



Protects and Promotes Public Health

Annual Report 2004

Foreword



The year 2004 was the first fiscal year of the new Director General, Professor Pekka Puska. He started at KTL already in 1977 and has served as a Research Professor and Head of the Department. In 2001–2003 Puska worked as the Director of Non-Communicable Disease Prevention and Health Promotion at the WHO.

The National Public Health Institute of Finland – KTL – has in its nearly hundred years of history reflected changes in Finnish Society. Initially the institute helped to control epidemic infectious diseases nationally. Later on, many laboratory functions were developed, and the institute grew into a major central public health laboratory.

During the last 25 years, KTL has grown into a high level research and expert institute also by international standards. Nowadays, the Institute covers a broad range of health issues from infectious diseases to chronic diseases, from environmental health to mental health and health promotion. The high level of research is reflected by this year's record of quality publications in international journals.

The future of KTL looks good: Health is becoming an even more important value in society. At the same time, it is becoming a more complex issue, relating to many activities of society and calling for more comprehensive expertise. That is the role of a good national public health institute: working under the political leadership of the Ministry of Health it forms a critical mass of expertise and has the authority to give expert advice to various decision makers and to the public, to monitor the development of health and to study the problems.

The work of KTL rests on two pillars. The first is to attain the best possible knowledge on public health issues through high level research with broad international collaboration. The second pillar is to help to implement this knowledge for the benefit of public health in Finland.

This is also the outlook for the future: Both research and public health work of KTL will be strengthened. Research builds on sound infrastructure, good quality, innovative approaches, intense work, and international collaboration. Public health work is strengthened together with national health policy developments. KTL is already now widely seen as a credible central expert agency that influences national and local authorities, health services, NGOs and business. KTL reaches the public and helps people in their health-related decisions through multichannel communication and fruitful interaction with the media and partnerships.

With this annual report I extend my sincere thanks to all partners of KTL for good collaboration and to the great staff of KTL for their commitment.

Helsinki 29 April, 2005

*Pekka Puska, professor
Director General*



Tasks and Responsibilities

The task of KTL is to prevent diseases and promote public health. To reach this goal, KTL monitors major diseases and their determinants as well as general health and functional capacity of the people. Research at KTL focuses on the causes of major diseases, on health-related trends in the population and on prevention and health promotion methods and strategies. The Institute is responsible for the acquisition, quality control and distribution of the vaccines used in public health services. In addition, it is responsible for national screening programmes and medicolegal examinations. KTL also aims to ensure that policymakers and other decision makers in the society, as well as ordinary citizens, have the best possible knowledge for making their health-related choices.

In 2004, KTL research programmes were successfully carried out, and

the Institute achieved set goals. The health of the Finnish people has generally improved over the last few years; however, this development has not been uniform across different population groups, and new threats and challenges are emerging. Identifying and addressing factors that lead to inequality in health among population groups has become a key issue. Attention has been paid increasingly both on the health of children and adolescents as well as on the improvement of the functional capacity of the elderly. In the field of infectious disease control, the reform of national vaccination programme, preparations for the threat of influenza pandemic and control of antimicrobial resistant bacteria were among main issues in 2004. In the field of environmental health the effects of air pollution and related risk analyses have been key topics.



KTL ensures that policymakers and other decision makers in society as well as ordinary citizens have the best possible knowledge for making their health-related choices.



Changing Circumstances

In Finland, many changes now taking place have major implications to public health. The proportion of children and adolescents diminishes, and the post-war baby boom generation will retire within the next few years. The increasing number of elderly people is a challenge to public health care, where the need for services strongly depends on the ability of the aged to cope with activities of daily living. To meet these challenges, KTL has started a major cross-institute programme entitled “Healthy ageing”.

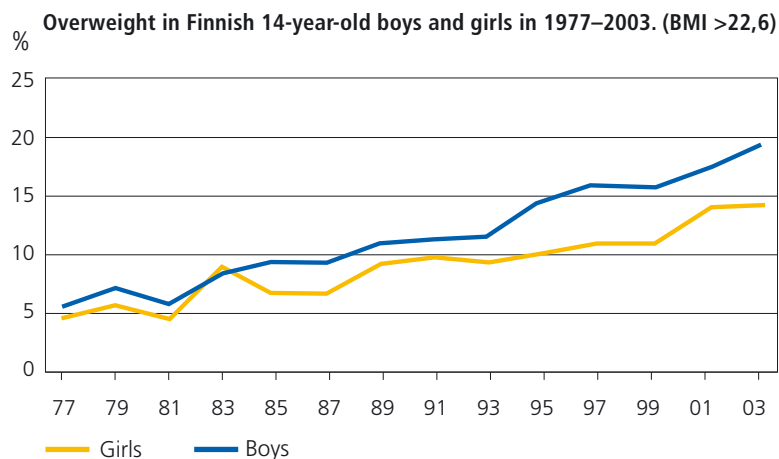
Cardiovascular diseases and cancer remain the diseases with major impact on public health, although their age-adjusted mortality rates are decreasing as consequence of successful prevention. Similarly, the prevalence of musculoskeletal diseases seems to

have decreased, but they are still an important cause of disability and impairment to cope with the activities of daily living. On the other hand, allergic conditions and diabetes are becoming more common. Mental problems and psychiatric disorders are more often than ever the cause for disability, and the need for mental health services is increasing. Infectious diseases remain an important cause of morbidity and create pressure on the health care system. As other countries, also Finland has to improve its readiness to prevent the dangers of various bio-threats.

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There are major differences in the health and lifestyles between various population groups. The health of the population in eastern and northern Finland is in many ways poorer compared with western or southern parts of the country. The health of Finnish men is poorer than that of women, although the differences tend to decrease. The differences in relation to educational level, profession and income rate are actually among the highest in Western Europe. The population is divided into subcultures; reaching some these groups and promoting their health is challenging.

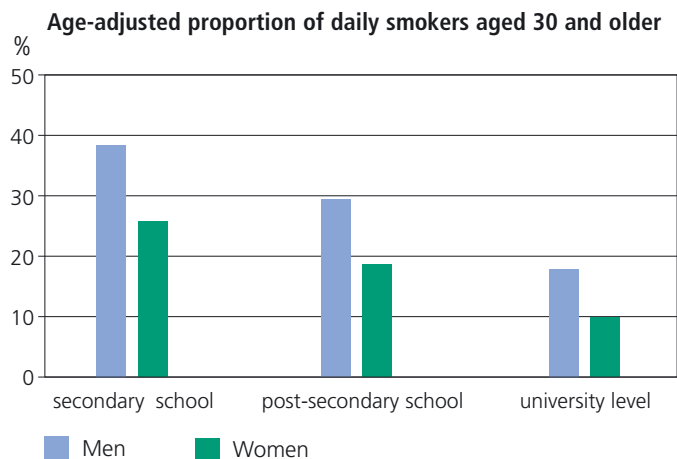
Today, many decisions on health promotion and public health services are made locally by local municipalities. Local actors need information of the state of health and its determinants in their region. The media and commercial marketing affect our lifestyle increasingly. On the other hand, information technology offers, new possibilities for health promotion and disease control.

Finland plays an active role in developing the public health programmes of the European Union. Cooperation with the World Health Organization integrates the work done in Finland into a global framework, especially in the fields of infectious disease control, tobacco control and nutrition programmes of the WHO.



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Infectious Diseases and Immunizations



High quality surveillance and control of epidemics

In 2004, KTL carried out important reforms in the national surveillance system for infectious diseases. Collecting microbial samples became an official part of the surveillance system. KTL also took part in the preparation of a new national zoonosis strategy.

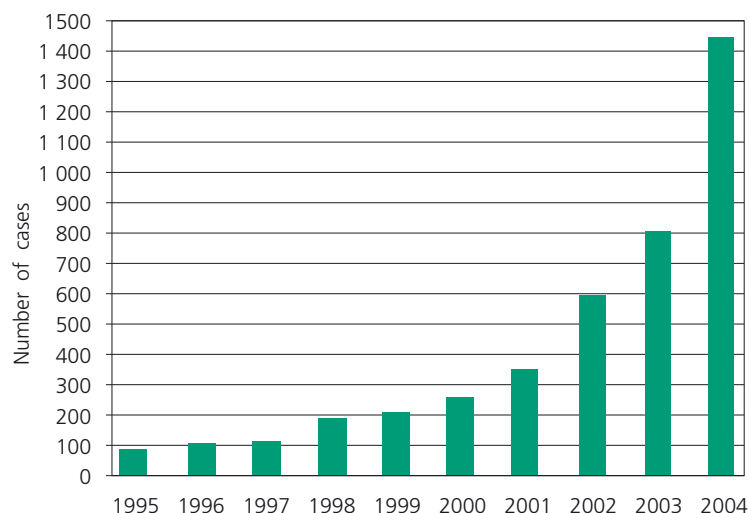
The increasing risk of an influenza pandemic motivated the updating of KTL's preparedness plan and catalyzed the preparation of wider national plans. KTL decided to establish a joint Research Centre for Biological Threats together with Finnish Defence Forces. This new centre will bring together expertise both from civil and military laboratories to improve our capacity to analyse the threats and respond to them.

The number of methicillin resistant *Staphylococcus aureus* bacteria

infections increased in 2004. The growth was due to two large epidemics. As a means to control epidemics of multidrug resistant bacteria more efficiently, KTL took into use new gene confirmation tests and classification methods. National guidelines for MRSA prevention were published.

The year 2004 brought along a major EU decision to establish a European Centre for Disease Prevention and Control. Experts from KTL participated actively in the work of the early warning and response system (EWRS) and the EU network committee. The experts also participated in collecting information and developing the reporting systems of more than ten disease-specific early warning networks. KTL was actively involved in the renewing of the International Health Regulation system.

Confirmed MRSA cases in Finland in 1995–2004





As part of its near region cooperation, KTL continued to monitor tuberculosis drug resistance in the Murmansk region in Russia. In the WHO polio eradication programme, KTL invested efforts especially in Egypt in making better use of environmental samples that are an important means for improving monitoring.

Research on infectious disease mechanisms and immunological defence systems

KTL continued its research into the disease- and epidemic-causing properties of bacteria and viruses that threaten human health. KTL research groups also studied natural microbial flora and its health effects and the defence mechanisms of the human body.

KTL continued in projects elucidating the development of oral and upper respiratory tract microbial flora and the emergence of antimicrobial resistance, the heredity of acute erysipelas infections, the initiation of transmitter production in various target cells by different viruses and bacteria, and possibilities to reduce inflammatory reaction by blocking important vascular endothelial cell surface molecules identified by KTL researchers.

KTL also continued to study the role of infections in the aetiology of chronic diseases, for example, the

epidemiology of reactive arthritis following gastrointestinal infections, the role of pulmonary Chlamydia in cardiovascular diseases and asthma, that of gingival infection in cardiovascular diseases as well as the role of enterovirus infections in type 1 diabetes.

Vaccination programme

The national vaccination programme and monitoring of its effects are now more comprehensive than ever. As the diseases that are preventable by vaccinations become rarer, the adverse effects of immunizations gain more attention. Despite this, vaccination coverage has remained very high in Finland. To ensure that the coverage continues to remain good, the effects of vaccinations must be monitored carefully to gain reliable information, also on the true rate of adverse effects.

KTL has given up its own vaccine production gradually over the past four years. The production of the last vaccine made by the KTL, DTP, was stopped at the end of 2003. During 2004, KTL started to purchase all vaccines of the national vaccination programme from foreign manufacturers. The storage and distribution of vaccines was also outsourced.

In 2004, KTL invested greatly in educating and informing health care personnel about the new immunization programme that started at the beginning of 2005.



The number of MRSA bacteria cases increased in 2004 by more than one third. KTL took into use new gene confirmation tests and classification methods. National guidelines for MRSA prevention were published.

Chronic Disease Prevention and Health

During the last few decades Finland has had remarkable success in reducing the mortality rates of cardiovascular diseases, tobacco related cancers and several other causes and improving oral health etc. This has resulted in major improvements in life expectancy and in public health in general. At the same time there are many new challenges.

Progress and new challenges

The large national Health 2000 study, coordinated by KTL, gives an updated picture of the health of the nation. The results of the study increase our knowledge of especially cardiovascular diseases, mental health and psychiatric disorders. Obesity is an increasing problem affecting to public health. Young Finnish adults are gaining weight, and the long-term decline in cholesterol levels has slowed down. Oral health of the population has improved considerably over the past 20 years, yet the need for treatment

continues to be great and self-care is not sufficient.

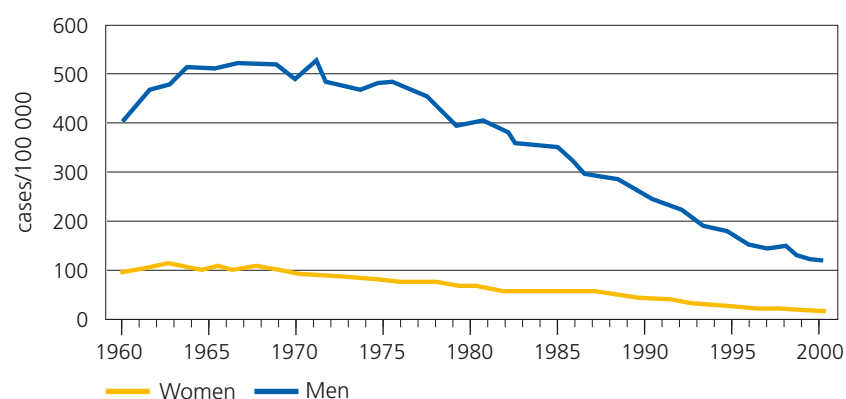
Studies have shown that the prevalence of most health problems is highest among persons with a lower level education and among the unmarried. About half of the difference in life expectancy between men and women can be explained by differences in the consumption of alcohol and smoking. To reduce inequality in health of the most underprivileged is a major challenge.

Studies on the health of the elderly have shown that their lifestyles have become healthier and functional capacity has improved in general. Depression has become the most common cause for disability pension, and at present it is also one of the most common reasons for sickness leaves. Studies do not, however, show an increase in prevalence of depression. The change that has occurred in attitudes and treatments has brought out the hidden need for treatment.



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Age-adjusted coronary heart disease mortality in age group 35–64 in Finland



Promotion



Tobacco and alcohol in focus

Research into smoking prevention and cessation continue to be a priority of KTL. The aim is to produce reliable information on the determinants of smoking initiation as well as on smoking prevention and tobacco cessation methods and smoking reduction programmes. In this field KTL has an active role also in international cooperation.

The Institute has participated actively in implementation of the national alcohol programme through its own research and has monitored the health effects of growing alcohol consumption. KTL has also supported the implementation of the national drug action plan and continued its research into the mechanisms of substance abuse and dependence. KTL has evaluated and developed new treatments for alcohol dependence.

Biomedical research

The growing prevalence of allergies and asthma probably results from many changes in the environment, lifestyle and nutrition as well as infectious diseases, particularly in the first months of life. Research groups at KTL continue to study the aetiology of diabetes, especially concerning genetics and immunology, as well as musculoskeletal diseases, rheumatoid arthritis in particular.

KTL has continued its successful cell and molecular biological research

into diseases that are either specific to the Finnish population or are of major importance for public health. The aim is to identify the causes, develop diagnostics and find new treatments for these diseases. Emphasis has been placed on cardiovascular and neuropsychiatric diseases and on diseases belonging to the Finnish disease heritage. KTL coordinates a European twin study assessing the relationship of lifestyle, environmental risk factors and genetic susceptibility with the onset of major chronic diseases, such as coronary artery disease.

During 2004, the Institute prepared its biotechnology strategy for the coming years with genetics of major chronic diseases as one of the main points of focus. Biometrics and genome-wide analysis methods are used increasingly to facilitate genetic research.

Two new units

Population Research Laboratory, situated in Turku, was established in 2004. It was moved to KTL from the National Social Security Institution. This laboratory develops methods for population level clinical studies, health monitoring and utilization of various registries, and participates in related research.

A new Unit for Prevention of Domestic and Leisure Time Accidents collects and disseminates information on the occurrence, causes and prevention of these accidents.

Environmental Health



The expertise of KTL has been in exceptional demand both in Finland and in the European Union regarding the health effects and risk assessment of air pollutants (particularly fine particles) and chemicals (dioxin-type persistent organic pollutant).

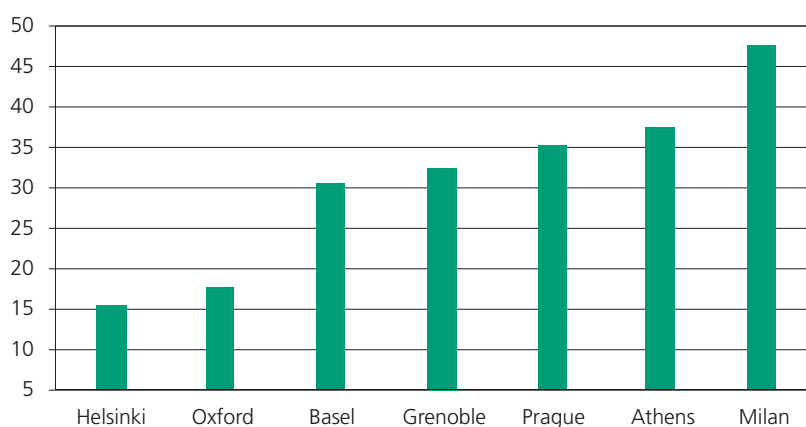
Environmental health research has been a national and international priority. KTL cooperates with several European and American institutes, which guarantees that new knowledge is rapidly adopted. KTL has been active in communication and advocacy related to environmental health.

KTL acts as a national expert agency in the evaluation of health effects and risks of the chemical, biological and physical pollutants of the environment. It also studies environmental factors that affect health at the population level. The public health expertise is based on the research work of KTL with emphasis

on health risk analysis, exposure to environmental pollutants and mechanisms of toxicity of persistent organic pollutants. Other focus areas include health effects of indoor air microbes and their mechanisms, exposure to air pollutants and their health effects and mechanisms of action as well as the effects of drinking water pathogens.

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Average exposure to fine particles in European cities ($\mu\text{g}/\text{m}^3$)



have caused great worry among the people. Finnish authorities have been obliged to report in more detail about the dioxin concentration in the Baltic Sea to fulfil the conditions of the EU five-year special permit concerning the consumption of Baltic herring. KTL had a central role in issuing new national recommendations on the consumption of fish. The researchers at KTL have been active in applying the results of their studies on the outdoor fine particles and in assessing the practical significance of exposure and risks. KTL experts also participate in the EU's Scientific Committee on Health and Environmental Risks.

In 2004, the KTL Department of Environmental Health had nine research projects ongoing within the EU Framework Programme 5. This programme funding has given KTL an excellent opportunity to carry out even quite costly research. The results of Finnish pioneering research into mouldy buildings and health have attracted attention widely and this health problem is now well acknowledged in other countries. KTL representatives have served in the WHO and the U.S. National Academy of Science scientific committees on mould exposure and health.

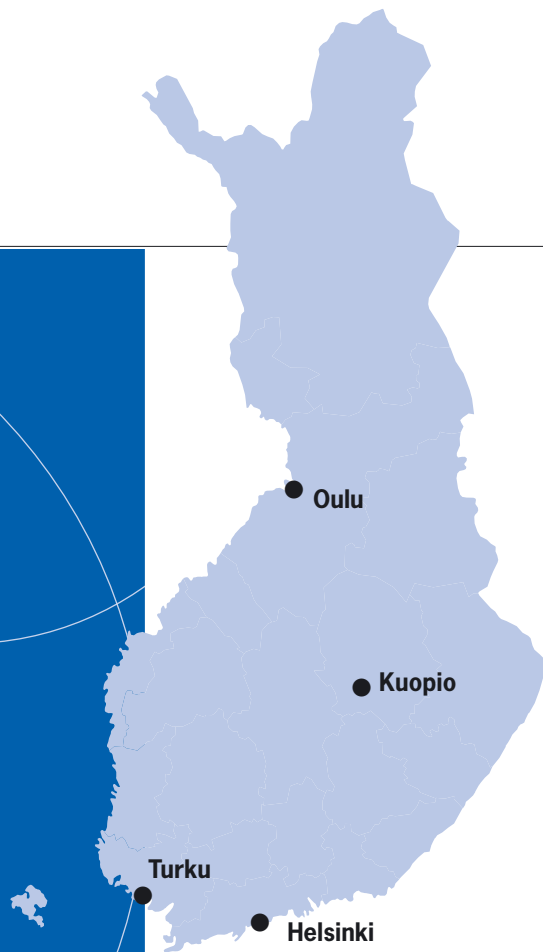


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Serving the Whole Nation

KTL is well present in different parts of the country. The main facilities are located in Helsinki. The three other facilities are located in Kuopio, Oulu and Turku.

KTL is divided into ten departments that cover the main fields of public health. During 2004, the changes in the organisational structure were prepared that became effective at the beginning of 2005.



KTL Departments and Units 2005





Budget 62 Million Euros

The funding of KTL has remained quite stable over the last few years. While the core national budget funding has been constant, the sources of external funds have changed markedly. The proportion of funding from the Academy of Finland, the European Union and the Ministry of Health and Social Affairs has grown compared with private funding.

The total expenditure in 2004 was 61.84 million euros with an increase of 9.1 million euros from the previous year. This addition in expenditure is explained by the new Population Research Laboratory, which was transferred to KTL from the Social Insurance Institution of Finland, by an increase in the cost of vaccines and by raises in rents. The operating expenses were 52.3 million euros when

the acquisition of vaccinations is excluded.

The state budget money covered 63% of the expenditure, income for services subject to charge 9% and external funding from various sources 28%.

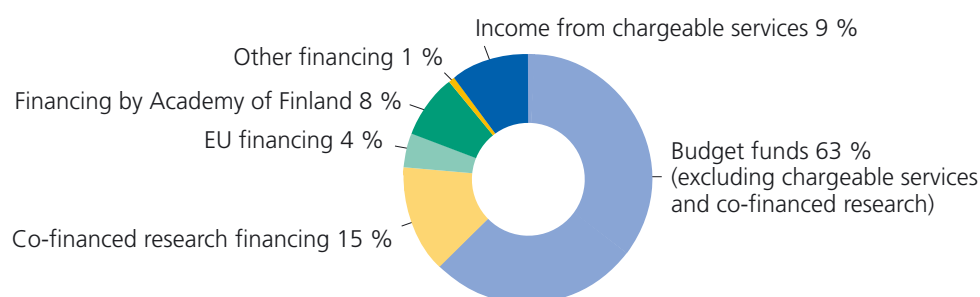
External funding was obtained in 2004 from almost 80 domestic and foreign funders for 370 different projects. The number of funders and the amount of funds obtained remained at the same level as in 2003.

In 2004, the volume of services subject to charge grew. The income from these services, some 4.5 million euros, came from national screening programmes, blood alcohol testing in drunk driving cases, drug testing, paternity testing and some special laboratory tests such as tuberculosis and HIV tests.

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**Operational Financing 2001
(Not Including Vaccine Procurement)**





Devoted Staff

At the end of the year 2004, KTL had a staff of 911, of which more than one third (38%) worked as researchers. Counted as person years the staff amounted to 843.

The share of temporary employment contracts counted as person-years was only one third (36%) in 2004, whereas five years earlier half of all contracts (51%) had been temporary.

In 2004, tens of foreign researchers worked at KTL, representing countries such as Yugoslavia, USA, Russian, Pakistan, Niger, Lithuania, Italy, China, Australia and Estonia.

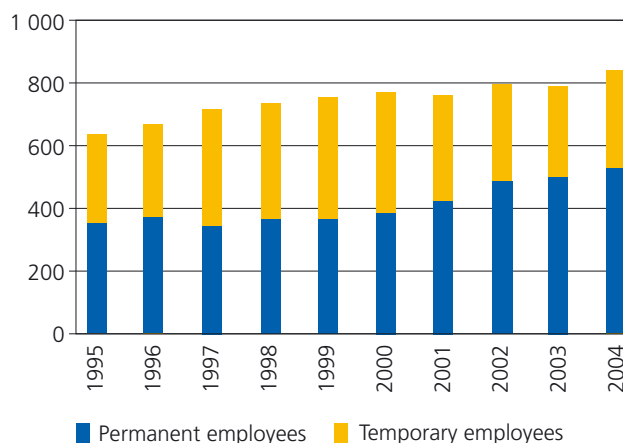
As an international research institute, KTL supports arrangements that allow its staff to work periodically in esteemed foreign research institutes.

The success of KTL builds on the high professional skills of its employees, on their commitment, their ability to shoulder responsibility and cooperate as well as to cope with changes. Over the past year KTL has strived to create an organisational culture that promotes the creativity of its staff. The skills of the staff are considered essential for achieving the aims of KTL.

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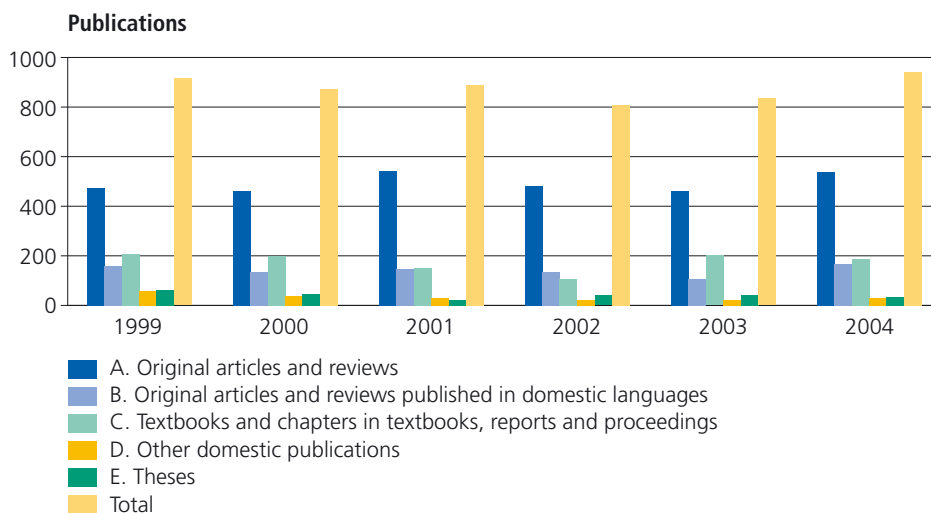
Permanent and Temporary Staff 1995–2004



Publications: a New Record

In 2004 a new record was made in the number of publications by KTL research staff. Of these altogether 946 publications more than half (536) were scientific papers published in international journals. 176 original articles were published in either of the two official languages, Finnish or Swedish.

In addition to research, one of the important tasks of KTL is to ensure that the results obtained are applied and have an impact at large. KTL staff also publishes other than strictly scientific works to distribute the results of their work to the public, to implement these results and thus to contribute to improved public health in Finland.



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