National Public Health Institute
Department of Health and Functional Capacity

Background material for the international evaluation

Georg Alfthan • Arpo Aromaa • Antti Jula
Seppo Koskinen • Jouko Sundvall
Evaluation of KTL, Department of Health and Functional Capacity

1. Introduction 2
2. National health examination surveys 4
3. Development of the department 5
   3.1. Overview 5
   3.2. Development 2002 to 2006 6
4. The department's units and personnel in 2006–2007 10
   4.1. Overview 10
   4.2. Public Health Research Unit, KTY 12
   4.3. Population Research Laboratory, VTL 16
   4.4. Laboratory of Analytical Biochemistry, ABIL 19
   4.5. Biomarker Laboratory, MALA 21
5. Organization of the department, the units and the research programmes 23
   5.1. Overview 23
   5.2. The current research programmes 24
6. Dissemination of some of the department's principles and practices 26
7. Scientific publications and public health outputs in 2002 to 2006 27
   7.1. Overview 27
   7.2. Selected publications by year 27
   7.3. Public health outputs 36
8. Resources and their recent development 38
9. Visions and plans for 2008 to 2013 39

Appendix 1. Selected findings in publications in 2003–2006 42
Appendix 2. All publications 50
Appendix 3. Resources 86
1. Introduction

This document is an account of the Department of Health and Functional Capacity (TTO), its past, present and anticipated future. The department was established in 1995 as a result of structural rationalization, which led to transfer of the medical research group of the Social Insurance Institution to KTL. The special expertise of the group was population based health research, which comprised also the core of the actions taken over by KTL. During the past 10 years immunobiological and biochemical laboratories of KTL joined the department and in 2004 the final step in structural rationalization was taken when the SII medical research situated in Turku joined the department.

The department contributes to the information base on chronic non-communicable illnesses, functional limitations and their causes, develops various aspects of health information and health monitoring, carries out health policy related research and development, and provides high-class biochemical laboratory services and sample management. Compared to other KTL departments it has special expertise in clinical aspects of cardiovascular diseases, musculoskeletal disorders, functional limitations, oral health, health services research, health policy research and health economics, health monitoring and indicators including international aspects, socioeconomic health disparities and their reduction, as well as the unique biochemical and physiological laboratory capabilities.

National health examination surveys (see below under 2) comprise an important basis for the department’s work. First, the Social Insurance Institution carried out Mobile Clinic surveys in different parts of the country between 1965 and 1980. The subjects have been followed up by health data containing registers for several decades. Those study materials were transferred to KTL with the medical research group in 1995. Second, the major KTL/TTO co-ordinated comprehensive survey, Health 2000, called for broad collaboration from other State research institutes, universities and other KTL departments. Third, whilst the department of health promotion and chronic disease prevention (ETEO) has carried out the five yearly FINRISK risk factor surveys of KTL, there has been close collaboration between the two departments in planning and executing the surveys and analysing the data. The most recent FINRISK-survey was collaborative work by ETEO and TTO. The biochemistry laboratories have analysed the samples: TTO/ABIL mainly those from FINRISK and part of the Health 2000 samples, and the Turku Population research laboratory those from the Mobile Clinic surveys and most of the Health 2000 samples. A rich population based material for research has inspired scientists of the medical research group and later at the department to carry out cross-sectional and longitudinal studies and publish numerous important findings since the 1970s.

Another much utilized source of data have been the Finnish national registers skillfully handled by the department and using the possibilities to link them at an individual level.

The department’s work is characterized by being on one hand (epidemiological or population based) typical research and on the other geared to R&D work in public health and health policy. The research supports the R&D tasks both by its findings and the expertise created. In 2006 core research programmes of the department were population based and clinical research, health monitoring (national and international), coordination and implementation of the Health 2000 study, and health policy research complemented by the laboratories’ work. Closely related important topics are health promotion and disease prevention, health disparities and reducing them, and the health and functioning of the elderly. The biochemical laboratories in Helsinki and Turku provide accredited services to projects of KTL and also collaborative projects. Their services range from taking biological samples and specimens to biochemical analyses and secure storage and retrieval for future studies.
During the 11 years of its existence the department has been developed on one hand by outside funding and on the other by assimilation of some KTL units. Outside funding has been sought mainly for R&D tasks related to the department’s mission such as Health 2000, health monitoring, and health policy. The main funding agencies have been the Academy of Finland, the Social Insurance Institution, the Ministry of Social Affairs and Health and the European Union.

The demand for R&D of the department is expected to increase. The department hopes to carry out future rounds of its current population studies, specially a comprehensive health examination survey Health 2012, and to develop and implement health monitoring both in Finland and in EU. It also expects to implement a follow-up survey of the Health 2000 population. The reduction of health disparities, the development of functional capacity measurements and several health policy studies are expected to continue.
2. National health examination surveys

Much of the department’s work is based on its large-scale population studies and their follow-up. The origins of many population health surveys are in Mobile Clinic actions carried out by the Social Insurance Institution of Finland since the 1960s:

1) the Mobile Clinic Health examination surveys (1965 to 1972) with 56 000 examinees,
2) the Mobile Clinic follow-up surveys (1973 to 1976) with 20 000 persons and
3) the Mini-Finland Health Examination Survey (1978 to 1980) with a sample of 8 000.

It is noteworthy that several of the current senior researchers have worked on those precursor surveys. Probably equally important is that biochemical laboratory determinations have been carried out in the SII laboratory now situated in Turku as part of the Population Research Unit.

The first survey was originally a multiphasic screening examination in a large number of communities in different parts of Finland. The second one followed up part of the cohorts to assess risk factor changes and disease incidence. Much weight was put on cardiovascular diseases, in particular coronary heart disease, its risk factors, hypertension and its treatment. A subset of the examinees were interviewed by a dietary recall method. All subjects have been followed up by data registers for mortality, work incapacity, use of medicines, hospitalizations and cancer.

The Mini-Finland HES was a first of its kind in being based on a nationally representative two stage cluster sample, with subjects living in 40 communities in all parts of the country. It was very comprehensive and looked at occurrence and variation of cardiovascular diseases, respiratory diseases, musculoskeletal diseases, oral health, and mental health problems as well as functional limitations. Possible determinants of these conditions were also measured and an assessment was made of to what extent need for care was met.

4) In 2000–2001 the much upgraded version of Mini-Finland was carried out and called Health 2000 (see www.ktl.fi/health2000). A two-stage cluster sample of 10 000 adults (over 18) was invited to the four-hour examination in 80 areas. One of the main goals was to assess time trends in risk factors and disease occurrence by comparison to the Mini-Finland findings. The spectrum of conditions was broad ranging from cardiovascular and respiratory through musculoskeletal and oral to mental health. In addition to interview questions, many tests were employed to assess functional capacity and other aspects of health.

5) The FINRISK risk factor survey of 2007 was carried out by ETEO with collaboration of TTO. TTO took care of the measurement of functioning and the implementation of the survey in South-West Finland.

Planning of follow-up studies of Health 2000 examinees has started. Soon, also the planning of a next survey phase will commence aiming at carrying out Health 2012, which will be a combination of the Health 2000 and FINRISK surveys.

It is possible that the department will be involved in future health interview surveys such as those by Eurostat and others sponsored by the EU seventh framework programme. However, these will depend on funding decisions.
3. Development of the department

3.1. Overview

The Department of Health and Functional Capacity was established in March 1995 when nine persons (five researchers) from the Social Insurance Institution’s medical research group with research programmes, data and archives were transferred to KTL. As a consequence of the then actual international evaluation of KTL the core of the Department of Immunology joined the new department in 1996. This brought with it two lines of research: rheumatology and epidemiology of rheumatoid arthritis and allergology, including prevention of allergies.

Later the two Helsinki units of biochemistry (ABIL, analytical biochemistry and MALA, the biomarker laboratory) also joined the department having previously been units of the Departments of Biochemistry and Nutrition, respectively. The next step in 2004 was affiliation of the Turku based 43 employees of the research department of the Social Insurance Institution. They performed medical research not deemed any more part of the SII profile. At the same time immunology was transferred to the Department of Viral Diseases.

The net outcome in 2006 is that the original department of nine persons has grown to encompass 110 to 120 persons. About 40 are funded by ‘external’ resources with a value of 1.2 to 1.5 m€ per year. The Department has four units: Public Health Research (KTY), Analytical Biochemistry (ABIL), Biomarkers (MALA), and the Population Research Laboratory (VTL).

The considerable growth has been directed mainly towards research based on Health 2000, to EU health monitoring, to the reduction of health disparities, and to health policy research financed by the Ministry of Social Affairs and Health and the Social Insurance Institution. Great care has been taken to apply for financing only for synergistic tasks. In particular, EU financed work is yielding expertise also for national work.

The Department and especially its Public Health Research Unit depend heavily on external funding. Recent developments in Finland suggest that regular budget funding is likely to be reduced in the name of increased effectiveness. This trend is enforced by the Ministry of Finance referring to a need to save and to increase effectiveness. Unfortunately, it is clear that such measures only reduce effectiveness in KTL and the department although they may result in savings. If continued this trend means that the department’s output decreases and so will the number of interesting jobs in our sector as well as the number of persons capable of attracting external resources. From the point of view of the Department this anticipated development endangers the ability to provide relevant R&D information for the Ministry of Social Affairs and Health, and other users. In particular, most recent proposals by the Ministries and the Government can be foreseen to have a negative effect on important public health research and R&D work by making researchers insecure of their future in the field and, effectively, reducing output and effectiveness. From the point of view of the Department, there has long been a need for more resources (i.e. several additional persons) to ensure our ability to provide the necessary support for the Ministry, and for municipalities and hospital districts.

Unfortunately, most of the recent State directed proposals do not take into account the needs in the field. Clearly, in decision making circles there is ignorance about R&D in public health as a cornerstone of population health. There is also limited understanding of the harmful effects of those proposals for R&D and ultimately for population health.
3.2. Development 2002 to 2006

YEAR 2002

There were 70 employees in four units. TTO (the department of health and functional capacity) published four books, of which three were doctoral dissertations, 42 English language original articles and 19 Finnish language original articles or reviews. There were 27 chapters in books or abstracts. One of the books was the baseline report from the Health 2000 health examination survey.

The activities of the department were greatly influenced by implementation of Health 2000, the FINRISK 2002 risk factor survey and handling and analysing its blood samples, and introducing the allergy programme. Also the EU funded survey project (HIS/HES) progressed well. Researchers and experts also worked hard on many specialist tasks to support the Ministry of Social Affairs and Health and the EU Commission.

The three main achievements were

1. Publication of the baseline results from the Health 2000 study
2. The observation that filaggrin antibodies have a strong contribution in the diagnosis of rheumatoid arthritis
3. The department took care of the collection of FINRISK 02 samples and their laboratory determinations.

YEAR 2003

There were 70 employees in 4 units. An agreement was reached with SII for a research group of 43 persons to join KTL and the department. A survey of employees carried out in 2002 showed that well-being at work and job satisfaction were better in the (TTO) department than in any other department of KTL.

TTO published 3 books, of which two were doctoral dissertations, 46 English language original articles or reviews, 8 Finnish language original articles or reviews, 52 chapters in books or abstracts. One of the books was the main report of the EU funded HIS/HES project.

The department was engaged in many other ongoing activities. Of these the expert work in health monitoring, the finalization of the editing of the Health 2000 data base, and several health policy studies are mentioned here. In health policy studies reports were prepared on the societal costs of public health problems, on the need for dental health care under sickness insurance, on the effect of reduced cost specialist consultations, on the Helsinki Psychotherapy Study (HPS), and on DNA and epidemiology.

European projects involved the final report of measurement for musculoskeletal diseases, the final report of the HIS/HES study (health interviews and health examinations), and the setting up of the HIS/HES database of all national surveys carried out in Europe.

Three main achievements were listed in the annual report:

1. The Health 2000 dataset was made available for researchers within and outside KTL and the distribution of data functioned well
2. The diagnostics of rheumatoid arthritis was improved
3. Improvements were made in the measurement of nutritional factors affecting health
YEAR 2004

As of 2004 the department comprised 110 persons, since the unit in Turku joined. A lot of work was put into integrating the Helsinki and Turku situated activities.

In Health 2000, follow-up field studies were carried out in severe psychic disorders, psychic disorders of young adults, and oral health. Oral health had considerably improved since 1980.

The department’s activities were centred on Health 2000, the allergy programme and the programme to reduce health disparities. The number of original publications (105) was higher than ever before.

Many expert duties supporting the Ministry of Social Affairs and Health or EU were carried out. The department continued development of KTL’s sample management and its laboratories analysed samples from population surveys. The department’s experts participated in the implementation of the EU Public Health Programme.

The annual report listed three main achievements:

1. The advancement of Health 2000 into a productive reporting phase
2. The development of an animal model for research on dietary allergy.
3. The integration of the Population Research Laboratory as part of KTL and the department

YEAR 2005

The department had over 100 persons in four units.

Much work was done to develop and integrate the Population Research Laboratory to KTL.

The main study areas in the department were population level and clinical health research, health monitoring, health policy research, analytic biochemistry and biomarker research. A large part of the resources was used to Health 2000 i.e. distribution of the study materials to research groups working in different research institutions in Finland and abroad, their handling and analysis as well as preparing scientific reports. Also, the book on the history of the Mobile Clinic was finalized.

The priorities in population level and clinical health research were Health 2000, health monitoring and studies based on the mobile clinic surveys, biomarker research on foodstuffs and nutrients and their usability and epidemiological risk factor analyses. Clinical and clinicophysiological studies on the circulatory system and circulation were carried out. Also effects of physical activity were studied.

TTO researchers collaborated in the publication of 8 books (2 doctoral dissertations and 3 pro gradu dissertations), 57 English language original publications or reviews (67 in 2004), 89 Finnish language original reports or reviews (38 in 2004). Overall, there were 146 publications (105 in 2004), of which 55 were chapters in books.

One of the books was Health in Finland (Finnish edition) published by the Finnish Medical Society Duodecim. The three doctoral theses dealt with the following subjects: speed strength, the influenza epidemic 1918–1920, and causes of diabetes. The other KTL publications dealt with health in young adults and the effects of the dental care reform of 2000–2001.
The most common topics of the original articles were: Diabetes (5), cardiovascular diseases and risk factors (4), functional capacity (4), mental health (3), musculoskeletal diseases (3), and oral health (2). One or two articles respectively dealt with socioeconomic health disparities, cancer and statistical methods.

Concerning EU DG Sanco projects funding agreements were made to support the data base of population surveys (EUHSID) and the implementation of EU health monitoring and health indicators (ECHIM). In 2005 a positive decision was also obtained for a project concerning the feasibility of health examinations in EU (FEHES, jointly with TTO and ETEO).

The actions for developing measurement of functional capacity were initiated. The first joint seminar on the subject was arranged in spring 2006.

Severe threats were due to the State’s so called productivity programme.

The prerequisites of information improved when a part-time information officer was engaged.

The three main achievements in the annual report were:

1. *Publication of Health in Finland (Finnish language version)*
2. *The good progress of Health 2000*
3. *The success of the EU tasks on health monitoring and health indicators*

**YEAR 2006**

The department had 120 employees in four units. The activities were greatly influenced by implementation of Health 2000, international health monitoring, reducing health disparities and the programme on healthy ageing. The follow-up studies based on the Mobile Clinic Health Surveys were continued. The FINRISK 2007 survey was in preparation together with the Department of Health Promotion and Chronic Disease Prevention. The network for measurement and assessment of functional capacity was in preparation.

Of the extensive publications several should be mentioned: the History of the SII Mobile Clinic, Health in Finland, Good Research Practice in the National Public Health Institute, and the Health 2000 based books Use of health care, the Dimensions of Work Ability, and the Internet data base on European health surveys.

The department’s researchers collaborated in publishing 9 books, 82 English language original articles, 38 Finnish language original articles and 81 reviews. Altogether 211 original articles or reviews were published, indicating an increase by 40% from 2005.

The most common topics of the English language original articles were cardiovascular diseases (12), socioeconomic factors and health (12), mental health problems comprising burn out and alcohol dependence (11), diabetes (9), musculoskeletal diseases (4), functional capacity (4), dental care and oral diseases (4). Other topics were rehabilitation, measurement of need for care, social capital, leisure activities and health, postural balance, alcohol use and economics, cancer and biomarkers. Many books and articles were published based on the Health 2000 data. The publications have been recorded above under various topics.
Health policy research concerned need for dental care and dental health insurance, trends in and possibilities to reduce health inequalities and their determinants, the family physician experiment, the study of need for care and met need (DONAU), the experiment on the efficacy of psychotherapy, the cost-efficiency of health promotion, and the experiment on automated distribution of medicines. A pilot experiment of automated distribution was carried out in the town of Vantaa in 2006.

KTL’s sample management system was developed to comprise new samples and previously stored samples. The resources were clearly insufficient.

The department promoted employees’ health and skills. The job satisfaction survey (2006) showed that the department was best in KTL already for the second time in succession.

Research achievements mentioned in the annual report:
1. Results of home blood pressure measurements are much lower than in a population study
2. Work related burnout is associated with job strain and can link depression and burnout
3. Quality of life is reduced most by osteoarthritis, depression, low back pain and urinary incontinence

Public Health Actions mentioned in the annual report:
1. The book Health in Finland
2. Implementation of the European health indicator project ECHIM
3. Implementation of TEROKA, the collaborative intervention to reduce health disparities between population groups.

YEAR 2007

Whilst this review ends by 2006 it was deemed important to provide a brief account of progress also during the first half of 2007. All the projects mentioned were either completed or were going on successfully. Major funding was sought from EU DG Sanco to be able to continue the various projects (Indicators, Health Examinations) after June 2008. Several doctoral dissertations were published and so were many important articles based mainly on the health survey materials. Examples of some articles can be found in the appendix.
4. The department's units and personnel in 2006–2007

4.1. Overview

The department has excellent personnel, many of whom have been recruited relatively recently. About 60% have academic degrees and 25% a PhD dissertation. Many senior researchers are University adjunct professors and have the qualifications for Professorship in Public Health and other areas.

Table 1. Typical degrees and vocational skills in the department

<table>
<thead>
<tr>
<th>Field</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine</td>
<td>16%</td>
</tr>
<tr>
<td>Other health sciences</td>
<td>36% (nursing, laboratory, physiotherapy)</td>
</tr>
<tr>
<td>Social sciences</td>
<td>11%</td>
</tr>
<tr>
<td>Biochemistry, Nutrition</td>
<td>11%</td>
</tr>
<tr>
<td>Statistics, data processing</td>
<td>13%</td>
</tr>
<tr>
<td>Secretaries, planners</td>
<td>13%</td>
</tr>
</tbody>
</table>

Table 2. Approximate number with specified degrees

<table>
<thead>
<tr>
<th>Unit</th>
<th>Professor, adjunct professor</th>
<th>PhD</th>
<th>Other academic degree</th>
<th>Other degree 1</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Health Research Unit, KTY</td>
<td>7</td>
<td>13</td>
<td>19</td>
<td>9</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>Population Research Laboratory, VTL</td>
<td>5</td>
<td>12</td>
<td>19</td>
<td>3</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Laboratory of Analytical Biochemistry, ABIL</td>
<td>3</td>
<td>6</td>
<td>1</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biomarker Laboratory, MALA</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>The department, TTO (N) (%)</td>
<td>14</td>
<td>19</td>
<td>36</td>
<td>38</td>
<td>8</td>
<td>115</td>
</tr>
</tbody>
</table>

Includes part-time, those on leave, students and emeriti.

1) Other degrees are those from vocational high schools in nursing, economics and others.

Recent recruitment is typical for the Public Health Research Unit. On the other hand, several of the senior researchers are among those transferred from the Social Insurance Institution. They are among the most esteemed in Finnish and international academic circles and in Public Health, obviously not young any more.

This mix of senior and junior researchers would be optimal if it were more equally distributed between the units, and if continuity was secure. Despite of all efforts, there is an imbalance with the majority of junior researchers being associated with the Public Health Research Unit, several are associated with the Population Reasearch Laboratory but only a few with other laboratories. Since 2004 the department has encouraged seeking funds for junior researchers in all units. Nevertheless, State actions have created uncertainty of continuity.
Some members of senior staff are presented below:

Arpo Aromaa, Research Professor, Director of Department, MD, PhD, Dip Soc Med (Edin.), Adjunct Professor in Public Health Science (Helsinki)

Public Health Research Unit, KTY
Seppo Koskinen, Chief Physician, Head of Unit, MD, PhD, MSocSci, MSc (London), Adjunct Professor in Demography (Helsinki)
Markku Heliövaara, Chief Physician, MD, PhD, Adjunct Professor in Epidemiology (Helsinki)
Anna Kattainen, Assistant Chief Physician, Specialist in Public Health, MD, PhD
Paul Knekt, Research Professor, Head of Laboratory, MA (Statistics), PhD (Public Health), Adjunct Professor in Epidemiology and Biometry (Helsinki)
Päivikki Koponen, Senior Researcher, PhD
Tuija Martelin, Senior Researcher, PhD
Antti Reunanen, Research Professor emeritus, MD, PhD, Adjunct Professor in Epidemiology (Helsinki)

Population Research Laboratory, VTL
Antti Jula, Chief Physician, Head of Unit, MD, PhD, Adjunct professor in Medicine (Turku)
Erkki Alanen, Senior Researcher (VTL), PhD, Adjunct Professor in Psychometrics (Jyväskylä)
Markku T Hyypää, Chief Physician (part time), MD, PhD, Adjunct Professor in Neurology (Helsinki) and Rehabilitation (Turku)
Olli Impivaara, Chief Physician (part time), MD, PhD, Adjunct Professor in Medicine (Turku)
Jukka Marniemi, Head of Laboratory, PhD, Adjunct Professor in Biochemistry (Turku)

Laboratory of Analytical Biochemistry, ABIL
Jouko Sundvall, Head of Unit (ABIL), MSc (biochemistry)

Biomarker Laboratory, MALA
Georg Alfthan, Head of Unit (MALA), MSc (biochemistry), PhD, Adjunct Professor in Nutritional Biochemistry (Helsinki)
Antti Aro, Research Professor emeritus, (MALA) MD, PhD
4.2. Public Health Research Unit, KTY

The Public Health Research Unit and the Department were established in 1995 as a consequence of the transfer of population based health research from the Social Insurance Institution to KTL. The Unit’s personnel has since grown from 9 to 50, and the tasks have increased and diversified accordingly. Main tasks are R&D on promotion of health and functional capacity, health monitoring nationally and internationally, implementation of large health surveys, and expert tasks in public health and interventions to reduce health inequities. Its main assets are the large population health surveys and its main challenges the 80% of staff who are financed from external sources.

Main tasks

The main tasks of the Unit can be grouped as

- Research on the development and promotion of health and functional capacity and associated factors in the population and its subgroups
- Participation in national health monitoring and the related international work
- Implementation of large surveys
- Expert tasks in the planning and implementation of policies, structures, processes and interventions to improve public health and reduce health inequities

Areas of research and expertise

Most of the activities in the Public Health Research Unit deal with functional capacity, major diseases and public health problems, and factors affecting these. Special emphasis is given to health and functional capacity of the ageing and elderly population and promoting health and functioning. Causes of and ways to to reduce health disparities between subgroups of the population are another priority.

Resources

In September 2007, the personnel of the Unit consists of 50 employees, of whom eight work part-time and six are either on maternity leave or temporarily working elsewhere. 20 persons have taken a PhD degree, 19 have a Master’s degree and 11 have completed some other education. The spectrum of fields of science is wide: the staff includes eleven physicians, one dentist, eight other health scientists, nine social scientists, four statisticians, three nutritionists, one economist, one psychologist, one historian, one geographer and one person with a background in technical science. Twelve of the employees are aged 50 or over, about twenty are between 35 and 49 years of age, and about twenty are younger than 35 years.

Funding comes mainly (60%) from external sources such as the Academy of Finland and EU, and only 40% of expenses are covered by the resources allocated to KTL from the State budget. Only nine of the fifty employees receive their salaries from the KTL budget. This funding structure is not in accordance with continuity and the activities of the Unit which to a large extent serve directly the needs of the Ministry of Social Affairs and Health and other public bodies responsible for the nation’s health. A considerable part of the working time of the senior staff goes into drawing up funding applications to obtain resources needed in carrying out health monitoring and other public health activities. There is a great need to strengthen the role of budgetary funding in order to meet with the demands set by the Ministry of Social Affairs and Health and other governmental bodies.

The Unit maintains several unique data sets and serves the scientific community by editing the data, by improving their value with linkages to various health registers, and by
constructing subsets of the data for the use of researchers all over the country and abroad. The main survey-based data sets maintained by the Unit include the following: Mobile Clinic Baseline Survey 1966-72, Mobile Clinic Follow-up Survey 1973-76, Mini-Finland Survey 1978-80, Health 2000 Survey 2000-01 and FINRISK Senior Survey 1997. In addition, health registers are widely used as such and linked with the major sample surveys.

In both research and development work the unit works in close collaboration with other partners. This is one of the major strengths of the Unit as collaboration provides the projects of the Unit with expertise and manpower which the Unit does not have. The main partners of the Public Health Research Unit are other units of the institute, other research institutes, universities, Ministry of Social Affairs and Health, regions and municipalities.

Scientific activities and achievements

Most of the Unit’s scientific work is carried out within the following projects: Health 2000 (http://www.ktl.fi/health2000) was planned and implemented by a large network of experts from different institutions, coordinated by the Public Health Research Unit. The main collaborators include Social Insurance Institution, Finnish Centre for Pensions, Institute of Occupational Health (FIOH), National Research and Development Centre for Welfare and Health (STAKES), Statistics Finland, Rehabilitation Foundation, UKK Institute, universities as well as regions and municipalities.

In 2000–2001 a nationally representative sample of 10 000 adults participated in a comprehensive health interview at home and a four-hour health examination at the local health centre. The interviews were performed by Statistics Finland’s interviewers (160). The health examination was carried out by 5 field teams, each consisting of 17 professionals. The survey data were complemented with a rich collection of register-based information. In further surveys on cardiovascular, mental, musculoskeletal and oral health, complementary data were collected from subsamples. A resurvey is being planned to obtain follow-up information.

Great efforts were made to maximise the participation rate, and they were successful. 80% participated in the examination proper, an additional 5% in the home health examination, and at least the most essential information was obtained from 93% of those aged 30 or over and from 90% of those aged 18 to 29 years.

The baseline report concerning population aged 30 and over was published in Finnish in 2002 and in English in 2004 (available also at www.ktl.fi/health2000). Eight other books have been published on the baseline results. Furthermore, nearly two hundred scientific articles have been published. The staff of the Unit serve the researchers at KTL and at other institutions by preparing and supplying subsets of the data to be used in studies approved by the relevant expert group and the project group of the Health 2000 Survey. In addition, the Unit provides contentual and statistical advice needed in the analysis of the data.

In the Public Health Research Unit the Health 2000 research focuses on functional capacity and its determinants, health disparities, circulatory diseases, musculoskeletal diseases, reproductive health, oral health, social capital and health, nutrition and health.

Follow-up of the Mobile Clinic Surveys is based on register based follow-up of Mobile Clinic data sets collected in 1965–1980. In this research, the emphasis is on the etiology of major diseases (cancer, musculoskeletal diseases, diabetes, cardiovascular diseases etc.) and on the impact of risk factors (nutrition, microbes, smoking etc.) as well as research on disease markers.

Determinants of healthy ageing are studied making use of cross-sectional data from 2000–01 (Health 2000) and from 1978–80 (Mini-Finland), and a 22-year follow-up (1278 participants of the Mini-Finland Survey re-examined in connection with the Health 2000 Survey). In
analysing the determinants of institutionalisation, Health 2000 data are complemented with register-based follow-up of institutionalisation in 2000-05. This project also includes comparisons between Finland and UK (ELSA).

Evaluation of the effects of public subsidies on the need and use of dental care in the adult population is analysed in collaboration with the Social Insurance Institution and the Ministry of Social Affairs and Health.

The Helsinki Psychotherapy Study (HPS), an evaluation of the effectiveness of four psychotherapies on depression and anxiety disorder, is a long-term intervention project funded by the Social Insurance Institution carried out in collaboration with the Hospital District of Helsinki and Uusimaa, the Biomedicum Helsinki and the Rehabilitation Foundation. The collection of follow-up data and the statistical analyses are continuing. The first main reports have recently been published.

DONAU - Do need for and use of hospital care meet? is a project carried out in collaboration with STAKES, Social Insurance Institution, Centre for Pharmacotherapy Development ROHTO and central hospital districts. The aim of the project is to develop reliable and relatively simple methods for assessing the need for care and the extent to which it is satisfied. The survey data have so far been collected in two phases. In addition, Health 2000 data as well as data from registers is being used.

Inequalities in health: causes, trends and scope for action is a group of projects carried out in collaboration with other units and departments of KTL, other research institutions, universities etc. The principal lines of research employing different data sets include

- Health disparities according to marital status and living arrangements
- Regional differentials in health
- Disparities between socioeconomic groups (defined according to education, occupation, income etc.)
- Health differences between language groups

Scientific publications of the staff of the Public Health Research Unit are summarized in table 3 below. They are included in Appendix 1 which lists all publications of the department.

**Table 3. Scientific publications in 2002–2006, Public Health Research Unit.**

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2002-06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original articles and reviews</td>
<td>15</td>
<td>24</td>
<td>28</td>
<td>33</td>
<td>48</td>
<td>148</td>
</tr>
<tr>
<td>Original articles and reviews published in domestic languages</td>
<td>21</td>
<td>7</td>
<td>22</td>
<td>12</td>
<td>26</td>
<td>88</td>
</tr>
<tr>
<td>Textbooks and chapters in textbooks, reports and proceedings</td>
<td>29</td>
<td>46</td>
<td>68</td>
<td>35</td>
<td>75</td>
<td>253</td>
</tr>
<tr>
<td>PhD theses</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Master’s theses</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Other publications</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>9</td>
<td>15</td>
<td>32</td>
</tr>
<tr>
<td>All</td>
<td>67</td>
<td>79</td>
<td>148</td>
<td>92</td>
<td>166</td>
<td>535</td>
</tr>
</tbody>
</table>

Other scientific outputs of the senior staff of the Unit from 2002 onwards include e.g.

- numerous referee statements for several scientific journals and funding organisations
- opponent of several doctoral theses
- reviewer of several doctoral theses
- reviewer of professor and adjunct professor applications
- reviewer of several master's theses
• numerous memberships and presidencies/chairpersonships in scientific organisations, committees and meetings in Finland and abroad
• editorial positions in several scientific journals
• supervision of dozens of PhD theses

Public health activities and achievements

The main public health activities and achievements include the following:

- Health monitoring (see also section 5.2)
  - National: Health in Finland books, development of regional and municipal health monitoring systems etc.
  - International: EU and others
- Coordination and enhancement of efforts to reduce inequities in health on the national level and in pilot regions
  - TEROKA (see also www.teroka.fi), launched in 2004, is a large collaborative project with other departments of KTL, other research institutes and universities, Ministry of Social Affairs and Health, municipalities and NGOs. The coordination centre of TEROKA is located at the Unit where three persons work full-time in the project and several others participate in the work. The project aims at
    • strengthening the knowledge base on socioeconomic health inequalities e.g. by
    • collating and distributing information for the assessment of the current state and trends in inequalities in health at the national level and in pilot areas and
    • preparing tools for the monitoring of health inequalities and their determinants at the national, regional and local level
    • raising awareness of health inequalities and ways of reducing them
    • developing practical methods to tackle inequalities in health
    • advancing the assessment of inequality impacts
  - Participation in the preparation, implementation and assessment of a national plan of action as part of the TEROKA project and within other work at the Unit
- Production of material for health promotion
  - A recent example is “Elämä pelissä” (“Life at stake” or “The game of your life”) which is a collaborative project between KTL (the Public Health Unit together with different units of the ETEO department), the Finnish Medical Society Duodecim and the Finnish Broadcasting company. KTL has provided the scientific expertise needed in the project and prepared an algorithm (based on mortality follow-up of the FINRISK surveys 1982–1997) predicting a person’s life expectancy on the basis of 39 questions on her/his living conditions, health behaviour, psychosocial and sociodemographic characteristics. On the basis of the algorithm, an internet test has been produced. In addition, the outputs of the project include a book published by Duodecim (Huttunen J, Mustajoki P, ed. Elämä pelissä, 2007), and a tv-series (during the autumn 2007) which supports and follows the pursuit six well-known Finns towards a healthier life. The project aims at improving the population level information on factors affecting health and at motivating the public to lead a healthier life.

In addition to specific public health projects, the staff of the Unit participates widely in the planning and follow-up of policies, interventions and structures aiming at the improvement of public health. This work is largely done in committees, advisory boards and other similar organisations nominated by the Ministry of Social Affairs and Health or other national and regional actors.
4.3. Population Research Laboratory, VTL

The Population Research Laboratory in Turku was created in 2004 when individual level health research activities of the Social Insurance Institution (SII) were incorporated into KTL. The unit has 40 employees and it comprises research staff and a biochemical and physiological laboratory. The unit’s traditional research areas are cardiovascular diseases, mobility limitations and development of methods. Particular priority is given to hypertension, fragility of bones, and lifestyles with adverse health effects. The unit collaborates closely with the Public Health research unit in analysing population health survey data and with the Turku University Central Hospital in two long-term projects on children’s health (LASERI and STRIP).

The Population Research Laboratory (VTL) includes a biochemical laboratory, a physiological laboratory and a radiological imaging subunit. The staff (currently 40 persons) consists of researchers, and laboratory, technical and administrative personnel. In addition to its own research the unit produces biochemical, physiological and imaging measurements for epidemiological and clinical research and some chargeable services.

Research areas

The research of the Population Research Laboratory centres on determinants and predictors of cardiovascular diseases (CVD) and mobility limitations as well as development and evaluation of research methods.

In CVD research main emphasis is on determinants and predictors of CVD, specially in hypertension and lifestyles, sleep, alexithymia, social capital and social participation. Research on mobility limitations and their determinants has a special emphasis on risk factors of hip fractures.

The research is based on epidemiological health surveys (Mini-Finland Health Survey, Health 2000 Health Examination Survey, FINRISK 2007 study, LASERI) and randomized controlled intervention trials (STRIP, Simvastatin-fatty-acid study, Diabetes prevention study (DPS), Berry-study) all being carried out in collaboration with researchers from several departments of KTL and from Finnish universities, especially from the University of Turku.

Public health significance of the chosen research areas

Hypertension. Globally, two-thirds of stroke and one-half of ischemic heart disease is attributable to non-optimal blood pressure. Although the mean blood pressure levels of Finnish adult men and women have decreased during the past two decades by as much as 15/13 mmHg in certain age groups the blood pressure levels are still generally far from optimal. The incidence of strokes and myocardial infarctions has diminished by 60–70% in middle-aged men and women during the past 20-30 years. However, the total number of these serious events is not declining because the events are now more common in older age groups.

Fragility of bones. Osteoporosis results in fragile bones. The significance of osteoporosis for public health lies in fractures causing increased mortality, extensive disability, and high economic costs. The burden of fractures will increase along with the number of old people in society. Hip fractures are especially costly and cause more disability than other types of fracture. The rate of hip fractures in Finland is at present more than 7,000 annually. About 30% of patients who have been living at home before a sustained hip fracture end up in long-term institutional care within a year.
Lifestyles with adverse health effects. The Finns now consume less sodium and saturated fats and more vegetables, fruits and fatty fish than they did 20 years ago. Consumption of alcohol and fast-foods has increased, and obesity has become more common. A low socioeconomic status, sleep disturbances, short or long duration of sleep, alexithymia and low social participation are associated with increased CVD risk or impaired health, or both. Such factors may act as determinants of lifestyles. Their role needs further study.

Mobility limitation. Mobility, such as ability to walk and climb stairs is an essential prerequisite for independent high quality life. Preservation of mobility in older people is of great importance for maintaining their functional capacity and independent living. Prevention or postponement of mobility limitation thus has a high research priority.

The main scientific achievements

The surveys described before play a central role also in VTL research.

The Mini-Finland Health Survey of a sample of Finns was carried out in 1978–1980 (Aromaa, Heliövaara, Impivaara et al. Health, functional limitations and need for care in Finland, Publications of the Social Insurance Institution, Finland, AL:32, 1989). Biochemical measurements for the survey were made in the laboratory of VTL (formerly Research and Development unit of the SII).

According to one of the most recent reports based on a 22-year follow-up, obesity and poor physical performance in middle-age are major predictors of walking limitations later in life. Social capital may mediate the link between socioeconomic status and health outcomes. We found that two proxies of social capital, leisure social participation and interpersonal trust, independently of conventional health risk factors predicted survival and cardiovascular mortality differently in men and women. Further longitudinal surveys on the stability and health effects of social capital are in progress.

The Health 2000 Health Examination Survey of a sample of Finns was carried out in 2000–2001. The study is presented in detail elsewhere (http://www.ktl.fi/health2000). A total of 1526 of the 45-74-year old subjects participating were invited to attend a thorough cardiovascular examination. Amongst others carotid intima-media thickness and compliance were determined. Many biochemical measurements for The Health 2000 survey were made in the laboratory of VTL.

According to the Health 2000 and Mini-Finland Health examination surveys blood pressure and serum cholesterol have decreased substantially, mostly due to changes in the Finnish diet. In contrast, obesity has increased in all 10-year age-groups of adult Finnish men and women. This is an obvious explanation for the increased prevalence of type 2 diabetes in Finland. Among classical risk factors, elevated blood pressure is the main contributor of increased carotid-intima thickness.

Compared to clinic BP, home-measured BP is a better determinant of increased carotid IMT and left ventricular hypertrophy. Isolated clinic hypertension (ICH) is a pre-hypertensive state. As compared to hypertensive subjects of the Health 2000 study, subjects with ICH have healthier life-styles but similar metabolic disturbances. Obesity, duration of obesity throughout the lifespan and obesity related conditions are important risk factors for older persons’ walking limitations. Longitudinal surveys on the determinants of health and functional capacity are in progress.

FINRISK 2007 study. VTL is responsible for data collection in one of the five study-regions (Turku-Loimaa) of the FINRISK 2007 study, for validity of blood sampling in the whole
study, for planning, execution, and reporting of the BP sub-study and collaborates in the
evaluation of measures of functional capacity.

LASERI. The Cardiovascular Risk in Young is one of the largest follow-up studies into
cardiovascular risk from childhood to adulthood. (http://vanha.med.utu.fi/cardio/youngfinnsstudy). VTL has performed practically all
biochemical measurements for the study. The study shows that the same risk factor and life-
style changes observed in adults over 30 stand also for children and young adults. The study
highlights the role of genes, lifestyles and CVD risk factors in the development and
progression of atherosclerosis

STRIP. The prospective randomized STRIP trial is the first-ever continuous life-style
intervention with onset in infancy. (http://stripstudy.utu.fi/eng/index3.htm). The study shows
that an individually-based continuous dietary counselling with onset in infancy is an effecting
tool to decrease cardiovascular risk factor levels of boys and girls, at this moment up to 15
years of age.

Simvastatin-fatty acid study. The study is a two-stage randomized controlled study were
participants were randomly allocated to a habitual diet or dietary treatment group, and to
receive, in random order, simvastatin 20 mg/d or placebo, each for 12 weeks, in a double-
blind manner. The study showed that simvastatin decreased cholesterol and LDL-cholesterol
with the effect of simvastatin being three-fold that of the dietary treatment. Simvastatin
decreased a-tocopherol, β-carotene, ubiquinol-10, increased fasting insulin and the relative
level of oxidized LDL in circulation. Dietary treatment potentiated the cholesterol-lowering
effect of simvastatin, counteracted its insulin-elevating effect, did not decrease levels of β-
-carotene, and ubiquinol-10 and did not alter relative level of oxidized LDL. Simvastatin,
increased ratios of stearic to palmitic, γ-linolenic to linoleic, and arachidonic acid to dihomo-
γ-linolenic acid suggesting increased fatty acid elongase, Δ6 and Δ5 desaturase enzyme
activities. The study suggests that formation of long-chain polyunsaturated fatty acids and
their metabolites may contribute a substantial part of the beneficial effects of simvastatin.

DPS. The prospective randomized Diabetes prevention study is one of the first studies
showing that a continuous dietary and exercise counselling may prevent the incidence of new
diabetes up to 60% in subjects who have glucose intolerance. VTL is one of the collaborating
centers of the DPS study.

The main public health achievements

The unit has produced cumulative data on cardiovascular health promoting lifestyles (sodium,
dietary fats, berries, vitamin D, exercising) and validated diagnostic measurements for clinical
use (such as home measured BP, DXA-measurements in the diagnosis of osteoporosis). The
expertise of the unit has been used in the work of evidence based clinical guidelines on
prevention, diagnosis and treatment of hypertension (Antti Jula) and prevention and treatment
of hip fractures (Olli Impivaara).
4.4 Laboratory of Analytical Biochemistry, ABIL

The Laboratory of Analytical Biochemistry has served a large number of KTL projects and several others in carrying out biochemical analyses. The main projects are FINRISK, Health 2000, EuroAspire and Dehko. The analyses include lipids and lipoproteins measurements for the surveys of cardiovascular diseases, laboratory measurements of glucose metabolism for the surveys of diabetes and hormones and special clinical chemistry measurements of clinical studies for research. The laboratory also engages in improving sample management and maintenance in KTL. The samples of the population surveys are in a guarded and safe system. The retrieving of samples is functioning as service for research groups.

The laboratory conducts biochemical determinations in basic research and population studies related to non-communicable public health problems. Clinical chemistry and sample management know-how of the laboratory is available for the research groups of the institute. The laboratory has been accredited by FINAS since 2000. General requirements for the competence of testing are based on the standard SFS-EN ISO/IEC 17025.

The Laboratory of Analytical Biochemistry was affiliated to the Department of Health and Functional Capacity in 2001. Earlier it was part of the Department of Biochemistry established in 1940’s.

There are 11 employees taking into account the secretary and pc-support person shared by the Biomarker laboratory. The personnel include two biochemists, a data base expert and several technicians.

Activities

The following population studies will be carried through during 2007:

1. The national FINRISK 07 study, laboratory measurements: total Cholesterol, HDL-Cholesterol, Triglycerides, Gamma-Glutamyl Transferase, Apolipoprotein A1, Apolipoprotein B and ultra-sensitive C-reactive protein in serum, n = 6300 samples.

2. The international EUROASPIRE III study (Euro Heart Survey on Secondary and Primary Prevention Of Coronary Heart Disease), laboratory measurements: total Cholesterol, HDL-cholesterol and Triglycerides in serum, Glucose in plasma and Glycated Haemoglobin A1c in blood, n = 35 000 samples.

3. The national SOKRAS study, laboratory measurements: total Cholesterol, HDL-Cholesterol, Triglycerides, Creatinine and ultra-sensitive C-reactive protein in serum and Glucose and free Fatty Acids in fasting and two hours plasma, n = 18 000 samples

4. The national DEHKO study (The Development Programme for the Prevention and Care of Diabetes), laboratory measurements: total Cholesterol, HDL-Cholesterol, Triglycerides, Gamma-Glutamyl Transferase and ultra-sensitive C-reactive protein in serum and Glucose in plasma, n = 9000 samples.

The main collaborations during the last ten years have been The National Diabetes Prevention Study 1995 -, The FINRISK 97 study, 1997, The international FIELD (Fenofibrate Intervention and Event Lowering in Diabetes) study, 1997 – 2006, The national Health 2000 study, 2000 –, The FINRISK 02 study, 2002

In regard to laboratory activities, ABIL and the biochemistry laboratory of the Population Research Laboratory have close collaboration.
External Quality Assessment Programs

The Laboratory takes part in the following External Quality Assessment Programs:
1. Lipid Standardization Program organized by CDC, Atlanta
2. Labquality Finland surveys for general clinical chemistry (long-term and short-term), glycated haemoglobin A1c, steroid and peptide hormones, lipids and lipoproteins and myocardial markers.

Vision and plans for 2008 to 2013

The laboratory continues to perform biochemistry measurements for population surveys and clinical studies. Strict quality assessment is needed to be able to interpret changes in serum lipids on a population level. In Finland, KTL is the only institute that maintains a high enough analytical quality for long-term population studies.

The laboratory will also be involved in the development of the sample management and sample storage system of KTL.

There are difficulties in comparing glucose and lipid levels between population studies in Europe, because a standardization program is missing. Several efforts have been made to obtain EU funding for developing such a system, but without success. The unit will continue to look into possibilities to introduce reference methods for lipids and glucose and then to open up a quality service for European laboratories performing lipid and glucose assays for population studies.
4.5. Biomarker Laboratory, MALA

The research of the Laboratory focuses on the association between nutrition and chronic diseases using nutritional and other biomarkers. This includes research on nutrient metabolism and effects, development of biomarker methodology and validation of biomarkers. The methodological approaches include epidemiological studies, human interventions, experimental animal studies and analytical chemistry.

Major research topics are currently the associations between plasma concentrations of nutritional factors (vitamins, polyphenols, fatty acids) and diabetes and coronary heart disease in the Finnish population. Different chromatographic and mass-spectrometric methods have been developed to enable the analysis of the above-mentioned compounds in plasma and urine. Collaborative intervention studies are conducted to validate their use as biomarkers and to investigate the health effects of dietary factors (e.g. berries, diets rich in fruits and vegetables, specific nutrients). Cardiovascular biomarkers, such as ADMA and homocysteine, are also measured. A large part of the work is done in collaboration with research groups within the institute and other domestic and foreign groups. Important collaborators outside KTL are currently the Universities of Tampere (S Virtanen), Helsinki (M Mutanen, K Wähälä), Oulu (A Kesäniemi), Turku (J Viikari, O Raitakari) and Oslo (R Blomhoff).

The personnel has a 30-year experience in clinical and analytical chemistry and biochemical and biomedical nutrition. It comprises ten persons. The unit is headed by an adjunct professor in nutritional biochemistry. His main research interests include development of methods for micronutrient analysis in clinical materials, clinical trials on bioavailability and metabolism of micronutrients and nutritional epidemiology, selenium metabolism and epidemiology and research on the effects of in vivo supplemented antioxidants on various aspects of lipid peroxidation, the role of B-vitamins and homocysteine in cardiovascular diseases and fat-soluble nutrients in the etiology of juvenile diabetes. A senior researcher (PhD) is responsible for polyphenol research and another (MSc) for fatty acid research. One PhD student in nutrition has started her thesis in 2005. There are four technicians. A secretary and a pc-support person are shared with the Unit of Analytical Biochemistry. A former Head of Department, emeritus professor in clinical nutrition has since 2003 acted as advisor in medical issues.

Expertise

Three employees of the Biomarker Laboratory have a work history in the institute exceeding 20 years. This has been and continues to be an asset regarding planning, training and documenting the laboratory functions and biological sample handling and storage necessary in large population surveys. Another long-term activity of relevance is the expertise in various fields of selenium research. As members of the Selenium Working Group appointed by the Ministry of Agriculture and Forestry, Aro and Alfthan have had a strong impact on increasing the selenium status of the Finnish population. In general, the Laboratory has played a key role in testing new hypotheses on nutrients and chronic diseases utilizing clinical samples from population surveys. The Laboratory focuses on novel biochemical measurements modified for small volumes, rapid throughput, pre-analytical factors, short- and long-term quality assessment and applicable to large numbers. The quality of laboratory work is assured by using in-house reference materials, certified reference materials, participation in external quality assessment programs, training of personnel and through documentation of activities.

Research

Research of the Biomarker Laboratory focuses on nutritional biomarkers to be applied to large-scale population studies. Since both qualitative and quantitative trends in nutrition are of
importance in nutrition policy, long-term quality assessment is well organized and documented in the unit. The homocysteine-lowering effect of betaine has been studied in several human intervention trials including short-term kinetics. Plasma homocysteine has not been found to be a risk factor for coronary heart disease in several Finnish population based studies. Strictly controlled dietary interventions aimed at comparing low fat with high fat or saturated with polyunsaturated fatty acids and increasing B-vitamins, carotenoids and polyphenols have been carried out. Among the outcomes have been lowering of plasma homocysteine, oxidative status and paraoxonase. Interventions on fatty acids have concluded that the intake of trans fatty acids in Finland is not associated with an adverse fatty acid profile. Bioconversion of trans-vaccenic acid to conjugated linoleic acid (CLA) was found and confirmed in later studies leading interest to CLA. The unit has played a central role in developing and designing laboratory field handbooks for several population studies. Due to the unique nationwide addition of sodium selenate to artificial fertilizers since 1985, the unit has been responsible for annually monitoring the selenium status of follow-up groups. Various metabolic interventions and epidemiological studies with different selenium compounds have been performed in cooperation with European groups. In polyphenol research, novel analytical methods have been developed for analyzing over 30 polyphenols and polyphenol metabolites by GC-MS and HPLC. The bioavailability of the compounds from various dietary sources has been shown. For epidemiological studies, plasma polyphenols concentrations have been validated as biomarkers of intake (e.g. biomarkers of a diet rich in fruits and vegetables, coffee, fiber). The first publication in the epidemiological project found a weak association between serum enterolactone concentrations and coronary heart disease. Particular focus is currently on the health effects of a diet rich in fruits and vegetables. The subject is being investigated in a number of own and collaborative intervention studies. An important recent finding is that in a placebo-controlled, randomized, intervention trial conducted in collaboration with VTL, consumption of berries inhibited platelet activation, increased HDL concentrations, reduced blood pressure and increased plasma concentrations of various polyphenols. A method for the analysis of ADMA (asymmetric dimethylarginine) has been developed. It was recently shown that there is a correlation between plasma ADMA levels and endothelial function as measured by flow-mediated vasodilation. Among the toxic heavy metals, human mercury exposure has been studied among risk groups, fishers and dental patients. Mercury exposure and risk for heart diseases and mortality have been studied in two population based studies in which no association was found.

Funding

Two researchers, two technicians, a secretary and a computer assistant are funded by the institute. Two researchers and two technicians and occasionally other personnel have been funded from external sources in Finland, Finnish Academy, Ministries of Social Affairs and Health and Agriculture and Forestry, domestic and foreign foundations and the National Cancer Institute, NIH. Funding through cooperation with research groups from different Finnish universities and to a lesser extent private companies has been received.

Main public health achievements

Biomarker laboratory had 140 scientific publications during 2000–2007. The unit has produced and disseminated data on the health effects of various nutritional and life-style factors (selenium, fatty acids, antioxidants, diets rich in fruits and vegetables). The ministry of Agriculture and Forestry has relied on the units’ expertise in decision-making concerning fertilizer supplementation. Many of the unit’s findings have been translated to public health achievements by other units and departments.
5. Organization of the department, the units and the research programmes

5.1. Overview

The department’s organization is in part based on its historical and geographic background. The two larger units (KTY and VTL) are entities whose original background dates to the 1970s and 1980s, when both were parts of the Social Insurance Institution’s research department. The Helsinki based Research group was working with the Mobile Clinic Studies and the Turku based group on clinical and rehabilitation related studies. Both joined forces to carry out the Mobile Clinic HESs. The two units situated in Helsinki and Turku now work together in population surveys and functioning and have also their own specific skills. Of these clinical, physiological and radiological studies are a strength in Turku and health surveys, health monitoring and health policy studies in Helsinki.

The two biochemistry departments in Helsinki (ABIL and MALA) are differentiated by ABIL carrying out high class analyses for population health surveys and MALA concentrating mainly on nutritional biomarkers and chromatographic and mass-spectrometric methods development. Thus the unit based organization is functionally sound. The biochemistry in Turku (VTL) serves clinical and collaborative studies. Whilst the Helsinki population level laboratory (ABIL) uses mainly standard sets of determinations made on large numbers of samples the Turku Biochemistry laboratory has greater flexibility. It can develop methods for relatively small scale studies and participates also in research an a smaller scale. The laboratory units in Helsinki and Turku are working closely together in surveys and methodological development.

The research programmes are in part specific to various units and in part shared by the department’s units and, in some instances, also by other departments of KTL. However, typically large studies and surveys are carried out in collaboration with other research organizations and researchers outside KTL. In fact, major programmes of both KTY and VTL are collaborative studies. Examples are the national Health 2000 project, TEROKA (reducing socioeconomic health differences), several health policy studies, STRIP and LASERI (risk factors in children and young adults).
5.2. The current research programmes

The current research programmes are:

1. **Population level and clinical research**
   Studies comprise analyses of disease occurrence, functioning, determinants and time trends in the large population surveys with comprehensive register-based follow-up. Collaboration with long-term studies on health in children (Cardiovascular Risk in Young Finns=LASERI; a randomised trial of (atherosclerosis prevention in childhood= The STRIP project) is continuing in the Turku centre. Clinical research concerns clinical scale experiments of the cardiovascular system and related factors such as lipoproteins and genes. Fishermen’s health and its determinants have been studied and an experiment of the health effects of berries has been carried out.

2. **Health 2000**
   Health 2000 continues to be a most important basis for research, with several hundred studies going on in KTL and elsewhere. The Unit in Helsinki serves all researchers by providing up-to-date data sets ordered by researchers over the Internet. In the annual reports and this report most of the Health 2000 based studies are presented under topic specific themes. A major funding problem for support functions has made it difficult to provide the needed aids to researchers.

3. **Health monitoring, Finland**
   Major current undertakings are: a proposal on how to carry out health monitoring in municipalities and their federations, construction of an Internet based site for viewing and analysing health data easily, and preparations for the next book Health in Finland to be published in 2008 or 2009. A key construct is an intelligent Internet based system of distributing the information. This system being prepared in KTL. It requires about two person years of funding for two more years, but obtaining it is uncertain.

4. **Health monitoring, EU**
   The large projects are ECHIM (implementation of health indicators and monitoring), FEHES (feasibility of a European health examination), HIS/HES data base. Applications to EU Sanco/PHEA have been made for further funding of these projects. For over a year there have been indications that EU Sanco and the PHEA (Public Health Executive Agency) are at divergence about all issues. The news based on PHEA selections suggest that none of these projects will receive funding – a most unwise decision from the public health point of view. This preliminary decision will be challenged by many members of the Programme Committee. We still hope that either the present funding proposals are reversed or that there will be some securities of obtaining needed funds during the next round.

5. **Analytical biochemistry**
   The Laboratory of Analytical Biochemistry has served a large number of KTL projects and several others in carrying out biochemical analyses. The main projects are Finrisk, Health 2000, EuroAspire and Dehko. The analyses include lipids and lipoproteins measurements for the surveys of cardiovascular diseases, laboratory measurements of glucose metabolism for the surveys of diabetes and hormones and special clinical chemistry measurements of clinical studies for research. The laboratory is also involved in the developing of the storage sample system in KTL. The samples of the population surveys are in a guarded and safe system. The retrieving of samples is functioning as service for research groups.
6. **Biomarker research**

Major research topics in the Biomarker Laboratory are currently associations between plasma concentrations of dietary constituents (vitamins, polyphenols, fatty acids) and chronic diseases, such as diabetes and coronary heart disease, in the Finnish population. Different chromatographic and mass-spectrometric methods have been developed to enable the analysis of the above-mentioned compounds in plasma and urine. Collaborative intervention studies are conducted to validate their use as biomarkers. The health effects of dietary factors (e.g. berries, diets rich in fruits and vegetables, specific nutrients) and other life-style factors are being investigated.

7. **Health Policy studies,**

Current health policy studies in 2006 were
- **Development of dental care.** To assess the impact of the new legislation several rounds of questionnaire studies were carried out between 2001 and 2007. Early results suggested that the changes in use had been in the direction of the aims of the legislation.
- **The family doctor experiment of SII.** The recent findings showed that the possibilities to consult a specialist at a much reduced price (to the patient) reduced hospital costs and increased satisfaction among both physicians and patients.
- **The Helsinki Psychotherapy Study (HPS).** This long-term intervention study was designed to compare the effectiveness of psychotherapies of different type and length and to evaluate patients’ suitability for therapy
- **Cost-efficiency of prevention.** The study reviewed available evidence and resulted in suggestions on the most cost-effective means of health promotion and prevention

8. **Methods for Population surveys.**

Measures of functioning were included in the FINRISK 2007 survey and they were assessed. Of clinicophysiological measures blood pressure values and measurement methods were also assessed.
6. Dissemination of some of the department's principles and practices

On behalf of the whole Institute, the department has participated in work to establish principles for quality assurance and sound research practices. Some of those have been outlined in the publication ‘Good Research Practice in KTL’ and quality assurance for laboratory work in ‘The Quality Handbook’.

a. Laboratory activities including division of tasks and quality assurance

The Quality Handbook establishes principles and practices to be followed in laboratory based studies and research. It gives instructions on all phases beginning with sample taking and handling and going on to laboratory analyses proper.

b. The department's research principles and practices of the whole Institute

Sound research principles for the whole of KTL are laid down in the handbook ‘Good Research Practice in KTL’. The book which is available also in the Intranet in an up-dated form deals with central topics for every researcher. Examples are: strategic goals for reasearch, legislation and guidelines, research ethics, violation of good scientific practice, planning and carrying out a project, transparency, publication and communications, archiving, steering and administration of research, research funding. The book is used both as a document and as material for research training.
7. Scientific publications and public health outputs in 2002 to 2006

7.1. Overview

The number of scientific papers has increased and their average quality has improved during the past five years. From 2002 to 2006 the total annual number of publications increased from 124 to 231, and that of original articles from 81 to 125. From 2002 the number of original English language articles increased from 54 to 87.

During the same time period the topics remained but their main emphasis was transferred to books and articles based on Health 2000, whilst dissertations on that study have mainly been published from 2006 onwards. This natural transition demonstrates that in large population studies the time between data gathering and publication is generally more than five years.

In addition to scientific publications, the scientific outputs of the Department include e.g.

- numerous referee statements for several scientific journals and funding organisations
- acting as an opponent of several doctoral theses
- acting as a reviewer of several doctoral theses
- acting as a reviewer of professorship and adjunct professorship applications
- acting as a reviewer of several master's theses
- numerous memberships and presidencies/chairpersonships in scientific organisations, committees and meetings in Finland and abroad
- editorial positions in several scientific journals
- supervision of dozens of PhD theses

A selection of publications is listed below with the aim to provide some insight into the topics dealt with in research publications. The appendices (Appendix 1. Main findings, Appendix 2. All publications) include a description of main findings per year and a list of all publications.

In the following, the impact of carrying out a large empirical survey on publications is clearly seen in the record of the department. The majority of the original articles have been written by collaborating researchers and often as their dissertations. The core group of researchers has taken care of documenting baseline results of the whole survey and the methodology for future use. If this is the rule it is important to devise ways in which to attract doctoral students and their supervisors also to future surveys. During the planning and field stages this means that up-to-date themes of scientific interest must be built into the field survey.

7.2. Selected publications by year

2002

Articles


Books


Theses


2003

Articles


Books


Theses


2. Paalanen L: Ruoka- ja terveyden monitoimintakysely: elintarvikkeiden vaikutus terveyteen. 2000 –tutkimuksessa (The validity of the food frequency questionnaire in...
2004

Articles

22. Suominen-Taipale AL, Koskinen S, Martelin T, Homen J, Johnsen R: Differences in older adults’


Books


2005

Articles


5. Härkänen T, Knekt P, Virtala E, Lindfors O, Helsinki Psychoterapy Study Group: A case study in comparing therapies involving informative drop-out, non-ignorable non-


Books


Theses


2006

Articles

Books


Theses


2007

Articles, some examples


Books
7.3. Public health outputs

In addition to research and other work in the scientific community, the department has broad tasks directly related to Finnish and European Public Health. From the national point of view these activities serve the development of Public Health Policy and Health Monitoring at various national and regional levels. Below, an overview is presented of typical public health activities and their results over the past years.

Examples of national activities

1. Membership of the scientific board of the Finnish Heart Association.
3. Membership of the Social and Health Ministry’s Steering group for planning.
4. Membership of the national research ethics board
6. The National Health Examination, Health 2000
7. Third national forum for ageing (organized by KTL)
8. Membership in working groups on Current guidelines on osteoporosis and on hypertension and respective publications.
9. Coordination of the National Network for Measurement and Assessment of Functioning
11. Report on efficacy of prevention
13. Proposal for health monitoring in municipalities
15. Expert participation in the Psychotherapy Consensus meeting
16. Participation in the preparation of the national Health 2015 programme
17. Indicator system for the Health 2015 Programme of the Finnish Government
18. Coordination and enhancement of efforts to reduce inequities in health on the national level and in pilot regions (the TEROKA project, see end of chapter 4.2)
19. Preparation of material for health promotion (e.g. “Life at stake”, see end of chapter 4.2)

One example of the public health activities is the TEROKA project coordinated by the Department. The project has catalysed various activities. A memorandum prepared by TEROKA was presented to the group of ministers responsible for social policy. In 2006 the group of ministers delegated the Ministry of Social Affairs and Health preparations for a national action plan to tackle health inequalities in Finland. The national plan aims to identify the policy areas and measures required to achieve the national target to reduce socioeconomic differences in health. Representatives from several administrative sectors, local government, the health service system, NGOs and professional organisations, and health research institutes are involved in the preparation. TEROKA has an important role in the preparation of the action plan and the project is also likely to have a major role in the coordination and follow-up of the action plan. Expertice provided by the research on health inequalities in the Unit is comprehensively utilized in the preparation of the action plan as well as in other TEROKA activities.

In addition to specific public health projects, the staff of the Department participate widely in the planning and follow-up of policies, interventions and structures aiming at the improvement of public health. This work is largely done in committees, advisory boards and
other similar organisations nominated by the Ministry of Social Affairs and Health or other national and regional actors.

**Examples of European activities**

1. Representation of Finland in NCA (Network of Competent Authorities) of DG Sanco
2. Participation in EU health information projects on musculoskeletal disorders, diabetes and regional health indicators
3. Participation in the Eurostat working group on Health Interview Surveys
4. Participation in the health indicator projects ECHI-1 and ECHI-2
5. Coordination of the HIS/HES project (interview and examination surveys)
7. Internet database on national health surveys, joint action with Belgian IPH.
8. Project on the feasibility of health examinations.
9. Coordination of ECHIM, the project on implementation of health indicators.

European Public Health development concentrates mainly on two lines: a) Health measurement, indicator development, and indicator implementation and b) Health surveys. Both areas are strongholds of KTL and Finnish researchers. We hope that our work can contribute to the development of European health information. It is important for Finnish Public Health to have access to networks of institutes and scientists in all European countries.
8. Resources and their recent development

With the growth of the department also resources and expenditure increased considerably from 2002 to 2006 from 2,3 m€ to 5 m€ (see Table 4 and Appendix 3).

Table 4. Total funding of the Department of Health and Functional Capacity from 2002 to 2006 (in m€)

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2,3</td>
<td>2,2</td>
<td>4,6</td>
<td>4,8</td>
<td>5,0</td>
</tr>
</tbody>
</table>

The department was initially (1995–1998) and is again after 2004 funded to a large extent by the Social Insurance Institution. The costs of the original research group were absorbed by year 2000 by the National Public Health Institute. As of 2004 the costs of the Population Research Laboratory have been covered by State budget funds transferred from the Social Insurance Institution to the Exchequer. Thus, in 2006 KTL funding/budget funds have been the main and largest source of income for the department’s shared expenses, those of the unit for Analytical biochemistry, the Biomarker laboratory and the Population Research Laboratory. In the Public Health Research Unit 40% of expenses were paid from budgetary income but 60% from external sources such as the Academy of Finland, EU, and other sources. Although the amounts were much smaller, other units also obtained considerable external funding.

Due to the long lasting stagnation of the funds from the State budget the only way to develop research and public health work is by obtaining grants mainly from external sources. Unfortunately several State initiatives are likely to make the funding situation worse. Examples are the so called productivity programme and proposals to start operating a State grants pool financed by reducing the institutional budgets. All these are severe threats in a department already overstretched with work and needing possibilities to develop. Therefore, the department feels that its only possibility is to obtain an increasing amount of external funds. An important source for funding policy relevant work in Europe has been EU with the only drawback that it is also in an almost monopoly position. If priorities change, the income may seize.
9. Vision and plans for 2008 to 2013

The department (TTO) continues to produce information on health and functional capacity, to apply it on disease prevention and health promotion, and to the development of public health policy in Finland and in EU.

Strengths and weaknesses

The strengths of the Department of Health and Functional Capacity are many. Due to its SII background it has substantive population research materials. It has considerable skills in data gathering, data handling and record linkage. The agreements with SII imply that it has easy access to many health related data. The original SII researchers and other personnel have a good training in high quality data handling and analysis and they have been able to transfer much of it to new personnel. The laboratory units have an extremely strong background in epidemiological work and specially in long-term and repeated field studies. Validity over long time-spans is essential for the interpretation of time trends between consecutive cycles of studies. Such trends have now been reported in Finland over 27 years. The KTL laboratories are better at handling these issues than any other Finnish biochemical laboratory known to us.

The department also has a long term understanding of public health needs and the application of research to policy and health care. The foundation for this was laid already during the 25 years in the Social Insurance Institution, where policy applications of research were a central issue. Add to this in the Population Research Laboratory a long affiliation with rehabilitation (The SII Rehabilitation Research Centre) and associated clinical work.

The broad educational background, experience and skills of personnel are positive assets. The large number of employees with the highest academic degree furthers any research endeavour. Many doctoral students have been attracted to work on the population survey materials and on other types of project – and have brought with them the dynamic touch of youth. Currently, the department enjoys skills such as:

- Medicine, Dentistry, Epidemiology, Demography, Public Health, Physiotherapy, Biochemistry, Nursing, Social Sciences, Economics, Psychology, Psychotherapy, Statistics, Data processing, Nutrition, Chemistry
- Based on special interests and ongoing work the skills can also be described in the following terms: Cardiovascular diseases, Respiratory diseases, Musculoskeletal diseases, Cancer, Diabetes, Osteoporosis, Oral health, Functioning and Functional limitations, Socioeconomic health disparities, Health behaviour, Living conditions and health, Social capital, Health information, Health projections, Health indicators, European projects on health indicators and surveys, Clinical Chemistry. Together with the solid experience of senior staff the broad range of interests means that good guidance can be given to doctoral students.

Although difficult to quantify, it seems clear that doctoral students learn a lot in addition to doing their dissertations. In fact, when leaving the department or continuing there in the postdoctoral period many young researchers are extremely qualified in their own subject but also in Public Health in general.

A weakness is the age structure of staff. Both in the Helsinki Public Health Research Unit and the Turku Population Research Laboratory many of the senior staff are aged 55-65 meaning
that bridging the age and knowledge gap between them and younger researchers is vital. Unfortunately, the State’s policies (productivity programme) reduce the chances of a smooth transfer. At any rate, the department will do all it can to secure a reasonable way forward for successors.

In contrast to many other KTL departments the TTO (Department of Health and Functional Capacity) is working in two cities 170 kilometres apart. Obviously, this may be a handicap due to communication difficulties. On the other hand experience suggests that it is possible to coordinate work and inspire employees regardless of the distance.

Finance is a constant worry. It is really unfortunate that administrative or other priority changes may lead to cutting funding of successful areas. In the true research realm it is usually possible to overcome such problems since there are many funding agencies. In the development area there are very few ‘customers’ (In Finland the Ministry of Health and Social Affairs, the Social Insurance Institution, possibly the Finnish Academy of Sciences, The Work Environment Fund, SITRA the Finnish Independence Fund, and TEKES the Fund for technological advancement). The two latter ones are bound to further projects expected to result in profitable production. In EU the major sources of health related research funds are those from DG Sanco and those from the research programme (now FP 7). Overall, in the area of health policy and health care development, possibilities to obtain major financial support are quite limited and unpredictable, meaning that it is difficult to plan for long-term endeavours. That is counterproductive since by nature development work is long-term, particularly if seen as a continuum from research to application and implementation.

A strength of the department is its extensive collaboration with scientists working in other State Research Institutes and Universities in Finland and abroad. Many skills not available in the department have thus become available to collaborative projects. Overall, the outcome is positive. An excellent example of collaboration is the analysis of the Health 2000 data. After the department had gathered and produced this worldwide unique data set the working groups have coordinated work in their respective areas. This has brought two extremely important assets to research: first, doctoral students working on theses based on the material and second, their supervisors with skills specific to that area. We expect also that the ability to attract key experts to Health 2000 ensures that this project and others will enjoy the benefit of up-to-date skills to the population based health research of KTL.

**Vision and plans 2008 to 2013**

The long-term experience, transfer of knowledge, expected future expertise and needs of public health policy mean that the department should concentrate on many of the current actions. In addition, it should become aware of new needs and challenges. Altogether this also means that both EU and Finnish administrations and funders must be aware of the public health relevant capabilities of the department.
The vision and plans include the following components:

- National health data gathering and collaboration in data gathering
  i. A follow-up survey of Health 2000 should be carried out in 2008-2009
  ii. The next phase of Health 2000 is a comprehensive Health 2012 health examination survey. It will combine the FINRISK survey of that year and the comprehensive Health 2000 methodology. Planning starts as of 2008.
  iii. A separate survey on functioning may be carried out in 2008-2009
  iv. The EHIS (Eurostat health survey) may be a joint effort of KTL, SII and Stakes. If so it might be carried out in 2008 or 2009.

- Epidemiological research
  i. Epidemiological studies on cardiovascular diseases, musculoskeletal diseases, cancers, neurodegenerative diseases, mental health and functioning and their determinants

- Health monitoring and health information portal
  i. National health monitoring
  ii. Health in Finland: the department will produce an up-to-date version of Health in Finland by 2009 with the help of the Health information portal.
  iii. Health in regions and municipalities; books and portal
  iv. EU health monitoring, indicators and health examinations
  v. Health information portal
     It is expected that the department will build a system for easy retrieval and analysis of health data and that the system should be available by 2010.

- Health policy research and development
  i. Up-to-date studies on current health policies and their impacts
  ii. Studies and collaboration in measures of functioning
  iii. Studies on socioeconomic health disparities and their reduction
  iv. Studies on the effectiveness of psychotherapies

- High quality laboratory services
  i. for KTL
  ii. for other research projects
  iii. development of a reference scheme for quality assurance in European population studies

All the above will be carried out in suitable collaboration with partners in KTL, elsewhere in Finland and in other countries.
Appendix 1. Selected findings in publications in 2003–2006

YEAR 2003

Cardiovascular diseases
- The increase in by-pass surgery has not reduced disparities between population groups in its use according to need
- Permanently raised levels of antibodies against C.pneumoniae, IC/IgA and anti HSP 60 IgA specially together with increased CRP are predictive of increased CHD risk
- Intake of abundant fibre is associated with reduced CHD risk
- In a prospective setting various indicators of oral health do not predict CHD

Musculoskeletal diseases
- The prevalence of strongly positive rheumatoid factor varies by region and is lowest in Southwest Finland
- Reactive arthritis is associated with faster disintegration of type I collagen
- Severe uveitis in children may be found also without joint inflammation
- anti-CRP-antibody is much more specific in rheumatoid arthritis of the elderly than determination of the rheumatoid factor

Cancer
- The incidence of papillomavirus HPV 16 increased between 1983 and 1997 whilst that of HPV 6 and HPV 11 did not.
- A high concentration of polyunsaturated fats in serum was associated with a lower breast cancer risk

Diabetes
- Prospectively, intake of whole grain products and cereal fibre was associated with a reduced risk of type 2 diabetes
- Prospectively, drinking a lot of coffee was not associated with incidence of type 2 diabetes
- A high concentration of carotenoids in plasma has a positive impact on glucose metabolism in diabetics
- Differences in mortality between population groups increased in diabetics

Asthma and allergies
- Allergic rhinitis does not associate with IL-polymorphism
- The IL 1 A-genotype is associated with nasal polyposis in asthmatic adults
- Systemic inflammation may be the mediator between social status and cardiovascular diseases

Health and functioning of the elderly
- During the past 20 years life free of major limitations has been extended by 3 years, i.e. the whole extension of life years has been due to healthy years.

Diet and chronic diseases
- Intake of folates from diet is sufficient
- Black currants, lingonberries and blueberries are important sources of quercetine
- Young women do not receive enough iron from diet
- Diet comprising a lot of fresh berries, citrus fruit and vegetables increases folic acid content of serum and red cells and reduces the homocysteine concentration of plasma

International health monitoring
- The main report of the survey methods for musculoskeletal diseases was published for EU Sanco
- The main report on national surveys (HIS/HES i.e. health interviews and health examinations) was published for EU Sanco
- The HIS/HES database comprising methods of all national surveys was published

Health policy studies
- In young adults demand and use of oral health care had increased from 2000 (reform) to 2001 so that unmet need had decreased
- In a large scale experiment, receiving specialist consultations at reduced price decreased hospital use and improved satisfaction of both patients and their primary care physicians

YEAR 2004

Cardiovascular diseases
- Functional limitations predicted mortality in men suffering from CHD but not in women
- Cardiovascular diseases are important causes of disability in persons aged 65 to 74 and with population ageing the prevalence of functional limitations increases
- Both CHD and disability have decreased among persons aged 45 to 74 but not among the elderly. About 25% of the reduction in disability was estimated to be due to reduction of CHD
- Based on antibody findings it was shown that microbes commonly causing gingivitis increase the risk of cerebrovascular accidents
- After the first MI more coronary operations were carried out in persons of higher social classes
- Pulse pressure of persons with type 1 diabetes increases faster with age than that of health persons indicating faster ageing
- Plasma folate concentration was strongly associated with reduced risk of CHD but plasma homocysteine concentration had no predictive power
- Raised serum uric acid concentration was associated with a four times increased risk of CHD death
- In a cohort study of type 2 diabetics from east and west Finland plasma homocysteine was a strong predictor of cardiovascular events.
- The 21 year follow-up of the children’s multicenter study showed that during the past 15 years young Finnish adults have become fatter, their triglyceride levels have increased and reduction of cholesterol levels has been relatively slow.
- There are major differences in CVD risk factors between young adults living in east and west Finland.
- In young adults flow-mediated dilatation of the arteries of endothelial origin is inversely proportional to the thickness of carotid intima-media.
- The number of CVD risk factors was associated with intima-media thickness only in persons with impaired endothelial function. Impairment of endothelial functioning is an early occurrence in atherosclerosis and systemic endothelial functioning may regulate the association between risk factors and atherosclerosis.
- The sensitivity of baroreceptors seems to decrease with increasing pulse pressure.
- Factors related to stiffness of the large arteries such as age, obesity and reduced insulin sensitivity are associated with increased short-term (beat-to-beat) variation of blood pressure and reduce sensitivity of baroreceptors.
- Patients suffering from idiopathic dilating cardiomyopathy have normal endothelial functioning but perfusion reserve of the myocardial muscle is abnormal.
- In IDC-patients poor perfusion reserve together with imbalance of oxidative metabolism are important factors reducing performance.
- Reviews dealt with renewal of the treatment guidelines for hypertension.

Musculoskeletal diseases
- Obesity is an important determinant of arthrosis (arthritis) of the proximal joint of the thumb.
- There is no dose-response between positive rheumatoid factor and smoking.
- Putting on weight from normal to overweight increases the risk of severe knee arthrosis more than stable overweight.
- Because of musculoskeletal diseases clearly fewer work disability pensions were granted to people with good performance of trunk extensors than to other persons.
- A controlled trial in patients with central spinalstenosis of average severity proved that operative treatment had a more positive effect on symptoms and functional capacity than other treatment. Heavy physical work load, climbing stairs and working on knees increase the risk of knee arthrosis.
- Diagnostics of rheumatoid arthritis in the elderly can be much improved by determining antibodies against rheumatoid arthritis specific citrullinized peptides.

Cancer
- Many different vitamins (alphatocopherol, betacarotene, retinol, retinol binding protein and ceruloplassmin) were analysed and it was found that pooled samples (compared to individual samples) yield to biased results on differences between cancer cases and controls.
- The speed of reduction of the helicobacter-infection in the population depends on genetics of the bacteria so that cagA+ strains disappear more quickly than cagA- strains. The observation is important both in regard of the infection, its treatment.
- Major weight gain during pregnancy is a risk factor of breast cancer.
- The novel SFSS-scale (Structural Functional Social Support Network) provides detailed information about cancer specific social support and social networks.
- The corrected (taking into account hysterectomies) incidence of cancer of the body of the uterus was 29% and that of cervical cancer 11% higher that uncorrected statistical figures suggest.
- A Bayesian intensity model was developed to assess cancer incidence, prevalence and fatality in a situation when mortality data are not available.

Diabetes and obesity
- Clinical trial showed that an 8% lowering of weight improved insulin sensitivity more effectively that preventing absorption of fat.
- Ample intake of tocopherols and tocotrienol from diet reduced the risk of diabetes.
- The duration of work disability was 0,63 years longer in obese than other men, the duration of coronary heart disease was 0,36 years longer and use of long-term medication 1,68 years longer. Thus, increasing obesity also implies an increase in the duration of chronic diseases and costs.
- Several reviews were written to demonstrate the time trend of diabetes and future increases of the disease burden.

Asthma and allergies
- When gut allergy develops in experimental animals, a large amount of a specific mediator substance (cell protease, MMCP-1) is released. The finding might enable a simple blood test for human dietary allergies.
- The main allergens of turnip rape and rape are napines (2 s albumins).
- A larger proportion of Finnish Olympic athletes had diagnosed asthma than were users of asthma medication. Their use of asthma medication was similar to that in the population as a whole.
- Measurement of specific IgE antibodies over 60 years (in persons born in 1923 to 1990) showed that allergies were rarest in the oldest age group and became more frequent with younger ages.
- Sensitization to dietary allergens was rarest in adults born during the second world war and becomes more frequent in younger people.
Oral health
- A comparison of the Health 2000 and the Mini-Finland surveys showed that there had been a dramatic improvement of oral health in the past 20 years. Dental caries and edentulousness were reduced. Still, need for dental care and personal care is high and is not adequate.
- A strong sense of coherence is associated with increased use of regular dental care

Mental health
- Work related burn-out was relatively frequent but much rarer than in studies from the 1990s.
- The design, methods and implementation of the experimental psychotherapy project were described in an early report. One of the conclusions was that also the assessment of short therapies requires long term follow-up.

Health disparities between population groups
- After the first myocardial infarction more coronary operations were performed on patients in the higher social groups
- The differences in use of specialist services between educational groups were steeper in Finland than in Norway
- More structures to reduce health disparities have been developed in England, Sweden and the Netherlands than in Finland
- Of the 7.6 year difference in life-expectancy between men and women at age 15 51-56% was due to differences in smoking and alcohol use
- A review showed that to reduce health disparities it would be important to improve health of the most disadvantaged groups

Health disparities between population groups
- After the first myocardial infarction more coronary operations were performed on patients in the higher social groups
- The differences in use of specialist services between educational groups were steeper in Finland than in Norway
- More structures to reduce health disparities have been developed in England, Sweden and the Netherlands than in Finland
- Of the 7.6 year difference in life-expectancy between men and women at age 15 51-56% was due to differences in smoking and alcohol use
- A review showed that to reduce health disparities it would be important to improve health of the most disadvantaged groups

Functional capacity and work ability in middle-age and old age
- A dissertation was published on the association between cardiovascular diseases and functional limitations.
- For the government’s report on the future forecasts were prepared on the number of elderly persons with functional limitations in 2000 – 2030. The number needing help doubles if the prevalence of functional limitations remains on the level of 2000, but the increase is only half of that, if functional capacity improves as it did from 1980 to 2000.
- Four months of speed and strength training improved power production of body extensor and flexor muscles
- Six months of physical training reduced exhaustion of flexors and extensors of the knee in women suffering from MS but not in men.

Diet and chronic diseases
- Plasma homocysteine is associated with depressive symptoms in middle-aged men
- Incidence of CHD is lowest in persons with high vitamin C intake but ample intakes of vitamin E and carotenoids had little impact,
- Ample intake of fibre from cereal and fruit was associated with a low CHD risk

Reproductive health
- Current reproductive health was analysed in the Health 2000 data
- Comparison of several cohorts of the Finrisk surveys showed that birth rates had declined and the proportion of both those receiving infertility treatments and using birth control had increased.

Social capital
- Several reviews associated with an ongoing dissertation dealt with the nature of social capital and its possible advantageous effects on health.

YEAR 2005

Cardiovascular diseases
- The decrease of CHD and in men the improved functional capacity in men with CHD have contributed to the improvement of functional capacity in men under 75 and women under 65.
- Although the prevalence of CHD has decreased, the number of persons suffering from CHD has increased during the past twenty years
- Secondary prevention of CHD is not sufficient and it seems that men receive treatment more likely than women
- Treatment of CHD varies systematically between socioeconomic groups and the treatment variation did not correspond to the differences in disease prevalence and severity. Differences in treatment may contribute to the socioeconomic mortality differences.
- In persons with glucose intolerance positive effects can be achieved on blood clotting factors by changing living habits and the most important explanation is weight reduction
- In age group 35-64 the sensitivity of baro-receptors decreases when pulse pressure increases
- Simvastatin reduces the proportion of short chain saturated fatty acids and increases that of long chain polyunsaturated fatty acids in the circulation by stimulating key enzymes of fatty acid metabolism
- Homocysteine is a risk factor of cardiovascular diseases
- Apolipoprotein A-I/C-III/A-IV SstI genotype groups were associated with the thickness of the carotid artery internal wall (intima-media) in young Finnish adults
- Determinants of C-reactive protein (reflecting inflammation) in men are obesity and smoking and in women obesity, use of oral birth control preparations and physical activity
- C-reactive protein, Interleukin-6 and the tumournecrosisfactor alpha predict the incidence of cardiovascular diseases and total mortality
- Lipid- and apolipoproteinprofiles of newborn and six year old children in Tallin were described.
Musculoskeletal disorders
- Measurements by different DXA apparatuses yield differences in the diagnosis of osteoporosis. The correlation of measurements and interpretations should be improved and a centralized quality assurance scheme should be set up.
- Radiologically observed hand arthrosis is associated with low bone mineral content and symmetric DIP arthrosis
- Unspecific neck-shoulder pain is associated with work related burnout, depression and alexithymia.
- Shortness at age 11 predicts the incidence of neck pains

Cancer
- Pepsinogen I levels were higher in men than in women. The helicobacter infection is associated with increased PG I levels. Persons with parietal cell antibodies had the lowest PG I levels.
- The IgA antibody response during H.pylori infection was much more frequent among gastric cancer and gastric ulcer patients than among persons with chronic gastritis
- The quality of life of cancer patients depends strongly on psychosocial factors. General stress factors affect quality of life.
- Neither the infection with HSV-2 nor HSV-8 were associated with prostatic cancer

Diabetes and obesity
- We can simply estimate the risk points of Finns.
- Physical activity prevents type 2 diabetes
- Diabetes and decreased glucose tolerance are common and increase by age in 45-64-year-olds
- Persons increasing intensive and/or quite intensive leisure time physical activity most avoid type 2 diabetes at about 60% probability.
- A two year physical activity and dietary intervention improves glucose metabolism in all examinees, but most changes were observed in persons with many fast muscle cells.
- The prognosis of type 1 diabetes has improved during the past four decades according to an interpretation based on advanced renal insufficiency. Patients diagnosed before 5 years of age had the best prognosis.
- The incidence of type 1 diabetes is six times as high in Finland than in Russian Karelia, although HLA DQ genotype is equally common. Thus, the influence of environmental factors is strong.
- The incidence of type 2 diabetes is smaller in persons eating more than average green vegetables, fruit and berries, vegetable oil and margarine as well as flesh from poultry
- The prudent diet is associated with a decreased risk of type 2 diabetes and a ’traditional’ diet with an increased risk.

Asthma and allergies
- Olympic endurance athletes suffer more often from allergic rhinitis than other athletes and they use more drug treatment.

Oral health
- A strong sense of coherence is associated with oral health based quality of life
- A weak sense of coherence is associated with poor oral hygiene and little tooth brushing

Mental health
- Burn out and depression are partly overlapping phenomena. Depression is quite strongly associated with severe burn out. Both should be taken into account when examining working age patients.
- In an experiment on the efficacy of psychotherapy, a larger than average proportion of the healthiest and the most ill patients dropped out of treatment.
- The father’s mental health problems in the examinee’s childhood were strongly associated with men’s depressions and the mother’s with women’s depression.
- A larger proportion of men had alcohol problems whereas a large proportion of women than men had depression

Other illnesses
- In young Finns coelicia was associated with low education and a poor performance in working life. This may be associated with depression and disturbed behaviour seen in teen-agers with untreated coeliacia

Differences between population groups
- At ages 30-64 the differences between marital status groups in mortality due to accidents and violence and to alcohol have increased. This suggests that health behaviour in single persons has changed. In the end of the 1990s 15% of deaths would have been avoided if age specific mortality of single persons had been the same as that of married ones.
- In 30-64-year olds the differences of functional capacity are the following: Those with the shortest education had poorer functioning than those with higher education. Married people had a slightly better functional capacity than other people and single ones a poorer capacity.

Functional capacity and work ability in the middle-aged and the elderly
- A screening instrument on chronic facial pain reveals quite similar classes of pain patients as the more comprehensive Multidimensional Pain Inventory measure.
- An index of muscle fatigue developed in the Population Research Laboratory measures reliable muscle fatigue of the knee extensor and flexor muscles of middle-aged persons
- Functional poor vision increases with age particularly from age group 65-74.
- For the government’s future assessment a forecast for the years 2000-2030 was prepared of the number of aged persons with functional limitations. The number needing help doubles if the prevalence of functional limitations remains at the level of year 2000. The increase is only half of this if the positive development observed in functioning during 1980-2000 continues.

**Diet and chronic diseases**
- A doctoral dissertation concerning dietary causes of diabetes was published.

**Social capital**
- Participation in different culture activities and other leisure-time activities predicts improved longevity.

**Health monitoring**
- The Finnish language book Health in Finland (Suomalaisten terveys) was published.
- Strand 1 of the EU Public Health Program was supervised in the Network of Competent Authorities.
- The Internet data base (HIS/HES) was improved and maintained.

**Health 2000**
- A large number of articles and books was published (mentioned above). Overall, 200 substudies, which 10 were doctoral dissertations, were advancing.

**Health policy research**

**Need for dental care and dental health insurance**
- Since the law of 2000 a questionnaire series showed that the development of dental care has been positive over the years 2001-2004, and according the aims of the law.

**The SII family doctor experiment**
- The consultation experiment organized in Turku showed that the possibility to consult specialists at reduced price to patients reduced hospital use.
- A doctoral dissertation was published showing that the model was superior to the usual one.

**Need for care and met need (DONAU)**
- Several articles were drafted.

**Other studies**
- Pharmacological skills of both nurses and student nurses were lacking in some respects but nurses’ skills were superior.
- With the increased power and responsibility of head nurses it has become increasingly important to study their internal job control.

**YEAR 2006**

**Cardiovascular diseases**
- Traditional risk factors explain about one third of the difference in coronary heart disease risk between blue collar works and upper white-collar employees.
- Coronary by-pass operations and PTCAs were carried out in a smaller proportion in lower socioeconomic groups than in higher ones.
- Future CHD mortality by year 2030 was predicted using Bayes-methods. If current trends prevail mortality in men under 70 and women under 60 will decrease steeply. In the following 20 year age groups changes will be small, but the number deaths in the oldest people will increase sharply. To compensate for these changes major preventive efforts are needed.
- In childhood the levels of C-reactive protein (CRP) predict CRP-concentration in adulthood and the association is not dependent on metabolic risk factors.
- In women, intake of an abundant amount of fish was associated with low CHD mortality but the effect disappeared after controlling for confounding factors.
- The prevalence of CHD decreased from 1980 to 2000 in persons aged under 65 and increased in those over 75. The total number of people suffering from the diseases increased by 18%.
- With the reduction of intake of sodium chloride the excretion of sodium into urine has decreased over twenty years, but it is still higher than the recommended one.
- In female workers doing overtime, physical exertion and few possibilities to influence once own work were associated with angina pectoris symptoms.
- The blood pressure levels measured at home are 7.7/3.4 mmHg lower than those measured in a population survey and the prevalence of high blood pressure is 15% lower when measured at home than when measured in the population survey.
- The prevalence of white coat hypertension is 15.6% in adults without medicine treatment and 37.5% in the non-treated whose blood pressure was raised in a casual measurement. Persons with white coat hypertension were leaner than normotensives. The results support the hypothesis that white coat hypertension is early hypertension.
- Systematic differences were investigated in the results of cholesterol determinations over 27 years. In comparison with external quality control measures (WHO and CDC) the mean bias over the years 1978-2004 was -0.74%. During the past five surveys (at five year interval, 1982-2002) the mean bias was 0.10%. After correcting for bias the interpretation of trends during the past five years (1997 to 2002) changed and is now that the population cholesterol levels have not changed but have remained at the previous level.
- A follow-up survey (FinRisk) showed that CRP predicts CHD risk in men. Also, TNFalpha has independent predictive power. The results strengthen the hypothesis that inflammation is important in CHD.
- At certain polymorphia-areas of apolipoprotein E (APOE-219G/T and +113G/C) there is an association with total and LDL-cholesterol in young men. However, these polymorphias are not the most important factors in regulating the physiological functioning of artery walls or the thickness of intima-media.
- Following the reduction of intake of sodium chloride the excretion of salt to urine has been reduced during 20 years but excretion is still above the recommended level.

Musculoskeletal disorders
- A dissertation was published relating to bone density and hip fracture.
- A small metacarpal-index measured from hand X-rays predicts the risk of hip fracture.
- The prevalence and risk factors of epicondylitis were studied. Prevalence at working age was 1.3% (lateral epicondylitis) and 0.4% (medial epicondylitis). Physical strain in these areas (repeated movements and use of strength), smoking and obesity were strong risk factors.
- The efficacy of operative treatment of spinalstenosis was assessed in a randomized trial.
- Contribution to a state of the art report on the treatment of hip fracture.

Cancer
- H.pylori infection is a most likely cause of gastric cancer with the exception of cancer of the cardia.
- A long survival of cancer patients is predicted by high socioeconomic status, long education and coping.
- The changes of H. pylori antibodies in the population were analysed over ten and twenty years. 35% of persons having originally only IgG-antibodies had developed IgA-antibodies and of those with both IgG and IgA, 48%.
- Working age cancer patients had received most support from fellow employees but they wished to receive more from occupational health care personnel.

Diabetes and obesity
- The risk of type 1 diabetes in the offspring of type diabetic parents was the same as in the population. Risk factors identified were male sex of the diabetic parent and diabetes detected in him at an early age.
- When studying the glycemic index of food-stuffs experimentally one should use capillary blood samples and reference tests should be done at least twice using glucose or white bread.
- According to a 3 months prevention experiment (living habits) in primary care the risk factors for diabetes were clearly reduced.
- The mother’s use of antimicrobial medication during pregnancy was not associated with type 1 diabetes in the children.
- Three years after the intervention of the diabetes prevention study had finished the number of persons developing type 2 diabetes was 36% lower in the intervention group than in the control group.
- Persons with glucose intolerance, a high serum uric acid concentration predicted a doubled risk of diabetes.

Oral health
- Temporomandibular symptoms (e.g. pain and crepitation) were observed in 40% of adults, symptoms were more common in women and their prevalence increased with age.
- Cynic hostility is a risk indicator of too little and poor quality brushing.
- Dental care of adults in health centres had developed into the direction of aims.

Mental health
- Job related burnout can develop in all occupational groups. A short education may increase the risk of burnout in women and living alone (single, divorced, widowed) in men.
- Burnout is closely associated with work load and strain and can be partial reason for the association between work strain and depression.
- Burnout and alcohol dependence are associated, and this should be taken into account in clinical work. In addition to traditional methods treatment of alcohol dependence should comprise assessment of working conditions and reducing job stress.
- In cross-section burnout is related to cardiovascular diseases in men and musculoskeletal diseases in women. Somatic diseases are associated with all dimensions of burn-out, not only exhaustion.
- The mortality of schizophrenia patients is very high in comparison to the population. This may be due to the disease itself or to the medication.
- The efficacy of short and long psychotherapy was compared in a randomized therapeutic trial.

Health disparities between population groups
- Traditional risk factors explain one third of the difference in CHD risk between blue collar workers and white collar employees.
- Perceived health has improved over the past 20 years but the differences between marital status groups have not decreased. Health was poorest in single and divorced men and in divorced women.
- The living conditions in childhood and strains are strongly associated with perceived health and psychic strain in young adulthood. Early detection of those factors could help prevent health problems in young adults.
- Living conditions in childhood are important determinants of smoking in young adults. Their effect is mediated through current living
conditions. Both one’s own education and parent’s smoking influence smoking in young adults.
- Educational difficulties at school are associated with the current situation in life and perceived health
- Socioeconomic health disparities and health policy in four countries were compared

Social capital and quality of life
- In a 20 year follow-up an abundance of leisure time interests, hobbies and activities predicted a much decreased mortality.
- The health-related quality of life of acromegaly patients was poorer than that of the whole population.
- On the level of individuals health-related quality of life was reduced most by Parkinson’s disease and next came anxiety, depression, knee and hip arthrosis. Taking into account prevalence, the conditions most reducing quality of life were knee and hip arthrosis, depression, low back pain and incontinence. The two methods (15D and Euroqol) gave diverging results since they emphasized different topics.

Functional capacity and work ability, training and exercise
- Postural balance was examined by a strain gauge sheet and the first population-based reference values were created. Postural balance starts to deteriorate quite early and the change becomes faster after age 60. The test can only be recommended for persons aged over 60 since a too high proportion of younger persons manage it well. On the other hand, for many elderly people the more demanding forms of the test (semi-tandem and tandem) are too difficult.
- The need for help and help received was investigated in the elderly.
- One year of speed strength type training in a fitness centre three times a week increased the proportion of myosin IIa-type heavy chains and reduced the proportion of IIx-type heavy chains.
- In middle-aged untrained persons training one’s muscles increased the myosin IIa-type heavy chains in the thigh muscle. Those chains are typical of physically active people.
- The ability to move about was examined by both interviews and tests (measurements). One third of women and one fifth of men did not achieve a walking speed of 1.2 meters/second. The performance of older women was poorer than that of men. There were major differences between the answer on ability to climb stairs and the actual stair climbing test. Both questionnaire methods and tests are needed in population surveys. Also, the non-response must be very small because functional limitations and disabilities are prevalent among the drop-outs.
- Additional weights of 2.2 kilograms each fastened to arms and legs enhanced the effect of a 22 week training period on performance capacity and it was seen in vertical jumping and anaerobic capacity.
- A comprehensive book was published on the population’s work ability and its different dimensions.
- For the first time in Finland a book was published analysing use of ambulatory physiotherapy.

Diet and chronic diseases
- The plasma concentration of the flavonoid quercetine increases when the proportion of berries in diet increases. Quercetine measurements are proposed as a biomarker of diet rich in berries and fruit.
- The phenolic compounds of oregano extract could be biologically utilized in a four week feeding experiment, which did not have any adverse effect on serum lipids or markers of lipid peroxidation.
- A comparison of the results of a dietary questionnaire and of a three day food diary, showed that the questionnaire was suitable for epidemiological studies.
- A single dose of betaine immediately affected its plasma concentration and reduced the plasma homocysteine concentration within 2 hours.

Other topics
- Systematic errors (biases) in cholesterol determinations over 27 years were examined using data from population surveys carried out at five year intervals. A comparison to external quality control data (WHO and CDC) showed that the mean bias was -0.74 during 1978–2004. During the past five surveys (1982 to 2002) mean bias was 0.10%. After correcting the results of the last two surveys (1997 and 2002) for bias, the interpretation of the time trend changed. Instead of an increase in cholesterol levels of 1.8% the population levels had remained unchanged.
- In national surveys repeated over a long time an emerging problem is the increasing non-response. Analysis of a questionnaire survey (AVTK) shows that non-response has increased faster in men than women and faster in young persons. The difference in non-response between educational groups increased with time. Representativeness and the validity of results decrease over time if this development continues.
- A book was published on the use of health care services.

Health monitoring
The book Health in Finland
- Health in Finland (up-to-date review) was published in August 2006
International health monitoring
- The EU Public Health Programme was supported by participating in its network of competent authorities and its working groups
- The project ECHIM to implement health indicators was carried out.
- A project on feasibility of health examinations in EU-countries was started.

Health 2000
- A large number of books and articles were published, and have been recorded above.

Health policy studies

Need for dental care and dental health insurance
- The final evaluation was being prepared

Need for care and meet need (DONAU)
- A review was prepared on assessing the need of health care

Effectiveness of psychotherapy
- Findings concerning the effectiveness of short- and long-term psychotherapy on psychiatric symptoms were published
- Personality factors predicting suitability for psychotherapy were detected

Cost-efficiency of health promotion
- Work for the final report was in progress
- A review was published about the economic effects of stopping smoking

The medicine’s distribution experiment
- The pilot study in Vantaa was carried out
Appendix 2. All publications 2002–2006

2002

A. Original articles and reviews


52. B. Original articles and reviews published in domestic languages


C. Textbooks and chapters in textbooks, reports and proceedings


D. Other publications


E. Theses


2003

A. Original articles and reviews


B. Original articles and reviews published in domestic languages


57

C. Textbooks and chapters in textbooks, reports and proceedings


D. Other publications

E. Theses


2004

A. Original articles and reviews


B. Original articles and reviews published in domestic languages


C. Textbooks and chapters in textbooks, reports and proceedings


D. Other publications


E. Theses


2005

A. Original articles and reviews


49. Uusitalo L, Knip M, Kenward MG, Alftahan G, Sundvall J, Aro A, Reunanen A, Åkerblom HK, Virtanen SM, Childhood Diabetes in Finland Study Group: Serum alpha-tocopherol concentrations and


B. Original articles and reviews published in domestic languages


C. Textbooks and chapters in textbooks, reports and proceedings


D. Other publications


2006

A. Original articles and reviews


24. Johansson E, Alho H, Kiiskinen U, Poikolainen K: Abstaining from alcohol and labour market underperformance—have we forgotten the 'dry' alcoholics? Alcohol Alcohol 2006;41:574-579.


78. Suominen-Taipale AL, Martelin T, Koskinen S, Holmen J, Johnsen R: Gender differences in health care use among the elderly population in areas of Norway and Finland. A cross-sectional analysis based on the HUNT Study and the FINRISK Senior Survey. BMC Health Services Research 2006;6:110.


B. Original articles and reviews published in domestic languages


C. Textbooks and chapters in textbooks, reports and proceedings


D. Other publications


E. Theses

## Appendix 3. Resources

### Department of Health and Functional Capacity’s (TTO) funding in the last 5 years

<table>
<thead>
<tr>
<th>Unit</th>
<th>Year</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3080, Department’s shared (TTOY)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KTL’s funding / budget funds</td>
<td>79,517</td>
<td>86,492</td>
<td>124,964</td>
<td>192,495</td>
<td>223,661</td>
<td>707,129</td>
<td></td>
</tr>
<tr>
<td>The Academy of Finland</td>
<td>7,964</td>
<td>18,935</td>
<td>33,852</td>
<td>20,961</td>
<td>29,817</td>
<td>111,529</td>
<td></td>
</tr>
<tr>
<td>EU funding</td>
<td>0</td>
<td>0</td>
<td>16,330</td>
<td>25,697</td>
<td>1,895</td>
<td>43,922</td>
<td></td>
</tr>
<tr>
<td>Other funding</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1,250</td>
<td>724</td>
<td>1,974</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>87,481</td>
<td>105,427</td>
<td>175,146</td>
<td>240,403</td>
<td>256,097</td>
<td>864,554</td>
<td></td>
</tr>
</tbody>
</table>

| **3081, Public Health Research Unit (KTY)** | | | | | | | |
| KTL’s funding / budget funds | 727,265 | 603,821 | 816,208 | 845,009 | 837,882 | 3,830,185 |
| The Academy of Finland | 72,512 | 57,888 | 116,106 | 212,843 | 221,014 | 680,363 |
| EU funding | 98,584 | 32,733 | 0 | 90,488 | 236,377 | 458,182 |
| Other funding | 391,575 | 519,286 | 555,032 | 449,387 | 651,746 | 2,567,026 |
| **TOTAL** | 1,289,936 | 1,213,728 | 1,487,346 | 1,597,727 | 1,947,019 | 7,535,756 |

| **3082, Immunobiology laboratory** | | | | | | | |
| KTL’s funding / budget funds | 192,989 | 229,909 | 349,318 | 69 | 0 | 772,285 |
| The Academy of Finland | 36,040 | 45,000 | 76,575 | 0 | 0 | 157,615 |
| Other funding | 6,646 | 14,348 | 201 | 0 | 0 | 21,195 |
| **TOTAL** | 235,675 | 289,257 | 426,094 | 69 | 0 | 951,095 |

| **3083, Analytical Biochemistry Laboratory (ABIL)** | | | | | | | |
| KTL’s funding / budget funds | 322,179 | 301,564 | 401,317 | 466,655 | 416,256 | 1,907,971 |
| Other funding | 65,979 | 49,440 | 27,967 | 73,610 | 86,777 | 304,273 |
| **TOTAL** | 388,158 | 351,004 | 429,284 | 540,265 | 503,033 | 2,212,244 |

| **3084, Biomarker Laboratory (MALA)** | | | | | | | |
| KTL’s funding / budget funds | 247,101 | 186,531 | 203,791 | 307,736 | 207,572 | 1,152,731 |
| The Academy of Finland | 0 | 0 | 38,043 | 37,170 | 44,787 | 120,000 |
| Other funding | 13,140 | 45,152 | 35,012 | 53,683 | 97,384 | 244,371 |
| **TOTAL** | 260,241 | 231,683 | 276,846 | 398,589 | 349,743 | 1,517,102 |

| **3085, Population Research Laboratory (VTL)** | | | | | | | |
| KTL’s funding / budget funds | 0 | 0 | 1,766,918 | 1,997,765 | 1,867,523 | 5,632,206 |
| Other funding | 0 | 0 | 0 | 40,325 | 59,348 | 99,673 |
| **TOTAL** | 0 | 0 | 1,766,918 | 2,038,090 | 1,926,871 | 5,731,879 |

**DEPARTMENT’S TOTAL** | | | | | | | |
| 2,261,491 | 2,191,599 | 4,561,634 | 4,815,143 | 4,982,763 | 18,812,630 |