

The Robert Koch Institute – The Public Health Institute for Germany RKI 2010

Report of the project group RKI 2010

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Summary

In recent years, health risks in Germany have changed radically and concepts for health care and for combating disease must therefore be appropriately modified. A competent and functional Federal Institute for Public Health must be available to implement a responsible and efficient health care policy.

New Challenges

New challenges to maintaining public health are presented in particular by:

- the aging society with a considerable increase in dementia, depression and cancer,
- the significant increase in the proportion of people suffering from obesity, circulatory disease or diabetes and the correspondingly crucial need to strengthen health promotion and disease prevention,
- an increasing risk of the spread of infectious diseases associated with a novel spectrum of pathogens resulting from globalisation and climate change as well as increasing antibiotic resistance,
- the threat of bioterroristic attacks,
- increasing international responsibilities and coordination duties, e.g. with the European Centre for Disease Prevention and Control (ECDC), the EU and the World Health Organisation (WHO).

A Solid Foundation

The Robert Koch Institute provides Germany with an internationally recognised institute that can confront these challenges. The RKI has a high degree of expertise and, as confirmed by the scientific board, an excellent reputation. The institute has a central function and is, in addition to other roles, the primary institute for public health. Its official duty is disease monitoring and with this essential 'antenna' function it has to identify health risks, determine their causes and develop targeted prevention strategies. The RKI therefore has comprehensive responsibility in the area of public health.

The new challenges to health politics have convinced the parties comprising the government to commit themselves as part of their Coalition Declaration to strengthening the RKI:

"The key position held in health-politics by the Robert Koch Institute (RKI), particularly in view of the growing potentially severe threats to the health of the population (for example SARS, risk of an influenza pandemic) should be expanded and institutionally supported".

In order to develop a workable concept for the necessary strengthening and reorganisation of the RKI as the Public Health Institute, a selected committee of national and international experts in public health was called upon.

Need for action

The concept for strengthening the RKI presented here is based on the recommendations of this committee. It concludes that the further development of the RKI as well as a substantial matching of the available resources to the challenges presented is essential. Only then will Germany be prepared for the new challenges and be able to maintain and, where necessary, extend its ability to act in the arena of international health politics.

The number of employees and the resources available at the RKI must be drastically increased in order:

- To reduce the incidence of preventable disease and deaths in the population
- To be capable of reacting appropriately to acute health risk situations
- To ensure that the costs of disease to the social security system and to the German economy be kept as low as possible
- To be able to offer expertise-based and independent advice to the government and the (expert) public in the event of a real or perceived threat situation.
- To be adequately represented and influential in international organisations

The strengthening of the Robert Koch Institute will contribute decisively to improving the health situation of the population and will therefore reduce the risks to the social security system and the German economy in the face of new health risks.

1. New Challenges

Infectious Diseases

Infectious diseases and contagions that have generally been regarded since the development of microbiology by Robert Koch and the discovery of antibiotics by Alexander Fleming to have been conquered are now returning with renewed vigour and new infectious diseases are emerging. Many millions of human lives are lost each year, for example, to HIV, tuberculosis and malaria. Even in Germany, the number of new HIV-infections and the proportion of resistant tuberculosis strains are increasing. The SARS-epidemic and the spread of avian influenza plainly show that new **infectious risks** can, due to international air traffic and global trade, reach virtually every corner of the Earth within hours or days. The bioterror attacks with anthrax-laden letters and the copycat events in Europe demonstrate the vulnerability of an open pluralistic society in areas of health. Epidemics can have not only rapid but also long-term serious economic and political consequences. Protecting its citizens from such health threats, whether from within or without, is an essential and fundamental duty of the state. Public health¹ places the health and the wellbeing of society in the foreground. The minimisation of economic loss incurred through medical expenses and absenteeism in the workplace is an integral part of this duty. **Global health risk situations** cannot be controlled at the national level, but require an early warning system as well as a strong international network of defence measures. A topical example of this is the global preparations for the expected and much-feared influenza epidemic. For this, Germany needs a strong and competent Public Health Institute that continuously monitors the health of the population and can participate in the coordination of preventative measures at the national and international levels. To achieve this it is necessary to employ and train highly qualified personnel from many disciplines to provide comprehensive expertise in the recognition, prevention and combating of diseases.

The magnitude of many health-related problems is often only recognised when **reports** have been **made, collected and competently analysed**. Only then is it possible to introduce treatment recommendations and targeted measures to improve existing problems. For example, between 400,000 and 600,000 infections occur annually in German hospitals, increasingly with resistant pathogens, and from the latter approximately 1 in 10 of the affected patients die. One third of these hospital infections could be prevented by appropriate measures. The development of recommendations must be based upon scientific advances and the efficacy of the preventative measures must be continuously assessed using reliable data. Reports concerning the still regularly occurring measles outbreaks and their resulting

¹ Public health means: recognition, prevention and combating of diseases in the population. It is not the health of an individual but the health status, the wellbeing of the populace, that is important.

diseases, such as that which occurred in NRW in 2006, clearly demonstrate the risk to unvaccinated children and the need for a population-wide protective vaccination programme. Moreover, Germany still suffers from distinct deficits in the area of preventative vaccination that endanger the global campaigns to eliminate polio or measles. From the viewpoint of the WHO, it is imperative that these vaccination rates be increased.

A new challenge for the health system is also being posed by **ecological-climatic changes** that also decisively affect the health situation and necessitate a corresponding adaptation of prevention measures. Increasing temperatures make it possible for many pathogens to encroach into previously temperate climates. This often involves pathogens that are transmitted by vectors such as ticks and midges. For example, in recent years an increased spread of infected ticks has been observed. A rise in temperature also places a burden on the aging population, as shown by the increasing numbers of heat-related deaths in recent years.

Non-communicable diseases

Non-communicable diseases constitute a significant proportion of the burden of disease in the German population. For example, about 70 percent of all deaths result from cardiovascular disease or cancer and it is estimated that four million people in Germany have been diagnosed with diabetes. Furthermore, the impact of psychological diseases, particularly depression, is increasing. A massive increase in non-communicable diseases will occur during the course of the demographic developments of the coming decades. Cases of dementia, for example, are expected to double by the year 2050. The development of these and other diseases associated with changes in life-style and increased life expectancy have to be monitored and addressed with targeted preventative measures. There is still a great need in Germany for basic data collection and research that would allow the existing potential for disease prevention and improved care to be better utilised. The Child and Adolescent Health Survey (KiGGS), with over 17,000 participants, is exemplary for such an approach in Germany.

The multiple cardiovascular diseases (mainly avoidable through targeted prevention) have an outstanding priority in health politics, as their causes lie in a complex interplay of different factors such as socioeconomic status, environmental influences and attitudes to health. It is equally imperative to research into the possibility of preventing certain cancers through vaccination and increasing the chances for a cure by early diagnosis.

Conclusion

During the last century, the burden of disease has taken a fundamentally new direction. In order to overcome this multitude of national and international challenges, Germany needs a

competent Federal Institute for Public Health. With the Robert Koch Institute, Germany already possesses an institute with a high degree of expertise and an excellent reputation in both the European and international community of states. However, in light of the known challenges listed above and new challenges yet to emerge, it is essential that the direction, the organisation and the facilities of our national institute be reviewed and the recognised necessary adjustments be made, particularly with regard to European and international responsibilities.

2. Description of the Analysis Process

Based on the commitment in the Coalition Contract to strengthen the RKI, a project group under joint chairmanship of the head of the "Prevention, health protection, combating disease, biomedicine" department of the German Ministry of Health and the president of the RKI was established in September 2006. This is composed of high-ranking members of the Ministry of Health and RKI, supported by designated national, European and international public health experts who brought their extensive experience in the fields of infectiology, infectious epidemiology, biological safety, health monitoring, health reporting, public health and public health service to the process.

Involved in this process were:

- Karin Knufmann-Happe, Head of the department "Prevention, health protection, disease prevention, biomedicine" of the Ministry of Health (Chairperson of the Project Group).
- Prof. Dr. Dr. h.c. Reinhard Kurth, Director of the Robert Koch Institute from 1996 until February 2008 (Chairperson of the Project Group).
- Prof. Dr. Peter W. Achterberg, Centre for Public Health Forecasting, RIVM, Bilthoven, Netherlands.
- Prof. Dr. Angela Brand, MPH, German Centre for Public Health Genomics, Bielefeld, Germany.
- Dr. David Harper, Health Protection, International Health and Scientific Development, Department of Health, London, UK.
- Dr. Jan Leidel, City Health Authority, Cologne, Germany.
- Prof. Dr. Angus Nicoll, European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden.
- Dr. Lyle R. Petersen, MPH, Centers for Disease Control and Prevention, Division of Vector-borne Infectious Diseases, Fort Collins, USA.
- Prof. Dr. Dr. h.c. mult. Harald zur Hausen, German Cancer Research Centre, Heidelberg; Germany.
- Prof. Dr. Dieter Bitter-Suermann, Hannover Medical School, President, Hannover, Germany (Chairperson of the Scientific Committee of the Robert Koch-Institute)

Taking into account the statement of the "German Scientific Council" concerning the RKI in November 2005, this project group worked together to prepare a concept for the restructuring and further development of the RKI from a modern public health point of view. It was helped in this task by advice from the RKI's external Scientific Committee.

3. A strong Public Health Institute for Germany

3.1 Responsibilities and main focus of a Public Health Institute

Public health is primarily concerned with the health status and wellbeing of the entire population². The central responsibilities of a Public Health Institute (not only) for Germany therefore consist of

- Early **recognition** of health-relevant problems in the general population and in risk-groups,
- Independent **evaluation** of developments, problem areas and risks on the basis of collected data
- Development of measures for health promotion and disease prevention (**action**).

All three fields of responsibility, **Recognition – Evaluation – Action**, are mutually dependent and complementary in a meaningful way. Therefore, experts from the most diverse of areas must work hand-in-hand. What follows is a description of the responsibilities of a modern Public Health Institute.

Early recognition of health-relevant problems – surveillance³ and health monitoring⁴

A national Public Health Institute collects data to facilitate recognition of health risks and trends in infectious diseases (e.g. notification data according to the Protection from Infection Law (IfSG) and from sentinels) and in non-communicable diseases (e.g. surveillance and health monitoring) in the general population and in risk-groups. It is able to identify the source of an infectious risk and to assign either a natural cause (e.g. disease outbreak, influenza pandemic) or human activity (e.g. bioterrorism). For this purpose it has laboratory expertise and capacity (including high-level safety laboratories) at its disposal. By sending experts to the sites of outbreaks it is able to form an authentic picture of developing risk situations and to contribute to an increased efficiency in countermeasures as well as providing "crisis capacity" and "management structures" in the case of cross-national risk situations.

² In 2006 the WHO defined the following under the heading Public Health: "Public health refers to all organised measures (whether public or private) to prevent disease, promote health, and prolong life among the population as a whole. Its activities aim to provide conditions in which people can be healthy and focus on entire populations, not on individual patients or diseases. Thus, public health is concerned with the total system and not only the eradication of a particular disease."

(www.who.int/trade/glossary/story076/en/).

³ In the context used here, surveillance means tracking the spread of diseases

⁴ Monitoring means the continuous observation of events in defined groups over a certain period of time

In the area of non-communicable diseases, it monitors changes in frequency and identifies connections between diseases, life-styles and the environment. A national Public Health Institute collects and evaluates data that serve to protect the health of the entire population.

Independent evaluation of developments, problem areas and risks

A national Public Health Institute carefully evaluates collected data, e.g. notification data according to the Protection from Infection Law (IfSG), from health monitoring and from the results of its co-operations with national and international partners and scientific networks. Furthermore, by carrying out research it is able, without dependence on third parties, to analyse both its own results and the knowledge generated world-wide, allowing risk areas and priority health problems to be recognised. The association between obesity, diabetes and arthropathy or between smoking and lung cancer was made possible through the analysis of epidemiological data. Appropriate prevention strategies could be developed on this basis, leading to cost-savings in the health system. Furthermore, it is possible, for example, to make prognoses concerning an epidemic (e.g. by mathematical modelling) or to estimate the burden of disease in the population. In addition, the efficacy of measures and prevention concepts can be assessed using the data collected. This includes educational and vaccination campaigns for vaccine-preventable diseases or the coverage of the HIV/AIDS prevention campaign, for example. In order to identify the actual health problems in Germany it is essential that the data collection instruments be continuously evaluated, adapted and further developed in line with quality control.

Action – measures for health promotion and disease prevention

A national Public Health Institute operates in an **intervention and action-oriented** manner and in close collaboration with other federal institutions, states and regional partners. This involves **in times of crisis** the provision of a catalogue of measures for intervention and protection at **the federal level** that can be quickly adapted to the respective situations. Included in this is the provision of laboratory expertise not available in other state institutions. Furthermore, it has the possibility of sending experts on-site, as well as ensuring the provision of scientific advice to ministries and state officials and of "crisis capacity" and "management structures" in the case of cross-national risk situations.

As they are part of the existing network, the strengthening of the RKI will also benefit other institutes and organisations (e.g. BMI, BMELV, AA, federal police, customs) in so far as the expertise and support for joint activities in the area of protection from health risks and risk situations will be available more quickly and in a more comprehensive fashion than has ever been possible before. The same is true for the provision to third parties (e.g. BZgA, GKV) of data concerning the health status of the population to facilitate the development of prevention measures and strategies.

A national Public Health Institute develops **strategies** for health promotion and disease prevention with the aim of providing as early as possible concepts that allow an improvement of the health status or appropriate measures that significantly limit risks of infection. For example, it is known that hospital infections can be drastically reduced by the implementation of appropriate hygienic practices and the correct use of effective, approved disinfectants. In practice, however, a high number of preventable infections still occur. There is a need to develop effective strategies and to promote their actual implementation to achieve a reduction in preventable infections. There is a similar situation in the area of vaccination.

Particular attention must be paid to the increasingly aging population: similar to the findings with adolescents, this population group also has characteristic problems and risks.

Advice – Information – Risk communication

A national Public Health Institute develops, at short notice, situation-relevant recommendations for action, not only upon request but also at its own initiative. This information must be reliable, independent, prompt and suitable for the recipient and is communicated in the appropriate form for political consultation and for scientific experts as well as being prepared and made available to the wider public. To achieve this, a competent information management system is necessary that is suitable for the special requirements of risk communication in the run up to (or in) crisis situations. A national Public Health Institute must be prepared to implement, in collaboration with the federation and states, expert-bodies and professional organisations, the measures and recommendations for actions that it develops.

Further and advanced training

A national Public Health Institute takes a central position in the training of specialists in the field of public health, as this expertise, with regard to competence, concentration and practical orientation, is not available in other educational facilities (universities, technical colleges etc.). The national Public Health Institute must spread its expertise as wide as possible so that other public health institutions and therefore ultimately the entire population benefit. To this end, it should offer epidemiological and laboratory-based training programmes in order to generate 'new scientific blood' and to create a national network of experts that not only fulfils the requisites of the states, but also ensures integration according to European and international requirements.

Public health-relevant research

The high degree of expertise demanded of a national Public Health Institute can only be assured by its own research. It also has to integrate the relevant research results of other national and international research facilities and cooperate with these facilities. The research

should be application-oriented and in accordance with the remit of the institute. In addition to research in the biological sciences it is, above all, necessary to maintain research in the social sciences. It can thereby be guaranteed that the complexity of the disease process is accommodated and that target-group specific preventative measures are effective. Based on its extensive data and specialised expertise the Public Health Institute should strive to cooperate with universities and research institutes at both the national and international levels. A national Public Health Institute has an "antenna function" (early warning function) to recognise looming health risks. It follows national and international developments with regard to new scientific knowledge, methods and techniques to provide impetus for new research topics. Sufficient resources should therefore be available to also enable the commissioning of independent projects to answer topical health-relevant research questions.

International Collaborations and Developments

A national Public Health Institute is the central contact and coordinator for collaborations with European and international health institutes and organisations. A Public Health Institute in the centre of Europe should take advantage of its location and strive to take a central position with regard to health challenges, in particular with respect to Eastern Europe. The German position should be competently established and emphatically represented in European and international committees. It is therefore essential to be personally represented in the appropriate committees.

Experts must be ready to provide on-site help in containing dangers to health in the case of health risk situations outside of Germany. The findings from such assignments, which must be scientifically analysed, are also of benefit for combating diseases in Germany. Furthermore, co-operations foster the trust necessary for the mutual exchange of information.

By sending epidemiologists to Asia and through its involvement in international expert groups of the WHO, it was possible for the RKI during the SARS epidemic to collect first-hand information relevant for Germany and to quickly adapt preventative measures for the German situation. Fortunately, thanks to the successful containment of the outbreak, this enormous strain on resources was limited to only a short period of time. This success would not have been possible without a strong international collaboration. At present, there is a similar need with regard to the situation with humans infected with avian influenza in Indonesia and other Asian countries. The flow of information from these countries is sometimes less than adequate.

Creating networks in the areas of infectious diseases (diagnostic laboratories and reference centres) and non-communicable diseases.

The modern diagnosis of pathogens requires techniques and expert knowledge offered only by centres specialised for this purpose. Bringing this expertise together in a national Public Health Institute is a goal for the future. As this process is not yet complete, it is necessary, in order to supplement its own expertise, to integrate the network of national reference centres into its own work. National reference centres will also become more important with respect to European collaborations with studies of cross-national problems. Creating networks to potentiate the expertise and resources in the field of non-communicable diseases is of equally outstanding importance and must be intensified and further developed.

3.2 Special structural elements of a Public Health Institute for Germany

A Public Health Institute must, as the leading institution for the public health service, maintain **sufficient capacity** to perform the areas of work outlined above. The persuasive professional and scientific competence must be continuously renewed and also be publicly visible, as only this will allow the necessary credibility of expert analyses and recommendations in the area of politics and to the public to be achieved. These responsibilities demand an **interdisciplinary collaboration** of all areas (e.g. scientists with different fields of expertise, communications- and IT-experts) in order to consolidate professional competence to answer questions at issue. The collaborations must go beyond the institute's internal co-operations and necessitates the involvement in national and international networks. To address special problems, the Public Health Institute calls on the expertise of external advisors in scientific commissions based at the institute or is itself a member of a multitude of national and international expert bodies. A particular challenge for a Public Health Institute in a federal system is to coordinate and secure the mesh of prevention and intervention measures at different levels. The differences in responsibility and the multitude of players demand a high degree of coordination.

A Public Health Institute offers young scientists excellent conditions for qualification. In this way, innovative techniques and procedures are also introduced that allow the institute to react in a flexible manner to new health-related challenges. In this respect, it is essential that the continuity of this knowledge in the sense of an 'institutional memory' be maintained. A national Public Health Institute should direct its own **advanced training programme** to allow it to prepare in a targeted manner its own qualified experts and external advisors for the highly specialised demands it faces.

With respect to unpredictable events and risk situations, a national Public Health Institute must have **flexible resources** available that ensure the ability to react at any time to a crisis. This entails sufficient laboratory capacity and expertise in all relevant areas at the institute and the possibility of sending experts to national and international on-site locations. A high degree of networking, both within the institute and with relevant partners and an infrastructure that meets the modern technical standards, are the preconditions for a **situation-appropriate crisis management** and constitute the 'added-value' of a national Public Health Institute.

As it is not possible for a national health institute to cover all health-relevant fields with its own research, a Public Health Institute should have the ability to award **independent project funding** to address specific questions, allowing current or newly emerging health-relevant topics to be tackled at short-notice.

To **strengthen international activities** a national Public Health Institute must have qualified personnel ready to work in other European and international health institutions and organisations. This makes it possible for the institute to represent national interests and to actively take part in the shaping of international health directives and programmes.

4. The RKI – Present and Future Remit

As the leading institute of the public health service, the RKI has the legal duty to monitor both infectious and non-communicable diseases, to identify risks and to develop preventative measures and strategies for action.

The RKI already today performs a large part of the spectrum of activities expected of a modern Public Health Institute (as described in Chapter 3). However, as a result of the developments in the last 10 years, the situation with regard to the relation between the number of staff and the duties assigned has become precarious. The RKI can no longer carry out all the assigned tasks with the diligence demanded, let alone face up to new challenges to the required extent. Over the preceding years the RKI has continuously been given new sovereign duties while the increase in positions has been far from adequate. The additional positions granted for particular areas such as the implementation of the Protection from Infection Law or the fight against terrorism have been eroded by the demand for general cost reductions. The positions obtained are committed to the new tasks and do not compensate for the lack of positions in other areas. In order to reduce the impact of personnel bottlenecks, certain disciplines have been suspended (parasitology) or severely limited and significantly reduced in function (mycology). Furthermore, it has become increasingly necessary, to a limited extent, to relocate staff in order to maintain the functionality of critical areas. These redeployments place a strain on the original duties of particular units. It is also important to realise that, given the highly specialised nature of modern techniques, such personnel movements are only possible to a certain degree. Further staff reductions are inevitable against the background of annual or other cost reductions.

The number of staff and the available resources of the RKI must be drastically increased:

- **To reduce the burden of preventable disease and mortality in the population**
- To allow the RKI to react appropriately in crisis situations
- To facilitate the participation of experts in international activities
- To ensure the prompt provision of information for politics, the (expert-) public, and the media so that, particularly in times of real or perceived threat, the population receives expert-based advice and necessary protective measures can be introduced.

Only in this way can the RKI be successfully expanded to become an efficient modern Public Health Institute for Germany.

4.1 Combating infectious diseases

Infectious diseases still represent a massive danger to the population. The situation is additionally aggravated by the increasing resistance of disease agents. The core elements for the prevention and combating of human infectious diseases and the corresponding responsibilities of the RKI will be described using prominent examples.

4.1.1 Seasonal influenza

The annually recurring wave of influenza seriously affects the population and the economy. For example, in the 2004/2005 season in Germany approximately 6 million additional cases of influenza are known to have occurred and over 2 million sick-notes were prescribed. On average, 14,000 people die as a result of the annual influenza epidemic; a figure that could be dramatically decreased by increasing the vaccination rate to meet the 75% coverage recommended for Germany by the WHO.

In addition to monitoring and combating seasonal influenza, the RKI has to carry out diagnostics and pathogen analyses as a prerequisite for adjusting the vaccines. Furthermore, the development of resistance to antiviral drugs must be carefully and comprehensively investigated.

4.1.2 Antibiotic-resistance in hospital infections and problems with an increasingly aging population.

The appearance of multiple antibiotic-resistance in bacterial pathogens that has been accumulating for years is a serious threat to the health of our population. The inadequate control of hospital infections and the reckless use of antibiotics are the causes of these developments. In addition, the increased transmission of these pathogens, not only in hospitals, plays a role. An increasingly aging population is, for a number of reasons (e.g. through age-related pre-existing diseases or a weakening of the natural immune response) particularly susceptible.

Noroviruses (NoV) cause acute gastrointestinal infections with severe vomiting and diarrhoea and spread very quickly in an outbreak situation. This continues to result in the deaths of elderly patients. The winter of 2006/2007 saw a record number of NoV infections – probably because of a new virus variant – with estimates as high as one million cases in Germany. As early as the beginning of November, it was possible for the RKI to recognise a clear increase in NoV infections and to warn those hospitals, retirement- and care-facilities most at risk and to inform them in a targeted manner about hygiene-management measures necessary to prevent or limit outbreaks. In order to interrupt such epidemics more effectively, it will be

necessary to expand the epidemiological and virological early recognition and monitoring systems as well as to provide better support to affected facilities during outbreaks.

The continuous monitoring of hospital infections and of resistances, the provision of hygiene guidelines and the strict implementation of necessary measures can contribute literally to the saving of human lives and to substantial cost-savings for the health care system.

According to estimates by the Paul Ehrlich Society, over 40,000 patients still die each year from infections contracted in hospitals. It is highly likely that the number of these preventable diseases could be reduced by 30% with adequate preventative measures. In other words, the lives of almost 15,000 humans per year are at stake.

The RKI must be in a position to successfully co-ordinate the implementation of the necessary preventative measures to inhibit hospital infections, to develop and expand the required diagnostics, and to fulfil an early-warning function for new antibiotic resistance and zoonoses. In this regard, the increased susceptibility of the elderly is also significant.

4.1.3 Transmission of pathogens from animals to humans (zoonoses)

Pathogens that are transmitted from animals to humans (zoonoses) and food-related infections in humans are highly relevant for public health. They account for the vast majority of notifiable disease cases and are responsible for over 6,000 outbreaks in Germany each year.

The special problems posed by zoonotic infections of humans occur predominantly as a result of international trade in food products and animals and are exacerbated by the modern practices of food mass-production. This necessitates a strengthening of outbreak surveillance (early warning system) and comprehensive epidemiological studies to allow the causes and sources of infection to be identified and appropriate control measures to be implemented. Furthermore, Germany is obliged as a result of new EU-directives (e.g. EU zoonosis directives) to collect a comprehensive set of epidemiological data and to report to EU institutions. The feared climate change has the potential to result in an increased spread of zoonoses: Changes in the environment and climate conditions could allow the numbers of pathogen-transmitting insects (e.g. for Chikungunya fever, West Nile fever) or ticks (e.g. for tick-borne encephalitis, Lyme disease) to increase dramatically or host animals such as rodents (e.g. as carriers of hantavirus) to encroach on human-occupied areas. This would lead to the spread of new diseases in Germany or a significant increase in presently established diseases. There are already indications that certain pathogens (hantaviruses, tick-borne encephalitis) are spreading to areas of Germany previously not affected. This involves complex interactions and associations that must be systematically and continuously studied and monitored to obtain reliable data about trends and possibilities for prevention.

Infectious diseases that have their reservoir in rodents or other wild animals exhibit yearly and seasonal fluctuations in their appearance in humans. In the last 2 to 3 years, however, many pathogens have increasingly infiltrated previously unaffected regions and even highly populated areas. 2005 saw an enormous increase in hantavirus infections of humans (reservoir: bank vole) also, for the first time, in urban areas of North-Rhein Westphalia and Lower Saxony. It is essential that the complex causes and interactions allowing the infiltration of these and other zoonotic pathogens causing life-threatening diseases of humans are studied. Only this will allow the threat to human health to be recognised early and protected against.

The RKI must be capable of fulfilling the new requirements of the EU (zoonosis directives) concerning the monitoring of food-related infections, of introducing modern characterisation and identification methods for the expected new pathogens and of guaranteeing the associated epidemiological surveillance necessary.

4.1.4 Increase in HIV and other sexually transmitted diseases

For many years it was possible thanks to successful target group-specific educational and preventative measures to keep the number of new HIV infections in Germany at a constant level. Since 2001, however, the RKI has observed a significant increase in the number of newly diagnosed HIV infections as well as an increase in other sexually-transmitted diseases such as syphilis. In neighbouring countries to the East, the number of HIV infections has risen dramatically. The successes of medical treatment are now under threat, as approximately 15% of the newly transmitted virus strains show resistance to one or more anti-HIV drugs. With the HIV/AIDS Action Plan (2007) and the HIV/AIDS Control Strategy on which it is based, the federal government has set the course for an intensification of the fight against HIV. With its selection of HIV/AIDS as one of the central themes for its Presidency of the EU Council, the attention of the community of states will be directed to this threat.

Improved treatments of HIV infection have led to a decreasing rate of mortality in the western industrialised countries. This is accompanied by a continuous increase in the number of people living with HIV. The primary aim of treatment must be to maintain or improve the quality of life and to avoid preventable suffering. Drug therapies cost approximately 30,000 – 35,000 Euro per person per year. Such therapies have made it possible for HIV-infected patients to survive for up to 35 years. Despite the relatively good therapies available for HIV-infection and the clearly increasing survival times, the prevention of every single HIV-infection is of highest priority. For this reason, it is necessary to continue with effective and group-specific preventative measures that lead to a reduction in treatment costs and hence a lessening of the strain on the health system.

The RKI has excellent instruments of epidemiological surveillance available for the monitoring of HIV-infections and AIDS-cases, although these are predominantly financed

through grants. Third party funding, however, increases the administrative efforts needed and endangers the continuity of projects. The present state of knowledge concerning other sexually-transmitted diseases is incomplete and must be complemented by additional surveillance instruments such as sentinels. An increase in personnel is essential if the duties and responsibilities in the area of HIV-monitoring are to be continued and the sentinel systems are to be expanded.

4.1.5 Neglected pathogens

Hitherto rare pathogens have been spreading virtually unnoticed. These include infections with parasites and fungi that are difficult to diagnose and treat as well as those transmitted by vectors such as midges, ticks or rodents. This is partially the result of manmade alterations in the environment such as climate and landscape changes and partly due to the increased frequency of travel by Germans.

Due to insufficient resources, the expertise for fungal infections at the RKI has been almost totally dismantled. As a result, the capacity for diagnostic and advisory duties is severely limited. An in-depth molecular-biological differential diagnostic or the analysis of resistance that is important for patient therapy cannot presently be carried out. The parasitological expertise that was previously called upon frequently had to be totally dismantled! In both areas, there is a need to expand or re-establish diagnostics and pathogen characterisation (laboratory expertise) as well as the ability to monitor disease spread (epidemiology and surveillance) because as a result of migration, globalisation, long-distance tourism and climate change, the health problems caused by these pathogens are currently increasing. Parasites native to this country (e.g. the fox tape-worm) and the increasing contamination of lakes used for swimming (e.g. by parasites transmitted by water fowl) also pose threats to health that are not a priority for parasitological diagnostic institutes (tropical institutes).

4.1.6 Vaccination

The spread of many infectious diseases can be hindered by vaccination. In Germany, the German Standing Vaccination Committee (STIKO) gives advice that serves as a basis for the recommendations for childhood vaccinations or for vaccinating particular occupational or risk groups, for example. In this respect, there is a great need for information by the public, including the medical community, as demonstrated by the heavy use of the RKI vaccine hotline. The adoption of STIKO recommendations by the German states also makes compensation possible in the case of injury from vaccination. It is therefore increasingly necessary for the RKI to provide, via the STIKO, the prompt and scientifically based foundation for transparent and industry-independent vaccination recommendations (e.g., estimates for the population-based use of a vaccine in relation to ever-increasing costs). New vaccines, such as that against human papilloma virus (HPV) that can prevent the occurrence

of particular cancers, open up new areas of operation and demand appropriately modified epidemiological methods as well as new vaccine concepts.

The eradication of vaccine preventable diseases such as poliomyelitis, measles and rubella is a declared aim of the WHO, an aim with which Germany has aligned itself. For this purpose, however, the vaccination coverage in this country must be increased and the surveillance improved, and the implementation of vaccination recommendations at all levels (federation, states and local authorities) must be supported more strongly. It is already anticipated that Germany, unlike Finland and Sweden, will not achieve the WHO targets for the eradication of measles and rubella by 2010 under present conditions.

According to the WHO, "Vaccines are one of the most cost-effective interventions for the health of the population and ... vaccination programs ... a decisive preventative element of the primary health care". Source: Resolution EUR/RC55R7 of the WHO regional committee for Europe in: Elimination of measles and rubella and the prevention of congenital rubella infection: Strategy of the WHO European region 2005-2010. WHO (2005), page 23.

The RKI is presently working on the preparation of strategies to improve vaccination, surveillance and diagnostics. In addition, they supervise the German Standing Vaccination Committee (STIKO) at the RKI. The analyses and justifications in future STIKO recommendations will have to be considerably more comprehensive to ensure their integrity at the highest scientific level, even compared to industry. Furthermore, personnel capacity must be made available for the expansion of vaccination programs and their systematic evaluation, for the identification of potential obstacles to the implementation of vaccination recommendations, for the further development of diagnostics and the evaluation of vaccines with regard to epidemiological monitoring of infection frequencies, for a strengthened co-operation with those involved in vaccine prevention as well as for the creation of a vaccine information service.

4.2 Coping with new biological threats

New risk situations of relevance to the whole of society can develop when an (in principle) known pathogen develops the ability to initiate a pandemic, when a totally new pathogen such as SARS appears, or when terroristic attacks with biological agents (bioterrorism) take place. Such situations demand that the ability to react in a rapid and appropriate manner at the state level be guaranteed. This requires both the necessary laboratory capacity as well as a comprehensive crisis- and information management by the RKI.

SARS

The SARS epidemic of 2003, which stretched the personnel of the RKI to its limit for weeks and months, demonstrated that the cross-border spread of a contagious disease can be

successfully controlled. However, even this limited outbreak (approximately 8,000 cases and 774 deaths within 9 months) had severe economic consequences: according to the World Bank, SARS cost the global economy about 45 billion US dollars.

"SARS was a tragedy" wrote the investigating judge Archie Campbell in the Commission Report of the Canadian SARS epidemic published in 2006 under the title "Spring of Fear". The dangerous lung infection escalated in the Spring of 2003 in Ontario to 375 cases of disease and 44 deaths because the health authorities did not react quickly and decisively, and because the health care system was underfinanced and unprepared for the outbreak. If there are no consequences following the SARS disaster "we will pay a terrible price in the next pandemic" says the report.

4.2.1 Influenza pandemic

At the latest since the outbreak of avian influenza in Southeast Asia, the German public too has become aware that an influenza pandemic poses a potential threat to the health of the population. The costs of an average influenza pandemic have been estimated by the World Bank to be approximately 1,300 billion US dollars, of which about 75 billion would fall to Germany. There is no doubt that another influenza pandemic will occur in the future.

Preparations at the RKI for the influenza pandemic have occurred essentially within the framework of the Influenza Research Crash Program of 2006-2008, financed externally. However, even after the expiration of this funding the RKI must continue to further develop and coordinate the pandemic planning. In addition, the monitoring of the influenza situation, as well as contributions to the development of new surveillance instruments, has to be carried out. Additional positions for this and for other projects (prompt registration of influenza-associated deaths, monitoring and evaluation of prevention recommendations) are needed at the latest when the external funding expires.

Fighting bioterrorism

In response to the bioterroristic threats following the events of 11th September, 2001 (including anthrax letters) the RKI was able through concentrated efforts to decisively contribute to providing prompt, competent and reliable advice to the public and to the political decision makers and to rapidly defuse the substantial degree of uncertainty. Reliable diagnostics for the corresponding agents were developed at short notice and used under the highest safety requirements.

As part of a long-term basis for dealing with bioterroristic threat situations, the RKI has established comprehensive special diagnostics for bioterror-relevant agents and has developed framework plans that must be continuously adapted to current developments and knowledge, providing the prerequisites for a rapid and targeted reaction to an incident.

As events in recent years have demonstrated, even mock attacks with biological agents can severely affect public life, and this can in turn cause significant economic damage. The dependable identification of risk situations, a rapid and reliable diagnostic as well as qualified risk communication, all contribute to minimising economic damage and preventing public panic.

The necessary resources for this are already accounted for in the respective areas, e.g. crisis management, use of high disease security laboratories and in the section dealing with risk communication.

4.2.2 Crisis management

With the Federal Information Centre for Biological Security the first structural prerequisites for the long-term crisis management of biological risk situations was created at the RKI. To ensure comprehensive information and crisis management, these structures have to be further expanded. Crisis management is a continuous organisational task that needs an appropriate structure and - unlike a task force or crisis squad – cannot only be formed in response to an incident. Consequently, in response to new threats, permanent structures and abilities must be maintained that ensure a comprehensive crisis- and information-management and which fulfil the following major tasks in a multidisciplinary and continuous way:

- Ability to react quickly to incidents
- Provide advice to political decision makers and relevant committees
- Crisis communication for experts and the public

In comparison to Germany, the information management systems in the major industrialised countries (e.g. France, UK) clearly have access to better resources. As well as needing additional positions in the areas of intervention and information, the RKI needs to be equipped with a Crisis Intervention Centre.

4.2.3 Laboratory capacity / biological containment facilities

Disease outbreaks with highly pathogenic agents (such as SARS, Lassa fever, Ebola) initiated by returning travellers, ecological/climatic changes and bioterroristic attack, also represent a serious potential threat for Germany. The federal government has acknowledged this by their authorisation of a new laboratory complex, including a Biosafety Level 4 high disease security laboratory, at the RKI that will be established a reference facility for Germany but will also support other selected German laboratories. With this, the federal government is in a position to independently gain experience with extremely dangerous pathogens through studies at the RKI.

The intrusion of humans into sensitive ecosystems often results in contact with new pathogens. In this way, approximately 70% of all newly discovered pathogens are transmitted to humans from animal reservoirs (zoonoses). Intensive animal husbandry can also lead to the increased transmission of such infectious agents, as can be observed in the case of avian influenza. Identification of new highly pathogenic organisms necessitates that competent diagnostics under conditions of high biological security be carried out as quickly as possible without the need for additional elaborate transport measures. In the future, pathogens eradicated by the efforts of the WHO will only be studied under the highest conditions of biosafety.

Additional personnel are needed if a crisis-capable management in the areas of monitoring, intervention and laboratory diagnostics are to be achieved. This includes positions for the technical maintenance and support of the high disease security laboratory. This highly technical facility will have to be continuously inspected by qualified personnel and in the case of a breakdown it will be necessary to perform a fault analysis and initiate the necessary safety measures. If these measures are not carried out promptly, it could, in extreme cases, result in severe damage to the facility and could even affect the personnel working within. Qualified personnel are essential for the monitoring, running and maintenance of the highly complex instrumentation and control (I&C) technology and for the air-control and sanitary systems.

4.3 Combating non-communicable diseases

Non-communicable diseases constitute a large proportion of the burden of disease in Germany and demand substantial resources from the social system. The prevention and combating of such widespread diseases also require the continuous monitoring of trends, risks and new developments as well as the identification of appropriate areas of potential prevention. The complex interplay between different health risks in the development of diseases is being investigated by no other facility at the federal level. To achieve an effective reduction of the burden of disease through active prevention programs, the RKI must expand its scientific expertise that allows it to deliver evidence-based and well-founded options for action.

4.3.1 Cancer, cardiovascular diseases, diabetes

The spread and the causes of non-communicable diseases such as cancer, cardiovascular diseases or diabetes have to be monitored and studied differently than is the case for infectious diseases. In addition to medical factors such as high-blood pressure, genetic disposition and metabolic disorders, risk factors for these diseases include personal life style (tobacco and alcohol abuse, obesity and lack of exercise) that can be influenced by preventative measures. However, other factors such as unemployment and poverty-

threatening life situations, poor health awareness, as well as air- and noise pollution are all involved in the spread of non-communicable diseases.

The annual costs of treating chronic diseases are high. For example, cardiovascular diseases cost €35 billion; diseases of the muscular and skeletal systems €25 billion; psychological and behavioural disturbances €22 billion and cancer €15 billion. A reduction of just 10% in these costs (approximately €10 billion) exceeds the costs for an effective Public Health Institute (ideally an annual budget of about €100 million) by a factor of 100!

An estimation of developments in health risks, disease burden and the requirements for care, all of which is information needed to make informed health political decisions, cannot be made by the RKI at this time. An active inhibition of further increases in these 'widespread diseases' require analyses of potential means of prevention and the consequent development of corresponding prevention and intervention strategies.

4.3.2 Health-monitoring / Child and Adolescent Survey

Germany does not possess a reliable, continuously updated and representative set of data that would allow an estimate of the health situation of the German population to be developed, particularly with regard to health status, health-related behaviour, subjective health conditions and the risks of different ways of living. The basic data, particularly in the area of non-communicable diseases, must be generated by establishing a continuous system of health monitoring. Only in this way would deductions about trends and causalities be possible. Developments in the burden of disease could be judged far more accurately and, as a result of the identification of health-relevant risk factors, also be predicted more precisely. Similarly, prevention strategies could be developed in a highly targeted manner and their impact reliably evaluated.

The multitude of preventative measures that are currently financed by health insurance companies, charities and funds are very rarely subjected to a long-term evaluation. The question of which preventative measures actually make a long-term and lasting contribution to the improvement of health related behaviour and the health status of the population remains unanswered. It is therefore difficult to concentrate the available resources on the most effective measures. A system of health monitoring that continuously examines health relevant factors in the population can fill this gap in our knowledge.

With the Child and Adolescent Health Survey (KiGGS), the RKI through third-party financing has been able for the first time to gather a cross-section of health data from over 17,000 children and adolescents and to document their physical and psychological health status to

provide a basis for preventative measures. By integrating the children and adolescents involved into a health monitoring system, this census can be expanded to a longitudinal study in which they are studied and questioned throughout their lives.

The first representative survey of the health status of German children and adolescents provided information that was previously only available for particular age groups or individual regions. It is now possible to draw precise conclusions concerning the frequency of obesity and adiposity in the younger generation, and about the risk groups and impact that can be deduced from these health problems. Questions about causes and effects, causal links and chronological progressions remain open. Which of the overweight children remain overweight as adults? What role does obesity play at particular ages in the development of disease as an adult? What influence does a change in diet and an increase in physical activity have on the health status of the child? These and other questions could be answered with the help of a so-called "KiGSS-cohort" that includes the further monitoring of the volunteers in this large study.

A reliable system for health monitoring has already been established in many other countries and is the basis for the ability to provide information concerning the health of the population and is therefore the factual basis for health-political measures. Only in this way is it possible to continuously develop analyses of trends and current health relevant problems of the entire population in a longitudinal manner. Through the establishment of health monitoring, a system comparable to European and international monitoring systems has been achieved that conforms to the EU concept and that will eventually become part of a pan-European health monitoring system to which Germany must make a significant contribution.

4.3.3 Increasing life expectancy

In addition to conserving the health of children and adolescents, it is necessary to combat diseases that appear predominantly later in life and which become more common through the demographic aging process. These include cardiovascular diseases, cancer, diabetes, depression and dementia. About 4 million Germans suffer at least occasionally from depression and approximately 1 million have to undergo medical treatment. The tendency (as with the age) is increasing.

Psychological diseases are the second most common reason for losing years of gainful employment. 15.5% of all productive years lost (651,000 years) in 2004 can be attributed to these diseases. The Federal Institute for Statistics calculates the costs of psychological diseases to be around €22 billion per annum. Psychological problems are responsible for 24.5% of all health-related early retirements in men and 35.5% in women. The observed

increase in the frequency of these diseases can be expected to continue in the coming years and decades.

Furthermore, cases of dementia are expected to increase dramatically in the coming years. Around one million people already live with dementia in Germany and there are almost 200,000 new cases each year. At present the areas of depression and dementia cannot be addressed at the RKI but this must finally be initiated.

During the course of 1995, 15% of the population passed their 65th birthday. In 2005, the number was already 19%. It is calculated that by the year 2050, approximately one-third of the population will be over 65. Prognoses concerning the changing needs for services from the health system are based on a comparison of the health status of the current elderly with that of older people of a future generation. However, this does not take into account to what extent changing attitudes to health and other social influences will alter morbidity in the population. In this respect it is necessary to study the factors influencing the health status of the elderly.

Health-relevant problems of the aging population are currently not addressed at the RKI, although these are becoming increasingly important in the area of non-communicable diseases as well as for infectious diseases (see also 4.1.2). It is the duty of a modern Public Health Institute to identify changes in the spectrum and frequencies of diseases occurring as a result of demographic change and to provide information concerning the psychological health of the population. Only in this way can these diseases, which are associated with a huge reduction in the quality of life, be adequately addressed by health politics in the future.

4.3.4 Environment and health

A reliable dataset concerning the health status of the population makes it possible to determine whether and how health and life expectancy are influenced by the environment. Examples of widely accepted correlations include allergies caused by the environment, the impact of fine dust in the air on chronic diseases of the respiratory system and the cardiovascular system as well as a connection between noise stress and cardiovascular diseases. This provides, similar to the case with sociodemographic and behavioural risk factors, opportunities for prevention and health promotion. A reliable set of data is the prerequisite for the development of prevention and intervention strategies that have to be evaluated and continuously updated. To achieve this, it will be necessary to increasingly integrate those who are expert in the methods of social science into the work of the RKI and to further expand the area of risk factors in monitoring and analysis. This will make it possible to provide recommendations about which measures should be implemented and how

aspects of health protection can be effectively integrated through the Ministry of Health in the legislation of other political areas.

Additional modules for the acquisition of data concerning environmental influences are included in the health surveys of the RKI. These extra enquiries have so far only been carried out in a minimal form. The potential for such combined analyses must be quantitatively and qualitatively expanded to allow actual, reliable statements to be made concerning the links between environment and health. It will only be possible to comprehensively analyze the constellation of risk factors represented by the sensitisation and allergic disorders identified in the Child and Adolescent Survey combined with social influences when environmental factors are sufficiently recorded and included in the model.

4.3.5 Genetics and public health

The health of the population is affected not only by environmental factors or behaviour but also by genetic predisposition. The advanced decoding of the human genome by the Human Genome Project provides new opportunities to reveal correlations between genetic make-up and susceptibility to certain diseases or environmental risks.

Our ever-growing understanding of genetic risk factors for common diseases such as cancer or heart attacks has not only been of consequence for individual patients and their treatment but also with regards to public health for the entire population. It offers innovative perspectives for prevention and health care: For example, prevention programs or preventative measures could be targeted at those who are especially susceptible to a particular health risk.

However, genetic tests also carry the risk that otherwise healthy persons are discriminated against or excluded from particular benefits. The adoption of genetic tests therefore demands on the one hand a thorough professional examination of the significance of the particular findings and on the other hand the coordination of the appraisal of ethical implications in the context of a comprehensive public health perspective.

4.4 Networking areas of responsibility

All of the areas of activity at the RKI require support through networking with a cross-section of areas that:

- Open new possibilities for knowledge (research)
- Ensure the adoption of new knowledge and techniques (further and advanced training)

- Establish and expand cooperation at the national (e.g. networking of laboratories and reference centres) and international levels
- Provide understandable, non-technical and factual information from all areas (counselling, information and risk communication)
- Provide and maintain resources and infrastructures (a functional administration)

4.4.1 Strengthening research activities

New challenges to the health of the community demand new ways of acquiring knowledge. Public health relevant research provides help in deciding on measures to maintain the health of the population. For example, the RKI has, through mathematical modelling, developed options for possible ways of dealing with bioterroristic scenarios or with the expected influenza pandemic. Mathematical modelling is of particular value in the areas of vaccination, of cost-benefit analyses and of disease burden analyses for Germany. For this, however, it is necessary to strengthen the area "applied research". To maintain public credibility it is essential that the RKI carries out excellent research, concentrated in project groups and junior research groups, selectively in the field of biomedicine. Through its own research competence it was possible for the RKI for example to react to acute threats such as mad cow disease, SARS or anthrax letters and to new developments in the area of non-communicable diseases. In each case, many millions of euros for extensive countermeasures were saved. Furthermore, the RKI must be in a position to assign independent research contracts that address topical themes.

Short-term junior research groups bring new methods and competence to the RKI. As a result of the known financial bottlenecks, the number of junior research groups has been reduced from six to two in recent years. To enable the infusion of know-how and new techniques and procedures in the future - making a flexible reaction to new health challenges possible - the number of junior research groups should be increased again to three. In order to answer topical questions of high health political relevance, questions that the RKI with its 'antenna function' is unable to address quickly using its own competence, or to quickly supplement existing data, it is necessary that a flexible 'project grant' system capable of allocating funds be established.

4.4.2 Qualification of specialised personnel

Threats to the health of the population or to a population group must be promptly and reliably identified. This requires qualified staff (also in communal health authorities) that have been trained in a manner not available at any university or technical college. The Robert Koch

Institute has, through many years experience, built up the advanced training of infection-epidemiologists at the RKI and is highly engaged in passing on this expertise to interested colleagues, who in turn pass this on to their own states and communities. Particularly in preparation for new health threats to the population (new pathogens, increased incidences of widespread diseases, demographic developments and climate change) it is necessary to expand the training capacity at the RKI for field epidemiology in the area of infectious diseases, to increase the available places for advanced training and to provide the scientific supervision necessary.

In most industrialised countries the relevant national Public Health Institutes run training programs for applied epidemiology. These are connected through an international network (TEPHINET) that ensures equivalent standards of quality. Graduates of these programs and even those currently taking the courses are in many cases integrated into the fight against disease outbreaks. In comparison to other countries, the German training program produces a very limited number of epidemiologists. Whereas a training cohort comprises 6-9 trainees in France, Spain or Italy, and approximately 80 participants in the USA, only 2-3 places are presently available per cohort at the RKI.

In the context of a European network, the RKI runs a two-year training program for infection-epidemiologists. The participants become prepared to take part in national and international investigations of outbreaks and to be involved in international organisations. However, at present only 2-3 people per year can be trained, which falls far short of covering the actual need. In order to adequately address problems arising within the context of globalisation and to be able to provide trainees with the qualifications needed, for example, to combat hospital outbreaks or to run vaccination campaigns (particularly on foreign assignment), it will be necessary to significantly increase the number of participants.

4.4.3 National and international cooperation

Because of the complexity and extent of health related problems, the RKI cannot cover all areas with its own expertise and therefore cooperates with national reference centres (in particular) that develop and perform special diagnostics for selected pathogens, providing a basis for monitoring their spread. This makes it possible to predict trends for specialised questions such as the development of resistance.

Being part of national and international networks gives the RKI access to a comprehensive range of data, sample material and methodological expertise. Although the limited amount of data available to one partner may be insufficient for analysis, the combined health-related data across the network can be interpreted together to provide new insights. The RKI has no

personnel available to ensure that these responsibilities are carried out or that experts can be sent or seconded to European and international organisations and task forces etc.

A health information system is presently being built at the European level in which components of a EU-wide health reporting system will be anchored. An increased participation of RKI scientists in commissions (especially DG Sanco and Eurostat) is necessary for a proactive involvement in shaping a European health reporting system and the integration of German expertise and experience in this information system.

Of the 17 national reference centres in Germany, 5 are based at the RKI. The Ministry of Health provides € 1.5 million each year for the temporarily established reference centres, the majority of which is given to external centres. Due to the complexity of scientific investigations and the continuously growing demand, there is a need to significantly increase the funding in this area.

The integration of health-related data from other institutions such as physicians associations and pension insurance institutions can successfully be called upon for differential epidemiological analyses. This has already been clearly demonstrated by grant-funded pilot-projects. There is an urgent need to continue using these sources.

New responsibilities for the RKI arise from its participation in European projects (e.g. health monitoring and reporting). For these duties the RKI has only very limited personnel capacity. It will be necessary to expand this capacity if the RKI is to be in a position to be active in international and European organisations. There have been frequent complaints concerning the limited involvement of German experts. Furthermore, involvement in European and international institutions leads to a networking of expertise that is of great benefit to the institute.

4.5.4 Advice, information and risk-communication

A central responsibility of the RKI that has a large impact is qualified public relations. Citizens and politicians rightly expect from the RKI competent and independent advice and information giving reliable and accurate interpretations of a situation, as well as analyses and instructions, particularly with regard to risk communication. Already, the RKI receives about 2 million hits per month on its internet site, the health reports have reached a circulation of over 700,000 and the weekly 'Epidemiological Bulletin' reaches 150,000 people per month. The continuous provision of public information, political counselling and information for the expert community demands a substantial expansion of the press and health reporting offices with regard to both personnel and technical resources (including the installation of a Crisis Reaction Centre, as described earlier). It has been clearly demonstrated that particularly in

times of crisis (e.g. SARS, anthrax) the RKI does not have the capacity to cope with the increased demand for expert information. The measurable and perceptible fear in the population in times of real or perceived health threats can only be curtailed by the quick provision of goal-oriented and trust-inspiring information.

Global and European rehearsals for the management of disease outbreaks have shown that further major efforts for overcoming crises are needed at both the national and international levels. Communication between the different organisations and decision makers can be improved so that unnecessary delays in making decisions are avoided. Public information can also be further improved.

The resources needed to achieve this have already been covered in the corresponding sections such as 'crisis management' and 'vaccination'.

4.6 Conclusion

The Robert Koch Institute is ready to accept the new challenges to protecting the health of the population. The RKI does not have the power to meet this voluntary commitment with the resources presently available. Providing the necessary help and support must be the aim of the combined efforts of responsible administrators and politicians. Only through a significant expansion will the institute be in a position to meet the health-political demands made in the coalition contract. The future begins with responsibility!