

2001

National Public Health Institute – KTL
Annual Report

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Overview by the Director-General

The task of the National Public Health Institute KTL is to promote, carry out research into and monitor public health. The aim of the Institute's activities is to have a healthy and active population. Last year was KTL's ninetieth year of operation. The unit, which started out as the State Serum Laboratory, has developed into a top-level international research institute with around 800 employees.

Over the past twenty years the health of the population has improved rapidly within the areas in which KTL has focused its efforts. Life expectancy has increased by four years over this period and by this measurement we are one of the healthiest nations in the world. Mortality from and the incidence of cardiovascular disease among the population of working age has reduced at a rapid pace and this trend looks set to continue. Cancer mortality in Finland is one of the lowest rates in Europe. Premature death due to infectious diseases is extremely rare. Thanks to an exceptionally well-functioning vaccination programme, most infectious diseases in children have disappeared. The incidence of and mortality from tuberculosis has reduced to

the same level as in the rest of Western Europe and the incidence of HIV is one of the lowest in Europe.

KTL has succeeded in developing follow-ups of public health and the factors which influence it. The tracking system for infectious diseases has set an example to other European countries. Health behaviour and risk factors among the population are followed up in a number of programmes that complement each other. The Health 2000 project, which was launched in the year 2000, provides supplementary information on the health of the population and the factors influencing this and forms the basis for our assessment of health care service needs in the coming ten years.

Nonetheless, a number of problems remain unsolved and there are also some negative trends. Diabetes, allergies and asthma are becoming increasingly common. The differences in health between different population groups are exceptionally great. Mental disorders are common and the suicide rate remains high. In recent years KTL has placed a heavy emphasis on these areas in its activities. However, the results of this work will not be seen for a few years yet.

During the financial year, we published nearly 1,000 research reports and actively participated as an expert body in health promotion work and in the development of preventive health care both in Finland and elsewhere in the world. We achieved most of the aims set us. Our business strategy and the plan for realising it was completed. Central aims include continual renewal, staff development, cooperation and the creation of networks.

The reform of the national vaccination programme progressed according to plan. The action plan that we had drawn up for risk situations caused by biological factors was able to be applied in practice in the investigation of suspected cases of anthrax connected with international terrorism.

All our employees were affected by the introduction of the new pay system which was introduced during this financial year and will continue for four years. The basic renovation of our premises in Ruskeasu, which started last year, also had an effect on our work.

Helsinki, March 28th 2002

Jussi Huttunen

Highlights of 2001

National study provides information on the health of Finns

Health 2000 is a national study of the health and functional capacity of Finns. The successful field surveys of the study were completed during this financial year. The material collected will form one of KTL's most important sources of information in the years ahead.

Top level research into environmental risks

The research programme on risk assessment that is in progress at KTL's Department of Environmental Health was appointed a centre of excellence by the Academy of Finland.



Genetic change causing lactose intolerance discovered with the aid of Finnish families

Lactose intolerance is a syndrome which is triggered by dairy products and occurs in between a third and half of the world's populations. A research group containing representatives of KTL, the University of Helsinki and the University of California (UCLA) discovered a genetic cause of lactose intolerance.



Adult diabetes can be prevented by changing lifestyle

It is estimated that the number of diabetics with adult diabetes will increase by nearly 70 per cent over the coming ten years. A Finnish study on diabetes prevention (the Diabetes Prevention Study, DPS) showed that adult diabetes can be prevented by changing dietary and exercise habits.

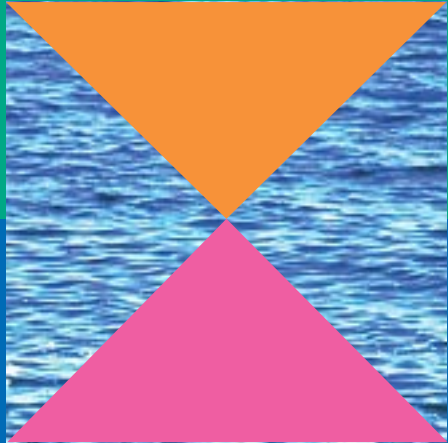
Use of naltrexone in the treatment of alcoholics

The study confirmed observations from earlier research: treatment with naltrexone reduces the risk of succumbing to alcohol abuse and also gradually reduces overall alcohol consumption, provided that the drug treatment is supplemented with other care that teaches the alcoholic not to relapse.



Renovation of schools with mildew problems pays off

In 2001 an intervention study investigating how the renovation of schools suffering mildew problems affects exposure to microbes and the health of pupils and teachers was concluded. Following carefully executed comprehensive renovation, both the microbe level in the indoor air and the number of symptoms reduced considerably. No changes were observed in schools which were only partly renovated. The results show that there is a strong health incentive to remedy mildew problems. Measurements of the microbe content of indoor air showed that renovation also markedly improved the air quality. The methods of assessing exposure to microbes were developed.



Cooperation on health promotion

Most decisions concerning health promotion and care services are now taken by the local authorities themselves and prescriptive management has been replaced by information-based management. Local authorities need information on factors affecting health and on the regional health situation, as well as support in implementing preventive measures. Together with its cooperation partners, KTL supported the local authorities in their work on preventing diseases influenced by lifestyle.

Support for the implementation of the programme Health for All 21

Almost all our activities at KTL relate to the implementation of the Health for All 21 programme, which was approved by the government in 2001. During the financial year representatives of the Institute presented the programme at various meetings that were organised for local authorities, organisations and the general public. Development of the indicators required for the evaluation of the programme was commenced.

Cooperation with local authorities on health promotion

Cooperation with county administrative boards, hospital districts, local authorities, organisations, trade and industry and universities was developed partly through the social intervention project in Päijät-Häme, which forms part of the Ikihyvä Päijät-Häme project. Several local indicators of health promotion were developed jointly with a number of the local authorities within STAKES' Healthy Cities project and Lammi-Tuulos. All-round cooperation with local authorities, county administrative boards and citizens' organisations in North Karelia continued.

Around 45,000 reports were notified to the register of infectious diseases. The external use of the register continued to increase and KTL provided guidance in the use of the register at various points around the country.

KTL took part in the investigation of virtually all water-borne epidemics. Thanks to this cooperation we succeeded in reducing the environmental risks that affect health. The worrying increase in cases of whooping cough in earlier years is thought to have receded.

KTL supported and participated in the development of health advice services for drug addicts which started up in a number of local authorities around the country during this financial year. The Institute also contributed to the work on preventing drug abuse carried out within the municipalities through the government-appointed drug policy coordination group.

Using the methods developed within the SIRO hospital infections programme, during the financial year we followed up the incidence of hospital infections in hospitals participating in the project, investigated epidemics taking the form of hospital infections and arranged training which aims to create a nationwide system of follow-up.

Within environmental health care the emphasis of our cooperation with local authorities remained on the matters of water hygiene. During the year negotiations took place concerning development of the control readiness which is crucial to health care, including methods of analysing pathogenic microorganisms in untreated water and drinking water. The local authorities made use of KTL's expert assistance in matters relating to contaminated land and damp in buildings.

KTL developed area epidemiological methods. At the request of local authorities the cancer risk among the population in selected areas was compared with the rest of Finland.

Activities within the area of infectious diseases

Many infectious diseases still occur, placing a heavy burden on care services. As living conditions and lifestyles change, old infection problems may increase and new problems may arise.

Contingency plans tested by powder sent through the post in the autumn of 2001

The threat that anthrax bacteria would be spread via unidentified powder sent through the post – a threat which was first seen in the USA – reached Finland in autumn 2001. The situation was brought under control through systematic measures and effective information. In cooperation with various authorities KTL drew up instructions for various players concerning how letters containing powder were to be dealt with and the measures to be taken if infection was suspected. KTL also participated in the development of diagnostic readiness. The effectiveness of smallpox vaccine that had been stored for over 20 years was checked and the vaccine batches were repacked for use.

The threat of an influenza pandemic caused by H5N1 virus in poultry reared its head again. KTL initiated cooperation with EELA, the Finnish National Veterinary and Food Research Institute, in order to improve readiness for the diagnosis of influenza virus infection in poultry and other livestock.

Food and water as a source of infection

Epidemics with a common source of infection which are spread through food and water are becoming increasingly common in certain municipalities. A nationwide system is often required to observe the epidemics and to find the common sources of infection.

KTL organised a course in the investigation of epidemics for experts within local authorities and other bodies. The Institute also provided local authorities and other players within health care with instruction and training in EHEC diagnostics and in the investigation of food poisoning epidemics based on patients' samples. When an epidemic occurs KTL coordinates microbiological diagnostics and the exact type determination of bacteria isolated from samples.

Around 100 suspected epidemics were notified to the register during the financial year. Most of these had their origin in food. In the majority of cases KTL contacted the bodies concerned and investigated the epidemic further.

In the investigation of an extensive calicivirus epidemic the internet was used as a new method of gathering information. In autumn 2001 KTL organised a one-week course on epidemic investigation for experts from local authorities and other bodies.

By investigating the microbiological characteristics of bacteria which affect the health of the population KTL was able to confirm over 20 epidemics which had their origin in Finland or which spread among groups of Finnish tourists abroad. The information produced by KTL and the rapid communication of this to the food control authorities made a significant contribution to restricting the epidemics and tracing the source of infection.

Food safety investigated in cooperation with other EU countries

The early warning system which forms part of the EU's follow-up system for infectious diseases functioned actively throughout the year. KTL participated in these activities within the EU's Enter-net and in the investigation of 15 international intestinal infection epidemics by passing on exact type information on behalf of Finland for international use. KTL has been appointed one of the institutions within the EU which will develop the harmonisation of methods for the genetic type determination of bacteria. This work was started during the financial year.

Together with representatives of other management areas, KTL participated in cooperation within the EU which is aimed at determining scientifically based limit values for the dioxin content in foods. The Institute also participated in the activities car-

ried out by the European Commission and the Council of Ministers to assess the dioxin limit values and created a scientific basis for the limit values which provide a guarantee of healthy food.

Fall in number of cases of type B and C hepatitis

The incidence of diseases transferred via blood did not increase further in 2001. The number of cases of hepatitis B and hepatitis C infection even fell somewhat. KTL participated in staff training at advice centres for drug addicts who use drugs intravenously and provided instruction to those centres introducing a rapid test for HIV. Similar cooperation also took place with health care services in prisons.

KTL was responsible for the national screening of infectious diseases in pregnant women. Carriers of syphilis, hepatitis B and HIV infection discovered among the 57,427 samples analysed in 2001 were referred to appropriate care. The number of carriers of HIV infection increased somewhat. KTL started a cooperation project which is investigating the incidence of hepatitis C virus infection in pregnant women and the risk that the disease poses to the newborn child.

Greater role for molecular epidemiology

This year KTL's reference laboratories again participated in epidemic investigations and research. Defining the specific genetic characteristics of microbe strains allows the strains to

be identified quickly and accurately. The efficiency of infectious disease follow-up can be further increased by carrying out more in-depth analyses and including new groups of pathogens in these. KTL was the only body in Finland to carry out analysis of HIV drug resistance based on genome analysis.

Fall in vaccination rate

The study of the vaccination of children born in 1997 was completed. The results indicate a reduction of 2-3 vaccinations carried out compared with a similar survey two years previously. Most children are still vaccinated, but the downward trend reflects international concern regarding the safety of vaccines and the lack of confidence in the health care authorities. Criticisms of vaccination have also been raised in Finland. KTL has responded to these with factual information and by gathering evidence of the effectiveness and safety of vaccines.

The vaccination telephone advice service received around 5,000 calls during the year. The listing of typical questions that the vaccine advice service receives and model answers for these was continued and the information was entered in a database. The vaccination manual for advice centres was updated in cooperation with the Mannerheim Association of Child Welfare. The follow-up system for side-effects of vaccines was extended in order to improve the function of these vaccines. The number of reports of side-effects rose slightly compared with previous years, but the proportion of reports of serious side-effects fell somewhat.

Progress on reform of the vaccination programme

The vaccine-related/disease-related evaluation of activities with a view to reform of the general vaccination programme continued during the financial year. A national health economic survey of the effect of the vaccinations provided a new perspective. The Institute edited a special issue of the journal of the Finnish Medical Society Duodecim on the vaccination programme. Controlled phase-out of KTL's own vaccine production continued according to plan. KTL began looking into the MPR vaccination timetable, the number of polio booster vaccinations and the scope of hepatitis B vaccination. The Institute drew up new recommendations for the use of pneumococcus and chicken pox vaccine. Chicken pox vaccination is recommended for all those who have reached the age of 13 without having had chicken pox and pneumococcal conjugate vaccine for all children belonging to any risk group.

Influenza vaccination for all over 65s and cell-free whooping cough vaccine for 6-year-olds

The evaluations of influenza, whooping cough and chicken pox vaccination were completed. As a result it has already been decided to start vaccinating all over 65s against influenza annually and to include vaccination of 6-year-olds against whooping cough in the general vaccination programme. To this end the safety for 6-year-old children of four different vaccines containing cell-free whooping cough vaccine was investigated. The field section of the study was completed in

December 2001. The study was successful and the preliminary results suggest that the children tolerated all the vaccines investigated well.

Tuberculosis vaccination only for risk groups in future?

Following the investigation of tuberculosis vaccination (BCG) which was completed during the financial year it was possible to make the transition from vaccinating all newborns to only vaccinating risk groups. A restricted vaccination programme may also involve risks, including a possible increase in tuberculosis and other mycobacterial infections among children. The report points out the importance of taking an overall view of tuberculosis prevention, regardless of the extent of the BCG vaccination programme.

Combined vaccine means fewer injections and better protection

A working party which evaluated the use of combined vaccines looked at the possibility of giving a vaccine against whooping cough, diphtheria, tetanus, serious haemophilus diseases and polio in a single vaccine dose. If such a combined vaccine were taken into use Finnish children could be protected against all these diseases with just 5 or 6 injections during the first two years of life. At present 12 vaccinations are required.

The results of the ear inflammation study FinOM showed that an "old-fashioned" polysaccharide vaccine given as a booster after three doses of conjugate vaccine provides

strong immunity and at least to start with is just as effective as an additional dose of conjugate vaccine.

International expert assistance provided in more areas

A new method of finding pneumococci was created which allows us to measure the quantity of bacteria in patients' samples more accurately than previously. KTL is coordinating a joint European study where carriers of pneumococci and the incidence of pneumococcal diseases are investigated in a number of European countries and charted the incidence of pneumococcal diseases in the Philippines, Bangladesh and Vietnam in cooperation with local players.

The Institute's researchers took part in the work on an international polio eradication campaign and in the development of an anti-smoking programme for the World Health Organisation. KTL's researchers also provided expert assistance to the Finnish Foreign Ministry, the GAVI management group for vaccine development, in the preparation and implementation of the UN special session on Aids and in the preparation process for the international convention prohibiting the production of biological weapons.

Greater knowledge of the significance of infections for the incidence of chronic diseases

The role which lung chlamydial infection plays in the incidence of cardiovascular disease has yet to be finally established. During the financial year a combination of three tests

was developed which is capable of revealing a substantially increased risk of illness. This combination test allows us to identify who will benefit the most from being treated with microbial drugs.

KTL continued its research into the significance of enterovirus infections as a risk factor for type 1 diabetes. However, an extensive joint study was unable to demonstrate that an enterovirus infection would increase the risk of the child developing diabetes during the first three months of pregnancy.

Genetic make-up affects the mechanism for occurrence of complications and long-term effects on many infectious diseases. It was discovered that genes influence the level of immunity to the different components of the lung chlamydial bacterium.

More research into allergies

A study which took place during the financial year and was carried out in farm environments indicated that exposure to livestock and possibly to microbial products originating in livestock prevents allergies. In addition, different methods were tested in order to confirm differences between exposure to microbes in rural areas and in urban environments along with methods of measuring the balance of the immune system; these will be used in a supplementary study starting in 2002.

Results were reported from studies which investigated the significance of damp in buildings for the incidence of asthma in children as well as the significance of exposure to allergens during pregnancy and early childhood for the incidence of asthma and allergies.



KTL started a study in Kuopio investigating changes in the incidence of allergies among 13 to 14-year-old school pupils over the past five years.

KTL identified a number of new allergens in potato and investigated their structure as well as their clinical significance and in cooperation with the Finnish Institute of Occupational Health continued the research into experimental animal models for allergies. An asthma model of allergy was also developed. Together with the Universities of Jyväskylä and Helsinki as well as the Institute of Occupational Health, KTL continued the investigation of allergens' epitopes to provide a basis for starting to develop allergy vaccines. During the financial year research programmes for allergy and asthma research were drawn up for the years 2002 – 2004 and 2005 – 2007.

Follow-up and training to prevent hospital infections

It is estimated that one in ten patients cared for in a hospital gets a hospital-related infection. In 2001 new hospitals were brought into the SIRO hospital infections programme within both focal areas of the programme, i.e. infections found through blood culture and infections in the operation area. KTL supported the hospitals in the investigation of epidemics and arranged training in order to develop a uniform follow-up system. The methicillin-resistant *Staphylococcus aureus* bacterium (MRSA) became increasingly common. KTL developed new methods of more precise follow-up of MRSA infections and showed that the strains can be divided into two main groups: one which is thought to be related to infection in the hospital and one which is spread within outpatient care.

More efficient follow-up of drug resistance

KTL continued its follow-up of the resistance of bacteria to drugs within the FiRe cooperation network for clinical microbiology laboratories. The macrolide resistance of pneumococcus bacteria has increased in Finland, possibly because the use of antibiotics within this group has become more common in the treatment of infections of the upper respiratory tract. KTL started an information campaign to reduce unnecessary use of antibiotics in the treatment of these diseases.

The training intervention within the MIKSTRA programme was launched. The programme is coordinated by KTL and aims to achieve optimal use of microbial drugs which maintains their effect in Finland. 30 MIKSTRA health centres, the Social Insurance Institution of Finland (KELA), the National Agency for Medicines, Stakes (the National Research and Development Centre for Welfare and Health) and the Finnish Medical Society Duodecim are taking part in the programme. In 2000 – 2001 a training programme was implemented in respect of the diagnosis and care of infections within outpatient care in accordance with the Current Care recommendations.

KTL is coordinating the FiRe programme, which is a cooperation programme involving 28 clinical microbiology laboratories and KTL with a view to creating an updated reporting system for the resistance of bacteria to antibiotics. Using the programme it was possible to track the development of resistance in the major multi-resistant bacteria.

KTL kept track of the drug-resistance of domestic and foreign salmonella, EHEC and dysentery bacte-

ria and campylobacter in order to observe the incidence of the strains and any increase. The sensitivity of foreign salmonella bacteria to the fluoroquinolones which are primarily used in their treatment is clearly continuing to weaken. The situation for salmonella-patients infected in Thailand is particularly concerning. This development is due to use in the rearing of production animals and the generous use of fluoroquinolone derivatives in the treatment of salmonella.

The Institute followed up the development of resistance in anaerobic bacteria in the mouth and intestinal tract. The resistance of these bacteria has remained at a relatively low level although resistance to beta-lactamase-transferred penicillin in anaerobic bacteria in the mouth of small children has increased due to exposure to microbial drugs. KTL is following up the incidence of multi-resistant tuberculosis in Finland by analysing all tuberculosis bacteria identified in Finland centrally. Only a few cases of multi-resistant tuberculosis have been found in Finland.

KTL participated actively in the cooperation within the EU on the prevention of resistance to antibiotics and represented Finland in the EARSS programme, which is charting resistance to microbial drugs. Together with the Finnish National Agency for Medicines and the Social Insurance Institution of Finland, KTL took part in the ESAC programme that is tracking the use of microbial drugs. The Institute was also included in the WHO's working party on the resistance of bacteria to microbial drugs, in the follow-up network for salmonella and EHEC bacteria as well as in the EU's hospital infections programme.

Activities within the area of health and chronic diseases

Chronic diseases are the largest group of diseases affecting the quality of life of the population and restricting its functional capacity. These diseases are the most common cause of incapacity for work and cause many premature deaths. The health of the population is substantially affected by how well we succeed in preventing and treating chronic diseases. This year KTL's research continued to concentrate on cardiovascular diseases, mental problems and drug abuse, diabetes, diseases of the musculoskeletal system, cancers and allergies.

Follow-up of health behaviour in the population

There are major differences in the health behaviour and health of different groups of the population. The population of eastern and northern Finland are less healthy than those in the west and south of Finland. The health problems in the big cities are becoming increasingly noticeable. Health differences associated with education, occupation and income level are thought to be the greatest in Western Europe. In an international comparison Finnish men are in relatively poorer health than women. Dietary habits have become healthier, with the result that

the population's average blood cholesterol level has fallen to the average for Western Europe and even lower. This change is in turn the main reason for the reduction in mortality resulting from coronary artery disease and cancer.

KTL is responsible for a number of regularly recurring studies which track the development of the state of health of the population and the disease situation.

In the Health 2000 study KTL together with its extensive cooperation network gathered relevant information concerning the state of health and functional capacity of the entire population. The field work for the survey was completed in June. Analysis of the material started in December and the advance report was almost complete by the end of the year. Initial preliminary results in respect of mental stress, well-being at work and depression were reported.

The field work for the Finriski study – which every five years charts risk factors for diseases in the population – was planned during the financial year and the study will be carried out during 2002. Comparable material was gathered previously in 1982, 1987, 1992 and 1997.

The questionnaire on the health behaviour of the adult population which has been carried out annually since 1978 provides information on the population's perceived health as well as factors affecting this.

Age structure of the population a challenge for health promotion

The population structure in Finland is changing rapidly. The proportion of children and young people is reducing and increasing life expectancy means that the proportion of older people in the population is growing. The sickness rate among the larger age groups is increasing substantially. A major internal shift is taking place within Finland: the population is moving to the centres of growth in the south and west of the country. The number of immigrants is rising. The family structure is changing. The number of children has fallen due to the reduced birth rate. Family ties have become looser and the nuclear family has lost its significance. Divorces are increasingly common and the number of single people has risen. Relationships between the generations have weakened.

In conjunction with the Health 2000 project, a follow-up study to the Mini Finland population survey carried out in the late 1970s was implemented. The follow-up study provided information on changes in the health of the population. Despite the fact that there has been positive development in respect of many chronic diseases such as cardiovascular disease, certain musculoskeletal diseases, psychoses and mortality from suicide, many health problems are on the increase.



Cardiovascular diseases still represent a serious health problem among the adult population. KTL's extensive and varied research and expert activities in respect of cardiovascular diseases ranged from cell biology and molecular genetics to epidemiology and clinical research. Diabetes is constantly on the increase among the population. The Institute continued its multifaceted diabetes research, which is of high quality internationally.

Well-being of children and young people is key to public health

Finland's young people are increasingly better educated, are active and international. However, negative trends can also be seen: smoking, alcohol consumption and drug abuse among young people are on the increase.

The health of young people and young adults, their experimentation with and use of drugs as well as their mental health were substantially emphasised in KTL's research programme and health promotion work. The research into diabetes in children, young people and adults was successful.

Health of older people investigated

Using research material gathered previously we investigated how different diseases affect aging. The information from the Health 2000 project was used to investigate the aging population's health, functional capacity and perceived health as well as changes in these.

Drug research focuses on epidemiology and prevention

Alcohol consumption is increasing and it is becoming increasingly common for people to drink in order to get drunk. This represents a serious threat to the health of the population. Consumption will increase further since the availability of alcohol is increasing. Mortality and diseases caused by alcohol are on the rise. Children and young people and adults in the lower social strata form particular problem groups. In recent years, KTL has directed many resources to these areas.

KTL, the Finnish Foundation for Alcohol Studies and Järvenpää Social Hospital cooperated to carry out a clinical drug treatment study investigating the effect and suitability of the opioid blocker naltrexone for the care of alcohol-dependent patients in Finland. The study showed that naltrexone is an effective drug for use in the outpatient care of alcoholics when combined with psycho-social care which supports the patient's adaptation to a life without alcohol. KTL also assessed the effects and consequences of other methods of care aimed at treating drug dependence within the Finnish health care sector and created the conditions for taking new types of care into use.

KTL was involved in the realisation of the government's decision in principle on drugs policy, for example by investigating the effects of drugs on health, developing preventive methods and forms of care and participating in various ways in the expert activities on drugs issues. The Institute substantially increased its

cooperation on drugs issues with the drug treatment unit at the University of Helsinki and the drug psychiatry unit within the Hospital District of Helsinki and Uusimaa.

Prevention aimed at injecting drug addicts produces results

The number of cases of HIV notified to the register of infectious diseases during 2001 was lower than in the two preceding years. Cases of infection via drug abuse also reduced. The number of cases of hepatitis B and hepatitis C has fallen for the first time.

Training in infections among injecting drug addicts was organised for healthcare personnel working with infectious diseases. The Institute took part in the project for peer education for injecting drug addicts by planning the content of the education as well as arranging education and drawing up information material in cooperation with the A-Clinic Foundation.

KTL helped local authorities by arranging training for decision-makers and other key personnel in the provision of health advice to injecting drug addicts and by participating in the planning of practical activities. One objective is to create a network of advice centres which provide information for the evaluation and development of the activities. At the same time methods were developed for epidemic investigations to be carried out at the easily accessible centres.

Together with the prisoners' health care service KTL carried out work to prevent the spread of infection within prisons. The Institute also took part in the cooperation on in-

fection within the Baltic region, where the emphasis is on activities aimed at risk groups at easily accessible advice centres.

Support for the national tobacco policy

KTL has carried out a lot of work aimed at reducing smoking. The objectives of these activities have been achieved and in some cases even surpassed. Finnish adults smoke less than the populations of most other European countries.

During the financial year a variety of research information was produced concerning the health risks of smoking, smoking by Finns and giving up smoking. The Institute employed an expert to work solely on the prevention of smoking. Among other things, KTL took part in the Current Care project which aims to reduce smoking, in the preparations for the world conference Smoking or Health and in the planning of activities at the unit for the prevention of smoking among young people which will start up in 2002.

Changes in smoking among adults of working age and retirement age as well as among young people were analysed based on the nationwide follow-up of the health behaviour of the population. A study was started to investigate the effects of tobacco legislation. An investigation car-

ried out among 13 to 16-year-olds in Helsinki showed that programmes aimed at young people reduce the number of young people who take up smoking.

Preparations were started for the international Quit and Win campaign and activities within the anti-smoking network for young people in EU countries continued. KTL also participated in the WHO's multilateral convention on tobacco control and in the preparations for the EU's tobacco programme.

KTL investigated the link between smoking and mental health as well as between smoking and the use of other drugs, particularly with a view to producing information about and expert activities in respect of drug trends among young people.

Suicide rate continues to fall

The suicide rate in Finland has fallen annually since 1990 by over 20 per cent in total, which is more than the objective of the national programme for the prevention of suicide. Thanks to the reduced suicide rate more than 20,000 expected life-years are saved annually. The basic strategy within suicide prevention has been to act in a variety of ways at all levels to prevent suicide. The biggest individual factor both in Finland and abroad has been the development of depression care during the 1990s.

Gene technology helps identify Finns' hereditary diseases

Various results from KTL's successful genetic research can be applied in the diagnosis of genetically conditioned diseases among Finns and also certain general diseases or characteristics. A good example is the research work which led to the discovery of the lactose intolerance gene. The identification of the DNA change which causes lactose intolerance makes it possible to develop a beneficial, fast and painless DNA test which replaces the intestinal biopsy used previously as a basis for diagnosis.

International cooperation has developed methods of health follow-up

Methods of national health follow-up were developed. KTL participated in the management and realisation of the EU's programme for health follow-up as well as in the health follow-up development activities of the EU, WHO, OECD and Nomesco.

KTL representatives participated in EU projects preparing the EU's upcoming health audit as well as European health indicators, information systems, methods of national health research and follow-up of risk factors.



Activities within the area of environmental health

Over the past 15, years environmental health has been one of the focal points of KTL's activities. The results of these activities have had a major influence on the prevention and remedying of environmental health problems. Air pollution in densely-populated areas can increase the incidence of and mortality from cardiovascular diseases and diseases of the respiratory organs to a greater extent than had previously been believed. Exposure to mildew in buildings with damp represents a significant health risk to the population. The microbiological quality of drinking water can still be considerably improved. Land and bodies of water polluted by old industrial discharges present a particular problem which requires research and new types of solution.

Health risks of indoor climate investigated

KTL has targeted its research within environmental health in accordance with the national environmental health programme and the latest international research findings. During the financial year problems relating to the indoor climate caused by damp and mildew were investigated along with the health risks that these present both in private homes and in public

premises. The link between damp, microbes and the health of those exposed was the subject of interdisciplinary investigation in the form of close cooperation between structural building surveys and studies of how exposure has affected health. We also examined the link between damage to buildings and symptoms using mathematical modelling, the microbiological reactions of building materials and the mechanisms of health damage caused by microbes. The results of the studies were applied in the prevention and remedying of problems in the indoor climate as well as to prepare instructions for the authorities.

Renovating schools with mildew problems pays off

In 2001 an intervention study investigating how the renovation of schools suffering mildew problems affects exposure to microbes and the health of pupils and teachers was concluded. Following carefully executed comprehensive renovation, the microbe level in the indoor air and the number of symptoms reduced considerably. No changes were observed in schools which were only partly renovated. The results show that there is a strong health incentive to remedy mildew problems. Measurements of the microbe content of indoor air showed that renovation also markedly improves the air quality. New methods of assessing exposure to microbes were developed.

In the long-term follow-up of dwellings with mildew problems not only long-term health damage but also long-term economic and social damage were observed in families exposed to mildew. Children could be seen to suffer more quickly than adults.

The research results show that the harmful effects of damp and mildew depend both on the extent of the damage and the material attacked. The mathematical modelling of observed damage and symptoms showed that there is a correlation between the scope of the damage and the symptoms. The investigation of building materials showed that the activity of typical microbes in cases of mildew is determined by the surface on which the mildew grows. This suggests that mildew damage to one particular material may be more harmful than damage to another material.

Clinical studies during the financial year investigated symptoms and diseases in employees exposed to damp and mildew. In nose rinsing samples higher contents of inflammation mediator were observed in those in schools and offices with damp problems than in the control group. There was a clear time link between exposure and symptoms.

KTL also studied the mechanisms by which health damage arises when caused by exposure to microbes in buildings with damp problems. The results showed that there are major differences between the capacity of different microbes to give rise to the production of inflammation mediator and cell death.



Local authorities get expert help with indoor air problems and risk assessment

The microbiological section of the instructions for indoor air issued by the Ministry of Social Affairs and Health was updated. KTL has an established role as an expert in property, building, heating and sanitation engineering as well as among property owners. The Institute particularly supported local authorities by offering expert services for solving problems with the indoor climate and by charting symptoms in problem cases involving schools and health care premises.

KTL acts as a national expert body for the assessment of how chemical, biological and physical damage affect health and the risks that these involve. The Institute investigates environmental factors that affect health at population level.

Trans-frontier environmental health

Environmental health research has enjoyed a central position both nationally and internationally. International examples are the action plans of the World Health Organisation and the EU for environmental health in Europe and the EU's, WHO's and European Science Foundation's research programmes for environmental health. The Academy of Finland leads the national research programme for environmental health, which is coordinated by KTL and the University of Kuopio. KTL's researchers have also played a central role in the realisation of the development programme Environment-Health-Society at Kuopio Science Park. The environmental health research was financed by the European Union, the Academy of Finland, TEKES (the Finnish National Technology Agency), the Finnish Work Environment Fund and a number of other bodies.

The need for KTL's expertise was particularly acute in discussions of the chemical risks of food and feed-stuffs both in Finland and within the European Union. The EU has set limit values for dioxins in both feed-stuffs and foods. Finland is negotiating concerning the use of Baltic herring as feed for fur animals, since they do not enter man's food chain. In the case of foods negotiations were also needed concerning the use of fish from the Baltic Sea, which is an important element of the Finnish diet. In both these cases KTL's expert knowledge was crucial to achieving a rational solution.

International cooperation on health promotion

Finland is actively participating in the development of the European Union's health policy and in its work on health promotion. This work is increasing as the EU gains greater powers in matters concerning health promotion. KTL has faced great challenges within the EU cooperation. The EU has the task of coordinating the Member States' cooperation within the area of public health, but in practice everyone must adapt and each state must harmonise its own types of activity if the cooperation is to work.

The EU's network for follow-up and control of infectious diseases is based on the expert institutions' disease-related networks and a network which coordinates these. During the financial year KTL participated in more than ten disease-related EU networks and acted as the national coordinator which collected and passed on information. The Institute participated in a number of projects which prepared the network's activities and had coordination responsibility for the network charting pneumococcal infections. The Institute was the Finnish node for both the EU's and the WHO's early warning systems for

epidemics, passing on information to the global system for observation and the prevention of epidemics.

KTL representatives were involved in developing the EU's policy on infectious diseases both through work within the network and programme committees for Aids and other infectious diseases and through the cooperation body for the directors of the Member States' follow-up and monitoring institutions and units. The Institute's experts participated in work within the UNAIDS and UNGASS processes.

The Institute's researchers took part in the international polio eradication campaign as well as in the development of an anti-smoking programme for the World Health Organisation. KTL also provided expert assistance in the preparation and implementation of the UN's special session on Aids and in the preparation process for the international convention prohibiting the production of biological weapons

KTL's researchers led and coordinated the extensive ARIVAC cooperation project with developing countries which is making vaccination policy in developing countries more efficient and helping these countries to prevent common childhood diseases. The Institute prepared the EU's initiative supporting the implementation of clinical studies in developing countries.

The major targets of cooperation with our immediate neighbours were Karelia, the rest of north-western Russia and the Baltic states. A temporary working party was formed for developing cooperation in respect of infectious diseases within the Baltic region. The work of the group was supported by political commitment at a high level. The working party includes programme committees concerned with HIV and sexually transmitted diseases, tuberculosis, primary care, follow-up and prevention of infectious diseases as well as resistance to antibiotics. In particular, KTL actively participated in the development of the programme for the HIV group and in the follow-up of infectious diseases. By the end of the year, 17 individual cooperation projects had been approved within the programme; KTL is taking part in a number of these.

Financing

Expenditure

Operating costs (excluding vaccines) increased by FIM 6 million compared with the previous year. The increased expenditure was primarily financed by budget funds. Net budgeted co-financed research financing fell by FIM 12 million, while financing from the Academy of Finland rose by FIM 2 million. EU financing, income from chargeable services and other external financing remained at the same level as in the previous year.

In 2001, KTL received external financing for more than 400 different projects from over 90 financiers. The biggest individual financiers were the Academy of Finland, the Ministry of Social Affairs and Health, Millennium Pharmaceuticals, Inc. (USA), the Social Insurance Institution of Finland (KELA), the National Institute of Health (USA), TEKES (the Finnish National Technology Agency), the European Union, Merck & Co. Inc. (USA), Pfizer Inc. (Finland and USA) and the WHO.

Investment

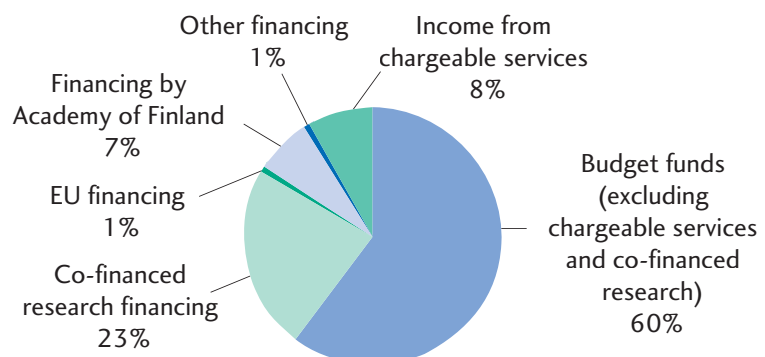
Investments in fixed assets in 2001 amounted to FIM 16.1 million in total. This is FIM 5.8 million more than in the previous year. The increased investments are due primarily to the fact that the Department of Molecular Medicine moved to new premises and was equipped with new apparatus. The investments were di-

vided up as follows: software FIM 0.9m, laboratory apparatus FIM 8.6m, workstations and other computer equipment FIM 3.1m, office furniture FIM 2.1m and transport, machinery and other equipment FIM 1.4m.

Financing

	2001		2000	
	million FIM	%	million FIM	%
<i>Budget funds (excluding chargeable services and co-financed research)</i>	161	60	145	56
<i>Co-financed research financing</i>	61	23	73	28
<i>EU financing</i>	3	1	3	1
<i>Financing by Academy of Finland</i>	18	7	16	6
<i>Other financing</i>	2	1	2	1
<i>Income from chargeable services</i>	20	8	20	8

OPERATIONAL FINANCING 2001 (not including vaccine procurement)



Employees

The number of employees changed in 2001 as a result of the fact that around 100 people working on the Health 2000 project, which had been started the previous year, left the Institute when the project was concluded in early spring 2001. At the end of the year a major new project (Finriski) was launched, for which around 50 people were employed. In December 2001 816 people were recorded in KTL's payroll system, of which 55.2 per cent were employed permanently or on conditional tenure. The proportion of temporary employees fell slightly compared with the previous year.

In accordance with KTL's strategy we are endeavouring to systematically reduce the number of employees on temporary contracts over the years to come. This means that people are increasingly being employed on conditional tenure irrespective of whether the financing has a time limit.

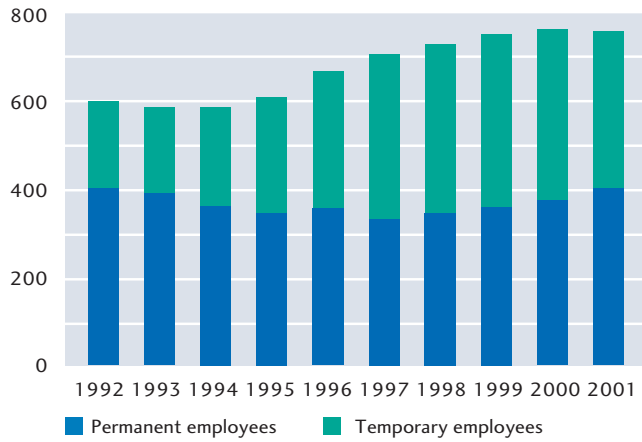
The number of person-years worked in 2001 amounted to 779, of which 428 related to ordinary positions and 351 to temporary positions. In total 1,881 different employment contracts were recorded, which is 171 more than in the previous year. The average age of KTL employees in 2001 was 42 years. The average age varies within the different personnel categories.

In accordance with KTL's strategy particular attention was paid to well-being at work. In October 2001 a steering committee on well-being at work was established, which planned various measures for developing the activities. The work was carried out in cooperation with the Finnish State Treasury and Medivire. The aim of the project is for each unit within KTL to start its own activities for well-being at work, which in future will form part of the everyday life of the units.

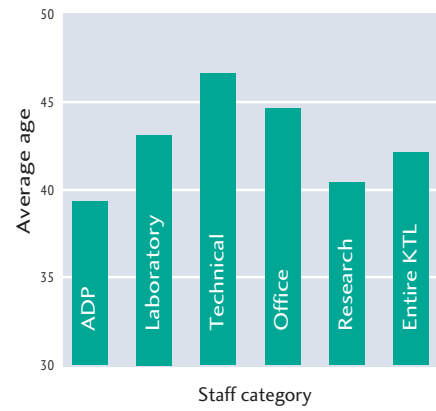
Definitions used in the chart:

Details of the number of employees and the employee structure refer to the situation at the end of the financial year, i.e. on 31 December. The number of employees refers to the number of people employed full-time or part-time.

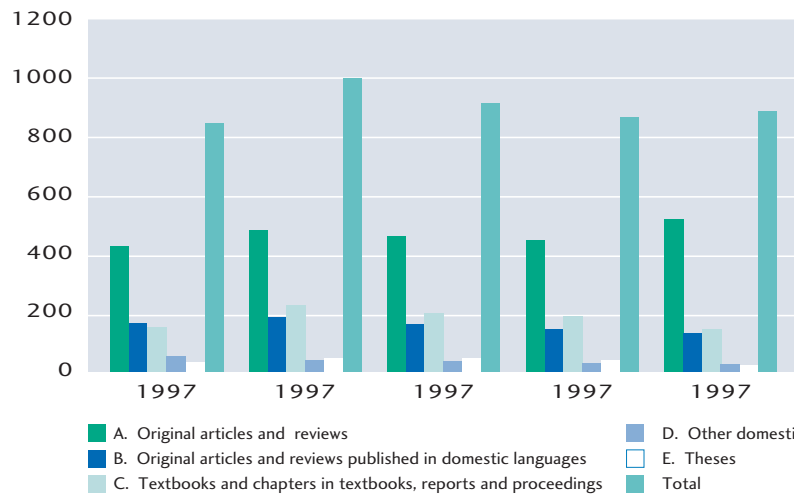
Person-years 1992 – 2001



Average age by staff category



Publications



Organisational chart

Director General Jussi Huttunen
Management Group
Department of Epidemiology and Health Promotion Erkki Vartiainen
Department of Infectious Disease Epidemiology Pauli Leinikki
Department for Mental Health and Alcohol Research Jouko Lönnqvist
Department of Microbiology Tapani Hovi
Department of Molecular Medicine Christian Ehnholm
Department of Vaccines Terhi Kilpi
Department of health and functional capacity Arpo Aromaa
Department in Turku Heikki Arvilommi
Department of Environmental Health Jouko Tuomisto
Department of Internal Services Jaakko Penttinen



Management Group

From left:
Eija Hynninen (communications officer),
Erkki Vartiainen, Arpo Aromaa, Jussi Huttunen, Pauli Leinikki, Terhi Kilpi, Jouko
Tuomisto, Tapani Hovi and Jouko Lönnqvist
Sitting:
Jaakko Penttinen, Christian Ehnholm and Heikki Arvilommi

Accounts

PROFIT AND LOSS ACCOUNT

	1.1. – 31.12.2001		1.1. – 31.12.2000	
Operating income:				
Income from chargeable activities	23 773 506.03		22 998 852.00	
Rents and operating payments	95 461.60		0.00	
Other operating income	62 112 108.21	85 981 075.84	67 920 212.69	90 919 064.69
Operating costs:				
Materials and equipment				
Purchases during the accounting period	49 270 365.31		43 033 069.16	
Increase (+) or reduction (-) in inventories	3 340 201.00		2 898 966.60	
Personnel costs	150 878 299.68		149 963 077.08	
Rent	28 413 527.73		25 850 370.82	
Purchases of services	28 633 047.16		33 085 020.55	
Other costs	17 522 683.88		13 236 019.10	
Depreciation	11 546 826.00		11 131 009.00	
Internal costs	270 000.00	289 874 950.76	440 000.00	279 637 532.31
Profit/loss I		-203 893 874.92		-188 718 467.62
Extraordinary income and costs:				
Extraordinary income	0.00			
Extraordinary costs	0.00	0.00	0.00	0.00
Profit/loss II		-203 893 874.92		-188 718 467.62
Transfer income and payments				
Payments:				
To households	200 100.00	200 100.00	144 229.54	144 229.54
Profit/loss III		-204 093 974.92		-188 862 697.16
Income from taxes and obligatory charges:				
Output value-added tax	3 073 840.98		2 410 482.42	
Input value-added tax	-21 126 924.06	-18 053 083.08	18 818 355.21	-16 407 872.79
Profit/loss for the accounting period		-222 147 058.00		-205 270 569.95

BALANCE SHEET

	31.12.2001		31.12.2000	
ASSETS				
FIXED ASSETS AND OTHER LONG-TERM INVESTMENTS				
<i>Intangible assets</i>				
<i>Intangible rights</i>	1 338 309.00	1 338 309.00	739 650.00	739 650.00
<i>Tangible assets</i>				
<i>Buildings</i>	275 745.00		298 875.00	
<i>Machinery and equipment</i>	38 365 594.34		36 500 333.00	
<i>Fixtures and fittings</i>	2 759 935.00		1 281 607.00	
<i>Other tangible assets</i>	45 000.00		0.00	
<i>Charges paid in advance</i>	9 322.27	41 455 596.61	0.00	38 080 815.00
<i>Securities included in fixed assets and other long-term investments</i>				
<i>Securities included in fixed assets</i>	3 200.00	3 200.00	3 200.00	3 200.00
<i>Total fixed assets</i>		42 797 105.61	3 200.00	38 823 665.00
CURRENT AND FINANCIAL ASSETS				
<i>Current assets</i>				
<i>Finished products/ goods</i>	17 269 710.00	17 269 710.00	20 609 911.00	20 609 911.00
<i>Current receivables</i>				
<i>Accounts receivable</i>	19 974 610.89		24 535 330.21	
<i>Other current receivables</i>	1 771 466.12		1 855 080.06	
<i>Advance payments</i>	147 794.18	21 893 871.19	71 365.93	26 461 776.20
<i>Cash, bank balances and other financial assets</i>				
<i>Current accounts</i>	8 761.00	8 761.00	8 427.30	8 427.30
<i>Total current and financial assets</i>		39 172 342.19		47 080 114.50
TOTAL ASSETS		81 969 447.80		85 903 779.50
LIABILITIES				
EQUITY				
<i>State capital</i>				
<i>State capital 1.1.1998</i>		28 840 125.26		28 840 125.26
<i>Changes in capital in earlier accounting periods</i>	11 520 276.23		9 651 711.04	
<i>Transfer of capital</i>	205 744 605.25		207 139 135.14	
<i>Cost surplus/deficit for accounting period</i>	-222 147 058.00	23 957 948.74	-205 270 569.95	40 360 401.49
<i>Total equity</i>		23 957 948.74		40 360 401.49
OTHER LIABILITIES				
<i>Current</i>				
<i>Advance payments</i>	17 850 552.65		10 045 947.59	
<i>Accounts payable</i>	5 213 405.74		8 968 786.76	
<i>Inter-unit transactions</i>	3 568 136.06		3 533 954.73	
<i>Transferable items</i>	2 255 785.92		2 691 347.52	
<i>Profit adjustment</i>	18 980 615.79		19 169 413.58	
<i>Other current liabilities</i>	10 143 002.90	58 011 499.06	1 133 927.83	45 543 378.01
<i>Total other liabilities</i>		58 011 499.06		45 543 378.01
TOTAL LIABILITIES		81 969 447.80		85 903 779.50

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