjustments and designed for sustainability – the latter by ensuring competent training. An NGO's potential to contribute to projects to improve health care lies above all in:

- ▲ their knowledge of the specific needs for medical assistance,
- ▲ their ability to advise international partners about these and
- ▲ to create contacts with the local governments and authorities or to maintain contacts.



The issue of whether it is useful to transfer modern medical technologies to less developed countries was the subject of controversial discussion in the run-up to the summit and during the conference as well. Critics accuse those who support technology transfer of "neo-colonialism": The transfer of modern technologies contributes to poor countries entering into new dependent relationships with rich nations and, in the long term, damages the already disadvantaged more than it benefits them.

The representatives of university medicine, however, did not want the sweeping accusation of "neo-colonialism" to be left unchallenged. "When a sensible concrete aim can be realized in a country with the help of a new technology, then a technology transfer can make a contribution to the further development of medical care in this country," said Professor Antoine Lafont, a cardiologist at the Université Descartes Paris. "To deny a country the appropriate assistance is equal to blocking its path to better medicine," he added.

As an example of a successful long-term effective transfer of knowledge and technology and of fruitful collaboration for all sides Lafont described the cooperation between the Hôpital Européen Georges Pompidou in Paris (HEGP) and Cambodia, which has been in existence since 2006. In its capital Phnom Penh, a cardiology centre of excellence is being established with the help of private and public funds and government support. Cambodian doctors were educated for two years and medical technical assistants and nurses for cardiological department patients trained for two months at the HEGP. Together with the doctors, they set up a hospital for cardiology with a catheterization laboratory and modern methods and technologies for performing interventions, in patients with complex hereditary heart defects and other cardiological diseases for example. French medical personnel gave their support to setting this up. The use of methods which were not previously established in the country, were evaluated by international standards. The medical results are outstanding, reported Lafont. The cardiology centre in Phnom Penh for its part serves as an educational institution for medical exchange students from France.

## Key Messages

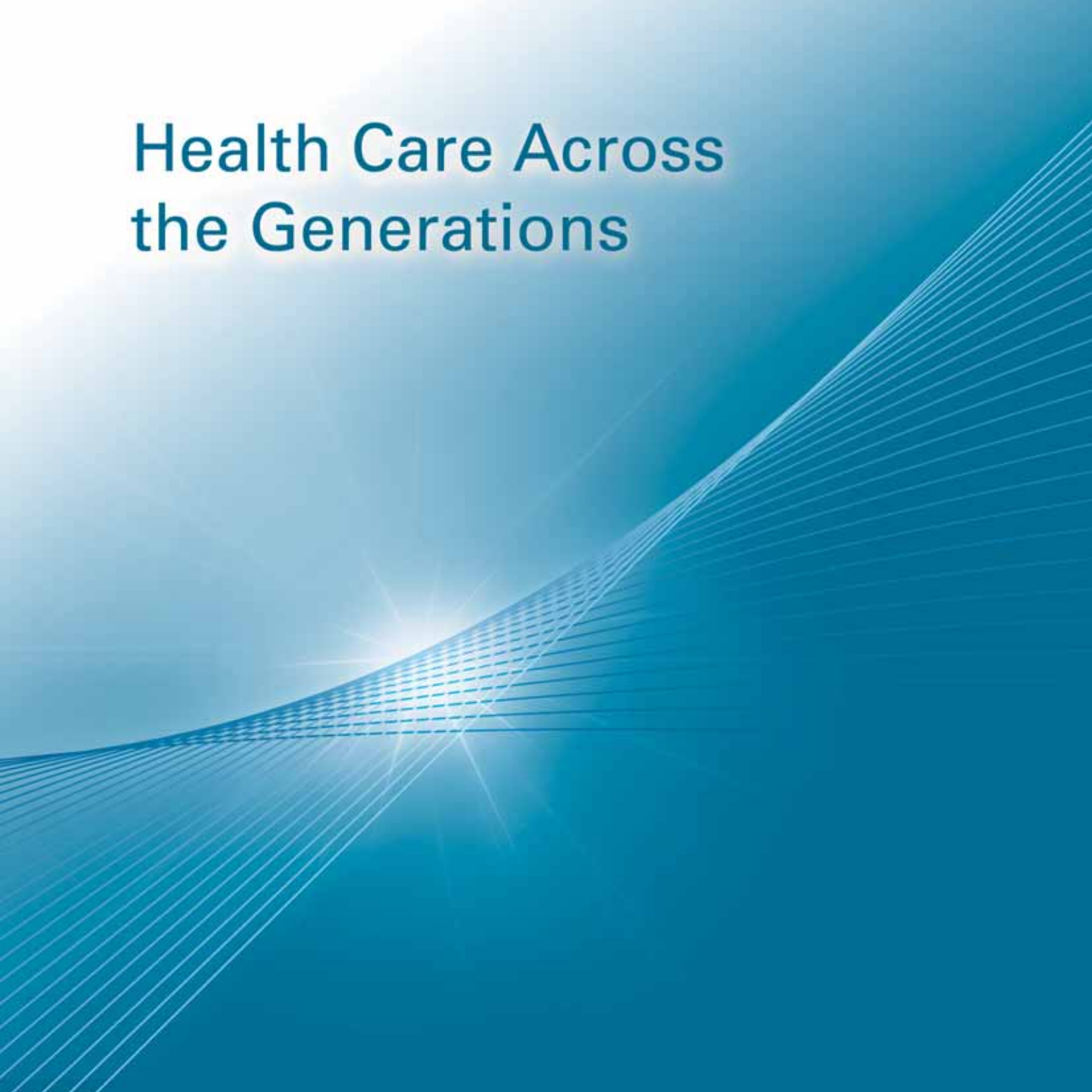
Aims of humanitarian medicine formulated at the summit are:

- ▲ to help less developed countries build up and extend basic medical care and
- ▲ to help set up centres of excellence,
- ▲ to adapt aid to meet the specific needs, general conditions and facilities of the country concerned and to constantly adapt,
- ▲ to offer both acute short-term aid as well as to establish approaches to effective long-term cooperation,
- ▲ to design long-term projects for mutual rather than one-way advantage as far as possible, because reciprocity helps to guarantee the sustainability of the project,
- ▲ to strengthen the autonomy of the countries in question.



This project is part of a sustainable international exchange program based at the Université Descartes. The university recruits 200 to 300 French medical students annually to spend at least eight weeks as guests in 42 cities worldwide at present. In the second and third year of their education, the students give help outside the medical establishment, in schools in the host country and then in hospitals in the fourth to sixth year of study. Many of them return to their host countries as qualified doctors. "In this way, an interest in working in developing countries is generated in successive generations of French medical students and doctors," explained Professor Patrick Berché, Dean of the Faculty of Medicine at the Université Descartes. Evidence of periods abroad during study or afterwards promotes in its turn the later professional development of the participants from France.

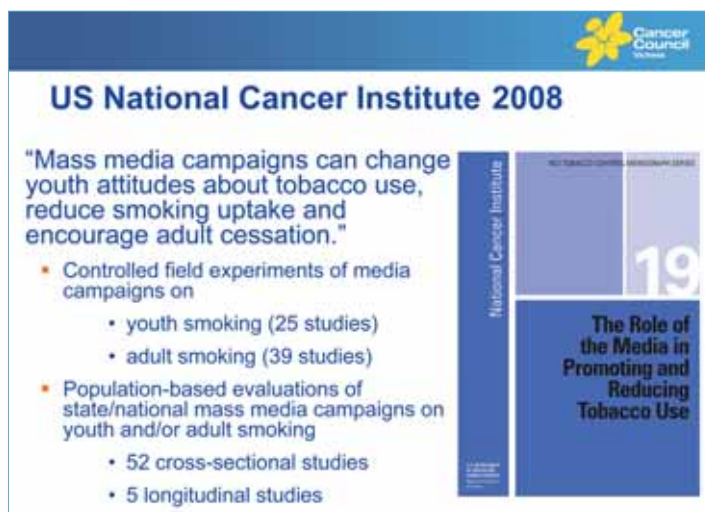
# Health Care Across the Generations



## Working Session:

### Prevention of Childhood Risk Factors for Chronic Adult Diseases

#### Current Situation



**US National Cancer Institute 2008**

"Mass media campaigns can change youth attitudes about tobacco use, reduce smoking uptake and encourage adult cessation."

- Controlled field experiments of media campaigns on
  - youth smoking (25 studies)
  - adult smoking (39 studies)
- Population-based evaluations of state/national mass media campaigns on youth and/or adult smoking
  - 52 cross-sectional studies
  - 5 longitudinal studies

**The Role of the Media in Promoting and Reducing Tobacco Use**

19

Many chronic diseases that manifest themselves in adult life, such as cardiovascular diseases, type-2 diabetes, mental ill-health, obesity-related and smoking-related diseases, have their origins in childhood and adolescence. To combat an anticipated future epidemic of life-style related diseases, not only in developed countries but increasingly also in low-income and middle-income countries, preventive efforts need to start in early childhood, school-age children, and adolescents. Following on from the great successes in childhood immunisation rates in the 20th century in developed countries, and renewed and continuing efforts in developing countries, the current unmet need in long-term disease prevention is to create the best possible foundation for a healthy life in our children and young people by preventing risk factors for diseases later in life. The current trends are alarming.

Childhood obesity rates are soaring, alcohol and drug use is widespread, mental illness in young people is often unrecognised, the proportion of young people who smoke in countries, such as China, is staggering, and developing countries face the paradox of under- and over-nutrition in the same generation with equally detrimental consequences for later life.

For preventive efforts to be successful, they need to be based on scientific evaluation and on the recognition that a multidisciplinary and multisectorial approach is needed. Successful strategies and interventions should be scaled up and continuously evaluated. Policymakers and politicians need to recognise that population-wide efforts and laws that are not specifically aimed at young people and children may have the greatest effect on them. Measuring success needs to also take into account the long-term benefits for an individual's lifespan and, furthermore, its positive effect on future generations.

Without recognising and preventing risk factors early, future generations will be less healthy than their parents, health-care costs will increase astronomically, and the future development and economic potential of countries will be hampered.

## Challenges

A shift in mindset is required to approach preventive actions in children and adolescents from a population-based life-span public-health aspect. Sectors, such as education, health, transport, and urban planning, need to work together to formulate comprehensive and complementary policies that have long-term health and wellbeing as outcome goals. Results and data from long-term intervention studies, cohort studies, and implemented policies need to be systematically evaluated. Successful strategies need to be implemented, scaled-up, and transferred to other appropriate countries and settings. Positive health messages need to assume the same strategies and urgency as commercial advertising. Children and young adults need to be protected from inappropriate commercial advertising and sales practices. Schools and other community actors need to take a greater role in positive health education, especially for disadvantaged children and young people. Microfinance schemes in developing countries, and income support in developed countries, need to be aimed at families with young children, and given to mothers in particular, to ensure adequate and healthy nutrition early in life. Young people should be involved and be seen as part of the solution to solve future health problems rather than be vilified, marginalised, and blamed.



### Ads to elicit negative emotions

- Ads eliciting negative emotions perform well (loss, disgust, sadness, dread, anger).
- Depict serious harm from smoking or secondhand smoke; tobacco industry deception
- Humorous or emotionally neutral ads perform less well



## Discussion

The primary goal of the working session was to highlight aspects of childhood risk factors for adult chronic diseases in both low- and middle-income and in developed countries, stress their importance for future healthy and productive populations, and to discuss possible broad strategies for preventive and protective actions.

- ▲ Cesar Victora (University of Pelotas, Brazil) pointed out the long-lasting effects of early life exposures in low- and middle-income populations. For example, exposure to environmental, nutritional and infectious agents in utero and during the first years of life leads to long-lasting, often irreversible consequences. Findings from the five longest-running birth cohort studies in low- and middle-income countries, carried out in Brazil, Guatemala, India, Philippines and South Africa, allow to study the consequences of early exposures on chronic diseases and their risk factors, as well as

on the development of human capital – including intellectual development and economic performance. Victora also addressed the relation of early under-nutrition and adult obesity.

- ▲ Bärbel-Maria Kurth (Robert Koch-Institut, Berlin) presented effective prevention strategies derived from the German Health Interview and Examination Survey for Children and Adolescents (KiGGS). For this investigation comprehensive data on the health status of 17,641 children and adolescents living in Germany aged 0 to 17 years were collected. The survey involved questionnaires filled in by parents and parallel questionnaires for children aged 11 years and older, physical examinations and tests, and a computer assisted personal interview performed by study physicians. A wide range of blood and urine testing was carried out at central laboratories. For the

first time in the history of the Federal Republic of Germany representative data exist for the precise assessment of the physical and emotional health of the young German population. The results of the survey show a strong correlation on the one hand between health status, health risks and health behaviour of German young people and their social background on the other hand. Especially the education of the mother seems to be an important factor to prevent health risks like smoking, passive smoking, alcohol consumption, lack of physical activities, psychological disorders, obesity and others. “One of the most important conclusions can be that giving equal chances for better education is the best prevention programme of our society to foster and improve the health of the population,” Kurth said in Berlin.

- ▲ For Bjørn Holstein (University of Copenhagen, Denmark) the international comparative “HBSC study” may contribute to future preventive strategies. The Health Be-



## High performing emotional ads can also work with youth

- Emotional ads resonate directly with youth
- Change the image of smoking, thus reducing broader societal pro-smoking norms
- Reduce smoking among parents, with flow-on benefits for reducing youth uptake



haviour in School-aged Children (HBSC) is an international research project on health and behaviors, a WHO collaborative cross-national study. It presents the key findings on patterns of health among young people aged 11, 13 and 15 years in 40 countries and regions across the WHO European Region and North America. Its theme is health inequalities: quantifying the gender, age, geographic and socioeconomic dimensions of health differentials. “Its aim is to highlight where these inequalities exist, to inform and influence policy and practice and to help improve health for all young people,” Holstein said. The report clearly shows that, while the health and well-being of many young people give cause for celebration, sizeable minorities are experiencing real and worrying problems related to overweight and obesity, self-esteem, life satisfaction, substance misuse and bullying. According to Holstein, policy-makers and professionals in the participating countries should listen closely to the voices of their young people and ensure that these drive their efforts to put in place the circumstances – social, economic, health and educational – within which young people can thrive and prosper.

- ▶ Melanie Wakefield (Cancer Council Victoria, Australia) presented successful public health campaigns for children and adolescents. Recent comprehensive reviews have concluded strong evidence that mass media campaigns can change youth attitudes about tobacco use, curb smoking initiation and encourage smoking cessation among adults, especially when these campaigns are supported by other tobacco policies and programs. In contrast, media campaigns to change risky youth alcohol use, reduce unhealthy eating and increase physical activity have been less clearly positive, but all three operate in an environment where policies, marketing practices and community norms largely continue to strongly promote the unhealthy behaviour. Wakefield pointed out the importance of a whole-of-population perspective to influence youth. Media campaigns should be a part of a comprehensive approach with other policies, but not a one-off stand alone strategy: “Last but not least, be careful not to let the industry undermine the progress.”





## Key Messages

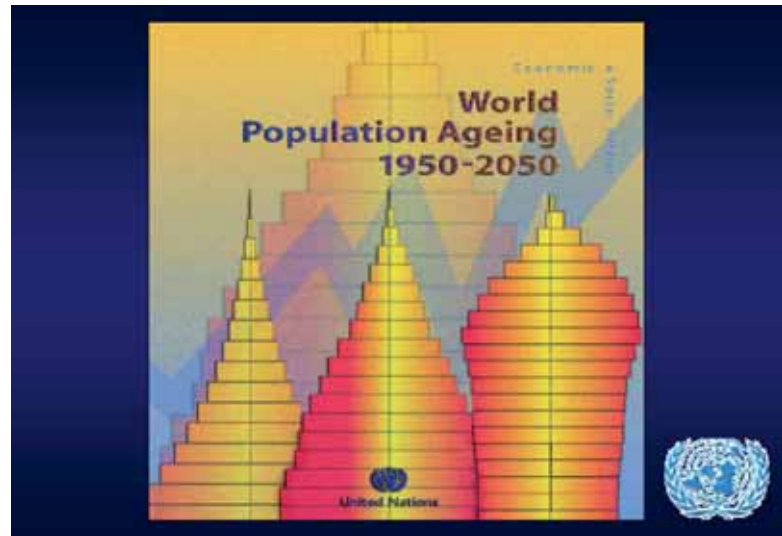
- 1. A shift in mindset**  
is required to approach preventive actions in children and adolescents from a population-based life-span public-health aspect. Policymakers need to recognise that efforts and laws are not aimed at young people.
- 2. Cooperation:**  
Education, health and community actors need to work together to formulate comprehensive and complementary policies that have long-term health and wellbeing as outcome goals.
- 3. Systematical Evaluation:**  
Results and data from long-term intervention studies, cohort studies, and implemented policies need to be systematically evaluated and country-specific (especially in low-income countries).
- 4. Emotional health messages:**  
Positive health messages need to assume the same strategies and urgency as commercial advertising. Children and young adults are very much affected by emotional (less rational) messages.
- 5. Early combat against malnutrition:**  
In low- and middle-income countries undernutrition need to be tackled in utero and in children up to 2 years. After that period of time health (not increased) nutrition needs to be encouraged.

## Working Session: Aging Populations

### Current Situation

We, or at least many people in the world, are becoming increasingly elderly. While today one tenth of the world's population reaches at least the age of sixty, by the year 2050 it will be more than one fifth. The proportion of people reaching 80 and over will rise from currently 1.3 per cent to 4.3 per cent. According to information from the United Nations, the trend in countries such as Germany, Italy or Japan is particularly drastic – here more than 30 per cent of the population will be 65 and over by the year 2050. This means a gain of around 30 years of life expectancy in the period from 1950 to 2050 alone. Since 1840, according to the director of the Max-Planck-Institut for Demographic Research, James Vaupel, the life expectancy in developed countries has increased by three months every year. And experts are certain that it continues to rise.

This means, among other things, that children born today in countries such as Germany, France, the United States or Japan have a life expectancy of over 100 years. In addition to this, their living conditions and general health in the 21st century are much better than in the 20th, according to Vaupel. This generation, the demographic researcher emphasized during the first World Health Summit in Berlin, will become old with less complications than previous generations – a thesis which is so far not proven.



**Observed and Projected Percentages of the Elderly (65+ years) in Selected Areas, Regions, and Countries of the World: 1950, 2000 and 2050.**

| Major Area, region and country  | 1950  | 2000  | 2050  |
|---------------------------------|-------|-------|-------|
| World                           | 5.2%  | 6.9%  | 19.3% |
| Africa                          | 3.2%  | 3.3%  | 6.9%  |
| Latin America and the Caribbean | 3.7%  | 5.4%  | 16.9% |
| China                           | 4.5%  | 6.9%  | 22.7% |
| India                           | 3.3%  | 5.0%  | 14.8% |
| Japan                           | 4.9%  | 17.2% | 36.4% |
| Europe                          | 8.2%  | 14.7% | 29.2% |
| Italy                           | 8.3%  | 18.1% | 35.9% |
| Germany                         | 9.7%  | 16.4% | 31.0% |
| Sweden                          | 10.3% | 17.4% | 30.4% |
| U.S.A.                          | 8.3%  | 12.3% | 21.1% |

SOURCE: United Nations 2001 cited in Leonid A. Gavrilov and Patrick Heuveline, "Aging of Population," in Paul Demery and Geoffrey McNicoll (eds.) The Encyclopedia of Population. New York, Macmillan Reference USA, 2003.



Medical Challenges

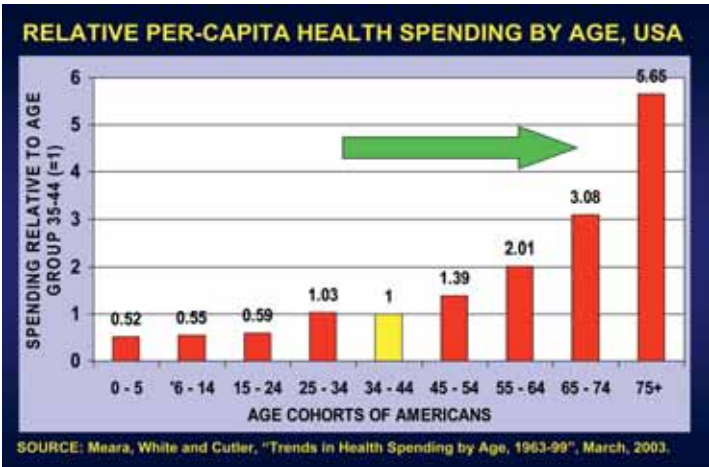
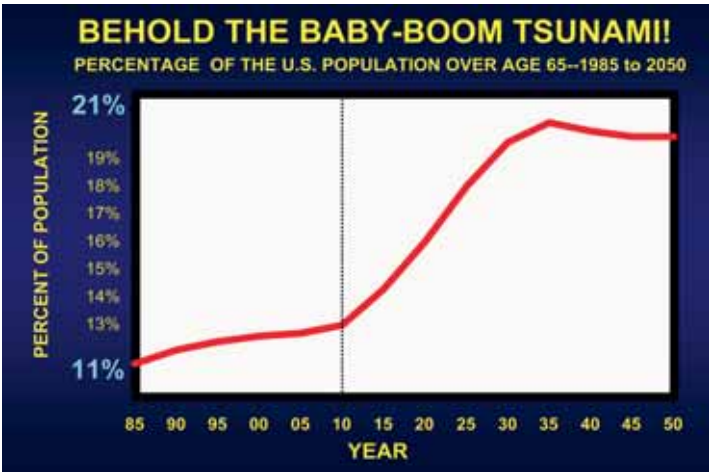
What we do know is that changes in people’s general health are unavoidable. According to Adelheid Kuhlmei, Director of the Institute for Medical Sociology at the Centre for Human and Health Sciences at the Charité-Universitätsmedizin in Berlin, the extended life expectancy increases the chances of previously latent health disorders manifesting themselves as chronic illnesses. The proportion of people suffering from a dementia will increase massively by 2050 – thus also increasing the number of people in need of nursing

care. In addition to this, in the future around one of every two 65-year-olds will suffer from one or more chronic disorders, forecasts Linda Fried, Deacon at the Columbia University Mailman School of Public Health. According to Pierluigi Nicotera, Director of the German Centre for Neurodegenerative Diseases (DZNE) in Bonn, age-related diseases such as Alzheimer’s and Parkinson’s will be more common than cancer by the year 2040.

Political Challenges

All of the scientists at the congress agreed that these changes in general health will pose major challenges for healthcare systems worldwide. Aging populations have a massive influence on their respective national economies. In the Western countries the bulk of the healthcare costs is already accounted for by people over 65 years – and the trend is rising. Due to the demographic trend, there are ever fewer people to pay for the growing healthcare costs, established Uwe Reinhardt, Professor of Economics and Public Affairs at Princeton University. The economist also pointed out that, at the same time, people spend more on their health with increasing age.

Our aging world population not only constitutes an enormous financial burden for our healthcare systems. It also faces them with structural challenges. Healthcare experts and politicians have to reconsider the hitherto structures and improve them if the changing needs of this aging society are to be met, said Chad Boulton, Professor of Health Policy and Manage-



ment at the Johns Hopkins Bloomberg School of Public Health, and Linda Fried.

## Discussion and Possible Solutions

The assurance of nursing care for many old people in the future, particularly in the industrial nations, will depend decisively on the extent to which we succeed in creating mixed care arrangements and in achieving a productive interaction between professional care and care provided by families and relatives, says scientist Kuhlmeier. For example, the development of case and care management systems could be helpful for the control of long-term nursing care provision.

Scientists at the Johns Hopkins Bloomberg School of Public Health have tested such a “Guided Care” model in a pilot study in Baltimore. Introduced on a nationwide basis, Boulton believes that an integrated care model such as this could save costs and also lead to greater satisfaction on the part of old people, doctors and family members. The idea is to take the burden off the doctors by the use of nurses in the patient’s home and to improve the way the nursing care levels (inpatient, outpatient) are linked up.

According to DZNE Chairperson Nicotera, a lot more research is needed before such new forms of care can be introduced in order that they can be applied effectively. The German Centre for Neurodegenerative Diseases in Bonn, which was founded in June 2009 and is funded by the federal and state governments, is an important step in the right direction, believes the toxicologist. At present the centre is working on a register for dementia and neurodegenerative diseases, and is searching for new therapy approaches for the treatment of persons in need of nursing care.

The scientists at the World Health Summit did not make any concrete suggestions as to how the increasing costs can be mastered. It was agreed, however, that the systems have to react more flexibly to the aging process. US Professor Reinhardt, for example, regards a fixed retirement age such as applies in Germany as obsolete. Those who want to work longer and thus contribute towards further growth should be allowed to do so, and not obstructed by the state. The Austrian-American chemist and novelist Carl Djerassi called on governments in aging nations such as Germany to reduce the number of old people by loosening up immigration regulations. The inventor of the contraceptive pill also said that new approaches to the issue of reproduction were necessary in order to increase the number of births in countries with too few children.

|  | 1850–1900 | 1900–25 | 1925–50 | 1950–75 | 1975–90 | 1990–2007 |
|--|-----------|---------|---------|---------|---------|-----------|
| 0–14 years   | 62.13%    | 54.75%  | 30.99%  | 29.72%  | 11.20%  | 5.93%     |
| 15–49 years  | 29.09%    | 31.55%  | 37.64%  | 17.70%  | 6.47%   | 4.67%     |
| 50–64 years  | 5.34%     | 9.32%   | 18.67%  | 16.27%  | 24.29%  | 10.67%    |
| 65–79 years  | 3.17%     | 4.44%   | 12.72%  | 28.24%  | 40.57%  | 37.22%    |
| >80 years  | 0.27%     | –0.06%  | –0.03%  | 8.07%   | 17.47%  | 41.51%    |
| Data derived from reference 12 and the Human Mortality Database. |           |         |         |         |         |           |

Age-specific contributions to the increase in record life expectancy in women from 1850 to 2007

## Key Challenges

- ▲ The additional years of life increase the possibility of the manifestation of a previously latent chronic disorder.
- ▲ Age-related diseases such as Alzheimer's and Parkinson's are becoming more frequent.
- ▲ The number of people needing care is multiplying.
- ▲ The increase in the number of old people leads to increased healthcare costs.
- ▲ There are too few people to pay the growing healthcare costs of too many.
- ▲ The structures of the healthcare systems must be reformed to meet the changing needs of an aging population.

Not least of all, the scientists called for more preventive action in order to put a brake on the costs for illness, in particular in old age. The way we live our lives is becoming increasingly important here. The rapid increase in living standards is accompanied by the occurrence of so-called civilisation diseases. Lack of physical exercise, overeating and poor nutrition, stress, environmental pollution and social factors have led to a situation where even younger people are increasingly suffering from obesity, diabetes, high blood pressure, cardiac and pulmonary diseases and depression. These so-called prosperity disorders are now beginning to appear in developing countries due to the transition processes occurring there. This has led to a situation where as early as next year most of the people in developing countries will die of cardiovascular diseases – not of infections. Developing a consciousness for a healthy lifestyle is thus the best way to achieve a long and healthy life, emphasized the age researchers.

## Key Messages

- ▲ Aging is not a health crisis, it is a success of modern health, an opportunity for improvement of medical care and the design of our healthcare and public health.
- ▲ Nevertheless we need major adjustments in our healthcare systems because of the special needs of the elderly, which have heterogenous health conditions, often connected with multimorbidity. They need a personalized medicine.
- ▲ We need innovation in medical research, education of health professionals in the health needs of the elderly, innovation in life-long prevention and in evidence-based concepts of integrated care.
- ▲ Longer lives in health and activity will change the ways people look at their lives: many will want to work longer, so uniform mandatory retirements should be eliminated in order to create more flexibility.
- ▲ Prevention is effective across the life span up to old ages. We need a life course of age- and disease-specific prevention with a mix of environmental, medical, social and regulatory measures.

## Partner Symposium: Evolutionary Medicine

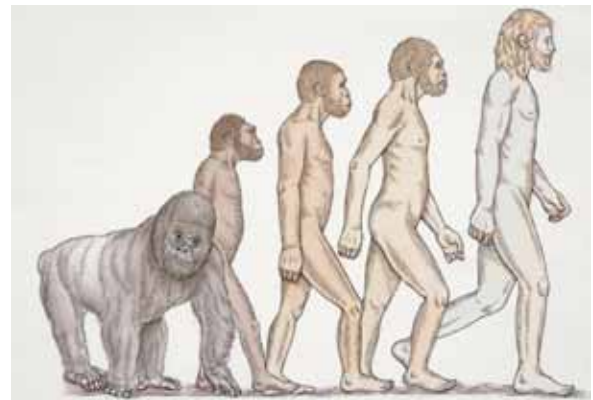
### New Perspectives for Medicine

The workings of the human body and the diseases affecting it are at the center of medical research. Evolutionary considerations are becoming increasingly important, whether in population genetics or pathogens which develop resistance to certain medicines. Only by taking a look at evolution it is possible to understand not only how the human body is well adapted to the majority of situations but also why it possesses necessary weaknesses. Bones could be more stable for example. But in order to do so they would lose flexibility. Besides this kind of compromise, protective mechanisms have been established in the course of natural selection which are more likely to cause medical problems today. These include fever, vomiting as well as anxiety and depression. In the history of human development, these reactions fulfilled an important function that is no longer needed in today's environments.

A widespread misunderstanding is that evolution favours characteristics which make the body healthier or longer lived. However, mutations, which increase the number of progeny, assert themselves even when they shorten the lifespan. Because of this, human beings are suited neither to such a long lifespan as they have now nor to modern environments. This leads to medical problems such as allergies, metabolic disorders or psychiatric disorders. Evolutionary medicine makes it possible to differentiate between actual disorders such as cancer and diseases arising from protective mechanisms which have their origins in our evolutionary inheritance.

However, very few doctors are in any way familiar with evolutionary medicine, be-  
wailed Professor Randolph Nesse, Director of the Evolution and Human Adaptation Program at the University of Michigan, in his lecture. It plays practically no role in medical education to date. But it can help us to understand better many of the so-called diseases of civilisation.

Kristen Hawkes, Professor of Anthropology at the University of Utah, made it clear in her lecture that the ageing processes are also a result of natural selection. The menopause is an example of this: in humans, women live for many years after the menopause while in apes the age of menopause coincides with that of natural life expectancy. In evolution-



ary terms, women who are no longer fertile but who take care of children and grandchildren, thus ensuring their survival, represent an advantage.

The age at which the first menstruation occurs was also subject to evolutionary processes, as illustrated by Gillian Bentley, Professor of Medical Anthropology at the University of Durham. The time of first menstruation can vary by several years depending on ancestry. Despite this, many doctors give their female patients hormone treatment if

menstruation does not begin at the “normal” age without taking individual differences or divergent evolutionary development into account. And they do this although hormone therapy can increase the risk of breast cancer.

Which diet our body processes and how depend on the dietary habits and food sources available to our ancestors, explained William Leonard, Professor of Anthropology at the Northwestern University of Evanston, in his lecture. Today, food is no longer limited but continually available. This leads to a situation where people consume more energy-rich food. At the same time, we expend less and less energy in the modern working environment. The positive energy balance ensures that the number of overweight people rises. But this problem cannot be solved by dietary recommendations for all. The body is adapted to different food sources depending on the ethnic origin of our ancestors. People in the Arctic regions predominantly ate meat for example. Peoples in the Ama-

zon region in contrast generally ate food of vegetable origin. This influenced not just their culture but also how they absorbed and digested foodstuffs. Differences of this kind have not yet been taken into account, however, in treating overweight, although they can exert a substantial effect on therapy.

Besides obesity, allergies are a typical disease of civilisation. Dr. Kathleen Barnes from the Department of Medicine, Johns Hopkins University, showed that allergy originates from lower exposure to pathogens in the modern environment. People who have grown up in rural regions and who are thus exposed to more pathogens in their childhood are less likely to have autoimmune diseases.

In the psychiatric sciences, people are just beginning to show interest in the evolution of humankind. Professor Dan Stein from the University of Cape Town reported that much is already known about mental illnesses, but to date therapies would only be effective to a certain degree. A look at evolution shows that not all psychiatric problems are also pathological. Many are natural bodily reactions that have asserted themselves in evolution. The evolutionary theory can provide a basis for understanding how emotions are regulated, what motivates people and how to deal with social conflicts.



Human beings are the result of many million years of evolution. Because of this, they are adapted to environments and conditions which have little in common with those obtaining today. Some of the so-called diseases of civilisation are a result of this, such as obesity, allergies or mental illnesses such as depression or anxiety. To understand how these mechanisms and behaviors have evolved may help to combat these problems. This does not necessarily have to be done via medical treatment but can be achieved by better adaptation of the conditions of life to the needs of the body. It is for this reason that evolutionary medicine must become part of medical education. For only when doctors are familiar with evolution and its mechanisms are they able to recognise and treat the diseases in question as such.

Evolution has not created only one species of human being. Depending on the environment inhabited by our ancestors, we are variously well adapted to individual environmental influences for example. These ethnic and individual variations can result in medically relevant divergences such as metabolic differences, more rapid or slower physical development. This is paid little attention when selecting a therapy. With regard to individualised medicine, evolutionary aspects and their consideration in treating disease will play an ever increasing role. This applies not only to doctors which have to take such differences into account, but also to research. Ethnic or gender-specific divergences have hardly been considered in studies to date, although this can exert substantial effects on the course of therapy.

## Key Messages

- ▲ Evolutionary medicine must be a component of medical education. Only when doctors are familiar with evolutionary differences can they react appropriately with their therapy.
- ▲ Not every human problem is a disease. Evolution has adapted human beings to conditions of life other than those they find themselves in today. This can lead to physical or psychological afflictions that can be treated not only by appropriate therapy but also by changing lifestyle habits.
- ▲ Ethnic and individual differences must be paid more attention. Evolution did not take the same course in different peoples, who are variably well or poorly adapted to individual environmental conditions depending on their habitat. Both doctors and scientists must pay more attention to these differences in their work.

## Key Challenges

- ▲ Evolution plays no role at all in the education of most of the medical profession. So these kinds of problems are foreign to its members. Afflictions arising from deficient evolutionary adaptation are almost always treated the same as a normal disease.
- ▲ The conditions of contemporary life are no longer comparable with those of our forebears, which means that the human body is not optimally prepared for the modern environment. The problems arising from this need to be recognized as such, for here lies the key to combating them.
- ▲ Individual differences are not taken into account when selecting a therapy. Evolution means that there are a high number of variants in individual genes. These result not only in people-specific but also in individual genetic differences, which can have marked effects. Doctors are almost always oriented towards average data. People who deviate genetically from these may be given the wrong treatment.

# Partner Symposium: Diabetes – the Global Problem

## Current Situation

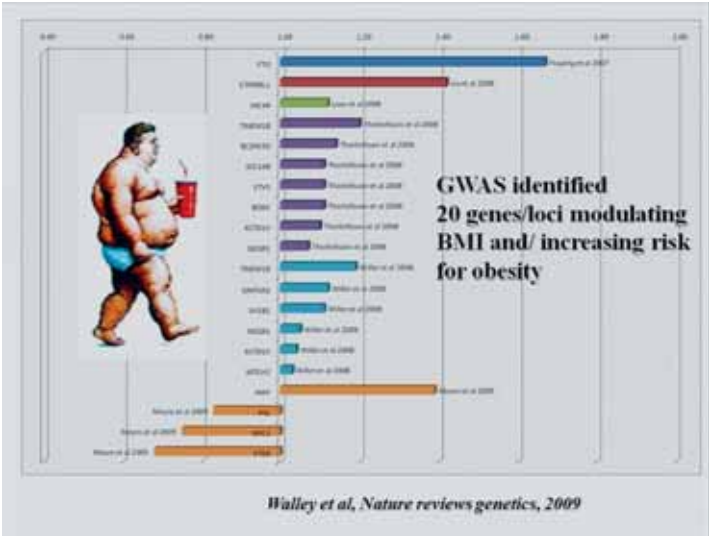
In 2003, about 194 million people worldwide had diabetes. The majority of those affected had type 2 diabetes. According to Professor Desmond G. Johnston, London, its incidence and prevalence vary in the different regions of the world. “This metabolic disorder

is particularly common in the USA, in Europe and above all in India,” stated Johnston during the World Health Summit in Berlin. The number of people with diabetes doubled from 1994 to 2003. It will continue to grow in coming years. According to estimates by the World Health Organization (WHO), there are expected to be 333 million people worldwide with diabetes in 2025. The treatment and care of this high number of patients will be an enormous challenge to the healthcare systems in practically all nations.

According to Johnston, overweight and obesity are important pathogenetic factors for type 2 diabetes. Both are also widespread disorders and their frequency shows a tendency to increase further in almost all parts of the world.

The significance of type 2 diabetes is still often underestimated. It is a disease which must be taken seriously and which shortens the life of those affected greatly. “The mean life expectancy of a person with type 2 diabetes is on average 15 years shorter than that of a metabolically healthy individual,” explained Johnston in Berlin. The main reason for this is that cardiovascular mortality is about two to four-fold higher than it is in the metabolically healthy. Diabetes is also one of the most common causes of amputation, blindness as well as of acute renal failure and thus for the need for dialysis treatment.

In comparison, it is still not widely known that diabetes also increases the risk of cancer. There are reliable indications that cancer risk is about 20 per cent higher than normal when type 1 diabetes is present. Type 2 diabetes is also associated with a higher risk of developing certain tumours. In particular, a higher number of breast and bowel cancers as





well as pancreatic carcinoma occurs. The reasons for this, according to Johnston, are to be found in the hyperinsulinaemia and insulin resistance that accompany diabetes.

As well as the burdens of diabetes, the economic consequences should also be considered because diabetes is an expensive disease. Patient care currently accounts for 5 to 15 percent of healthcare costs in the western world. The greater part of these costs arises from treating the complications of the disease, particularly the cardiovascular consequences.

## Challenges

There are currently substantial shortcomings in research into the fundamentals of the disease in the case of diabetes. Professor Philippe Froguel from London drew attention to this in Berlin. It is clear that this is a multifactorial event in which genetic predisposition and environmental factors interact.

Overweight and obesity, which must themselves have a genetic basis, play a central role in pathogenesis. "This is obviously a polygenetic disorder, for we know of 20 different gene loci which modulate body weight and which could thus be implicated in the development of overweight and pave the way to diabetes," stated Froguel. "The genes appear to control the synthesis of diverse modulators which are formed both by the CNS and also directly by the adipocytes in the fatty tissue. Obesity can thus be considered to be an endocrine condition," according to Froguel.

But although the need for research continues to grow because of increasing patient numbers, the general framework of research has become more difficult. Scientists are battling, according to Johnston, with increasingly complex regulatory requirements and less and less research funding is granted. The research activities which do exist are not sufficiently practice-oriented and the various approaches are poorly coordinated.

## Discussion and Potential Solutions

There is no doubt, however, that there are ways to overcome these shortcomings. "We are working towards building up a national diabetes research network," explains Johnston. It is important, in his opinion, to establish local clinical research networks which should increasingly include research nurses. "We also need primary and secondary patient care networks, collaborations in which GPs and clinicians are coordinated and cooperate with all the groups of people involved in caring for people with diabetes," emphasized Professor Johnston.

### Key Challenges

- ▲ The increasing incidence and prevalence of diabetes
- ▲ A pressing need for research into the pathology of overweight, obesity and diabetes
- ▲ Less research funding and more complex regulatory requirements relating to research



For, according to Johnston, it is not necessarily more research that is needed, it is rather that existing resources must be more stringently coordinated. Diabetes research networks must be formed and there is a need to consolidate the translation of fundamental research into clinical research. “We also need better linking of fundamental research to clinical and industrial pharmaceutical research,” urged the professor.

An enormous cost pressure stands in the way of this, as high quality clinical studies are very expensive.

In contrast to Johnston, Froguel called for more fundamental research in Berlin. His justification for this was that there is still too little known about fundamental aspects of the development of overweight and diabetes. If the exact causes of the disease were clear, it would be possible to develop causal therapy, in his view. Better understanding of the

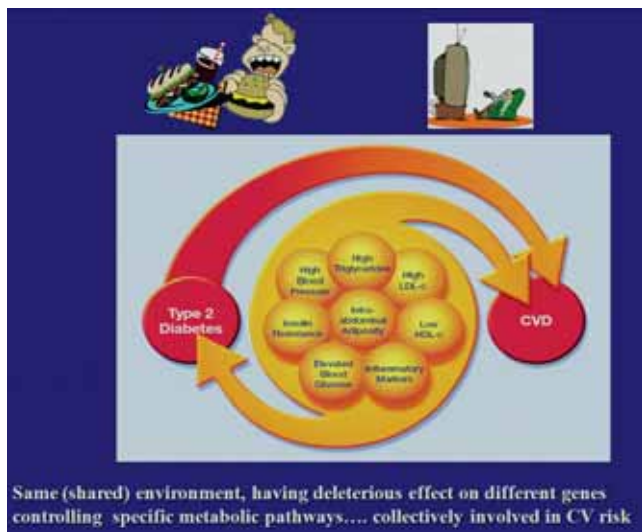
molecular connections would provide a basis for formulating new target structures for drug therapy and for developing new active substances to treat diabetes.

Independently of this, according to Froguel, better understanding of the underlying genetic factors would make it possible to make individual estimates of the risk of the disease. Better understanding of the environmental factors which trigger diabetes could help to accelerate efforts towards prevention. This is urgently required in Johnston’s opinion to gain control of the problems that currently threaten because of the increasing incidence and prevalence of diabetes. “We need better prevention strategies, otherwise we will be unable to contain the increasing prevalence,” according to Johnston.

In the view of Professor Peter Sever, London, more stringent screening of patients with prediabetes, disorders of glucose tolerance and/or metabolic syndrome could help. Professor Sever wants to see special prevention programs for these people with the aim of making changes in

diet and their overall lifestyle. “As experience to date has shown that it is extremely difficult to implement this kind of program, we need targeted pharmacological interventions to avert the manifestation of diabetes in patients with prediabetes,” stated Sever. In his opinion, more efficient strategies must also be developed to stop the progression of atherosclerosis in type 2 diabetics.

“We urgently need to change the way we think. Nor should we shrink from imposing restrictions on the food and drinks industry,” said the professor. In his opinion, this should aim to limit marketing and sales of high-calorie soft drinks and junk foods, particularly to children and adolescents, and would best be done through cooperation with



the industry. Furthermore, the opportunity to develop a polypill with active substances against hypertension, cholesterol and elevated blood glucose should be taken, as this is an effective and particularly cost-effective way of counteracting the underlying risk factors for diabetes development through appropriate treatment.

## Key Messages

- ▲ More research funding is needed; in particular research networks should be built up.
- ▲ More fundamental research should light on the molecular basis of diabetes.
- ▲ Effective screening programs should be established to catch the disorder as early as the prediabetes stage.
- ▲ Efforts at prevention should be increased to contain incidence and prevalence.

## Working Session: Personalized Medicine: Prevention and Treatment

### Current Situation

The future of healthcare in the 21st century will be patient-centered genomic care. Preventative medicine guided by genomic information and patient preference will enable further reductions in common chronic diseases, especially with the significantly aging population. This care will increasingly involve corporate genomics companies and services to accomplish evidence-based medicine and patient-centered delivery.

Personalized medicine means using all available information – molecular and clinical – on a person in order to better manage their disease or their predisposition to a disease. This concept will enable physicians to act pro-active rather than reactive when it comes to maintain the health of the individual patient. Personalized medicine aims to achieve the best medical outcomes by taking into account an individual's genetic profile and their environmental exposures.

**7 Technologies that are transforming drug discovery and development**

- **Next Generation Sequencing**  
Gene variants  
Transcriptomics
- **MALDI-TOF**  
Proteomics  
Metabolomics
- **Genetic engineering**  
Animal models
- **Neuroimaging**  
Target validation
- **Combinatorial Chemistry**
- **Adaptive Trials**
- **BIOINFORMATICS**



*half full or half empty?*

**Will the "big 7" deliver on their promise?**

The clinical application of genetic information to make individualized treatment choices is increasing, as evidenced by greater pharmacogenetic testing in specialty practices (oncology, HIV/AIDS, psychiatry) and the emergence of biological therapies or vaccine approaches at specific genetic and immunologic targets.

Despite increased awareness, pharmacogenetics has been relatively slow in becoming incorporated into mainstream medicine because of several major barriers. These include uncertainty regarding the course of action following a genetic test result, limited incorporation into guidelines and practical aspects of testing (assay validity, time to results) and costs. Some of these factors are less likely to be significant constraints as the field matures, but others deserve structured debate and discussion in order for the field to advance. Moreover, patient education will play a prominent role in the acceptance

of personalized healthcare, given that patients will need to become more involved in managing their own health portfolio.

## Challenges

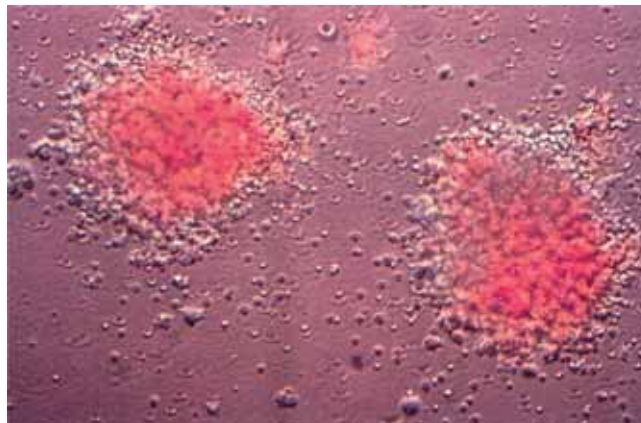
"After many years of wishful predictions, we now stand on the cusp of an era of personalized medicine, with applications already emerging in several areas of clinical care," all speakers agreed. "Nevertheless, this promising future faces many obstacles, which have to be resolved soon." They gave the following examples:

- ▲ Healthcare authorities are not sufficiently prepared for dealing with the increasing part of personalized medicine.
- ▲ Institutional electronic medical records provide some promise for characterization of a patient's complete health state, as do personal health records.
- ▲ Commonly expectations are overly optimistic with regard to the speed and comprehensiveness in which the use of molecular diagnostics and therapies will change general medicine. Physicians have to be prepared for a more differentiated communication to their patients.
- ▲ The key to successful fulfillment of the expectations for the personalized medicine era will not be driven primarily by finding new molecular targets with which to direct customized therapy. A too narrow focus on genetic variation fundamentally blinds to the personalized information that can and should guide our clinical decision-making for individuals.

- ▲ Personalized information should extend to observables such as the environment and physiology, which cannot be easily inferred from examining genome-scale variation.

## Discussion and Possible Solutions

- ▲ Deployment of personalized health care approaches must always be evidence-based.
- ▲ To arrive at patient tailored therapy, well-qualified biomarkers as well as patient specific factors have to be validated and integrated into a comprehensive model of personalized medicine.
- ▲ Health economics must evaluate the market for individualized therapy. Obstacles to overcome are implementation, regulatory requirements, reimbursement, education and logistics.
- ▲ To realize the financial promise of personalized medicine, drugmakers need to form partnerships with genomic companies to find important gene variants, and with molecular diagnostic firms to develop biomarker-detection tests. Academia may, in addition to industry, provide valuable collaborations for pharmaceutical companies.
- ▲ We must create a universally usable electronic health records system capable of managing, in a standardized way, the new kinds of genetic information that will be at the core of personalized medicine.
- ▲ Governments will have to deal with this “have versus have not” systems, which is a reality when looking at the differences of healthcare standards between countries but also increasingly within countries, including the developed world, where affordability of best healthcare standards is not equal.



## Citations

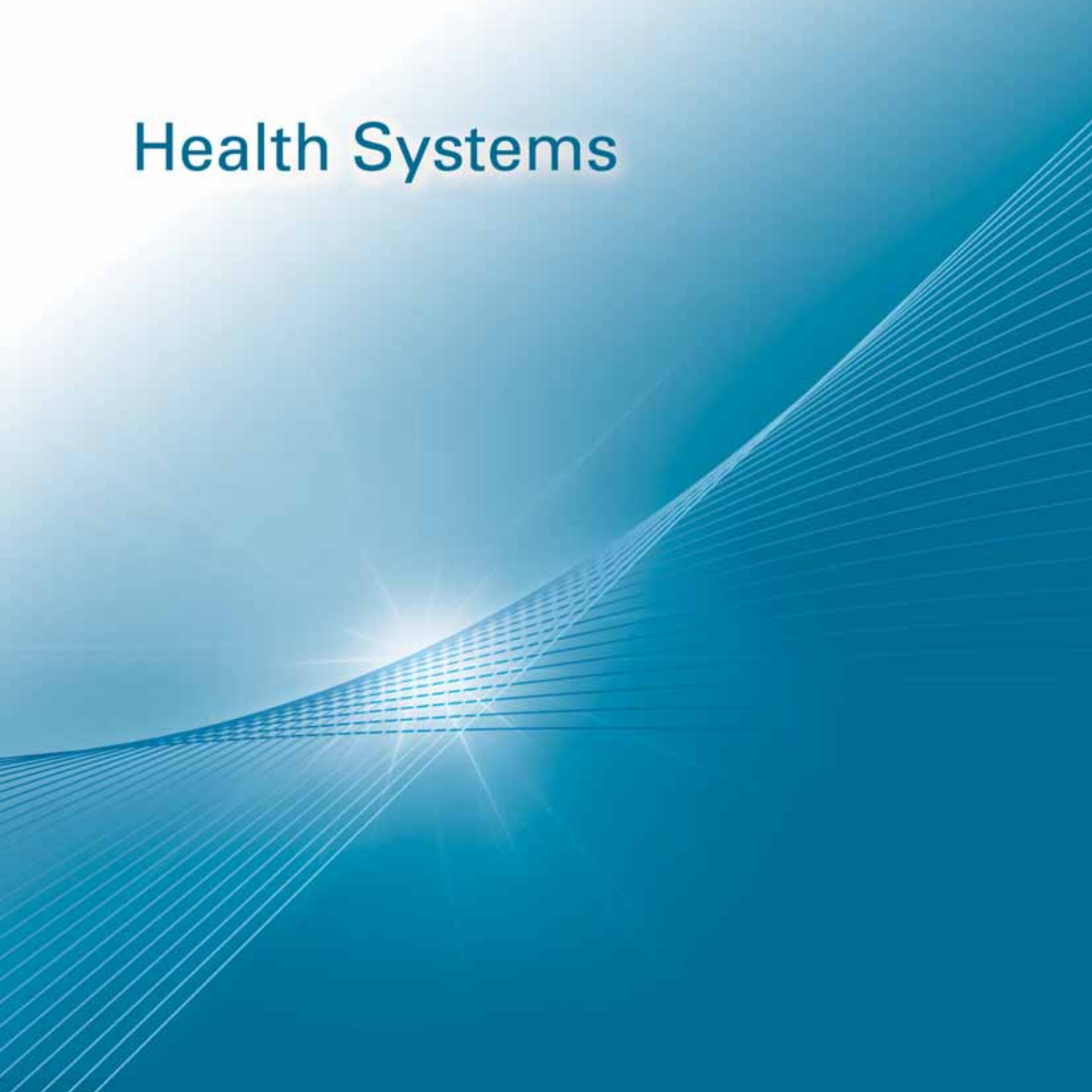
- ▲ Erich R. Reinhardt (Siemens AG, Ex-CEO Healthcare): “The key driver in today’s personalized medicine is molecular diagnostics: Diagnostic imaging, regenerative medicine, telemedicine and e-health are the most dynamic fields of medical technology.”
- ▲ Florian Holsboer (Max-Planck-Institut of Psychiatry, Munich: “We face increasing use of genetic or other molecular biomarker information to improve the safety, effectiveness and health outcomes via more efficiently targeted risk stratification, prevention and tailored treatment management approaches.”

- ▲ Geoffrey Ginsburg (IGSP Center for Genomic Medicine, Duke University Durham): “The mission is to develop and translate novel therapies and predictive biomarkers into clinical research and practice to optimize efficiency, effectiveness, and success in bringing the right therapy to the right patient at the right time.”
- ▲ Fanyi Zeng (Shanghai Jiao Tong University, Shanghai): “Induced pluripotent stem cells, artificially derived from an adult somatic cell, are truly pluripotent as scientists developed a full functional mammal recently. Their potential seems high, yet their perspective has to be defined.”
- ▲ Paul J. Wallace (Kaiser Permanente, Oakland) : “Breakthrough of targeted therapies could save many lives and a great deal of money. But, as higher expectations from new diagnostics and treatments in general population arise, science community and policymakers have to define strategies, how to create new business models, regulations and reimbursement systems.”

## Key Messages

1. **Paradigm shift:**  
New possibilities in prevention, diagnosis and treatment will lead to a paradigm shift in clinical medicine, basic, social science and health economic research.
2. **Patient empowerment:**  
Patient choice and empowerment will require different forms of patient support and education.
3. **Evidence and justification:**  
Deployment of personalized health care approaches will require different types of evidence and justification.
4. **Business model & collaboration framework:**  
Patient benefits and business cases need to be established for a broad application of individualized medicine. In this process new frameworks for collaboration need to be formed.

# Health Systems



## **Working Session:**

### **Socio-Economic Transition: Health Care Consequences**

#### **Current Situation**

Major upheavals have taken place in the countries of Central and Eastern Europe and Central Asia in the past 20 years. The transition from communism to parliamentary democracy also had an impact on the respective health systems which before the political changes were totally controlled and financed by the state. In the course of the reforms, most of the governments introduced people's or national insurance schemes with mandatory membership for the whole population. In some cases, for example in the Czech Republic and Slovakia, several health insurance companies established themselves. In other cases, for example in Poland, Hungary, Slovenia, the Baltic States, Romania and Bulgaria, national single health insurance companies with regional branches were set up. It was determined that the insurance company concludes contracts with healthcare service providers. Usually the health insurers are regulated by the respective health ministry. Private health insurers only emerged gradually. Due to the lack of clientele, they are still not as well established as in the west. Most of these health insurance systems are financed presently by contributions from employees and employers, some mainly by tax or by a system of mixed financing. In almost all of the countries the hospital landscape was restructured in the course of the transformation. There were reductions in bed numbers, closures and, in some cases, the introduction of DRG (diagnosis-related groups). Doctors who formerly worked in polyclinics gradually went into independent practice, giving rise to individual and joint practices with governments supporting primary medical care systems. In some countries the government introduced surcharges on drugs, dental and other medical services, and the share of health expenditure in the GDP was increased incrementally.

#### **Political Challenges**

If Bismarck's social insurance policies were the cure-all solution for the dilapidated state of the formerly state-controlled healthcare systems in Eastern Europe, most of these countries would now not be facing the immense challenges described at the Summit. The main reason for the lack of success of the reforms thus far in almost all countries of Cen-

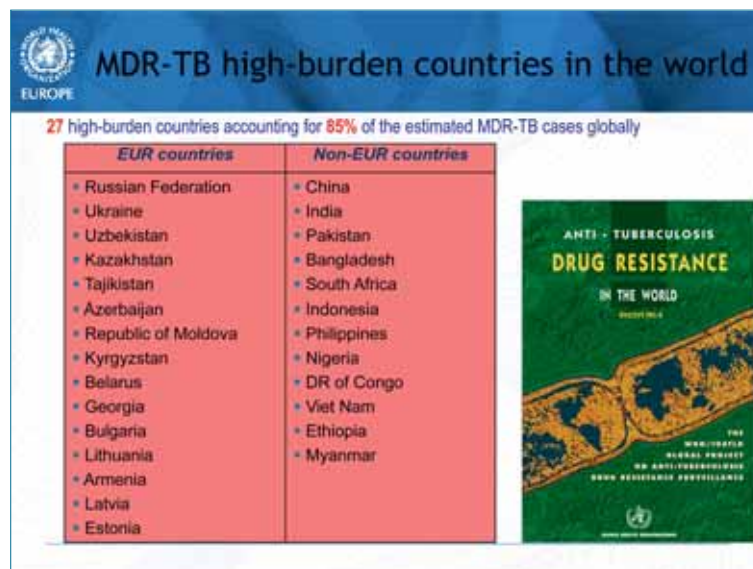


tral and Eastern Europe and Central Asia, are their floundering national economies, often coupled with high unemployment rates. In Macedonia, explained Vladimir Lazarevik from the Medical Faculty of the University of Skopje, the unemployment rate is over 30 per cent. At the same time, there is an increasing commercialisation of the healthcare system, says the doctor, a process which so far was only beneficial to few rich people. Solidarity such as (still) exists in Western Europe's healthcare systems is a foreign concept, according to Lazarevik.

The chronic lack of income combined with contribution rates which were miscalculated and are too low means that there is no money for state investments in the necessary areas. Particularly in the inpatient sector, the chronic underfinancing has led to long waiting lists, lack of innovation, particularly in equipment, and inadequate salaries for doctors, report the representatives of the Central and Eastern European countries. In the outpatient sector doctors are complaining about excessive workloads and inadequate payments by patients. The entitlement expectations of the patients – a residue from former times – are too high. As many of the health insurers are insolvent after just a few days of a new month, clinics are only being utilised at around 50 per cent of their capacity. Alongside their work at a state clinic, doctors have to take on second jobs in the private sector. Not least of all, many of the governments in the transition countries lack continuity. In some cases, there was a high turnover of health ministers in just a few years. Against a background of major challenges and upheavals, the ministers themselves were rarely popular.

## Medical Challenges

In Central and Eastern Europe and in Central Asia, infectious or communicable diseases are one of the major health threats. While there is now a worldwide consciousness for the risks posed by HIV/AIDS thanks to numerous initiatives and campaigns, tuberculosis (TB) still lives in the shadows. According to the European Centre for Disease Prevention and Control (ECDC), both HIV and TB have spread faster in Central and Eastern Europe than in other countries. The 27 countries with the highest TB incidence worldwide (high burden countries) include 15 member states of the European Union, emphasized Richard Zaleskis, regional adviser for tubercu-



## Key Challenges – Politics

- ▲ Economic recession, poverty and socially vulnerable groups (homeless, unemployed, alcohol-dependent)
- ▲ Floundering national economies
- ▲ High unemployment rates
- ▲ Lack of investment in the necessary areas
- ▲ Contribution rates to health insurances calculated too low
- ▲ Old way of thinking

## Key Challenges – Medicine

- ▲ Increasing problems in infection control, namely in tuberculosis, due to lack of awareness of the spread of various infectious diseases in the population
- ▲ Emergence of multi-drug resistance caused by a lack of compliance and control in the intake of drugs due to insecure or changing infrastructures

losis control at the WHO regional office for Europe, during the summit. According to Paul Sommerfeld, Chairman of the British non-governmental organization TB Alert, almost two million people die every year from a treatable disease. Sommerfeld says this is partly because only just over 60 per cent of all cases are identified. If the virus is diagnosed, the treatment is not easy, because it extends over several months and requires co-operation on the part of the patient.

During the Soviet era, TB control played an important role in the healthcare system and there was a policy of active screening measures, explained Timo Ulrichs from the Koch-Metschnikow-Forum in Berlin. As the end of the Soviet Union and its disintegration into the Russian Federation and other independent states also led to the collapse of the Soviet healthcare system and its blanket-coverage, centrally organized healthcare provision in its hitherto forms, the medicament supplies for combination treatments were suddenly in different states, explains the doctor, scientist and official at the Federal Ministry for Health, Berlin. Centrally controlled provision was no longer possible. The combination therapy of three or preferably four different drugs (first-line drugs) could no longer be provided on a nationwide basis. Doctors neglected the control of the drug intake (adherence, compliance), which in turn gave rise to resistances in *Mycobacterium tuberculosis*. Implementation of WHO-recommended strategies like DOTS (directly observed therapy – short course) has to consider the special situation in tuberculosis control in Russia and the other successor states of the former Soviet Union. It also has to emphasize the microbiological diagnostics as prerequisite for any successful treatment strategy and reliable epidemiological information.

According to the WHO, 49 people are infected every hour with *M. tuberculosis*, while seven die per hour of this infections disease. With nine million new infections annually and just under two million deaths, TB is number two on the list of threatening infectious diseases. The HI virus is number one. 14 per cent of all deaths from TB worldwide occur in persons infected with HIV. Without the appropriate treatment, most of the HIV-infected individuals die within two months of being infected with TB. Thus, tuberculosis has become the main cause of death in persons with HIV.

## Discussion and Possible Solutions

The representatives of Central and Eastern Europe and Central Asia all agreed that the medical and political challenges in this region are highly complex. Karl Ekdahl from ECDC emphasized that only jointly developed, linked-up programs for the respective countries would help to overcome these challenges. He said that ECDC and the European Commission have to play a very important role here. While ECDC can provide technical

support in the respective countries, EU money must be used for investments in health-care systems. The rapid increase of tuberculosis cases and HIV infections since 1990 shows how much damage has been caused by failure to invest in the public health system and the infrastructure after the fall of the Iron Curtain. According to Ekdahl, scientists, public health experts and politicians have to develop a better understanding for the diversity of countries and cultures. But according to Sommerfeld from TB Alert, civil society also plays an important role. Up to now, too little emphasis has been placed on the “resource of civil society,” in particular to reach people who are socially or geographically isolated. The use of NGOs in the fight against TB and other diseases can only be successful if the governmental partners recognize and support this, believes Sommerfeld.

## Key Messages

- ▲ Improve and implement existing strategies to meet current health challenges (e.g. spread of communicable and non-communicable diseases)
- ▲ Develop strategies to meet current political challenges such as insufficient health care financing, deficient educational system, brain drain of medical personnel and fragmented primary health care
- ▲ Evaluate international guidelines and recommendations and potentially adapt them to the specific situation in Eastern Europe
- ▲ Strengthen international collaboration to meet the challenges evolving from transition processes of health care systems in Eastern European states, such as insufficient financing, deficient education and brain drain. Collaborative efforts should include Private-public partnerships, NGOs and bi-national collaboration.

# Partner Symposium: New Technologies in Diagnostics and Treatment of Socially Significant Children’s Disease

## Current Situation

The medical care of children occupies a high place in public health in Russia. According to the presentation given by Professor Leyla Namazova-Baranova, Moscow, paediatric faculties have been in existence for as long as 80 years. She reported that about 80,000 paediatricians are currently employed in Russia. This includes various specialities such as paediatricians working in oncology. It takes from six to as long as eight years to train to be a paediatrician depending on speciality.

Children are cared for in out-patient departments as well as in special paediatric hospitals and sanatoriums. The push to improve the medical care of children is, according to Namazova-Baranova already reflected in a markedly decreasing mortality rate in children, which is principally due to a regression in infectious diseases in children. This is, in turn, based on vaccination programs, which were conducted on children as well as on the entire family. Special prophylaxis programs are also carried out in schools in Russia, where children undergo regular medical examinations, to improve the early diagnosis of diseases.

| Chronic Somatic Diseases Associated with Microorganisms |   |
|---|---|
| Pathology   | Pathogen                                      |
| Cardio-vascular   |   |
| Atherosclerosis   | <i>Chlamydia sp. (?)</i>                      |
| Myocarditis   | Coxsackie, mumps viruses<br>Hepatitis C virus |
| Infarction  | Influenza virus                               |
| Stroke  | Influenza virus                               |
| Gastrointestinal  |   |
| Gastric and duodenal ulcer, gastritis                   | <i>Helicobacter pylori</i>                    |
| Metabolic   |   |
| Juvenile diabetes                                       | Rubella virus                                 |

## Challenges

“Children account for only 20 to 25 percent of the population, but are 100 percent of our future,” said Leyla Namazova-Baranova at the World Health Summit in Berlin. “So we need to do everything we can to improve children’s health”. According to the Russian paediatrician, action is needed in relation to all chronic diseases, particularly rheumatic diseases such as juvenile chronic polyarthritis.

Further research is also needed, according to Professor Mikhail Ivanovich Davydov, President of the Russian Academy of Medical Sciences in Moscow, into cancers in chil-

dren. In his opinion, cancer is also one of the principal causes of death in children and adolescents in Russia, although about 20 percent of cases can be cured by surgical removal of the tumor, chemotherapy and radiotherapy. The fact that treatment options are still generally very aggressive and thus cause a high degree of stress in children presents an additional challenge here.

## Discussion and Potential Solutions

According to Professor Mikhail Ivanovich Davydov, therapy-related stresses for children can be decreased by using new endoscopic and less aggressive surgical procedures in tumor resection. Work is being done to develop procedures of this kind and to improve ways to remedy defects arising during surgery for chondrosarcoma, for example, by supplying orthoses. In chemotherapy as well, the intention is to use less aggressive therapy regimens and new substances to reduce the stress resulting from tumor treatment in children.

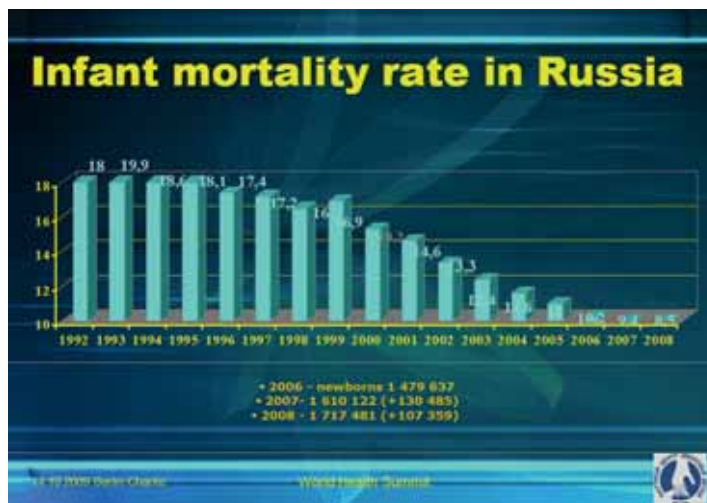
A further option named by Dr. Vitaly Zverev, Moscow, to improve children's health in Russia was vaccination programs. According to the presentation he gave, vaccination is the most effective and cost-efficient method of reducing paediatric morbidity and mortality and of increasing the life expectancy of children of all age groups. "This applies to the industrialised nations as well as to developing countries," stated Dr. Zverev.

Diseases can be completely stamped out by systematic implementation of available vaccinations, he said, as is illustrated by smallpox for example. In theory, a similar development would also appear to be possible with measles. It would be desirable, therefore, to extend vaccination programs on the national level.

The further development of medicines for immune prophylaxis and immunotherapy of oncological diseases would also appear to be a priority and work is needed on improved options for giving up smoking, urged Zverov. This would also substantially improve children's health in the long run. In his view, the focus should increasingly be on developing vaccines for prevention and improved therapy options for immunologically mediated diseases. By way of example, he named allergies, bronchial asthma, neurodermitis and allergic conjunctivitis as well as various immune diseases.

## Key Challenges

- ▲ The medical care of children must be further optimized.
- ▲ Improved therapy options are needed, particularly in chronic diseases and especially in cancer in children.
- ▲ Work must be done to reduce the stresses of tumor treatment for children by using gentler forms of therapy.



Increased efforts should be made to develop new vaccines specifically against those microorganisms that are associated with chronic diseases. Zverev gave the following examples: chlamydia, for which a connection with atherosclerosis was discussed, coxsackie viruses, which may prove to be responsible for myocarditis, *Helicobacter pylori*, a bacterium that can cause stomach cancer, and the rubella virus, which appears to be associated with juvenile diabetes. There is a great need, according to Zverev, for vaccines against HIV, malaria and tuberculosis.

### Key Messages

- ▲ Less aggressive therapy procedures should be developed to treat cancer in children.
- ▲ Vaccine programs must be more systematically implemented to provide children with more effective protection against disease.
- ▲ There should be a push to develop new vaccines against infectious diseases and against the micro-organisms associated with chronic disease.

## Partner Symposium: How to Reimburse Innovations in Regenerative Medicine?

### Current Situation

One in five older people (over 65 years) needs some kind of therapeutic replacement of entire organs, organ parts or tissues. These may take the form of implants such as joint replacements, cardiac pacemakers, vascular stents, heart valves, skin and cartilage or organ replacement procedures conducted outside the body such as dialysis or artificial ventilation. Because of demographic change, the need for organ replacement therapy is rising in the industrialized nations by eight to ten percent annually. In research, on the other hand, regenerative medicine is undergoing dynamic development: stem cell therapy,



the cultivation of tissue or three dimensional organ parts such as blood vessels in the laboratory are examples of this. There appears to be enormous potential in the development of innovative and causal forms of treatment based on regenerative medicine. Recently, the first medical device based on tissue engineering was authorized in Europe: autologous chondrocyte transplants to treat extensive cartilage defects.

## Challenges

But how can the potential of novel forms of treatment be realistically assessed compared to established therapies? Who is going to make an advance payment to finance this kind of assessment? And what should the development and application of new forms of regenerative medicine cost in relation to their expected treatment success?

Novel therapies have a chance of being financed and thus developed through to the application stage only if they are relevant in clinical and health economic terms, said Dr. Jan Benjamin Pietzsch from the Department of Management Science and Engineering at Stanford University. They have clinical relevance if they reduce patient morbidity, and possibly mortality, in comparison to established treatments. The methodological strategy is globally comparable; however, it is worth taking into account the national conditions, structures and preferences of the health care system in question.





## Key Challenges

The financing of studies on the potential of individual methods from the sphere of regenerative medicine is frequently insecure. One of the reasons for problems with financing is that many cell and tissue therapies are individual-specific and are not the material that “blockbusters” are made of. In addition, the general legal framework often makes planning and conducting clinical studies with novel cell and tissue preparations very onerous, including the preclinical stages. The deficiencies in many studies conducted to date on the economics of innovations in regenerative medicine are, in Langer’s words, based on the fact that

- ▲ No prospective controlled and randomized studies are available with adequate case numbers and follow-up period.
- ▲ To date, health economics studies take account of disease-specific effect measures only rather than QALYs (QALY stands for quality adjusted life year: with QALYs both years of life obtained and health-related quality of life are taken into account).
- ▲ Treatment alternatives and their costs are not comprehensively presented and thus the new procedure’s potential for making healthcare cost savings is unclear.
- ▲ No studies of high transparency and of acceptable form and quality are available for the reimbursement authorities.
- ▲ The efficacy of clinical studies cannot be translated without further work into everyday clinical practice i.e. routine application.

Essentially, according to accepted decision rules, medical procedures with higher efficacy and low costs should always be accepted in relation to comparison interventions (e.g. the usual therapy generally applied), while procedures with lower efficacy and higher costs should always be rejected. However, when there are corresponding benefits, higher costs are always justified, said Business Administrator Astrid Langer from the Institute for Health Economics and Management in Public Health at the Ludwig Maximilian University, Munich.

## Discussion and Potential Solutions

As the number of projects that can realistically be sponsored is limited, it is important to focus and prioritise early and to set clear targets for the product to be developed, stated Dr. Barbara Pfüller of the Berlin-Brandenburg Center for Regenerative Therapy. All parties involved in the application, admission and cost reimbursement of therapies such as authorities, hospitals, scientists and patient organizations should be involved in the development process as early as possible. Discussion focussed on how to concentrate, in situations where the coordination of international admission authorities is desirable, on how clinical studies should be designed to be relevant to admission.

## Key Messages

Early assessment of the potential of regenerative medicine in relation to clinical and economic aspects is a necessary precondition for the development of innovative therapies but is both time-consuming and expensive. It is essential to improve the quality of assessments of this kind so that, in future, the potential of regenerative medicine benefits the patient and does not remain unexploited.

- ▲ The criterion for sponsoring the development of new therapies is the expectation that morbidity and mortality are decreased and costs reduced as far as possible in the long term.
- ▲ Research into reliable cost-benefit ratios must be intensified.
- ▲ All parties that are involved with use, authorization and reimbursement should be included at an early stage in the development process for new procedures.
- ▲ Better coordination between international authorization authorities on the question of how to design studies that are relevant to authorization would be desirable.
- ▲ In financial terms, public-private sponsorship is necessary for all those therapies which are tailored to the individual patient and are not the material of blockbusters.

## Partner Symposium: Improving Research Conditions for Young Scientists

### Challenges

#### Key Challenges

The main problems facing young scientists include:

- ▲ financial insecurity,
- ▲ lack of independence,
- ▲ inadequate career planning as well as
- ▲ high pressure of competition.

“The best way to promote global and individual health is to promote the research and creativity of young scientists.” As Chair of the working group “Improving Research Conditions for Young Scientists” Dr. Martin Ebinger, a Neurologist at the Charité in Berlin, emphasized from the start of the session how vital it is to promote the young to find solutions to health problems. Scientists from Germany, France, Japan, Australia and the USA made it clear that the situation of young scientists differs from country to country and from university to university. However, there are also a high number of things in common. The main problems facing young scientists include financial insecurity, lack of independence, inadequate career planning as well as high pressure of competition.

### Discussion and Potential Solutions

“These are problems that also confront young scientists in Japan,” said Professor Motoko Yanagita from the Kyoto University Graduate School of Medicine. But attempts are being made to overcome these difficulties and to improve research conditions. The Japanese government introduced a tenure track program in 2006 that is intended to guarantee young scientists a certain degree of autonomy and independence. The University of Kyoto is the first to implement the program. After obtaining a doctorate, scientists are granted a fixed-term contract of employment for three to five years. During this time, they can pursue their research independently but are subject to strict quality controls. “There’s a lot of competition,” explained Yanagita. Those who prove themselves are given unlimited tenure. However, it is still too early to evaluate the program, she admitted. “But it is a very promising way forward.”

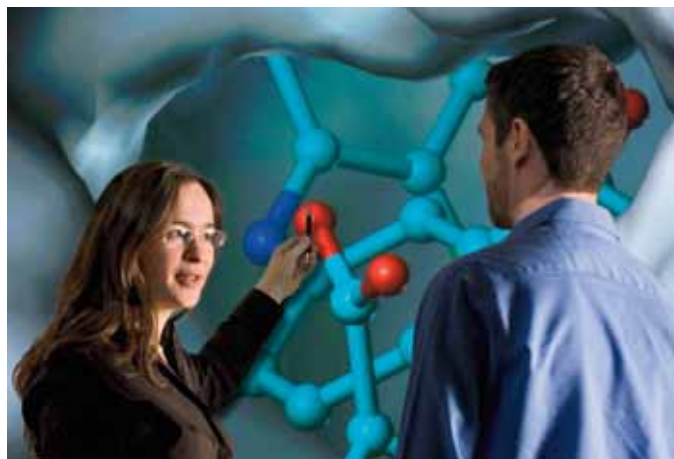
Yanagita also considers the poor networking among young scientists in Japan to be a problem. The Japanese Society of Nephrology has introduced an internet portal in an endeavour to remedy the situation. There scientists can find lists of available research funds, protocols and information on planning studies or submitting manuscripts. Clinicians can obtain information on clinical trials, available posts or opportunities for working abroad. Yanagita considers this approach to be very promising. “The system can promote information exchange between young scientists as well as a mentor system outside

the traditional university setting,” she said in Berlin. Her plea to those in charge: it is essential to create a framework for structured training which communicates not only research techniques but also includes the planning of studies, provision of sponsorship funds and laboratory management.

“To be able to research and work creatively you need to be independent,” said Professor Samer Kayal from the Université Paris Descartes. “This not only includes independence in selecting your own research project but also independence from financial concerns.” The pay young scientists receive at public institutions is a problem,” continued a participant from the auditorium on this subject. “In industry, they earn twice as much.” At the same time, working in research is a highly privileged profession: “There is hardly any other job where you can be creative in this way, where you can define your own field of work and essentially do what you choose to do.”

Michelle Dunstone from the Australian Monash University emphasized the value of mentor programs and networks. Individual support from mentors can make it easier for young scientists to define research projects, to finance them and to plan their own careers. “My mentor offered me the opportunity to take part in a board meeting where the granting of research contracts was discussed. After that you really understand how things work,” reported Dunstone. Her advice to young scientists: “Talk to each other, talk to the professors and ask for advice.” Young researchers must also take an active role in creating opportunities for networking with each other, stated Dunstone, whether through informal meetings during meals in the canteen or in conversations in the corridors. “Mix with people,” she encouraged her fellow scientists. “In my experience this is something scientists find difficult.”

“A large part of success in science is based on successful communication,” stated Michael Klag, Dean of the US American Johns Hopkins Bloomberg School of Public Health in this context. “We are still not very good at communication.” Klag is a great supporter of the mentor programs. He also refers to a certain obligation on the part of those mentored: “A committed mentor is very important. But the mentored have to play their part. It is always bad if people cannot take advice.” Klag also emphasized how important a high degree of flexibility is, “to get the best out of our people”. For example, not everyone is suited to leading a research group. For this reason, it is important to offer career prospects to those who are simply just good scientists. For this reason, the Johns Hopkins Bloomberg School of Public Health also provide a scientific career path (“scientist track”) for people who do not wish to assume management duties.



In the plenary session, there was some criticism that too much value in research sponsorship was put on impact factor. “The sponsoring institutions are full of bureaucrats who sit counting impact factors,” was the general comment. “And that is actually the least important consideration”. Instead, you should also look at the results that research groups produce and the man in the street makes use of. The number of publications says too little about the quality of the research. “Why should I publish ten articles when I could just as well summarize my research results in one paper?” asked a participant from the auditorium.

A trend away from individual research sponsorship towards support for research groups in large projects was described by Mylinh La, also from Monash University. In biomedical research particularly, more support is given to interdisciplinary centers where biologists, chemists, engineers and others work together to answer complex biomedical questions. These large teams sometimes aim, through their interdisciplinary structure, to achieve results which individual researchers do not achieve and frequently also have better access to expensive technology. There are potential disadvantages to this kind of research and research sponsorship: it creates hierarchies. The creativity and scientific independence of the individual researchers are subject to restrictions. For La there are two questions in particular when contemplating research in large groups: How big is too big? And how can we create a balance between the creativity and independence of the researcher and the need to achieve relevant results? However, it is worth reconciling scientific independence and teamwork.

## Key Messages

It was the organizers’ wish that the results of the working group session were translated into concrete projects:

- ▲ The working group discussion should be included in a manifesto which the organizers want to publish in an international scientific journal.
- ▲ An “ambassadors” group should be set up to campaign to promote young scientists.
- ▲ The aim of all endeavours is to encourage the willingness in governments, politicians and those in charge in public health and industry to create appropriate research conditions for young scientists.

# Adapting the Research Agenda

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## Working Session:

### Can We Cope with Medical Progress?

#### Current Situation

Progress in medical research is developing with enormous speed. In the field of regenerative medicine, the menu of beneficial diagnostic and therapeutic procedures is expanding at a breakneck pace. Regenerative medicine is an emerging interdisciplinary field of research and clinical applications focused on diagnosis, repair, replacement or regeneration of cells, tissues, or organs to restore impaired function resulting from any cause, including congenital defects, disease and trauma. It uses a combination of several technological approaches that may include – but are not limited to – the use of stem cells, soluble molecules, genetic engineering, tissue engineering, and advanced cell therapy. Pharmacotherapy and molecular medicine are moving towards a personalized approach opening new possibilities to tailor treatment to individual needs.

The resulting changes for the scientific community and society have to be interdisciplinary addressed with expertise in science, medicine, law, philosophy, ethics, social science, and health policy. Their purpose is to examine and anticipate the ethical, economic, environmental, legal and social issues that might arise with the progress in regenerative medicine. The aim is to maximize the benefits and minimize the risks of advances in regenerative medicine through careful social evaluation. The goal is to ensure that as development, commercialization and clinical introductions unfold,

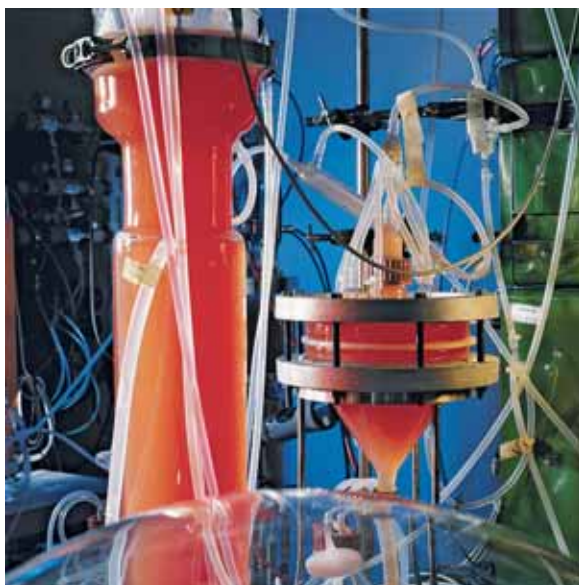


societal values are protected, stakeholder interests are appropriately considered, and the public is informed and engaged in decision-making.

New technologies and regimens in regenerative medicine have to prove if they reduce mortality/morbidity rates and accelerate recovery in clinical trials.

Early and appropriate assessment (HTA) of innovative technologies have to provide answers for policy makers, providers and payers to allow early access. Once this new technologies become widely used in clinical practice, it is expected, that the potential benefits to health care system and economy will be enormous.

Today health-care is the largest increasing sector of economy in industrialized countries. At the same time, the financial crisis and macroeconomic factors such as



an aging population and insufficient public funding emerge as growing challenges for health care providers and for society in general. Healthcare authorities are not sufficiently well prepared for dealing with this paradigm shift.

Robust models of partnership between the private and the public sector will be the basis for the innovative power of medicine and scientific development, and crucial

for the translation of new insights to the people in need of them. Otherwise, the huge potential of medical progress remains far from being sufficiently realized. This task can only be solved by joint effort of those who produce medical progress, those who pay for it, those who market health and those who develop political and economic strategies for health care and research.

The ability to measure all interventions by outcome and cost will push all therapies toward greater unity, bring a wider range of therapies into official payment systems, and allow true comparison of intervention and prevention strategies. Outcomes management is spreading, but has only begun to penetrate globally.

## Key Challenges

The medical field that shows the highest promise for improving people's health is regenerative medicine derived from the Human Genome Project. Recent progresses of genomics, stem cell research and other basic bioscience are bringing about enormous impact on the future of clinical medicine and we may expect that personalized medicine, regenerative medicine, targeted drug development and other cutting-edge technologies could revolutionize health care.

But, scientific progress is costly. New possibilities bring along new obligations to distribute the results of medical progress to every patient. The question remains urgent and open if and how we can afford an equal translation of progress to all parts of the population. Due to this paradigm shift healthcare is changing globally with great speed and turbulence.

Outcomes measurement uses massive databases scanning millions of cases to determine what therapies actually work best in particular circumstances. Its use as a management tool tends to make the practice of medicine more of a science, and less of a craft, driving costs down and quality up at the same time.

To achieve this goal, proper and efficient translational researches must be done to overcome various obstacles. Japanese researchers propose “Integrative Celerity Research” which is done based on basic science and clinical epidemiology, introducing new research tools and integrating various steps of clinical research as much as possible.

### Key Messages

1. Novel technologies and regimens are emerging rapidly and in the case of regenerative medicine are promising to reduce mortality/morbidity rates and accelerate recovery.
2. It has to be clarified, if high initial costs of (causative) regenerative medicine in the long-run are more cost-effective than conventional (more symptomatic) therapies for years or even decades. Appropriate health economic assessments are warranted to clarify the cost-benefit ratio of these treatments. Early and appropriate assessment (HTA) of innovative technologies will provide answers for policy makers, providers and payers to allow early access.
3. Regulatory agencies can cope with medical progress only if the interaction between the science of the emerging therapies and their particular existing regulatory framework is understood.
4. New models of interaction between scientific competence centers and NHIs are required.

## Working Session:

### Clinical Trials: Innovation, Regulation and Cost

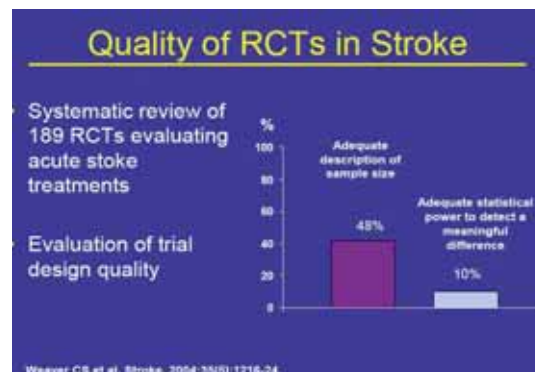
Clinical studies are the basis for evidence-based medicine. All new therapies and every new drug must demonstrate in a clinical trial that treatment is effective and safe for patients. Randomized controlled trials, RCTs, represent a gold standard which should always be aspired to as far as possible. RCTs have to meet high scientific and ethical requirements. Elaborate organization and careful selection of patient populations are necessary to achieve this. National and international regulations cause immense administrative work. These high requirements make randomized controlled clinical trials expensive.

### Higher Standards, Less Bureaucracy

It is not only the administrative and financial requirements that make it difficult to conduct conclusive RCTs. Many studies do not have satisfactory and properly selected patient populations. Brian G. Feagan, Director of Clinical Studies at the Robarts Research Institute, referred in his lecture to the fact that no more than ten percent of the RCTs conducted result in statistically sound conclusions. The remainder show methodological deficiencies even though the basic requirements for a sound RCT have been known for a long time. The high costs involved present a further problem as they mean that RCTs can hardly ever be conducted without funding from industry. Public funding of clinical trials is insufficient for researchers to conduct RCTs without industry participation. In addition, the legal requirements have led to the hyper-regulation of RCTs. This results in high administrative efforts which do not increase the quality just the duration and costs of trials.

This was confirmed by Dr. Manfred Haehl from Boehringer Ingelheim GmbH. In the past 30 years, the research and development costs involved in introducing a new drug have increased from 50 million US dollars to 1.7 billion. The time spent on a clinical trial has been extended from five to eight years. This has led to a situation where fewer and fewer new drugs come onto the market. Multinational studies are particularly difficult. It is not only the different provisions in individual countries that increase the administration involved. Import and export regulations also make any exchange of substances and samples more difficult.

Janice Soreth, from the US Food and Drug Administration, also agreed with this assessment. There was a lack of international standards which did not just apply to tariff



## Key Challenges

- ▲ Existing routes of funding are inadequate. Funds from the public purse alone cannot make randomised controlled trials possible. Without financial support from industry, RCTs cannot be funded at present and under the present system medical studies hold no interest for private investors.
- ▲ Studies are frequently of insufficient quality. There are still too many that do not meet the high standards of RCTs. Deficiencies often arise in the selection of patient populations, although the proper method of doing this has long been known.
- ▲ Too much bureaucracy increases costs and the time spent on clinical studies. RCTs require large quantities of documents to be supplied and applications to be written. This hampers multicentre and multinational studies particularly.
- ▲ The infrastructure for clinical trials is very different depending on the country and to some extent on the institution. There are no standards which could make international cooperation easier.
- ▲ A career in science now offers many disadvantages and few advantages to the medically qualified. Because of the lengthy training involved, fewer and fewer of those studying medicine opt for research, which means that fewer and fewer staff will be available for RCTs.

regulations and legal requirements. She stated that there was no uniform structure for clinical trials. This applies to almost all areas, starting from electronic data collection, including training standards for study personnel and extending to the data quality required. This makes it substantially more difficult to conduct studies over several different countries.

Håkan Billig from the European Medical Research Council considers opportunities for researchers to conduct clinical trials as particularly crucial. Both adequate funding and incentives for the scientists involved are lacking. For those studying medicine, the extended period of training involved in a scientific career no longer offers any advantages. The opposite obtains: those who commit themselves to research have come to expect financial penalties. In addition, research is no longer the highly respected career that it was some years ago. Established educational structures have the effect of deterring young medical students from a career in science. This means that increasingly fewer competent staff are available who are sufficiently well trained to conduct RCTs.

## Discussion

The funding of clinical trials is almost always dependent on whether sponsors from industry can be found. This means that RCTs on rare diseases or patient populations are difficult to finance. Therapies that do not promise sufficient profit, which is the case with diseases that occur almost exclusively in developing countries for example, do not generally attract funding. Dr. Jürgen Schölmerich, Vice President of the German Research Foundation, calls for new routes of funding for clinical trials on rare diseases. In the opinion of Brian Feagan, it is important in this connection to enhance cooperation between private investors and public funding. Private and public investors have very different ideas in relation to both motivation and the time it takes for an investment to yield a return. New concepts must be developed to make funding clinical studies more attractive to private investors.

Both time and money can be saved by higher quality in clinical trials. That many trials lack the necessary authority because they are poorly designed does not necessarily have to be the case, as the basic requirements are well known. Thus, obligatory standards for clinical trials should be produced to increase the number of reliable RCTs. One aspect that has

hardly been taken into consideration to date in those studies that are well conducted is gender-specific differences or divergences between different ethnic groups. For example, women and men often respond differently to many therapies and drugs. The reason this aspect is neglected is that it is easier to deal with male trial subjects as there are fewer reasons for excluding them while a study is in progress. As a result, women are underrepresented in clinical trials. The same applies to animal studies which are almost exclusively conducted on male experimental animals. The basic study design should be adapted so that differences between the genders or between other groups such as children can be recognized.

Only highly trained scientific staff are capable of producing this kind of complex study design and of conducting the RCTs. The disadvantages associated with a career in research mean that it is increasingly difficult to win students over. The education of scientists must be reviewed accordingly and streamlined. It is also necessary to make appropriate infrastructures available to the young researcher, for example clinical trial units, to assist with RCTs.

The legal requirements lead to hyper-regulation of clinical trials and a bureaucracy that is scarcely manageable. Multinational projects in particular have so many administrative hurdles to overcome. Cooperative ventures between two institutions from different European countries for example must be conducted in accordance with both the relevant national and European guidelines. Bureaucracy must be cut back to an appropriate degree. International standards should be established that are valid over several countries.

## Key Messages

- ▲ The quality of clinical trials must be improved. Clinical trials should be designed according to high quality standards and carefully planned. Special patient groups should be taken into consideration as to enable specific conclusions to be drawn in relation to them. These groups also include women, who always participate in smaller numbers in clinical trials and are rarely treated separately in the analysis. There is a range of therapies and drugs which act very differently in the different genders. The same applies to ethnic groups, children and other minorities who may react differently to a treatment or drug.
- ▲ The training of scientific staff must be reviewed. Career planning in research no longer meets today's requirements. A medical student who opts for science must accept many disadvantages. Training and careers in research must be reviewed and structured more attractively.
- ▲ Develop new funding models. Existing funding routes are unattractive to private investors. However, clinical studies that are of no interest to industry, on rare diseases for example need cooperation from private and public sponsors. New concepts must be developed here to make clinical trials more interesting to private investors.
- ▲ Dismantle bureaucracy. The immense administrative effort involved in clinical trials is a hurdle that is difficult to overcome especially for RCTs conducted over several countries. Hyper-regulation must be abolished and reduced to an appropriate level.



## Working Session: Patients Needs and Health Research

### Current Situation

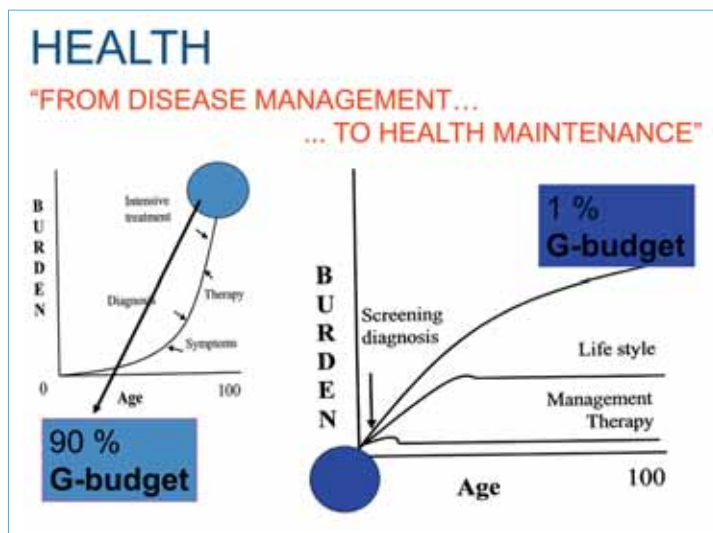
Recent years have seen decisive changes in the needs and rights of patients. Patient needs have increased because healthcare and to some extent diseases have become more complex. At the same time, this complexity has led to cooperation between physician and patient

indicating that patients are no longer voiceless entities but can be genuine partners, emphasizes Ysbrand Poortman, Vice President of the World Alliance of Organizations for Prevention and Treatment of Genetic and Congenital Conditions (WAO), during the recent summit.

The development of the self-help movement in Germany alone emphasizes which other important public health agency is now sitting at the negotiating table. It is estimated that there are 100,000 local self-help groups in Germany, more than 100 federal self-help organizations for the chronically sick and handicapped people and about 250 professionally operated points of contact. In addition, it is estimated that two to three million people take an active role in self-help; the number of issues dealt with in the groups is on the increase.

Germany is one of the frontrunners in providing financial support for self-help groups. As well as funding from local, regional and federal authorities and the project-related sponsorship of individual self-help groups by the pharmaceutical industry, self-help groups have also received financial support from the statutory health insurance schemes since 2000. In addition, the most important decision-making committee in German public health, the Federal Joint Committee composed of physicians, hospitals and the health insurance schemes, has included patient representatives for several years now, with an increasing number of rights.

Last but not least, patients are involved in clinical studies and in producing guidelines. Patients are no longer just pawns in the hands of the more important players, unable to act for themselves.





## Challenges

However, further action is needed if healthcare and research are to be genuinely oriented towards patient needs, as the scientists at the World Health Summit in Berlin made clear. And there are many different reasons for this: to date research has concentrated primarily on common diseases, for instance asthma or diabetes. As Harry L. A. Janssen explained during the conference, translating research results into patient care can take up to ten years and is extremely expensive, which means that expectations of a return in investment are very high, according to the professor from the Erasmus Hospital, Rotterdam. Rare diseases known as orphan diseases are all too often neglected.

As a report from the World Health Organization (“WHO Report on Priority Medicines for Europe and the World”) states, in the European Union alone 30 million people are affected by rare diseases. This means more than four million in Germany alone – as many patients as have diabetes for example.

Although more and more patient organizations have come into being in the field of rare diseases, the scope for their participation, in the opinion of Marylou Selo from the Werner Alfred Selo Institute in Zürich and New York, is not yet sufficient. In poorer countries in particular, the word “patient organization” is as yet unknown. A very paternalistic doctor-patient relationship obtains in these countries as was the case in Europe 20 or 30 years ago. That could change in the foreseeable future, however. For an increasing number of non-government organizations are being established all over the world for patients with certain diseases, often rare or neglected conditions, emphasized Selo.

According to Greg Simon, Senior Vice-President of Pfizer, regarding investments in the health of patients as worthwhile rather than an onerous expense presents a further challenge. For, according to the lawyer, “a proper accounting of healthcare costs and returns would tally costs – healthcare insurance and care- and value-avoided costs and the economic return to society of maintaining a healthy life into the future”. Everybody knows what his own car or house is worth, because these values can be defined in concrete terms. There has to date been no research into the value of a human life saved, according to Simon.

## Discussion and Potential Solutions

In the search for potential solutions, the watchwords of those taking part are couched in rather more general terms than is the case with many other issues discussed at the World Health Summit. However, this should not discourage us from following this line in the future. To be able to implement today’s research results more rapidly, bureaucracy must be dismantled and more money invested, urged Janssen. In addition, research

### Key Challenges

- ▲ To recognize patient organizations as stakeholders in the policy development regarding healthcare and biomedical research
- ▲ To bring the speed of innovation transfer in line with patient needs
- ▲ To define which are the clinical trials needed to help improve the healthcare conditions worldwide
- ▲ To include the value of a life saved in healthcare accountings. Healthcare expenditures that improve the high quality longevity of human capital create a net economic gain to society.

results must contain more patient-relevant conclusions. To consolidate the influence of patient organizations, these associations should co-ordinate their efforts more on the national and international level, regardless of whether it is rare or widespread diseases that are involved. Responsible health policy makers must start to invest a larger part of the available financial resources in the prevention of diseases rather than in healing those already present.

### Key Messages

- ▲ From “sick” care to healthcare – We have to shift resources from curing patients to curing and preventing.
- ▲ From cost to value – Today we measure cost, but do not ask for the value of healthcare spending as investment in the future of patients and societies.
- ▲ From national thinking to global acting – In regulation and research we have to diminish bureaucracy to offer new treatments to the patients in a faster way on a global scale. The patient should be more in the centre of healthcare decisions.
- ▲ Patients interests have to be bundled – Today diseases are covered by separate patient interests groups, those groups have to act coordinated.
- ▲ Patients are powerful and should use that – Patients can particularly help in getting political awareness and in generating financial support.

# Conclusions

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## World Health Summit Working Groups: Call to Action



Professor Detlev Ganten

For five days, physicians, scientists and politicians from all over the world discussed the greatest challenges facing healthcare at the World Health Summit under the heading “The Evolution of Medicine”. The main focus was on the following questions: How can we deal with the results of demographic change? How can “personalized” medicine be made accessible to the patient? What are the consequences of global warming for the healthcare system? How can international cooperation and research and the fight against disease be improved?

Although the various working groups were tackling very different themes, some fundamental problems emerged: too little disease prevention, lack of international co-operation, inadequate training and lack of finance. Prevention is essential to deal with the increasing costs of healthcare provision. “We have to move from ‘sick’ care to healthcare,” declared Professor Harry L. A. Janssen, from the Rotterdam University Hospital. Just one percent of global health expenditure is currently invested in preventing disease. Prevention does not just include medical care in the form of vaccinations and examinations but also people preventing disease through their lifestyle. “This is not what is taught at universities today,” emphasized Professor Detlev Ganten, Chairman of the Board of the Charité Foundation. “To achieve this, research must be reoriented and textbooks rewritten.”

Education is a critical factor, not only in developing countries but also in industrialized nations. “Without education we cannot change people’s lifestyles,” emphasized Dr. Elias Zerhouni, former Director of the US National Institutes of Health. But it is not just the potential patients who need better education. The medical profession and politicians must be more knowledgeable too about how diseases are to be avoided. When pandemics arise, such as the H1N1 virus or SARS epidemic, it is vital that decision-makers are well informed.

Many of the problems in healthcare, such as climate change and the consequences of demographic change, are global. Solving them requires close international cooperation. But national interests and rules generally make this difficult if not impossible. Clinical studies are subject to



Dr. Elias Zerhouni

highly different regulations which make conducting them over several countries excessively onerous. Import and export regulations governing medical samples also complicate cooperation in medical research. Reinhard Schweppe, German Ambassador to the United Nations in Geneva, called for the international health organizations to be reorganized. The World Health Organization (WHO) would be the right organization to take the lead in international health policy. In its current form, however, it is too weak to achieve this task. In addition, all existing health organizations should be accommodated under one umbrella. Keiji Fukuda from WHO responded that the healthcare systems in different countries show an increasing tendency to technical, organizational and political differences. This meant that the WHO member states also differed in their political orientation. In some cases, such as a pandemic, it was possible to react rapidly in producing appropriate guidelines. If there is time for discussion, WHO recommendations become a diplomatic affair.

## International Standards Are Lacking

The funding of healthcare systems and scientific research must also be improved. Research lacks standards for international funding models. Much can be achieved through more intensive discussion of research aims and common studies. However, international standards are lacking in all areas: for conducting studies, transporting substances or samples, training staff etc. This not only made endeavours involving several countries very time-consuming but also very expensive. Common guidelines needed to be defined here to make international research possible. To date, medical research in the west has been financed from public funds or by industry. This means that studies of rare diseases hardly ever find sponsors. New concepts for funding must be developed that are also attractive to private investors. This applies to studies conducted on diseases which are rife in developing countries only, such as tuberculosis. They are also almost impossible to finance. One reason for this are the high costs of clinical studies; another is that industry cannot expect any profits from them. The scientific and ethical requirements made of clinical studies today mean that they have become cost-intensive and time-consuming. Victoria Hale, founder of OneWorld Health, a non-profit pharmaceutical company, called into question whether these standards were really necessary. "Some say yes, others say no. I think it is for the people who are affected by them to decide." If it were possible to agree on lower requirements for studies of these diseases, this would make developing medicines and therapies affordable.



## Key Messages

- ▲ Healthcare instead of “sick” care  
Preventing disease must take a higher place. To date, medicine has just treated disease, but taken very little interest in preventing disease or maintaining health.
- ▲ Improving education  
Knowing how a disease functions, spreads and can be treated is the key to fighting it. It is not just people’s education that must be improved to avoid contagion for example. The medical profession and political decision-makers must be better informed so that they can deal with diseases, pandemics or epidemics more effectively.
- ▲ International cooperation must be extended  
To be in a position to deal with the consequences of climate change and demographic change, a higher degree of international cooperation is needed. International standards must be set for research, for clinical studies for example or for the import and export of samples. Research aims must be agreed at an international level and international treatment guidelines must be developed. The various health organizations must act together here to build up more political influence.
- ▲ New funding concepts are needed for research and development  
The costs of research into novel treatments and medicines are immense. They are increased even more by national legislative differences. New ways must be found not just by standardizing regulations but also through identifying new sources of funding. International funds, more private investors and higher public investment are needed. Research into diseases that occur predominantly in developing countries is particularly dependent on this, as they are of little interest to industry.

## Recommendations and Calls to Action

### Global Visions on Health and Medical Progress, October 16th 2009

1. **Working Session: Socio-Economic Transitions: Health Care Consequences**  
Strengthen international collaboration for health systems in transition including private-public partnerships, NGOs and bi-national collaboration
2. **Working Session: The Best of Two Worlds? Aligning Competition and Regulation in Health Care Reform**  
Establish valid parameters to evaluate the return on investments in health care
3. **Working Session: Can We Cope with Medical Progress?**  
Early and appropriate assessment (HTA) of innovative technologies is needed to provide answers for policy makers, providers and payors on cost-efficacy issues, as well as appropriate access. Greater harmonization between national regulatory agencies and health technology assessment agencies would allow a more effective evaluation and decision making on how best to utilize novel therapies.
4. **Working Session: Pandemic Preparedness**  
Pandemic preparedness needs behavioral change on an individual basis, including on the part of health care workers, and a sense of trust between countries (sharing of data, collaboration). Flexibility is key to any effective action plan.
5. **Working Session: Innovation in Healthcare Delivery**  
Build a market place for innovators in health care delivery models. This will aid stimulation, development and replication of solutions and re-feed its ideas into high-income countries

### Personalized Medicine: Translation from Bench to Bedside to Populations, October 17th 2009

6. **Working Session: Healthcare Innovations: Structural and Financial Requirements**  
New ecosystem in R&D: 6 aspects to overcome barriers – externalization, payors perspective, regionalization, connectivity, flexibility, talent management. EU calls should address “4p medicine” (predictive, preventive, participatory, personalized) as improved personal measurements and personalized treatments are keys to improving health care.
7. **Working Session: Improving Strategies for Global Health: Disease Control Priorities**  
Develop a critical mass of researchers and leaders in science and public health who have the analytic as well as operational capability to address the burden of disease in



their respective regions using a systematic approach. Especially in developing countries, we currently lack this capability and capacity.

8. **Working Session: Personalized Medicine: Prevention and Treatment**

Personalized medicine is a paradigm shift in clinical medicine, basic and social science and health economic research. Patient benefits and business Gases need to be established for a broad application of individualized medicine. In this process new frameworks for collaboration need to be formed. Patient choice and empowerment will require different forms of patient support and education.

9. **Working Session: Patients' Needs and Health Research**

A shift from sick care to health care and prevention is needed. Patient groups must more actively participate in this process by bundling their interests.

10. **Working Session: Clinical Trials: Innovation, Regulation and Costs**

Clinical trials are the bottleneck in the R&D process: simplify regulations, improve transparency, infrastructure and international data standards. Consider gender-specific aspects, special patient groups, minorities, diverse ethnic groups and children.

### Emerging Medical Challenges, October 18th 2009

11. **Aging Populations: Preparing Our Health Systems**

Longer lives in health and activity will result in people wanting to **work longer**, so uniform mandatory retirements should be eliminated in order to create more flexibility.

We need a **life course of** age and disease specific **prevention** with a mix of environmental, medical, social and regulatory measures.

12. **Working Session: Preventing Childhood Risk Factors**

Health systems need to develop age-specific approaches to prevention and care from a population-based life-span public-health aspect. Prevention starts in early life years. In low and middle income countries undernutrition needs to be tackled in utero and in children up to 2 years. After that period of time health (not increased) nutrition needs to be encouraged.

13. **Working Session: Climate Change: Emerging Health Challenges**

Climate change: We cannot delay urgent action an mitigation and adaptation. The establishment of networks between public and private sectors and relevant institutions is of paramount importance. More research is needed to understand the linkages between climate change and infectious and particularly non-communicable diseases.

14. **Working Session: Infectious Diseases: Prevention and Intervention**

Promote health education. It is the best vaccine against infectious diseases. Promote understanding of genetic factors determining susceptibility to infectious.

## Clear Signal from the M8 Alliance of Medicine at the World Health Summit

More than 700 top-level and prominent opinion-leaders from politics, economics, science and civil society met in Berlin from 15 to 18 October 2009 to discuss subjects which will occupy medical research and healthcare worldwide over the next ten years. The participants from more than 60 countries declared the summit a great success.

### A Need for Action

All players in healthcare followed the call to participate in the World Health Summit. “We have recognised that there is a need to act to manage the challenges, and together, we want to achieve health for everyone.” “The basic human right to health, which is anchored in the UN Charter, can only be implemented if everyone works together,” states Professor Detlev Ganten, President of the World Health Summit, Charité. “Our aim of permanently improving health standards cannot be realized without international co-operation across all the sectors involved.”

### Coordinated Action Is Essential

“We know that an initial meeting cannot lead to improved global health and that this objective is very ambitious in itself. This is only possible in the long run and only if global players act with better and longer-term coordination,” Ganten said. “We are facing enormous medical and structural challenges. No group of players can handle these challenges alone; naturally, we scientists cannot do so either. Academic medicine must take on greater responsibility here.”

### Germany’s return to the International Global Health Stage

“For too long now, Germany has been almost invisible in global health. Discourse has been almost exclusively Anglo-American,” observed Richard Horton, Editor-in-Chief at The Lancet. “This makes the World Health Summit an extraordinary event. Once Germany had a reputation as world leader in medicine thanks to remarkable individuals such as Virchow, von Behring, Koch, Ehrlich, Kossel, Warburg, Hain and Krebs. The World Health Summit was the first serious attempt in half a century to put Germany back on the map of global medicine. It succeeded. The health predicaments faced by nations and peoples today need the intellectual capacities that are available within German healthcare, research and civil society to join the growing international movement for health,” Horton added.

### Key Points

- ▲ Foundation of the M8 Alliance as a worldwide academic network
- ▲ Implementation of the UN Charter “Healthcare is a universal human right”.
- ▲ Challenges in global healthcare include access to medical care, pandemics and infectious diseases, effects of climate change on health, aging populations, restructuring and financing healthcare systems.
- ▲ Opinions are divided regarding the application and implementation of personalized medicine.
- ▲ Clinical research is excessively regulated.
- ▲ Coordinated action by science and civil society through political and economic channels is needed.
- ▲ Global health is a feasible aim.

“It was time for German medicine to find its voice again. At the World Health Summit it did find that voice. It is now up to German health professionals to listen and respond with equal vision and commitment,” Horton pointed out. Under the patronage of the Chancellor of the Federal Republic of Germany, Angela Merkel, together with French President Sarkozy, the Federal Republic has made a clear statement of its engagement in international and European responsibility.

Professor Karl Max Einhäupl, CEO of the Charité in Berlin, emphasized: “The Charité will take its responsibility seriously and provide initiatives for the future. We will meet this challenge. Universities must bridge the gap between medical challenges and political solutions in our healthcare systems and be ready to act as a platform for multidisciplinary solutions and create space for innovations – in terms of both science and technology and of institutions.”

### **Health Is Global and Global Health Is Local**

The Summit has taken a decisive step towards achieving its aim of establishing health as a human right. This is only possible through the co-operation of all involved. Professor Peter Piot, Director of the Institute for Global Health at Imperial College in London and former Under-Secretary-General of the United Nations as well as former Executive Director of UNAIDS, sees the need for worldwide governance in the healthcare sector: “Piot sent out a call to everyone to assume greater responsibility, because: ‘Health is global and global health is local.’ Our task is to bring the results of medical advances more quickly to the people who are waiting for them. We have begun to unite the forces from politics, research, science and civil society into a single voice in order to improve world health. Everyone is asked to participate.

# The M8 Alliance

The background is a deep blue gradient. A series of thin, white, curved lines sweep across the frame from the bottom left towards the top right. In the center of this sweep, there is a bright, glowing light source that creates a starburst effect with several rays emanating outwards. The overall composition is clean and modern, suggesting a high-tech or corporate theme.

## Voices on the World Health Summit and M8 Alliance

*"The World Health Summit brings together 8 of the world's leading universities along with partners in industry, government, and advocacy groups to address the major issues facing delivery of health care in the future. The spirited discussions and interactions from different sectors are identifying problems and solutions."*

Michael J. Klag, Dean Johns Hopkins Bloomberg School of Public Health



*"It is an outstanding meeting to address the more pressing problems in world of health. This meeting is a model in how we have to move forward to concrete the problems."*

Ed Horwitz, President-Elect International Society for Cellular Therapy Head Office

*"In today's world the greatest advance is working together. It is so rare that all these seniors come together. The World Health Summit has to be continued. It would be a great success if one could achieve that more military money (50 % of the GNP) could be shifted into health care. Concrete solutions will come not now but later on."*

Ed Byrne, Vice-Chancellor Monash University

*"The Association of Academic Health Centers is excited to be part of the M8 Alliance. The global community is increasingly interdependent, and the necessity to close the gap between the achievements of science and healthcare delivery has never been greater. I look forward to the summit as a means towards this end. The AAHC, with its specific focus on the institutions that*

*educate the next generation of health professionals, deliver comprehensive patient care, and conduct medical research, strives to mobilize and speak on behalf of these institutions to foster the concept of an international academic health center community driven by the ideal of improving health and well-being worldwide."*

Steven A. Wartman, President and CEO Association of Academic Health Centers



*"We hope WHS will help understand the purpose of medical science and medical service at the present moment so that all the participants can share in the benefits irrespective of the country and economic condition. WHS should make it possible for all the par-*

*ticipating countries to make an effort hand-in-hand for the future of human health and the best possible medical care.”*

Masao Mitsuyama, Dean Kyoto University Graduate School of Medicine

*“Monash University is very excited to be a member of M8 and believes that by bringing together universities with a strong track record in health and bioscience, we can address some of the critical health issues facing the world more effectively.”*

Steve Wesselingh, Dean Faculty of Medicine Nursing & Health Sciences, Monash University

## **The M8 Alliance of Academic Health Centers, Academies and Medical Universities**

Health and personal well-being are of highest importance, not only for the individual, but also for society as a whole. Much has been achieved by the medical advances of the last century. Whilst recent discoveries promise to bear the potential for even greater improvements in health care, the new millenium also poses new challenges for the standard of health world wide. The rising cost of health care, together with demographic changes, require a conscious effort to improve medicine, whilst keeping it affordable. Health is a basic human right; it has to be ensured that it is delivered.

Only a global effort can succeed in tackling this global challenge.

The Charité-Universitätsmedizin Berlin (Germany), the Université Paris Descartes (France), the Imperial College London (United Kingdom), the Russian Academy of Medical Sciences (Russian Federation), the Kyoto University Graduate School of Medicine (Japan), the Peking Union Medical College and Peking Union Medical Hospital (China), the Johns Hopkins University (USA), the Monash University (Australia), and the Association of Academic Health Centers and the InterAcademy Medical Panel, resolved to mark a new stage in the taking the international responsibility for health by the establishment of the M8 Alliance of Academic Health Centers, Academies and Medical Universities (“M8 Alliance”)

The M8 Alliance, an Alliance of Excellence, is set up as an international network of prestigious medical faculties to further this process. Medicine and the Life Sciences have to be firmly established on the political and social agenda. The first step towards this goal will be increased exchange between the members of the M8 Alliance and co-operation in the realms of research, education, health care and the organization of the World Health Summit.

The M8 Alliance will closely co-operate with other bodies such as the Association of Academic Health Centers (AAHC) and the InterAcademy Medical Panel (IAMP) to in-



crease the leverage of academic medicine to improve health together with stakeholders on the national and international level.

The World Health Summit will be the central platform of the M8 Alliance and will be held annually. The first World Health Summit in October 2009 has marked the formal inauguration of the M8 Alliance.

### Charité - Universitätsmedizin Berlin, Germany

## From a Plague House in the Past to a Medical School with a Future

The name “Charité” was coined in 1727. It was given by the Prussian king Friedrich Wilhelm I to an institution that was erected by his predecessor, Friedrich I, in 1710. In that

year the city of Berlin was under the threat of the Black Death approaching rapidly from the Northeast and killing already tens of thousands of people. In order to do anything at all the king ordered a plague house to be built outside the city gates, when all of a sudden the epidemic stopped. That allowed to assign a new function to the building originally established as a quarantine facility, and the plague house started to be used as a mixture of homeless shelter and geriatric nursing home. After Friedrich Wilhelm I became King of Prussia in 1713, he ordered the “Pesthaus” also to serve as a military hospital (“Lazarett”) where surgeons could learn to operate. In 1727, he was advised (and he permitted) “that a civilian and military hospital be established in the Garrison hospital by the Spandau gate for the treatment of citizens and soldiers.” And the king added on the corresponding document in his own hand that “the building should be called the charité” – “es soll das haus die charité heißen.”

From the beginning onwards, treatment at the Charité – French for charity – was free of charge with the exception that those who could afford to pay their expenses were charged a few “Groschen” a week. Also from its onset, excellent physicians worked at the Charité the first being Johann Theodor Eller who introduced admitting therapeutic procedures and started to segregate patients according to the diseases that were diagnosed.





It did not take long for the original buildings of the Charité to become too small, and in 1785 King Friedrich II (the Great) allowed new constructions to go ahead. The reshaping of the Charité was completed at the end of the eighteenth century providing now around 700 beds. In the following years the hospital became a well-established and highly demanded institution as well as the subject of heavy criticism for too many deficiencies – the shortage of clean linen being only one of them. After the difficulties had been overcome the Charité was attractive enough to become part of a university. In the early nineteenth century the state of Prussia underwent many reforms that eventually extended to the educational system. In 1810 a new university was founded in Berlin that today carries the name of its master mind Wilhelm von Humboldt.

At this time the Charité was fortunate to have an outstanding physician among its members. We are talking about Christoph Wilhelm Hufeland who became the first Dean of the Medical School of the new university.

In the coming decades medical practice was in general put more firmly on a scientific basis and this development can be traced to what historians refer to as “The Berlin School”. It produced very important scholars with Rudolf Virchow being the most famous and influential one. Virchow worked mainly as a pathologist. He introduced terms like “infectious disease” into his field and published his groundbreaking work on “Cellularpathology” in 1858. While Virchow himself was focusing on the description, documentation, and interpretation of specific signs of disease in organic structures beneath the skin and on detecting immanent healing powers in human cells, others concentrated on foreign organisms to cause health problems. This lead put researchers at the Berlin medical faculty and the Charité on the way that eventually produced the development of the new science of bacteriology. Its methods helped Robert Koch to discover the tubercle bacillus and Richard Schaudinn to identify the cause of syphilis. Emil von Behring was working in Koch’s institute when he developed a way to fight diphtheria that made him the first recipient of the Nobel prize for physiology and medicine in 1901.

In the years between 1896 and 1917 the Charité was again rebuilt and substantially enlarged this time with the red bricks that till today are characteristic of its outer appearance. At the same time the rapid growth of the city of Berlin caused a move of the Charité more or less from the periphery to the center (Berlin-Mitte).

From its beginning a special part of the Charité history is played by its surgeons. Among the important ones in the twentieth century was August Bier who was followed by Ferdinand Sauerbruch in 1927. Both men were surgical geniuses with Sauerbruch the much more flamboyant who risked highly complicated operations on



lungs, brains, and bones. He was at the height of his fame when Hitler became Reichskanzler in Germany, and whenever Sauerbruch's story is told one has to answer the question about his relation to the Nazis. The easiest way out of this dilemma is to stress that Sauerbruch considered himself a physician in the first place meaning that he treated all patients equally and opposed the killing ("euthanasia") of mentally handicapped. When the Russian troops conquered Berlin and entered the Charité in 1945 they found Sauerbruch in the basement operating soldiers and civilians independently of their nationality.

During the 1933–1945 period of German history the Charité had a record of expelling Jewish physicians and researchers equal to other German academic institutions. Several Charité officials were involved in sterilization campaigns as well as in performing criminal experiments on and with humans. Some scientists, like the Charité psychiatrist Max de Crinis, even played leading roles in the NS-euthanasia programs. In the course of World War II a lot of damage was done by the barrage and fighting to the buildings of the Charité.

After 1945 the Charité found itself in the eastern side of a divided city in a divided country. In the following decades the German Democratic Republic (GDR) treated it as its most prestigious medical institution. After the construction of the Berlin Wall in 1961, the Charité had become its immediate neighbor. As a consequence between 1977 and 1982 the government of East Germany erected a 21-story high-rise building at the Luisenstraße that should be recognized "as the leading hospital of the capital of the GDR". Its height allowed the name Charité to be easily seen from the western part of Berlin. Here several other clinics existed or had been built that had to be merged and coordinated after the reunification of Germany in 1989.

In 1998 the combination of the Humboldt University's medical faculty (in the former east) with the Free University's Virchow Klinikum (in the former west) created the "Universitätsklinikum Charité, Medizinische Fakultät der Humboldt Universität zu Berlin". This construction with a rather complicated name has in 2003 given way to a new unit after merging with the Universitätsklinikum Benjamin Franklin. As a result the new "Charité-Universitätsmedizin Berlin" now combines the complete medical facilities of the Free University in West Berlin and of the Humboldt University in East Berlin. The editor in chief of the Journal of Molecular Medicine, Detlev Ganten, became founding Director of the new "Charité-Universitätsmedizin Berlin" in 2004. The Charité comprises 128 clinics and research institutes, now reorganized in 17 Charité Centers: The Charité has three major university hospitals with more than 3,000 beds, 15,000 employees, 8,000 students and a total budget of one billion Euro per year. The Charité develops a corporate identity into a modern, science-driven enterprise with a new logo and great ambitions for the future. It is

planned to upgrade all hospitals in a 500 million Euro reconstruction program to celebrate the 300th birthday of the Charité. This addition will cost more than the 14,000 Thaler needed to convert the original Pesthaus into a modern hospital in the eighteenth century and put it on the road to health. The Charité-Universitätsmedizin Berlin with its great tradition and potential in patient care, research and teaching will have the potential to become a Leuchtturm der Lebenswissenschaften – the beacon of life sciences.

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### Université Paris Descartes, France

## A Major Player in the Field of Social Sciences and Human Health

The University of Paris, created in the 13th century, disappeared following the French revolution in 1793. It was reinstituted in 1896, with faculties of literature, law, medicine and pharmacy. In 1971, following major social upheavals in France, the University of Paris was closed for the third time before being split into 13 “autonomous” universities and schools. One of these, Paris 5 University, was composed of several faculties (now called UFRs: Unités de formation et de recherche – training and research units), including the old faculties of medicine and pharmacy. Over the past 30 years, several faculties (law, social sciences, etc.) have merged with Paris 5 University, which was renamed Université Paris Descartes in 2006.

The Universities’ Autonomy and Responsibilities Law (“Libertés et responsabilités des universités”), passed in August 2007, gives French universities more freedom regarding their use of public resources, and allows them to create private foundations in order to provide more flexible support for innovative projects. Paris Descartes was the first French university to re-organize following the new law. The new board of governors elected Axel Kahn, an outstanding and internationally renowned medical researcher, as president of Université Paris Descartes on January 1, 2008. Kahn proposed an audacious project designed to develop multidisciplinary research at the interface of social and health sciences, bringing together teaching and research in medicine, pharmacy, psychology, law, economics, biology and mathematics.

Many of the 13 Paris universities and schools have joined, or are in the process of forming new groups, along the lines of a collegiate university.

| Faculties (UFR)  | Students | Professors* | Researchers** | ETA* | ETA** |
|--|----------|-------------|---------------|------|-------|
| 1 Central Services   | 0        | 15          | 2             | 420  | 1     |
| 2 Medicine   | 8354     | 842.5       | 892           | 273  | 455   |
| 3 Pharmacy   | 4492     | 215.5       | 111           | 139  | 42    |
| 4 Dentistry  | 1147     | 139         | 0             | 54   | 0     |
| 5 Biomedical   | 4422     | 86.5        | 162           | 138  | 42    |
| 6 Human and Social sciences  | 2977     | 11.5        | 38            | 41   | 11    |
| 7 Mathematics and Informatics  | 1478     | 59          | 3             | 12   | 1     |
| 8 Law and Economy  | 4223     | 116.5       | 0             | 49   | 0     |
| 9 Psychology   | 4006     | 127         | 63            | 60   | 31    |
| 10 Sports  | 866      | 44          | 27            | 19   | 0     |
| 11 Technology  | 2518     | 152.5       | 0             | 69   | 0     |
|  | 34,483   | 1909        | 1298          | 1274 | 586   |
| ETA: Engineers, Technicians, and Administrative Staff, * Appointed by Université Paris Descartes, ** Appointed by INSERM, CNRS or IRD. |          |             |               |      |       |

Université Paris Descartes and its components in 2009

Today More Than 30,000 Students

Université Paris Descartes focuses strongly on medical sciences, and possesses the leading French faculties of medicine and pharmacy. It provides education for 34,483 students through 10 UFRs (also called faculties or institutes). In France, all students are eligible for university if they pass the final high school examination (Baccalauréat). A variety of teaching programs are offered in the social sciences, law, mathematics, technology, psychology along the European BMD format (bachelor's, 3 years; master's, 5 years; PhD, 8 years).

Candidates to study medicine (10 to 12 years), dentistry (6 to 8 years) and pharmacy (6 to 9 years) compete for a fixed number of places determined each year by the minister of health, through an examination after their first year of study.

More than 500 post-graduate students from all over France and abroad have joined one of the five doctorate schools (écoles doctorales) of Université Paris Descartes in order

to obtain a PhD. The doctorate schools focus on the university's major scientific themes and are open to international programs (especially co-tutorship).

## More Than 100 Research Groups

Université Paris Descartes supports 105 research groups that form a large “campus” on the left bank of the Seine, close to the historic Latin Quarter. As shown in the figure, the “campus” includes the different faculties and the five Paris teaching hospitals (Assistance Publique-Hôpitaux de Paris) grouped together with the faculty of medicine under the heading Groupe Hospitalier Universitaire (GHU Ouest).

The top 65 research groups receive funds from national institutes such as the French National Institute for Health and Medical Research (Institut national de la santé et de la recherche médicale, INSERM), the French National Center for Scientific Research (Centre national de la recherche scientifique, CNRS), and the Research Institute for Development (Institut de recherche pour le développement: IRD). INSERM, CNRS and IRD appoint permanent researchers, engineers, technicians and secretarial staff. These groups are called “mixed research groups” (Unités mixtes de recherche, UMR), whereas groups funded by the Ministry of Higher Education and Research (MESR) are called “hosting teams” (Equipes d’accueil, EA).

**During the past four years the université Paris Descartes research groups published more than 10,000 articles in peer review journals, 136 of them in major journals with impact factors (IF) > 20, 458 in the best specialized journals with IF 10–20.**

The new law will allow universities to play a major role in piloting research, and Paris Descartes has a particularly ambitious policy for both education and research. The Foundation will be important for providing support rapidly to competitive research teams working in areas that have been selected as priorities (“axes thématiques prioritaires”), as well as for creating dedicated institutes (Université Paris Descartes Institutes) and for enabling outstanding international scientists to join our university for periods of several years.



## Vocation

Université Paris Descartes focuses its teaching and research on the fields of Human Sciences and Health, and notably on human mental and physical development, fulfillment, social interactions, transactions and conventions, health disorders and treatments. The university is underrepresented in material sciences, with the exception of chemistry-biology, but covers a very large swathe of social and human sciences, including psychology, law, biology, medicine, odontology and pharmacy. Studies range from procreation and early embryonic development to the development of the human mind and its connections with the social and familial environment; the rules and conventions governing social life and individual rights; aging; disabilities, diseases and their relationships with the environment; medicine and therapeutics; and the interfaces between health, law and ethics. The sciences of sport, economics and management are harmoniously integrated. Mathematics and informatics make a fundamental methodological contribution to modeling and understanding human activities. Our University Technology Institute specializes in training for careers in the services industry, including informatics, management and welfare.

During the next four-year period, the governors of Université Paris Descartes intend to restructure its multidisciplinary training and research in the social sciences and health, in order to become more efficient, better-known internationally, and more attractive. The university will thus be better able to teach and train young people, to prepare them for a rewarding social and professional life, and to enrich the economic and intellectual life of the community and nation. It will pursue this objective in close association with Université Paris Diderot and its other partners in the Paris Center University Alliance.

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## Imperial College of London, United Kingdom

### A Top Class Academic Player

“Knowledge is the glory and the protection of the empire” – is still the motto of Imperial College London today. The college, which was founded in 1907, is currently considered to be one of the world’s leading academic institutions. The rambling campus situated right next to London’s Hyde Park has produced no less than 14 Nobel prize-winners to date – evidence of how good at research the college actually is. “The Imperial” has a firm place in the hearts of many Londoners.

When “The Imperial College of Science, Technology and Medicine,” which is the college’s official name, was ceremoniously opened on 8 July 1907, none of the founding fathers guessed how important it would soon become. Great Britain was its zenith in terms of both economic influence and science. “The Empire ruled the world.” And in years to come, the researchers, professors and students at Imperial College London were soon to play their part in making Britain a top class academic player.

There were numerous organizational hurdles to overcome before people were able to get down to work in the rambling corridors, lecture theaters and research laboratories. Technically speaking, Imperial College is actually nothing more than an amalgamation of many great time-honoured institutions, some of which are more than 500 years old. The “College of St. Gregory and St. Martin” was founded in 1447. Charing Cross Hospital, Westminster Hospital and St. Mary’s Hospital (all in London) were opened between 1823 and 1845. They were all finally amalgamated into Imperial College. “Together we are stronger” is the college motto.

Today, about 13,400 academics study at the college situated in Kensington, a respectable middle-class area of London, where students and lecturers from all over the world have long been a common sight. What is more, it is impossible to imagine West London today without Imperial College. It has become an important part of Kensington both economically and socially.

If you talk to the students it soon becomes clear that Imperial College is not just any UK university. “I am proud to be able to study here. The admission examination was really difficult and I know that many candidates failed the very first exam,” revealed Emma Potter, a student at Imperial. The college management makes no secret of the fact that the admission of new students is a highly selective process. All candidates must apply for a place through the normal admissions process known as the University and College Admissions Service (UCAS). Most courses require at least 3 A levels. This is the highest achievement in the British school-leaving examination. Between 1999 and 2007, only one out of five applicants was accepted, according to the college. The fact that four out of five applicants do not pass the admission examination shows how hard this examination really is.

Those who pass this hurdle are proud of it. “To study at Imperial College is really special, because it is playing in the top class academic league! It is in no way second to top universities like Oxford and Cambridge,” according to one student.





The college regularly comes out correspondingly well in university rankings and tests, both nationally and internationally. In the Research Assessment Exercise Test 2008 (RAE), five subjects taught at Imperial College, Mathematics, Epidemiology, Public Health as well as various branches of engineering, occupied a top position. The internationally recognized research quality assessment is by no means the least important aspect

of the RAE Evaluation. Imperial College has excelled in it for years. Consequently, the campus is popular with international students.

Medicine is a particularly important subject at the college. The Imperial College Healthcare Trust was founded on 1 October 2007. It is an amalgamation of two large British hospitals: the Hammersmith Hospital Trust and St. Mary's NHS Trust (both in London). These two hospitals, both of which are part of the British state health service (National Health Service, NHS), have amalgamated with the Faculty of Medicine at Imperial College.

The new group, which is organized as a healthcare trust, assumes responsibility for a total of five large NHS hospitals: Charing Cross Hospital, Queen Charlotte's and Chelsea Hospital, Hammersmith Hospital, St. Mary's Hospital and Western Eye Hospital. At present, the Healthcare Trust is the largest of its kind in

Great Britain. Every year, more than one million patients are treated by the hospitals attached to it. The annual budget comes to more than 900 million Euros. Interestingly, one of the most important aims of the Imperial College Healthcare Trust is to combine research and daily clinical practice. In other words: research and daily clinical practice are successfully integrated at Imperial. This offers patients treated in the associated hospitals many advantages. It is by no means uncommon for them to benefit from new innovative treatment methods and drug therapies earlier than other British patients.

Like many other British teaching and research institutes, Imperial College London suffers from the present economic crisis. Research funds no longer flow in abundance. Many sponsors are either withdrawing completely or at least reducing their financial commitment. However, experts view the future prospects of Imperial College in a very positive light. In part, this is because of its long tradition. Additionally, the college has succeeded in the past ten years in restructuring both its organization and orientation. International competitiveness plays an increasingly important role here.



## Johns Hopkins Hospitals/Medical School/University, Baltimore, USA

### Breeding Ground for Top International Medics

Blue no more. Helen Taussig noticed it right after the operation. The little eleven-month old girl no longer had the blue (cyanotic) face colouring typical of her disease. This was the first successful surgery on a “blue baby,” a child with Tetralogy of Fallot. 29 November 1944 was a day of hope for countless children with a cyanotic heart defect. For Helen Taussig, the paediatric cardiologist at the Johns Hopkins Hospital, aged 46 years at the time, it was a double triumph. Together with the surgeon, Alfred Blalock, she had designed the surgical procedure that was successfully used for the first time on the little patient: anastomosis of a branch of the sub-clavian artery (or common carotid artery) onto the pulmonary artery.

Helen Taussig's triumph is one of the many milestones in medical history to come from the university hospital in Baltimore in the US State of Maryland that is named after a patron from the bygone golden age of the harbour town. The Johns Hopkins Hospital can look back on a staff list which reads like a “Who is Who” of the history of modern medicine, especially in the surgical fields. As well as 17 Nobel prize-winners to date, the Johns Hopkins Medical School, which commands a whole range of other clinical and experimental institutes in addition to its most important hospital, the John Hopkins Hospital, as well as a recently acquired dependency in Singapore, was the academic home of Harvey Cushing (1869–1939). Cushing was not only a pioneer of modern neurosurgery but also the person who discovered the disease characterized by elevated corticoid release that is named after him. It was also the home of William Osler, who left behind copious medical literature ranging from the serious, such as a clinical account of subacute bacterial endocarditis to the humorous like the very first description the penis captivus (purely fictional and published under a pseudonym). William Halsted (1852–1922) was also a professor at the Johns Hopkins. His biography sparkles with his many pioneering surgical deeds. One of his most significant achievements is the introduction of the surgical glove for antisepsis.

The Johns Hopkins Medical School endeavours to command a world-class faculty today as well, even though in salary negotiations with top-class scientists other bidders are often better equipped in terms of budget. So today, the university is happy to make its mark as a kind of breeding ground for top international medics, and many doctors have moved from Baltimore to head prestigious hospitals. In the case of the radiologist, Elias Zerhouni, it was to lead the politically highly influential National Institute of Health (NIH). After the change of president from Bush to Obama, Zerhouni returned to his former place of work.

The Johns Hopkins Medical School continues to be rated as one of the best medical institutions in the USA, while the Johns Hopkins Hospital has just been voted the country's best hospital once more by the news magazine U.S. News and World Report (in front of the Mayo Clinic in Rochester, Minnesota). There can be no doubt that the Faculty of Medicine is the flagship of the Johns Hopkins University. It dates back to its endowment by business man and philanthropist John Hopkins, who died in 1873. Hop-



kins, who made a fortune as an investor in the Baltimore and Ohio Railroad Company, was a practising Quaker and an early campaigner for the liberation of slaves in slave-owning Maryland. There can be no doubt that model on which "his" university was to be built stood for the patron and name-giver: it was to be a classic German university modelled on the example set by Wilhelm von Humboldt.

At present, about 20,000 students attend the university, which is a very high number for a top American university of this calibre. Studying medicine at this alma mater comes at a price: the four-year residence (after a foundation course) at the Medical School and everything associated with it costs about 270,000 dollars at current rates. The long-term prospects make this investment in your education almost pain-free. A degree from the Johns Hopkins opens the doors to the best medical posts in the USA. The certificate displayed in your own consulting room is a good reason for generous professional fees.

Internal Medicine in particular is highly regarded at the Medical School. In the Department for Gastroenterology and Hepatology, research focuses on the molecular basis for tumor development in the digestive tract, the genetic mechanisms of chronic intestinal inflammation and the effects of alcohol consumption as well as America's number one widespread disease, obesity. A research project is currently devoted to another form of addiction, one that is often underestimated or ridiculed: caffeine dependency – a problem which not only the omnipresent Starbucks branches contribute to, but more particularly the fact that 70 percent of the "soft drinks" available in the USA contain caffeine.

The particular focus of neurological and neurosurgical research is new therapeutic approaches to brain tumors and multiple sclerosis. At the Multiple Sclerosis Center of the Johns Hopkins, research centers on the interactions between the nervous and immune system and the role of leukocytes in disease. One of the university's most ambitious projects, called Restore, aims to use embryo stem cells to restore mobility to patients with multiple sclerosis and transverse myelitis whose mobility is substantially compromised.

Research conducted in the “minor” clinical specialties is targeted on pemphigus in the case of dermatology. The Listening Center has specialised in the further development of cochlear implants. The aim of a large-scale study conducted at the Wilmer Eye Institute is to find out which approach to therapy offers the best chance of survival, enucleation or radiotherapy, in ocular melanoma, a malignant tumor of the eye. A high number of Americans should be awaiting the results from the Johns Hopkins Sinus Center with baited breath.

No other rhinological research unit is granted as much funding as the Center, which is currently investigating the causes of chronic sinusitis and nasal polyposis. A total of 40 million Americans suffer from chronic sinus infections; in senior patients the disease is often the reason for leaving the country’s colder regions in winter for Arizona which pensioners love for its dry warm climate.

Despite the current crises and uncertainties within a public health system that is high on the political agenda despite being highly resistant to reform, the Johns Hopkins Hospital is definitely on an expansion course. In 2011, the new hospital extension, costing almost one billion dollars will be inaugurated on the campus in East Baltimore. With a glass facade suffused with light, it will offer not only top class medicine but also top class comfort: every patient will have his own room. Two 12-storey skyscrapers will dominate the skyline of the medical campus, towering above an entrance block the size of a football field. Both “towers” will accommodate two quite distinct disciplines: a hospital for cardiovascular diseases in one and a paediatric high performance center in the other. A combination which could just be in homage to Helen Taussig.

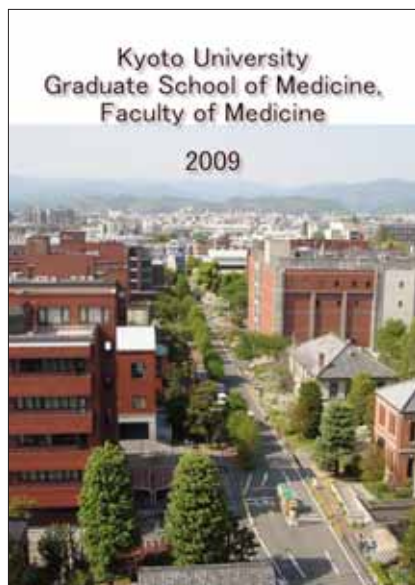
## Kyoto University Graduate School of Medicine, Japan

### Tradition and Modernity Harmonized

The city of Kyoto boasts a proud heritage tracing back to 794 AD which marked the beginning of its reign as the capital of Japan. It remained the capital for more than a thousand years until 1868, when the Meiji emperor proclaimed the “Meiji restoration” and all executive government functions, along with the title of capital, were transferred to Edo (known today as Tokyo). In 1897, roughly three decades after this transition, Kyoto University was formally established as the second Imperial University, followed two years later by the erection of the national medical school. In its 110-year history, Kyoto University has, among other things, made invaluable contributions to the promotion and advancement of the basic sciences. Since its establishment, six scientists from Kyoto University (graduate or faculty member) have been awarded the Nobel Prize in the fields

of physics, chemistry and medicine (Hideki Yukawa 1949, Shin-ichiro Tomonaga 1965, Ken-ichi Fukui 1981, Susumu Tonegawa 1987, Ryoji Noyori 2001 and Toshihide Matusukawa 2008).

These monumental achievements aside, the Medical School at Kyoto University has a very modest and humble beginning (Fig. 1). It only started with the fundamental departments of anatomy, physiology, medical chemistry, pathology, pharmacology, hygiene, legal medicine, internal medicine, surgery, psychiatry, obstetrics and gynecology, pediatrics, ophthalmology, and dermatology. In 1919, the total number of departments was expanded to 24, in accordance with an amended national policy. Among the countless outstanding research carried out prior to World War II, the extensive research carried out by Dr. Hiroshi Fujinami, a professor of pathology, is revered even today for its impact on modern medicine. Prof. Fujinami not only discovered *Schistosoma japonicum*, the causative parasite of an endemic disease (Katayama disease), but also found that myxosarcoma in chickens can be transmitted by a filterable agent from the lesion. These findings paved the way towards development of the current concept of viral oncogenesis.



## University Hospital

For a long period following the foundation of the University Hospital, each clinical department was granted its own building consisting of an outpatient clinic, inpatient ward, physician's office and a laboratory.

Under this previous system, the university hospital was not a consolidated healthcare facility placed under the comfort of one roof, but a compound lined with multiple wooden buildings – each catering to a specific branch of medicine. This style of healthcare prevailed at Kyoto University until 1958 when the construction of an avant-garde centralized hospital building began. This modern university hospital with about 1300 beds is now composed of 31 clinical divisions, 21 central clinical centers, a pharmacy, and affiliated research centers that would conduct front-line research in aspects such as translational research, clinical trial and management, and medical informatics (Figs. 2 and 3).

Many recent advances in the field of clinical medicine have been led by our faculty and staff. Prof. Kiyoshi Takatsuki identified a novel clinical entity of adult T-cell leukemia (ATL); Prof. Yorio Hinuma and his colleague discovered the causative agent of ATL, a human retrovirus HTLV-1. Prof. Kazuo Honjou successfully carried out the world's first whole resection of a pancreas. In addition to this, Prof. Koichi Tanaka successfully negotiated one of the first liver transplantation procedures from a live donor in Japan. This is a vital feat considering the lack of organ availability from brain-dead donors in our country. Since then, Kyoto University hospital has assumed an active

role in transplantation surgery and has since come to be known as one of the world's finest institutions in this field.

## The Present: Education in the Graduate School of Medicine

The scope and frame of the graduate school far surpasses that of the medical school. Kyoto University has 13 affiliated research institutes and some of these are deeply involved in medical science. Some of our more recent accolades include the world's first establishment of iPS cells by Prof. Shinya Yamanaka at the Institute of Frontier Medical Sciences (IFMS), and the discovery of HTLV-1 at the Institute for Virus Research (IVR). The Graduate School of Medicine now consists of over 150 independent laboratories headed by full professors including most of the divisions at IFMS, IVR and some laboratories from the institute for Chemical Research and the Research Reactor institute. In the year 2000, the School of Public Health was founded and has since been integrated into the Graduate School of Medicine. Similarly, the School of Health Sciences has also joined the ranks of the graduate school.

The PhD course at the Kyoto University Graduate School of Medicine has a diverse background with regard to its proportion of international students and researchers. The student population for the graduate school is 700, of which more than 100 are accounted for by foreign students from countries such as China, Thailand, Bangladesh, Korea, Myanmar, Vietnam, USA, Germany, France, and Nigeria. Graduate students are assigned to and carry out PhD research at any one of the more than 150 laboratories actively conducting research at the Graduate School. While the students are required to obtain a minimum amount of credits in required coursework, they are mainly assessed by the publication of original articles in international academic journals of high standing and recognition. Numerous papers have been published by our promising graduate students in leading journals such as Nature, Cell, Science and PNAS.

More recently, the "career path unit" was established where outstanding postdoctoral fellows or young faculty members can be promoted to the position of Associate Professor. Those who are selected by a committee are granted a research stipend, independent laboratory space and a couple of laboratory technicians as principal investigator (PI). In the last five years, five such PIs have been promoted to the status of full professors in Japan.

To facilitate inter-specialty collaboration among individual laboratories, we have initiated several projects supported by generous sums provided by national funding. The COE (Center of Excellence) project is a prime example and promotes, among many other things, collaboration in the field of animal disease models and regenerative medicine



(tissue engineering). Collaborative studies on lifestyle disease and cancer by the recently established School of Public Health, Translational Research Center, and Human Genome Research Center are now also underway and are expected to pave a path for the advancement of the clinical science not only in Japan but on the international stage as well.

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### Monash University Melbourne, Australia

## International Networking Is the Key to Excellent Research

The Clayton campus, the core of the Monash University in Melbourne, is a patchwork in terms of architecture: buildings made from glass with aluminium struts, concrete and brick are grouped around a large, green inner area where the students sit out in summer. Patchwork is the order of the day. Since its foundation in 1958 a network has gradually formed

currently consisting of eight campuses, six in Australia and two outside Australia: in South Africa (Johannesburg) and Malaysia (Kuala Lumpur). The university is continually evolving and has worked its way up within a few years to be one of the 50 best universities in the world (Times Higher Education Survey). To date, 75 research centers associated with the university have been developed, not just in Australia itself but also in Europe (Great Britain and Italy). International and intercultural competences in terms of long-term work in institutions with close links – the university seems to have been brought up with this concept, as it was founded with the motto “ancora imparo” (I am still learning).

The university, which was named after the Australian engineer and lawyer, Sir John Monash (1865–1931), opened its doors to its first students in 1961: 363 were then congregated on the Clayton campus and the library was still a decommissioned Volkswagen factory. Now almost 18,000 students study there every year, including 1300 who study overseas. Overall, about 57,000 students have graduated from the Monash University, a third of whom are from outside Australia. There are ten faculties of which the Faculty of Medicine, Nursing and Health Sciences, (MNHS) with approximately 6000 students, is the biggest. The MNHS Faculty has an annual budget of a good 400 million Australian dollars (AUD), equivalent to about 238 million Euros, 211 million of which (AUD, 124 million Euro) are for research.





“You feel part of a global network here at the university,” says Dr. Jochen Grassinger, who has been working at the internationally prestigious Australian Stem Cell Centre (ASCC) for three years, two of which were sponsored by German Cancer Aid. The ASCC is situated on the Clayton campus. It was founded as a Centre of Excellence in Biotechnology and is funded by the federal budget, by the State of Victoria and increasingly by money from industry, as fundamental and applied research is closely related. Grassinger is a German physician. He obtained his doctorate in the Haematology and Oncology Department at Regensburg University Hospital. At Monash, Grassinger joined Professor Susie Nilsson’s team, where research is carried out into the haematopoietic stem cell niche, the immediate environment of stem cells, which provides the right conditions for multiplication and differentiation.

“In Nilsson’s laboratory, there is working on the mechanisms by which stem cells interact with their environment and on how one can use drugs to loosen this interaction temporarily so that they can be more readily induced, for therapeutic purposes, to migrate into the peripheral blood,” says Grassinger. Mobilisation is inadequate in about 20 percent of cancer patients, whose stem cells must be mobilised and removed before high-dose chemotherapy so that they can be transfused back to the patient after chemotherapy to rebuild the patient’s haematopoietic system.

In a modern glass building completed six years ago, right next to Nilsson’s laboratory, are the rooms of the university’s own Monash Immunology Stem Cell Laboratory (MISCL). MISCL and ASCC share a flow cytometry laboratory containing Australia’s three most advanced pieces of equipment. “There are only a few pieces of equipment of this quality world-wide. That the team is allowed to use them is obviously a great advantage,” says Grassinger. His stay must be regarded as a scientific success with papers published in internationally renowned journals such as the specialist journal “Blood” before his return to Germany in December 2009.

Australia is one of the M8 countries. In 2008, it became a member of the European Molecular Biology Organization and in 2009 the EMBL laboratories were founded, the majority of which (nine) are located at the Monash University. More than 5000 publications annually come from the university alone, many of which are published in specialist journals with a high impact factor. Since the 1990s, university research has focussed on regenerative medicine and stem cell research as well as infectious and immune diseases. Other important areas are cardiovascular diseases and thrombosis (Centre for Vascular Health and Australian Centre for Blood Diseases), as well as Public Health, Epidemiology and Medical Ethics. With



19 million US dollars annually, infrastructures for future-oriented technologies in molecular biology are sponsored, such as high-throughput protein production and purification, proteomics and collaboration with the Australian Synchrotron for genome research.

Germany is one of Australia's most important scientific partners. The cooperation partners are the Alexander-von-Humboldt Institute, the German Academic Exchange Service and the German Research Association. The Ranke Heinemann Institute in Berlin, which represents the Australian-New Zealand University Association in the German-speaking world, facilitates research and knowledge transfer and the exchange of students and scientists.

The Forum for European-Australian Science and Technology Cooperation (FEAST) is a platform for promoting knowledge and technology transfer between the countries of the European Union and Australia and is intended to define the relevant tasks of science and medicine world-wide.

In 2005, Professor Harald Schmidt, researcher in Pharmacology and Cardiovascular Disease, changed from a teaching post at the University of Gießen (Germany) to Monash

University where he led the Institute of Pharmacology, built up an interdisciplinary research centre and was appointed as Associate Dean International Research. "Many medics undertake a Post-Doc abroad after their doctoral work. I considered moving to Monash University as a 'Post-Prof'. Every larger company sends research workers abroad for a year, why should the same not apply to professors? Monash operates quite differently from a German university," says Schmidt. "In a way that appears unusual for German professors, your dean is your superior, your professional partner and sponsor and also the person who sets performance parameters and makes annual assessments. This introduces pressure into a specialist area. Deans and the university vice-chancellor are full professors, who have specialized in university management. Student feedback is very important. German universities could learn a lot from this," says Schmidt.

Jochen Grassinger has now returned to the University of Regensburg and is investing the knowledge he gained at the ASCC in his own laboratory for haematopoietic stem cells. Back in Germany, he is trying to achieve something very important in his own lab: the good working environment he experienced at Monash. "Of course there are hierarchies in Australia as well," says Grassinger, "but you don't experience them as such. The atmosphere is friendly and pleasant and so you can concentrate on what is most important: advancing research."



## Peking Union Medical College Hospital, China

### Union of East and West

At first sight, the Peking Union Medical College Hospital (Peking Xiehe Yiyuan) does not look like a hospital. The main building at the west entrance, with its curved roofs and circular green bricks, is reminiscent of a traditional Chinese palace. You would never expect to find a hospital amidst the shops and restaurants in the eastern part of the area – if it were not for the occasional patient in white and blue striped hospital pyjamas who wanders out from between two shops. Today, the capital city’s largest hospital, with a history steeped in tradition, is situated in the middle of the central Beijing shopping area not far from the Wangfujing pedestrian zone.

When the hospital was founded in 1921 it was not just the hospital site that was a wide open field. Modern western medicine had just gained a foothold in what was then Nationalist China (Kuomintang) under General Chiang Kai-shek. In 1906, physicians sent by British and US American mission societies had begun to construct a western-oriented medical education in the neighbouring superordinate administrative organization, the Beijing Union Medical College. The Rockefeller Institute, which was also active in Beijing, founded the teaching hospital later.

The Chinese name “Xiehe,” “to unite” or to “harmonize” in English, became part of the agenda. The founders modelled the architecture in traditional Chinese fashion with red-green wooden facades and curved roofs. Administration, professional development and the division into specialities were based on western hospitals. In the early years, physicians from Britain and the USA occupied management positions. However, Chinese colleagues educated in China were quick to take on leadership roles. They set standards not only in China but internationally as well, especially in the fields of endocrinology and oncology.

The hospital’s own museum presents both the bright and dark sides of its 90 odd years of history: forced closure during the 2nd world war, construction of a rural health care system after the founding of the People’s Republic in 1949, initial experiences with the human immune deficiency virus (HIV) in the 1980s, wrestling with the pathogen associated with Severe Acute Respiratory Syndrome in 2003 and providing a health service for athletes and organizers during the 2008 Olympic Games.



The hospital, which was enlarged in the 1980s and 1990s, now extends over an area of about 80,000 square metres. The old buildings principally house the laboratories and patient rooms belonging to the Department of Internal Medicine.

The hospital has different sections for in-patients (about 1800 beds) and for out-patients who leave hospital after the examination. About 13,000 patients are admitted every year. Almost 5200 people seek medical advice every day without being admitted to the hospital. China's cities have no system of medical practices outside the hospitals. The hospital has a staff of about 4000, including about 500 physicians with the rank of vice-professor or above. All departments are comprehensively represented in the Beijing Union Medical College Hospital, a multidisciplinary hospital, focussing on the fields of proctology, endocrinology, cardiology and gynaecology.

As is also the case in other Chinese hospitals, every potential patient must first register before treatment. In the one-storey building specifically designed for this purpose, personal data are recorded on a hospital pass for a fee of one Euro. The patient carries this booklet himself from department to department at every out-patient visit. After data acquisition, the patient or one of the people accompanying him attends one of the six appointment counters. Over the counters, an illuminated display board give the names of the doctors on duty on this day of the week, their qualifications, their speciality and the afternoon appointments that are still available. The lists, which change every month, can also be viewed on line.

The registration hall opens from 6.30 to 21.00 hours. It is really crowded around lunchtime. Doctors who are in demand can become rapidly booked up. A notice in the entrance warns resourceful dealers attempting to hawk appointments with well known professors that they face criminal prosecution. Only in special cases appointments can be made several days in advance. Patients whose symptoms are not urgent may have to come back early the following morning. Or they can make do with a specialist registrar. The appointment fee ranges from 90 cents to 1.40 Euro depending on the physician's qualifications.

The Xiehe Hospital makes all prices available to public scrutiny on the internet. Surgical fees are scrupulously established according to the type and duration of the surgery, staff costs, electricity and heating costs as well as the items used – imported instruments are somewhat more expensive than those “made in China”. The average cost of an uncomplicated procedure is 5000 Euros. (By way of comparison, the mean annual income of a Beijing citizen amounts to just 3000 Euros). According to official information, about 70 percent of the urban population have basic health insurance. The most basic medical services are covered; in the case of complicated procedures, the insured are reimbursed for up to 30 percent of costs.

A bed in Beijing Union Medical College Hospital costs from 1.60 to 2.40 Euro per day. The older, generally 3-bedded rooms are simply furnished. Washing facilities are

found in the whitewashed corridors. Relatives or friends assume some part of patient care, as necessary. They provide the patient with food or sometimes hold a drip. In what is known as the “international department,” both non-Chinese and Chinese patients alike enjoy all-round service at an appropriate cost. The furnishings in friendly light brown and seating areas in pastel colours make for a warm atmosphere. The rooms which range from single to 3-bedded rooms are equipped with flat screens and their own showers. The excellent medical team speaks more than one language and has been internationally trained.

Duan Wenli (Head of the Public Relations Department) speaks about the hospital with pride. Particular pride is also taken in its rich tradition and broad-based range of specialities, according to Duan. The hospital intends to make improvements, especially in the areas of service, administration and fundamental research. International exchange plays an important role here. “In our hospital, the boundaries of east and west have long been dissolved,” says Duan laughing.

## Russian Academy of Medical Sciences, Russian Federation

### Leading Center of Bio-Medical Research in Russia

Historic roots of the Russian Academy of Medical Sciences go back to the reforms of Peter the Great. Carrying out the reforms in Russia Peter I attributed special attention to the training of highly qualified scientific and medical personnel, to the creation of the national medical basis.

In 1725 the first large-scale research center, Saint Petersburg Academy of Sciences was set up in Russia. Medicine was represented in the Academy by the chairs of anatomy, physiology and chemistry, headed by the world famous scientists. In the XIX century university medical schools, where educational activity was closely connected with scientific research, became genuine centers for the development of medical sciences in Russia.

The leading role at that belonged to the medical faculty of Moscow University. Later, medical faculties were opened at Kharkov University (1805) and Kazan University (1814).

The Imperial Institute of Experimental Medicine (1890) became the first independent scientific research institution in Russia working in the sphere of medicine and biology. The task of the institute was to carry out all-round study of what causes the disease, working out and practical application of methods of its treatment. Prominent national and foreign scientists were invited to head the scientific departments of the institute that

promoted the development of new directions in medicine. In 1907 the clinic of the institute started functioning.

The first 25th anniversary of the institute was marked with outstanding achievements in the development of medical science. In 1904 Ivan P. Pavlov got the Nobel Prize for his works in digestion physiology, which he fulfilled at the institute. A special laboratory was set up at the institute to produce antiplague preparations. Later on the laboratory was engaged in the production of sera and vaccines against extremely hazardous infections.

After 1917 the state health system was created in the country. Medical science became a component part of this system and was included into the sphere of the state health protection policy.

Prominent scientists joined in their efforts to organize large-scale scientific centers for fundamental studies in all spheres of medicine. The All-Union Institute of Experimental Medicine, organized on the basis of the Imperial Institute of Experimental Medicine became one of them. Leading scientists were invited to work at the institute, affiliated institutions were created to develop new scientific ideas, scientific schools came into being, and, in the result, priority scientific studies, primarily in theoretical medicine, were accomplished.

By the beginning of the 40-s of the 20th century it became vitally important to establish a special organization to provide guidance to medical thought, to synthesize new achievements in different spheres of medicine, develop fundamental medical sciences and carry out planning and coordination of scientific research. Taking into consideration the experience of the All-Union Institute of Experimental Medicine, scientific potential and the network of scientific research institutes created in the country, the USSR Academy of Medical Sciences was established on June 30, 1944, by the decision of the USSR Council of People's Commissars. The task of the Academy was to develop theoretical and practical aspects of medical science. To cope with these problems the Academy got the right to found within the Academy new scientific research institutions, laboratories, clinics, medical libraries, experimental industrial enterprises, etc.

With the establishment of the USSR Academy of Medical Sciences a very important historic period in the development of Russian medical science was over, the period of its



formation. Possessing a considerable personnel potential and satisfactory technical and material basis the USSR Academy of Medical Sciences was from the very first days of its existence not only the main science organizing body but also the leading theoretical center. On January 4, 1992, by the decree of the President of Russia, the USSR Academy of Medical Sciences was transformed into the Russian Academy of Medical Sciences (RAMS) and got the status of an independent state organization.

The Russian Academy of Medical Sciences is a state scientific institution, which acts in accordance with its own Charter and the legislation of the Russian Federation, and is financed from the federal budget.

The Russian Academy of Medical Sciences comprises outstanding scientists and specialists in the field of health and medicine. The membership of the Academy amounts to 380 full and corresponding members and more than 100 foreign members. The Russian Academy of Medical Sciences implements scientific management of medical sciences in the country. The RAMS identifies general directions and makes prognosis of the development of medical science, coordinates activities of medical institutions, as well as it controls the implementation and quality of research at the RAMS institutions.

During almost 70 years of the RAMS activity a powerful scientific research complex was created which comprises clinic, theoretic and preventive medical institutions, among which there are large-scale medical centers specializing in oncology, mental health, pediatrics, general surgery, microsurgery and cardio-vascular surgery, medical genetics, etc. The RAMS activity contributed to the general rise of research work in the country that resulted in the creation of highly specialized qualified personnel in various spheres of medicine – neurosurgery, ophthalmology, infectious diseases, medical radiology, labor hygiene, etc., as well as to the development of regional institutions, studying pathology typical for the given area.

Among priority medical research are now maternal and child health care, cardio-vascular disease prevention and control, prevention and control of oncological, neuro-psychical, endocrinological, infectious and other socially significant diseases, nanotechnologies.

The development of fundamental medico-biological investigations is of particular care of the RAMS. These investigations are devoted to molecular, cells, and system's mechanisms of pathological processes.

Under the Academy work now about 70 independent research institutes and centers. Their staff comprises more than 7200 researchers including over 2000 PhDs.

At present the institutes and centers of the Academy carry out research on almost 30 special purpose programs, i.e. "Prevention and combating of social character diseases," which includes problems of oncology, vaccinal prevention, HIV/AIDS, viral hepatitis, TB, psychiatry, arterial hypertension; "Children of Russia," "Genome and



Postgenome Technologies in Creation of Medical Drugs," "Industry of Nanosystems and Nanomaterials," "Bioengineering Technologies," "Proteomics," "Cell Technologies," etc.

A very important role in manpower development is played by the WHO collaborating centers functioning on the base of some RAMS institutions where specialists are trained in some specialties by using modern methods, technologies, etc. Training of specialized scientific manpower is of high priority for the RAMS institutions themselves and for this purpose they create on their basis chairs for postgraduate training as well as educational methodological centers.

During more than 60 years of its existence the Russian Academy of Medical Sciences has created a powerful complex of research institutions of clinical, theoretical and preventive medical profile. All this has contributed to the development of numerous problems of paramount importance for practical health.

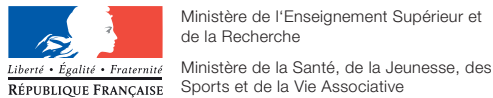
The Academy has won wide international authority and renown and in the country it acquired the status of a unique state and at the same time self-governed institution and is the incarnation of the highest form of organization of medical science, its governing body which coordinates the development of most important problems of diagnostics, treatment and prevention of human diseases.

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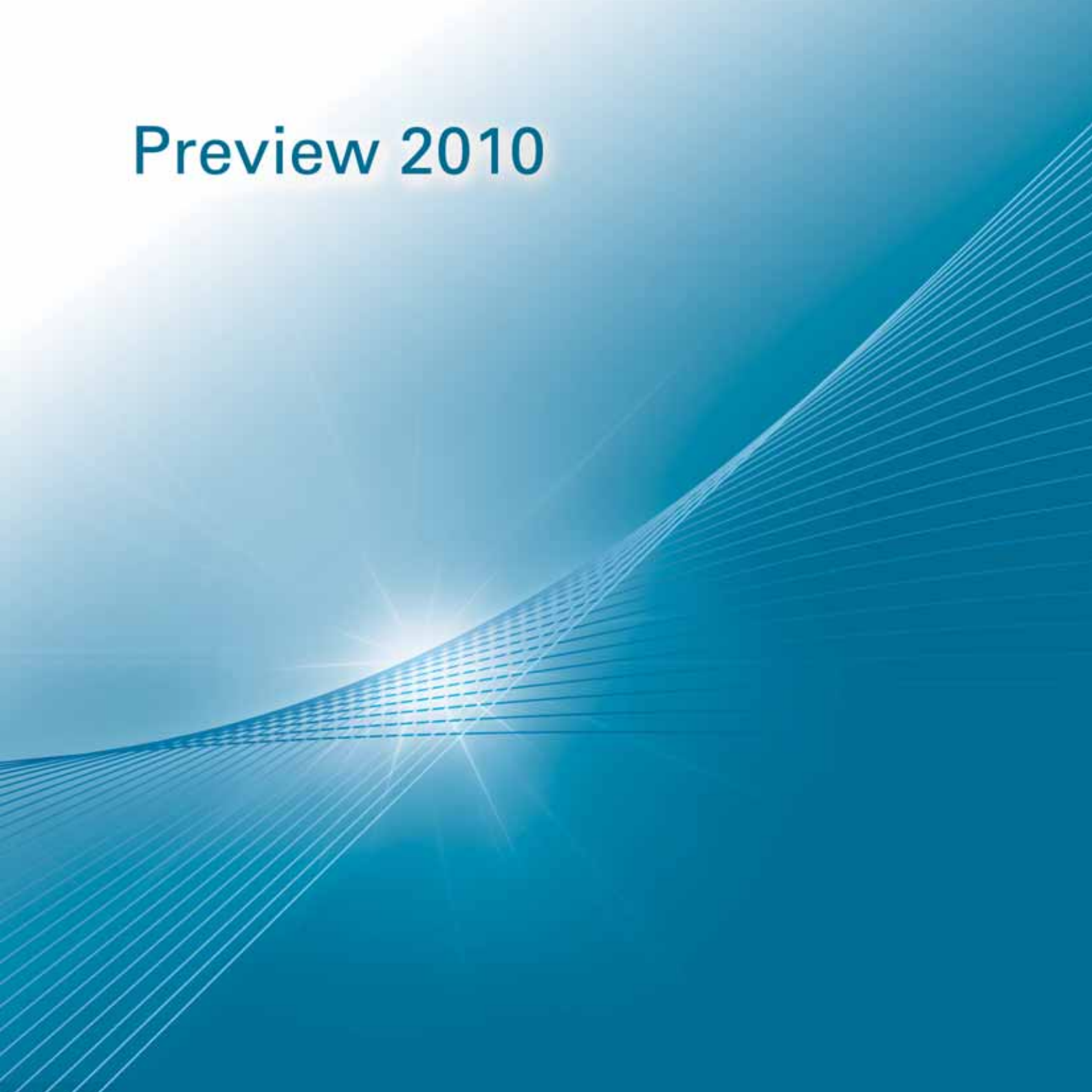
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Preview 2010





The poster features a blue-tinted image of the Brandenburg Gate in the background. A large, stylized globe is positioned on the right side, showing the continents of Africa and Europe. A series of white, curved lines sweep across the center of the image, creating a sense of motion and connecting the gate to the globe.

# Charité Berlin World Health Summit 2010

Translation, Transition, Transformation

Berlin, Germany

October 10<sup>th</sup> - 13<sup>th</sup>, 2010

[www.worldhealthsummit.org](http://www.worldhealthsummit.org)

1<sup>st</sup> Announcement



*"This initiative represents an opportunity to bring together politicians, public and private decision-makers dedicated to the health of our citizens."* Nicolas Sarkozy, President of the French Republic

## Dear Friends Dear Colleagues

Today's world is changing rapidly and our health is threatened in many ways. Global warming, malnutrition, urbanization, aging societies and the massive downturn of our economies are alarming examples for factors that bring about enormous changes in our environments regardless of where we live in this world.

Health is the most vulnerable value that reacts to these changes of our environments and our societies – and it remains the most universally agreed human right. Initiating and realizing adequate and tolerable conditions of life and the way we jointly think and act will be crucial to cope with the health challenges that we are facing in the next years and beyond.

We have to take over responsibility and leadership for the transition of our natural and social environments by developing innovative health care delivery models.

We have to protect and develop our medical innovation capacities and translate our increasing scientific competence into prevention and improved treatment of diseases across global regions.

We have to develop the cultural requirements to actively transform the agendas and collaborative efforts of policy, industry and science into better medicine and health care.

*Translation, Transition, Transformation* are therefore the key topics that will guide us towards the upcoming World Health Summit 2010:

The coalition of academic medicine, governments, industry and civil society will continue to develop and monitor joint solutions to improve health worldwide. Join us in our efforts to protect and improve health which remains our strongest currency we share around the globe and across all borders.



Detlev Ganten, MD, PhD  
Charité-Universitätsmedizin Berlin  
Summit President

Stephen K. Smith, MD, DSc, FMedSci  
Imperial College London  
Summit President

Detlev Ganten  
Stephen K. Smith

## Translation

### **Delivering innovation beyond bench and bedside**

Translating medical knowledge into interventions that benefit patients across global regions remains one of the greatest challenges of modern medicine. It also requires innovative methods of accessing and transferring knowledge. What conditions make it possible to effectively translate knowledge into medical and public health interventions, and vice versa? How can we facilitate close links between research and clinical practice, and what innovative options exist? How can we improve exchange between scientists and policy-makers, and how can research results have a greater impact on the political agenda? How can research capabilities be built up in poor countries in ways that are adapted to specific regional and cultural needs?

## Transition

### **Coping with new health challenges and accelerating change**

Our environment is constantly changing: non-communicable diseases play a growing role in developing countries; populations are aging; socio-demographic developments also mean more and more people live in “megacities”; the health-related consequences of climate change are increasing; the worldwide financial crisis is affecting healthcare; the need for basic care in low- and middle-income countries is accelerating; and the focus of healthcare treatment is shifting from acute to chronic diseases. These are just a few of the profound changes forcing everyone in the health professions to constantly adapt the ways they develop and deliver health care interventions.

*“One of the problems in tackling these big health care issues are the walls that exist between the various groups that are trying to achieve them (...). You’ll find very many conferences associated with various parts of science, you’ll find various conferences around public health issues. But this is a group that is coming together across various disciplines, with public and private sector, to try to mobilize people, to move science for the betterment of health around the world.”*

Christopher A. Viehbacher, CEO sanofi-aventis

# Transformation

## **Reinventing health politics and management**

To adequately respond to the constant changes occurring both within and beyond the healthcare field, health professionals, scientists, and political leaders must actively transform the ways we address health issues and deliver care. Solving the global translation and transition challenges we face, requires us to rethink our approach to health management. What areas of cohesion and conflict exist between political and economic health agendas, and how can we develop models for cross-sector collaboration? How can we support a shift in focus from “sick care” to healthcare – in other words, from a model focused on treating specific diseases to an approach that truly promotes health? How can global organizations foster the healthcare internationalization? And how can we best fulfill our responsibilities to shape and execute the healthcare agenda? In order to make effective decisions on global health issues, we need adequate ways to measure outcomes of healthcare interventions on a global scale.

*“Building a critical mass of sustainable research capacity in the world’s poorest countries is vital to combat diseases that kill millions of people each year.”* Mark Walport, Director, The Wellcome Trust, at the World Health Summit 2009

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# World Health Summit

## The Evolution of Medicine

The world is in a worrisome state of health. Therefore the **first World Health Summit**, which took place from 14 to 18 October 2009 at the **Charité** Universitätsmedizin Berlin, set the task of responding to the **most important global medical challenges** – such as pandemics, barriers to access to effective healthcare and epidemiological change – with a more intensive and solution-oriented social involvement.

Under the **patronage** of the German Chancellor, **Angela Merkel**, and **Nicolas Sarkozy**, President of France, 700 **leading representatives of science, economics, industry, politics and civil society** came together for four days to discuss the central questions in global healthcare and medical research. These prominent thought-leaders elaborated **concrete recommendations** for dealing for instance with pandemic planning, effective prevention strategies and climate change-related disease.

**Highlights** of the conference and concrete recommendations are presented in a variety of articles by renowned science writers. A summary of „**Key Challenges**“ and „**Key Messages**“ will give an orientation for quick readers.

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