

SWEDISH INSTITUTE FOR INFECTIOUS DISEASE CONTROL



SMITTSKYDDSinSTITUTET
Swedish Institute for Infectious Disease Control



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CONTROL OF INFECTIOUS DISEASES AND KNOWLEDGE DEVELOPMENT

Sweden is relatively well protected from the spread of infectious diseases. Good hygienic conditions prevail and public health is well developed. Medical progress and preventative measures protect the Swedish population from infections that, in other countries of the world, may cause large scale disasters. However in spite of this, infectious disease prevention must be continuously maintained at a high level. It is vital that Sweden continues to vaccinate, trace infections, fight outbreaks, engage in research and disseminate information on infectious diseases. Otherwise there is a risk that diseases that are rare in Sweden, but which claim millions of victims in other parts of the world, will return. A high level of preparedness must also be maintained in order to prevent new infections such as SARS and avian influenza from gaining a foothold in Sweden.

It is the mission of the Swedish Institute for Infectious Disease Control (SMI), a governmental expert agency, to monitor the epidemiological situation for infectious diseases in humans. It is also responsible for promoting protection against such diseases.

Public health is everyone's responsibility

Current threats in Sweden are not caused by poverty or elementary lack of basic awareness among individuals. One of our modern challenges is that bacteria become resistant thus leading to inefficacy of medication. Another is new, previously emerging infectious diseases that are related to rapid communications and increased travelling. It is vital for each

individual to keep up-to-date when new diseases crop up in order to protect themselves and others through responsible behaviour. This could mean, for example, taking protective measures during sexual contacts or respecting regulations on the importation of foodstuffs or animals from other countries.

SMI is a leading research institute and knowledge centre

One of SMI's tasks is to contribute to public awareness as concerns risk of infection and protection from infectious diseases. Another is to make politicians and other decision-makers aware of the resources necessary to maintain and develop protection against infectious diseases. The foundation of SMI's authority in this work is its role as expert agency and cutting-edge research institution.

Many of the country's most eminent scientists work at SMI in cooperation with colleagues all over the world. SMI also houses one of the world's most modern and high-security laboratories for microbiological diagnostics and research.

Protection against infectious diseases pays off

In spite of the fact that Sweden has been relatively spared, infectious diseases represent a substantial economic burden to society. Fighting these diseases at an early stage is consequently a cost-effective method of contributing to improved public health. Our solid starting platform and high standards as concerns methods, equipment and competence makes Sweden and SMI important cooperating partners in the global fight against infection.

INCREASINGLY EFFICIENT TRACING

Approximately sixty diseases must be reported to government authorities according to the Communicable Diseases Act. In addition there is a voluntary monitoring system for calici virus, RS virus and influenza.

Central to SMI operations is to – with the help of reports received – efficiently trace, analyse and combat these infectious diseases. Cases of notifiable disease diagnosed by any physician or laboratory in Sweden are reported to SMI, registered and analysed. Reports on infections and outbreaks of disease scrutinizes the epidemiological situation in the country.

Analysis and statistics – broken down by infectious agent, county, age and gender – are regularly published on the SMI website and in its epidemiological annual report. From 2007, all county councils are connected to SmiNet2, a web-based monitoring system for reportable diseases.

Increased preparedness for pandemics

A pandemic occurs when an infectious disease spreads over most of the world and affects a large number of the population in each country. At the beginning of 2006 there was great concern about avian influenza, which required information inputs as well as intensive inter-agency cooperation. As a result, SMI has been able to strengthen its preparedness for pandemics using various inputs such as information, sample collection, large scale ability for influenza testing and more efficient follow up of vaccinations. Preparedness is at a high level at SMI and at other agencies as concerns outbreaks of severe infectious diseases – both inside and outside the country's borders – which may lead to a pandemic.

Continuous monitoring

SMI is responsible for the monitoring of vaccination coverage for diseases included in the child vaccination programme (diphtheria, tetanus, whooping cough, polio, measles, German measles, mumps and *Haemophilus influenzae* type b). Additionally children whose parents are immigrants receive vaccination against hepatitis B and tuberculosis. In order to assess the efficacy of this programme, SMI continuously monitors the number of children vaccinated, who have protective antibodies against the infections and the number suffering from these diseases.

If any problems occur SMI is able to propose solutions. For example in 2006 an increase in the frequency of whooping cough within certain population categories motivated a strengthening of vaccination protection against this illness. In the long run this new vaccination programme is expected to reduce whooping cough among teenagers and younger adults.

Combatting antibiotic resistance

Antibiotic resistance and health care associated infections is a growing public health problem which causes illness and death from bacterial infections. This generates considerable costs for both pharmaceuticals and extended periods of care. When bacteria become resistant to vital pharmaceuticals, illnesses such as pneumonia, blood poisoning or tuberculosis will once again become a deadly threat. Considerable resources are invested by SMI in monitoring the Swedish situation as concerns resistance to antibiotics. Trend analyses of data from several years show a gradual increase of resistant bacteria generally. SMI works in close cooperation with Strama, a national organisation combatting antibiotic resistance.



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RAPID, QUALITY ASSURED ANALYSIS

SMI carries out diagnostic analyses of different bacteria, viruses, parasites and fungi, as well as water and environmental analyses, which other laboratories are not able to do due to high levels of risk for laboratory infection or because the illness in question is rare and consequently requires special competence to carry out analyses.

New methods, advanced laboratories

New molecular biological methods have led to considerable progress as concerns epidemiological monitoring of microbial infections.



As the only laboratory of its kind in the Nordic countries, SMI carries out microbiological diagnostics in the highest biosafety class, P4.

SMI also houses the only laboratory in Sweden that uses electron microscopy for verification of viral infections.

High availability

The SMI coordinator for preparedness of threats of bioterrorism or rare infections is the Centre for Microbiological Preparedness (KCB). In order to be able to eliminate or confirm the occurrence of bioterror classified microorganisms in sample material, the laboratory staff at KCB maintain a 24/7 availability. SMI also provides medical advice around the clock to public health care and medical entities at a national level.

FRONT LINE RESEARCH

SMI's research and development is closely connected to its other preventative measures, as well as to the current public health situation. The research carried out at SMI is cutting edge which brings an increased flow of external grants (from for example the Bill and Melinda Gates Foundation, EU and Sida/SAREC). In this manner space is created for research of long-term importance to Swedish and international protection against infectious diseases.

One major international arena is SMI's involvement in Africa both as concerns public health and in the form of research into HIV/AIDS, tuberculosis, malaria and AIDS related infections. This international cooperation provides SMI with access to extensive research material within the HIV/AIDS field.

Research projects in cooperation

Research and development projects undertaken by SMI range over a wide number of scientific and problem areas. Some examples:

- HIVIS (HIV Vaccine Immunogenicity Study) is a cooperation project between Sweden and Tanzania (SMI, Karolinska Institutet, Södersjukhuset, Muhimbili University) with financing from Sida/SAREC and EU with the aim of developing a vaccine against HIV.
- Hepatitis research in cooperation with Karolinska Institutet and the University Hospital of Örebro.
- Scientists at SMI and Karolinska Institutet have developed a promising prototype for a vaccine against Malaria.

- New immunology and vaccinology centre to be built up partly financed by the Swedish development cooperation funding.
- New, safer methods for tuberculosis diagnosis developed jointly with Statens Seruminstitut, the Danish institute for infectious disease control.
- HIV public health projects focused on Africa and China jointly with Sida/SAREC.
- Stomach ulcer bacteria research and the development of a common typing system in cooperation with the National Food Administration and the National Veterinary Institute.

Experimental biomedicine

The Astrid Fagraeus Laboratory is responsible for SMI's experimental biomedical activities. Here studies are carried out on animals in order to develop vaccines and other protection against diseases such as Tuberculosis, HIV/AIDS and Alzheimer's disease. SMI's engagement and actions in the field of animal welfare is unique in international contexts.





**“The research and development projects
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and problem areas.”**



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INFORMATION SOURCES AND SERVICES

The knowledge that is developed within SMI is channelled in a number of different ways to those who need it, not least those working with health and medical care training and education in Sweden and abroad.

At Karolinska Institutet, SMI participates in the training of researchers, doctors, nurses and biomedical analysts, as well as participating in the Steering Committee of the Infectious Biology Programme. SMI also contributes to teaching at several other universities. Internationally, SMI has worked on longer courses on, for example, sanitary systems and health for participants from South and Central America, Asia and Eastern Europe/Central Asia, in cooperation with Linköping University and the Swedish University of Agricultural Sciences.

Education and training

SMI also carries out its own educational and information operations for professionals working in the field of protection against infectious diseases. For example SMI Days are organised on a regular basis in which important issues are covered. These are mostly held in the Gard Auditorium at SMI, but they have also been held at other locations around the country.

SMI also arranges regular courses for doctoral students, for specialist competence as well as other inputs concerning with protection against infectious diseases and hygiene issues within health care. In addition, SMI employees hold a large number of lectures every year on subjects such as hygiene for food workers or tuberculosis for specialist doctors and nurses.

Website, journal, media contacts

The number of visitors to the SMI website is increasing, which is encouraging. Most visitors want information on infectious diseases. Once weekly SMI's electronic newsletter entitled "EPI-aktuell" is published on the website and also distributed to subscribers. Since 1995, SMI has published a journal on a two monthly basis entitled "Smittskydd" which is very much appreciated as a channel of information providing up-to-date, competence-enhancing and easily accessed information.

Annual reports – epidemiological annual reports as well as reports on, for example, the influenza situation – are produced both digitally and in hard copy.

It may generally be said that the Swedish Institute for Infectious Disease Control's expertise is highly requested among other organisations and agencies, the general public and, not least, the mass media. Services provided for the media and public are, consequently, extensive.

EXTENSIVE NETWORKS

Infectious diseases know no bounds. Consequently SMI must work free of geographical constraints.

National

For local, regional and central actors within the protection against infectious disease field, SMI functions as a coordinating and advisory expert agency in Sweden.

Scientifically, practically and geographically, SMI works especially closely with Karolinska Institutet. One example of success within this research cooperation is the promising results of experiments with the development of a vaccine against HIV.

SMI also undertakes organised cooperation with a large number of other institutions in the country – universities, hospitals, government agencies and organisations such as the National Pandemic Group which, in addition to SMI, consists of representatives of the National Board of Health and Welfare, the Medical Products Agency, the Swedish Work Environment Authority, the Swedish Emergency Management Agency and the Swedish Association of Local Authorities and Regions.

Bilateral and in Europe

One example of cooperation is SMI's joint project concerning public health and research with the National Institute for Communicable Diseases (NICD) in South Africa.

Cooperation at European level has also been extended and gained depth. For example SMI participates in a number of working groups connected to the EU's European Centre for Disease Prevention and Control (ECDC).

International

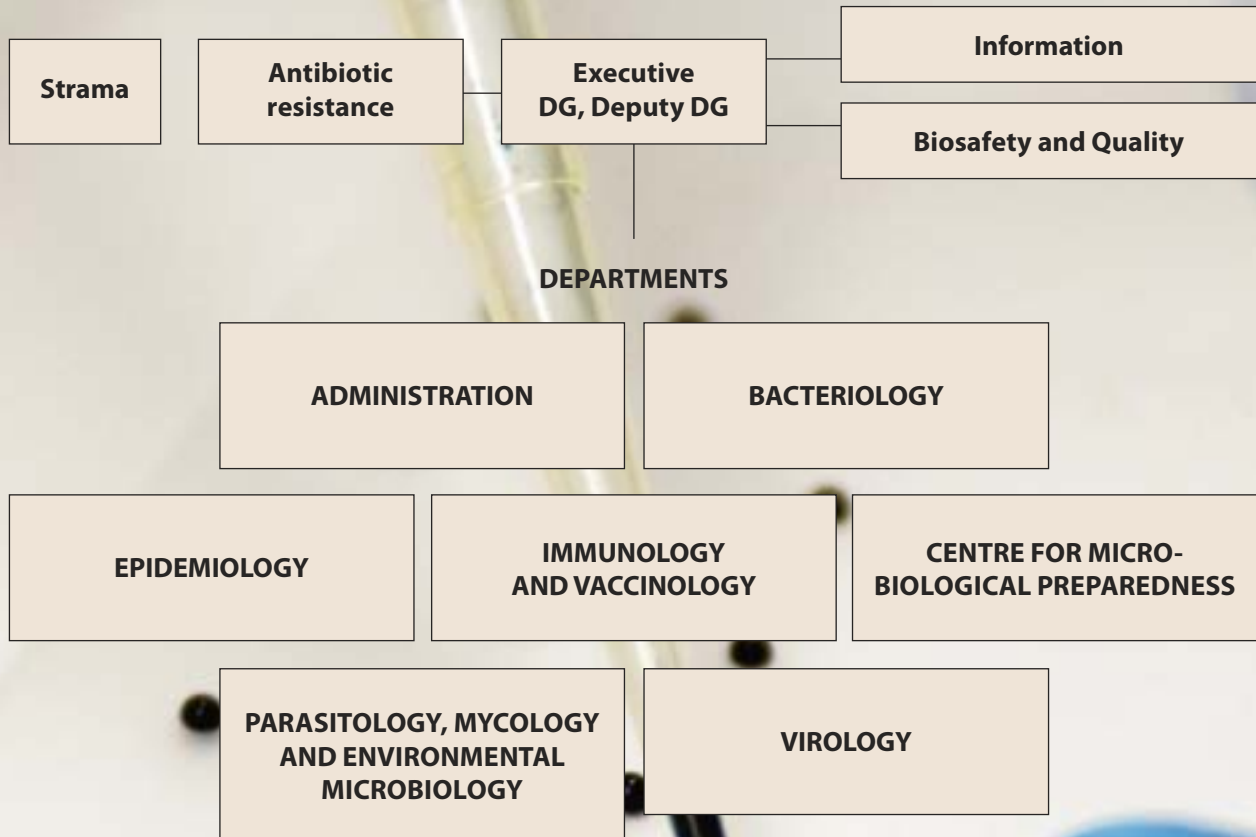
Exchange of knowledge on protection against infectious diseases is international at both organisational level and within the various research cooperation activities. World wide issues are also viewed as a common concern financially, such as when an SMI research project receives support from the International AIDS Vaccine Initiative (IAVI).

SMI's contacts within the World Health Organisation are maintained partly through its European Office in Copenhagen and partly through HQ in Geneva. In this cooperation SMI's field of responsibility is for example research and development projects of infectious diseases in Africa and South America.



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SMI'S ORGANISATION



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their development is a cost-effective method of contributing
to good public health.”**



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