

Karolinska
Institutet



Aging Research Center

Stockholm
University



Activity Report

Year 2004

IN COLLABORATION
WITH



*Gerontology
Research Center*

Activity Report compiled by:

Eva von Strauss

Stockholm, April 2005

Introduction

The center was established in the year 2000 thanks to the initiative of The Swedish Council for Working Life and Social Research (FAS) that announced a call for applications to promote multidisciplinary centers focused on aging research. FAS supplies the basic economical support equally matched by Karolinska Institutet (KI) and Stockholm University (SU) for a first three-year period followed by a second triennium after a scientific evaluation.

Organisation

ARC is a multidisciplinary center in which both the medical university KI and SU are collaborating, as reflected by the board members. The administration of the center is placed at the Division of Geriatric Epidemiology, Department of Neurotec, KI.

ARC is led by a board, whose members are elected every three years. The present board was installed in September 2003 with most of previous members still remaining in their positions (see page 3).

ARC is organised into three units: geriatric medicine, psychology, and social gerontology. Each unit has two seniors (a professor and a lecturer) who are financed by the basic grant from FAS. Post docs, PhD students and other staff are financed by KI, SU, Äldrecentrum, or through other research grants (see personnel, page 4).

New positions at ARC

Sofia Österman obtained the position as university secretary by replacing *Helene Hägglund* whom retired in April 2004.

Major events at ARC during 2004

External scientific evaluation

On September 20th, ARC was visited by FAS and three of the four external reviewers who initially evaluated the first application by ARC. It was previously decided that the same external committee would make a scientific evaluation of the center after four years of activity. The external reviewers were *Carol Brayne*, University of Cambridge, UK ; *Sarah Harper*, University of Oxford, UK; *Kees Knipscheer*, Virje Universiteit, Amsterdam, The Netherlands; and *Ursula M Staudinger*, Dresden University of Technology, Germany (not present on September 20th). The scientific evaluation was based on a self-evaluation report from ARC as well as the on-site visit. The final report from the external committee was extremely positive, and their recommendations for the future of ARC were: 1) A continuation of FAS funding; 2) to maintain the independence of this inter-disciplinary co-operation and thus maximise opportunities for this kind of collaboration and productivity; 3) That KI and SU assess whether their financial contribution is as extensive as guaranteed; and 4) That Äldrecentrum, with its extensive potential for policy influence, be given a higher priority in future developments.

In conclusion, ARC has already achieved high productivity with valuable output, sufficient to justify a strong recommendation that ARC should continue.

Open house

On February 10, Äldrecentrum and ARC had a daylong open house at The House of Aging Research with lectures, demonstrations, and video presentations (see page 16). The event was very well attended with an estimated 350 participants.

Visit by FAS

On April 20, ARC was visited by the Secretary-General of FAS, Rune Åberg, and the Research Secretary, Kerstin Carsjö. We presented our major research lines, results, and future plans.

Visit by Heads of Karolinska Institutet and Stockholm University

On June 11, ARC was visited by the President of Karolinska Institutet, Harriet Wallberg-Henriksson, and the President of Stockholm University, Kåre Bremer. During the afternoon, we presented our major research lines, and took a guiding tour in the House of Aging Research.

Phd thesis

During the year, five doctoral thesis and four half time seminars have been carried out (see page 12).

Grants received

Several major grants from large Swedish research councils, such as The Swedish Council for Working Life and Social Research (FAS), The Swedish Research Council (Vetenskapsrådet), and The Bank of Sweden (Riksbankens Jubileumsfond) were achieved (see pages 18-19).

ARC Board

2003-09-01 — 2006-08-31

Daniel Tarschys	Professor, Stockholm University (chairman)
Gunn Johansson	Professor, Stockholm University
Maria G Masucci	Vice Dean of Research, Karolinska Institutet
Lena Borell	Professor, Karolinska Institutet
Boo Johansson	Professor, Göteborg University
Karin Renblad	Luppens Kunskapscentrum, Jönköping
Gabriel Romanus	Member of parliament
Bengt Sandin	Professor, Linköping University
Sven-Erik Wånell	Chairman, Stockholm Gerontology Research Center

Additional members:

Bengt Winblad	Professor, coordinator ARC
Laura Fratiglioni	Professor, substitute coordinator ARC
Åke Seiger	Department Chair, Neurotec, Karolinska Institutet

Secretary:

Magnus Ericson	Administrator, Board of Research, Karolinska Institutet
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Personnel

Coordinator: Bengt Winblad, professor
Vice coordinator: Laura Fratiglioni, professor
Scientific coordinator: Eva von Strauss, RN, PhD
Administration: Sofia Österman

Geriatric medicine

Senior researchers: Laura Fratiglioni, professor; Johan Fastbom, lecturer
Post doc: Hedda Agüero-Eklund, PhD; Christel Cornelius, PhD; Vesna Jelic, PhD; Miia Kivipelto, PhD; Jonny Olsson, PhD; Chengxuan Qiu, PhD; Eva von Strauss, PhD; Hui-Xin Wang, PhD; Anders Wimo, docent
PhD Students: Tiia Anttila, Anna Beckman; Barbara Caracciolo; Diana DeRonchi; Linus Jönsson; Anita Karp; Inga Klarin; Alessandra Marengoni; Gunilla Nordberg; Stephanie Paillard-Borg; Katie Palmer; Galina Passare; Margareta Westerbotn
Research assistants: Cecilia Larsson, Tora Dahlin, Annika Iyer, Zahra Shah-Shahid

Psychology

Senior researchers: Lars Bäckman, professor; Agneta Herlitz, lecturer
Post doc: Anna-Karin Berger, PhD; Cindy de Frias, PhD; Håkan Fischer, docent; Stuart MacDonald, PhD; Åke Wahlin, docent
PhD Students: Petra Dahlström; Anna Derwinger; Joachim Gavazzeni; Sari Jones; Erika Jonsson Laukka; Åsa Livner; Erik Nilsson; Jenny Rehnman

Social gerontology

Senior researchers: Mats Thorslund, professor; Marti Parker, lecturer
Post doc: Kozma Ahacic, PhD; Ingemar Kåreholt, PhD; Kristina Larsson, PhD; Carin Lennartsson, PhD
PhD Students: Neda Agahi; Bettina Meinow; Emilia Forssell
Research assistants: Stefan Andersson, Stefan Fors, Sara Hjulström, Imran Haider Syed

Database (in collaboration with Äldrecentrum)

Database managers: Maria Wahlberg, Peter Axelsson

Data input (in collaboration with Äldrecentrum)

Coordinators: Tina Kiderud, Gunilla Svanhagen (vice)
Nurses: Linda Hermansson; Emma Josefsson; Annika Lind; Cecilia Rahn
Physicians: Christel Cornelius (senior); Birger Andersson; Annika Garmén; Jelena Johnsson;
Psychologists: Maud Aminoff Fyring; Tiina Carlstedt (pt); Ingemar Karlsson (pt); Maria Larsson (pt)
Research assistant: Weihua Liu

Information (in collaboration with Äldrecentrum)

Information manager: Inger Raune
Librarian: Carl-Erik Olsson (retired April, 2004)

Research

ARC carries out epidemiological studies on different health related aspects of brain aging and the elderly. New projects have been initiated using a more experimental study design. Below follows a summary of our available projects and databases.

Our longitudinal data bases

PROJECT AND WEBSITE	-- 1999	2004
<p><i>Project leader</i></p> <p>The Kungsholmen Project www.neurotec.ki.se/doge/kungsholmen/ <i>Bengt Winblad</i></p> 	<p>A cohort of 1,810 persons, who were 75+ years old living in a central area in Stockholm, was clinically examined at five occasions during 1987-2000.</p> <p>Since 1995, the project was expanded to include a rural elderly population (Nordanstig). At baseline, 919 people aged 75+ years participated. The 1st follow/up ended in year 2001.</p>	<p>Thirty PhD theses have been written using data from the project and much data remain to be analysed.</p> <p>Most of the research within ARC that has been ongoing during 2004 has been conducted using data from this project.</p> <p>A code book can be downloaded from the home page.</p>
<p>SWEOLD www.sweold.se <i>Mats Thorslund</i></p> 	<p>SWEOLD I & II Nationally representative samples of 550 persons (77+ years) were interviewed in 1992 and 2003. Both samples are based on a panel study of 6,000 persons that began in 1968 and focused on socio-economic status, function, and social relations. Most subjects were re-interviewed at later waves of the survey: 1974, 1981, or 1991.</p> <p>A codebook is now available online that includes the questionnaire and frequencies for most variables.</p>	<p>SWEOLD III was carried out from Sept 2004 to March 2005; a nationally representative sample of persons aged 69+ (n=1351, response 87.2%) originating from the Level of Living Survey. Structured telephone interviews were made of ½ hour each. Interviews were recorded corresponding to 400 hours; 15.5% were proxy interviews. The design of SWEOLD III follows the earlier studies with adjustments to suit the telephone situation.</p>
<p>SNACK population study www.aldrecentrum.se/snack/ <i>Laura Fratiglioni</i></p>  	<p>The study is part of the Swedish National study on Aging and Care (SNAC) promoted by the Ministry of Health and Social Affairs.</p> <p>Special focus is given to brain aging research, service and care of the elderly. Data collection consists of an interview by a nurse, and a medical and a psychological assessment (2 hours each).</p> <p>All subjects are 60+ years old and living in a central area in Stockholm.</p>	<p>Baseline data collection ended in August 2004, and 3,363 persons participated. Of these, 552 underwent magnetic resonance imaging (MRI), and 400 Electro-Encephalography (EEG) examinations. The 1st follow-up started in November 2004.</p> <p>To increase reliability and efficiency for the computerisation of the data, we have adopted a scanning procedure of the questionnaires.</p> <p>Furthermore, all variables have been organised in a code book which basically follows the structure of the database and provides an easy overview of possible combinations of data. The book can be downloaded from the home page.</p>

Project with experimental design

PROJECT AND WEBSITE <i>Project leader</i>	-- 1999	2004
<p>Brain imaging <i>Lars Bäckman and Håkan Fischer</i></p> 	<p>Using fMRI, we study the neural basis of cognitive and emotional aging. PET is also used to determine the influence of age-related changes in dopamine functions on age-related cognitive changes. The project is a collaboration with the Dept of Psychiatry and the MRI-center at KI.</p>	<p>A combination of fMRI and dopamine imaging is used in ongoing studies, in order to elucidate the chain of events that progresses from neuromodulation through blood flow to cognitive performance.</p>

Other major collaborative projects

PROJECT AND WEBSITE <i>Project leader</i>	START	2004
<p>The Betula Project www.psychology.su.se <i>Lars-Göran Nilsson</i></p> 	<p>A sample of 3,500 persons aged 35-80 years living in Umeå, Northern Sweden, has been assessed at four occasions since 1988 with regard to multiple cognitive, biological, and social variables.</p>	<p>A fourth follow-up started in 2003 and will be finished in 2005. Several articles have been published on how memory functioning and health status change in adulthood and aging.</p>
<p>HARMONY www.mep.ki.se <i>Margaret Gatz and Nancy Pedersen</i></p> 	<p>This project studies genetic and non-genetic risk factors for dementia. At baseline 14 435 twins underwent a screening test, and 1,569 persons were suspected to have cognitive impairment. Of them, 620 persons received a diagnosis of dementia. ARC, in collaboration with the University of Gothenburg, is responsible for the clinical examinations and diagnoses.</p>	<p>During 2003-2004, all dementia diagnoses were completed. A longitudinal examination for the questionable dementia cases was implemented. A first report including the study design and description of the demented cases has been published.</p>
<p>The dementia project – SBU www.sbu.se <i>The Swedish Council on Technology Assessment in Health Care</i></p> 	<p>The aim is to provide a scientific overview of dementing disorders by compiling a systematic review of established knowledge. Experts from the Nordic countries have been invited to participate.</p> <p>Responsible at ARC are: Laura Fratiglioni, Eva von Strauss, Johan Fastbom, Miia Kivipelto, Hedda Agüero-Torres, and Anders Wimo.</p>	<p>ARC has developed a computerised evaluation tool, that has been organised as a teaching activity for PhD students. During 2002-2004 over 900 scientific papers were evaluated on occurrence, risk factors and consequences (institutionalisation and mortality) of dementia, as well as drug use and health economy.</p>

Main research results

All of the results during 2004 are presented in detail in the 2004 Annual Report, which can be downloaded as a PDF from ARC's homepage. A short summary is given below.

Geriatric medicine

The research activities have followed four major research lines: 1) Prevention of dementia; 2) Mild cognitive impairment; 3) Disability and multimorbidity; 4) Use of drugs; and 5) Health economy. Major findings in each of the research lines are the following:

1. Prevention of dementia

- a. It has been already shown by our project and by others that high blood pressure is a risk factor for dementia. However, the relation of blood pressure to dementia and AD is much more complicated. In a longitudinal study we found that not only high blood pressure but even low diastolic blood pressure was associated with increased risk of dementia. The direction of causality remains unclear, as dementia pathology may lower blood pressure even some years before diagnosis (*Qiu et al, Arch Neurol, 2003*). To further explore this topic, we carried out a study examining blood pressure changes in 6 year long follow-up. We found that 1) the dementia-related decline in blood pressure was evident only 3 years before dementia diagnosis, and continued to decline thereafter; and 2) that clinically significant decline in systolic pressure over 6 to 3 years before diagnosis was predictive of AD and dementia mainly among older adults who initially had systolic pressure <160 mm Hg or had been affected by vascular disorders such as stroke and diabetes mellitus (*Qiu et al, Stroke, 2004*).
- b. The risk effect of APOE e4 allele for AD is in large agreement, whereas the putative protective effect of the e2 remains in debate. By analyzing data from the Kungsholmen Project, we concluded that APOE genotype-specific effects on AD vary by age and sex, in which the e4 allele has a stronger risk effect in men, and the e2 allele confers protection against the disease only in the younger-old persons (*Qiu et al, J Neurol Neurosurg Psych, 2004*).
- c. It has been consistently reported that subjects with low education are at a higher risk to develop dementia and Alzheimer's disease. We tried to verify whether this association was due to factors related to lower socio-economic status. An increased risk of dementia was found in subjects with only elementary schooling independently of their occupation-based socio-economic status or socio-economic mobility during life. These findings suggest that factors operating during the first two decades of life are relevant for the development of dementia in late life (*Karp et al, Am J Epidemiol, 2004*).
- d. Extremely-low-frequency magnetic field (ELF-MF) exposure is suspected to increase the risk of Alzheimer's disease. Such fields are present in the vicinity of electrical motors and other electric appliances containing coils: We explored this possible association within the Kungsholmen Project, and found that long-term occupational exposure to a higher ELF-MF level may increase the risk of Alzheimer's disease and dementia in men. Similar patterns were not seen in women, which may in part be due to a greater exposure misclassification in women than in men (*Qiu et al, Epidemiology, 2004*).
- e. From the Study of Dementia in Swedish Twins (known as HARMONY), we reported that concordance rates for Alzheimer's disease were 59% for monozygotic twins, 32% for like-sexed, and 24% for unlike-sexed dizygotic twins. Among monozygotic twins where both twins had Alzheimer's disease, the within pair difference in age of onset ranged from both becoming demented in the same year to 7 years difference in onset (*Gatz et al, J Neurobiol Aging, 2004*).
- f. To support previous results from our group, a systematic review of the literature concerning

the effect of social network, physical leisure, and non-physical activity on cognition and dementia was carried out. For all three lifestyle components (social, mental, and physical), a beneficial effect on cognition and a protective effect against dementia are suggested. Taking into account the accumulated evidence and the biological plausibility of these hypotheses, we conclude that an active and socially integrated lifestyle in late life protects against dementia and AD (*Fratiglioni et al, Lancet Neurology, 2004*).

2. *Mild cognitive impairment*

A Symposium was held in Stockholm, Sweden, 2-5 September 2003, with the aim to integrate clinical and epidemiological perspectives on the topic of Mild Cognitive Impairment (MCI). Agreement on new perspectives, as well as recommendations for management and future research on MCI were discussed by the international working group (*Winblad et al, J Intern Med, 2004*).

3. *Disability and comorbidity*

Functional disability after acute hospitalization is highly prevalent in geriatric patients. Depressive symptoms, comorbidity, and cognitive impairment often coexist, interact and are differentially associated with function depending on age. Considering that depressive symptoms are a modifiable problem, their detection in hospital settings may help clinicians in targeting subjects at high risk of functional disability (*Marengoni et al, Int J Geriatr Psychiatry 2004*).

4. *Use of drugs*

a. A project at the National Board of Health and Welfare (government assignment, project leader Johan Fastbom) with the purpose of examining the routines for follow-up of drug prescriptions in the elderly, was conducted and published in 2004. The results show, among others, that the newly published national quality indicators are well known throughout the country and often employed in for example drug utilisation reviews. In the report (*Socialstyrelsen 2004-103-19*) a number of additional measures to improve drug use in the elderly are suggested, including changes in legislation.

b. A study of drug use and levels of glycosylated hemoglobin (HbA1c) in the 2nd follow-up of the Kungsholmen project, showed that loop diuretics may have hyperglycemic effects in the very elderly. This finding can be of clinical importance as loop diuretics are among the most commonly taken drugs in this population. There are for instance studies that describe higher incidence of coronary artery disease with asymptomatic glucose intolerance. Use of loop diuretics has also been found to aggravate diabetes in patients with known glucose intolerance (*Passare et al., European Journal of Clinical Pharmacology 2004*).

5. *Health economy*

Informal and formal care was examined using the RUD (Resource Utilization in Dementia) instrument. The amount of informal care was much greater than formal care and also greater among demented than non-demented. The ratios between demented and non-demented persons were 10:1 for formal care and 14.5:1 for informal care, respectively. Tobit regression analyses showed a clear association between the number of hours of informal and formal care and cognitive decline although this pattern was much stronger for informal than formal care, indicating that informal care substitute rather than compliment formal care. (*Nordberg et al, Int J Geriatr Psychiatry, In press*).

Psychology

Research activities during 2004 have been pursued along four major lines: 1) Cognitive functioning in normal and pathological aging; 2) Sex differences in cognition; and 3) Neural correlates of cognitive aging; and 4) Cognitive intervention.

Lars Bäckman and Agneta Herlitz have been visiting scientists at the Max Planck Institute for Human Development in Berlin, Germany during the fall of 2004.

1. Cognitive functioning

- a. Longitudinal data demonstrate that the onset of decline of episodic memory occurs later in adulthood than what has been inferred from cross-sectional data, and that semantic memory may show increments from early to middle adulthood (Rönnlund *et al*, *Psychology and Aging*, *in press*).
- b. Meta-analytic evidence indicates that apolipoprotein E status affects cognitive functioning in non-demented persons relatively little (Small *et al*, *Psychology and Aging*, 2004), and it did not modify rate of cognitive change during the transition from preclinical to clinical AD in a six-year longitudinal study (Bunce *et al*, *Neurology*, 2004).
- c. Although the role of episodic memory as an early harbinger of AD and dementia has been substantiated (Bäckman & Small, *Physiology and Behavior*, 2005), a meta-analysis indicates that the size of the preclinical cognitive impairment in AD is similar magnitude for executive functioning and perceptual speed (Bäckman *et al*, *Neuropsychology*, *in press*).
- d. The notion of a preclinical period in vascular dementia has received further support (Jonsson Laukka *et al*, *Stroke*, 2004). In addition, tests of category fluency appear to be particularly effective in differentiating AD from VaD cases in the preclinical phase, the future AD cases exhibiting larger deficits than the future VaD cases (Jones *et al*, *Cortex*, *in press*).

2. Sex differences in cognition

- a. We have provided further evidence that women outperform men in episodic memory tasks (Maitland *et al*, *Memory & Cognition*, 2004). These differences are stable over a 10-year period, and are of similar magnitude for 35-year olds as they are for 85-year olds, demonstrating that age does not moderate sex differences in cognitive functions (de Frias *et al*, *Aging Neuropsychology and Cognition*, *in press*).
- b. With regard to hormone research, we have found a positive relationship between estrogen and episodic memory performance in healthy postmenopausal women who are under hormone replacement therapy (Yonker *et al*, *Aging, Aging Neuropsychology and Cognition*, *in press*).
- c. A functional imaging study showed that men activated the visual cortex and the anterior cingulate more than women when exposed to pictures of angry or fearful men, possibly reflecting enhanced vigilance in a potentially dangerous situation (Fischer *et al*, *Cognitive, Affective, and Behavioral Neuroscience*, 2004).

3. Brain correlates of cognitive aging

- a. Our functional imaging work demonstrates that young and older adults may activate partly different brain regions during emotional processing; in particular, when confronted with emotionally laden stimuli, there seems to be a shift in activation from limbic to neocortical regions with advancing age (Fisher *et al*, *Neuroscience Letters*, *in press*).
- b. New PET evidence on the role of dopamine functions for age-related cognitive deficits indicates that a presynaptic marker of dopaminergic neurotransmission accounts for a major portion of the age-related variation in tasks assessing episodic memory and executive functioning (Erixon-Linderöth *et al*, *Psychiatry Research: Neuroimaging*, *in press*). In a review article,

the correlative triad of aging, dopamine, and cognition is scrutinized and several promising areas of future research are identified (Bäckman et al, *Neuroscience and Biobehavioral Reviews*, in press).

4. Cognitive intervention

- a. Findings indicate that training in self-generated strategies may be more effective than traditional mnemonic training in skill maintenance for encoding and retrieving PIN-codes over an eight-month follow-up period among older adults (Derwinger et al, *Neuropsychological Rehabilitation*, 2005). A novel result is that self-generated strategy training may also result in less forgetting of learned information over the same time period (Derwinger et al, *Gerontology*, 2005).
- b. Older persons who can and cannot utilize mnemonic strategies to improve memory are differentiated primarily on the basis of their performance on tasks requiring associative binding. This difference was linked to lower hippocampal activity during encoding on the part of the less successful older adults (Jones et al, *Neuroscience and Biobehavioral Reviews*, in press).

Social gerontology

Research activities during 2004 have been conducted in the following areas: 1) Health trends among the oldest old; 2) Changes in population health; 3) Utilization of eldercare services; and 4) Financial transfers between generations.

1. Health among the oldest old

- a. Comparisons between the 1992 and 2002 waves of SWEOLD show very little improvements over time in health or function. Most of the indicators showed worsening or unchanged levels of health and function during this time period. Objective measures, such as peak expiratory flow, showed worsening health, while ADL showed no significant change. Contrary to earlier Swedish and international results showing improvements in health among elderly people, the SWEOLD data seem to indicate a worsening of health among the oldest portion of the population during this time period (Thorslund et al, *Läkartidningen*, 2004; Parker, Ahacic & Thorslund, *J of Gerontology: Medical Sciences*, in press). Recent results show that the decline in health is not due to reporting differences or changes in aspiration level. The reported differences are not due to changes in age and/or sex composition, different smoking habits, drinking habits, change in economic resources, nervous and sleeping problems, earlier work situation, socioeconomic situation, non-response rate or study design.
- b. Despite the lack of improvement in health, the proportion of elderly people who participate in leisure time activities has increased during this decade. Visits to restaurants and cultural activities have increased significantly. This could be due to increased accessibility. Or it could be that later cohorts are more used to these activities.
- c. The ability of elderly Swedes to manage their medicines was analysed with five tests included in SWEOLD 2002. The tests included cognitive and physical function abilities related to managing medicine. Over half the persons taking the tests could not do at least one of the tests. Among people living at home alone, one third failed one or more of the tests. As many people could not even take the tests due to poor vision or cognition, these rates must be considered an underestimation of potential problems in medication management (Beckman, Parker, & Thorslund, *Patient Education and Counseling*. In press).

2. *Changes in population health*

A study examined possible explanations for the improvement in population mobility and other health variables from 1974. Rather than an actual improvement in mobility in comparable groups, the changes in the labour market and social structure, i.e., the increased proportion of women in employment and the increased proportion of white-collar workers seem to account for the major part of the improvement in mobility.

3. *Utilization of eldercare services*

A study of the Kungsholmen population has examined predictors of public home help utilization, particularly mental health problems such as dementia and depressive symptoms. The study showed that among community-dwelling elderly persons residing alone, the public eldercare targeted individuals with extensive needs: dementia, functional impairments, and need of help with IADLs. Depressive symptoms, however, were not related to use of home help among highly educated persons. Among persons with lower levels of education, depressive symptoms reduced the odds of receiving help. Improvement of screening activities for public home help needs of community-dwelling elders might facilitate better targeting of limited social resources to the most needy (*Larsson et al*, *Journal of Aging and Health* 2004; 16(5):641-68).

4. *Financial transfer between generations in Sweden*

What is the extent and nature of financial transfers in Sweden, measured as financial support by means of relatively large money transactions or gifts between generations over a twelve-month period. Is there a net downward flow in the Swedish welfare state and if so, are there differences according to gender and social class? Results show that almost all intergenerational transfers are downward, from older generations to younger ones. Results reveal clear class and income gradients: both giving and receiving are more common in higher social strata. We also find a gender gradient among unmarried (single) recipients, whereby unmarried females more often receive financial support than unmarried males.

Other research activities

Our activities during the year 2004 include the successful publication of 87 articles in peer reviewed journals. Many of these articles were published in highly respected outlets. Furthermore, 15 book chapters, and 3 reports have been published from our group. For a complete Publication List of ARC, see our homepage (www.ki-su-arc.se). Furthermore, 5 doctoral thesis and 3 half time seminars have been carried out.

PhD students

During the year three new research students have been registered (*Barbara Caracciolo, Petra Dahlström, and Joachim Gavazzeni*).

Three of our students have carried out their half-time examinations and five students have completed and defended their PhD theses.

Half time seminars:

- *Tiia Anttila*: "The effects and interactions of social and life style related factors and apoE on dementia", August 27. Main supervisor: Miia Kivipelto
- *Erik Nilsson*: "Aging, diabetes and cognitive functioning - correlates and selective effects", November 12. Main supervisor: Åke Wahlin
- *Alessandra Marengoni*: "Comorbidity in the elderly", December 1. Main supervisor: Laura Fratiglioni

Dissertations:

- *Chengxuan Qiu*: "The relation of blood pressure to dementia in the elderly. A community-based longitudinal study", January 30. Main supervisor: Laura Fratiglioni
- *Christel Cornelius*: "Drug use in the elderly. Risk or protection? Findings from the Kungsholmen Project", March 19. Main supervisor: Matti Viitanen
- *Anna-Karin Berger*: "Occurrence and influence on cognitive functioning in aging and Alzheimer's disease", May 7. Main supervisor: Lars Bäckman
- *Kristina Larsson*: "According to need? Predicting use of formal and informal care in a Swedish urban elderly population", May 14. Main supervisor: Mats Thorslund
- *Katie Palmer*: "Early detection of Alzheimer's disease and dementia in the general population. Results from the Kungsholmen Project", September 29. Main supervisor: Laura Fratiglioni

Three students from Stockholm University have been doing their research training with us: *Stefan Andersson, Stefan Fors, and Sara Hjulström*

Post doc

One new post doc position, *Hui-Xin Wang*, from April 1.

We have had two post docs from abroad: Cindy de Frias and Stuart MacDonald from Canada, and one post doc from Sweden: Jonny Olson.

One of our post docs passed the teaching lecture for Docentur and became associate professors:

- *Åke Wahlin*: Aging and individual differences in health and cognition, January 12. Docentur in cognitive psychology.

Education

Undergraduate education

- Cognition - First level. A five-point credit course in basic psychology given twice a year at the Department of Psychology, Stockholm University. Course leader: *Agneta Herlitz*
- Cognition - Second level. A five-point credit course in psychology given twice a year at the Department of Psychology, Stockholm University. Course leader: *Åke Wahlin*
- Elderly and medication. Undergraduate course for nurses and medical students, at the School of Health Sciences, and Karolinska Institutet. Course leader: *Johan Fastbom*

Courses

- Läkemedelsuniversitetet. Kurs om äldre och läkemedel för medarbetare i den kommunala äldreomsorgen. www.fass.se Course leaders: *Johan Fastbom and Anna Beckman*

Postgraduate courses

- “Aging and cognition: Biological changes and individual differences.” Course leader: *Håkan Fischer*
- “Statistical Worksoop”. Course leaders: *Stuart MacDonald and Ingemar Kåreholt, Cindy de Frias and Maria Wahlberg*
- Postgraduate course in Alzheimer’s disease, Huddinge University Hospital. *Laura Fratiglioni, Miia Kivipelto, and Bengt Winblad*

Weekly seminars

Thirty-two seminars have been carried out in collaboration with Äldrecentrum (Thursday mornings between 9-10). The seminars are announced in KI’s local paper, and open for people from outside ARC. Both senior researchers and PhD-students are invited as lecturers. These seminars provide opportunities for scientific discussions and contacts with researchers from different areas which can lead to future collaboration. Organizers: *Johan Fastbom, Agneta Herlitz, Håkan Fischer, and Marti Parker*

”Brain storm”- meeting

On February 23, we had our third “Brain storm-meeting” where researchers get together over a glass of wine and discuss current concepts and strategies for research in specific areas. This time the topic was “Temporal variations of health”. Organizers: *Anna-Karin Berger, and Johan Fastbom*

Evidence-based scientific assessment

Teaching students how to apply evidence-based methods in dementia research and invention of a computerized evaluation tool. Responsible: *Laura Fratiglioni, Eva von Strauss and Miia Kivipelto*

For the general public

Äldrecentrum in cooperation with ABF, Vuxenskolan, PRO and SPF, are giving a series of seminars for the general public on the topic of aging, health and cognition. Senior researchers from ARC are invited as speakers.

COLLABORATION

Guest researchers

During 2004 we have had six guest researchers visiting ARC: 1 from China, 3 from Italy, and 2 from USA.

- *Wei-Li Xu*, MD, Tianjin Medical University, Tianjin (whole year)
- *Anna-Rita Atti*, MD, University of Ferrara, Italy (one month).
- *Francesca Mangialasche*, MD, Perugia University, Italy (two weeks).
- *Roberto Monastero*, MD in neurology, University of Palermo, Sicily, Italy (March - June).
- *Merril Silverstein*, associate professor in gerontology and sociology at the University of Southern California (May-June).
- *Ross Andel*, assistant professor, School of Aging Studies, University of South Florida, USA (May, three weeks)

In addition, Lars Bäckman and Agneta Herlitz have been visiting scientists at the Max Planck Institute for Human Development in Berlin, Germany during the fall of 2004.

National collaboration

Äldrecentrum (Stockholm Gerontology Research Center)

ARC's closest collaborator is Äldrecentrum, which is located in the same building. Most of ARC's senior researchers have previously worked at Äldrecentrum and maintain their collaborations there. Main areas of collaboration:

- Äldrecentrum has developed a close relationship with various national and local authorities, pensioners' organizations, as well as with medical and social services, and personnel working with elderly people. Therefore, Äldrecentrum has been instrumental in helping ARC disperse its research findings to the community and to decision-makers.
- Inger Raune, Äldrecentrum's journalist and editor of the magazine, *Äldre i Centrum*, works closely with ARC researchers in an effort to make their work accessible to a wide audience. She is also responsible for press conferences and journalist seminars.
- ARC shares a specialist scientific library with Äldrecentrum, which includes journals, literature and reports on gerontology, neurology, caring and other aging related topics.
- ARC and Äldrecentrum share many joint projects, such as the Kungholmen Project, SNACK, as well as organize courses and prepare reports jointly for relevant organisations.

The Institute for the Study of Ageing and Later Life (ISAL)

Beginning in 2003, we have taken the initiative to invite researchers from ISAL as lecturers to the weekly seminars at ARC. During 2004, *Dennis Maciuszek*, PhD student from ISAL, spoke about his research on "Virtual companions for later life".

Furthermore, the director of ARC, *Bengt Winblad*, is a member in the Board of ISAL, and *Bengt Sandin* from ISAL is a member in the Board of ARC.

University Departments

Geriatric Units in the Department of Neurotec, Karolinska Institutet; Department of Medical Epidemiology and Biostatistics, Karolinska Institutet; The Institute of Environmental Medicine, Karolinska Institutet; MR Center, Karolinska Institutet; Department of Psychology, Stockholm University; Department of Psychology, Umeå University; Center for Health Equity Studies (CHESS), Stockholm University; The Swedish Institute for Social Research (SOFI), Stockholm University; Department of Pharmacology, Göteborg University; Department of Social Work, Stockholm University; Department of Gerontology, School of Health Sciences, Jönköping University; The Institute for the Study of Ageing & Later Life (ISAL), Linköping University; The University of Gävle.

National Institutions

National Board of Health and Welfare; National Corporation of Swedish Pharmacies; The National Institute of Public Health; The Swedish Handicap Institute; Läksak – Regional drug and Therapeutics committee in Stockholm; Stockholm county council.

International collaboration

EU projects

- Invited experts in The European Forum on Population Ageing Research, a project funded by the European Commission's Framework 5 Research Program.
- Primary Health-care in Later Life (PHILL), collaboration between Bangladesh, Sweden and Vietnam

Institutes

National Public Health Institute, Helsinki, Finland; Norwegian Social Research (NOVA), Oslo, Norway.

Universities in Europe

Department of Psychiatry, University of Antwerp, Belgium; Department of Neuroscience and Neurology, University of Kuopio, Finland; University of Montpellier, France; Max Planck Institute for Human Development, Berlin, Germany; Department of Psychiatry, University of Bologna, Italy; Department of Geriatrics, University of Brescia, Ferrara, and Perugia, Italy; Department of Neurology, University of Palermo, Italy

Universities outside Europe

Department of Psychology, University of Alberta, Canada; Rothman Research Institute in Toronto, Canada; Department of Psychology, University of Tampa, USA; Andrus Gerontology Center, University of Southern California, USA; Department of Psychology, Australian University, Canberra; National University of Singapore.

Conferences

We have been organizers of the following international conferences:

- Brain-behavior dynamics across the life-span. International conference at Döllnsee-Schorfeide, Germany, September 21-25. *Lars Bäckman*
- International workshop on cognitive aging, 24-26 June in Castiglione della Pescaia, Italy. *Lars Bäckman*

National and international conference attendance:

Data have been presented and discussed at both national and international conferences. Researchers from ARC have visited several conferences and had both oral and poster presentations during 2004.

Information

Open House, February 10

Äldrecentrum and ARC collaborated to organize a daylong open house at The House of Aging Research with lectures, demonstrations, and video presentations. Invitations were sent to our financiers, politicians, administrators, and persons working with elderly people in medical and social services. The event was very well attended with an estimated 350 participants.



The Chairs of ARC (Daniel Tarschys) and ÄC (Margareta Olofsson) tied two ribbons together, symbolizing the unification of the two centers.

Journalist seminars: Two press conferences have been carried out where invited journalists could meet with one of our research leaders at each session; *Miia Kivipelto*, “Estrogen – black or white?” (Östrogen – svart eller vitt?), March 8; and *Ulla Gurner*, “Conductor missing” (Dirigent saknas), May 12. Organiser: *Inger Raune*

Media: Information about our research has been provided to the public on several occasions through the media (TV, newspapers and magazines).

Website: Our website can be reached via www.ki-su-arc.se, and includes Activity Reports and Annual Reports for each year, and can be printed as PDF-files. The website also includes links to our longitudinal studies, with information on design, code books, publications etc.



Social events

The Friday ‘fika’; every Friday at 14.30 everyone working in the House of Aging Research is invited to coffee and cake on the 3rd floor.

SNAC-K baseline



On June 16 we celebrated the completion of the SNAC-K baseline data collection with a party on the third floor terrace.

Christmas lunch & Lucia



On December 13 all staff in the House of Aging Research, the Boards of ARC and Äldrecentrum, were invited for a combined Christmas lunch and “Luciatåg” on the 3rd floor at ARC (see pictures). All together we were 80 persons eating and having a good time.



Other

A donation by Greta Barthelsson, a former participant to the Kungsholmen Project, has enabled Äldrecentrum to award graduate students who have completed their half-time examination or defended their thesis using data from the Project. During 2004 four students were awarded 5 000 SEK each for having passed their half-time examination (*Anita Karp, Inga Klarin, Kristina Larsson and Jan Nilsson*), and five students were awarded 10 000 SEK each for having defended their thesis (*Christel Cornelius, Anna-Karin Berger, Kristina Larsson, Katie Palmer and Chengxuan Qiu*).

External financing

Grants from FAS cover the operational costs and the salaries for senior researchers. Grants from KI and SU are used to maintain and update our large databases, and provide salaries for post docs and some PhD Students. The large research grants, which are reported below, make it possible for us to employ PhD students and carry out research to the standard that is necessary to maintain our position as a national center of excellence.

Institution	Title and Project leader	Period	Amount (SEK)
Swedish Council for Working Life and Social Research (FAS)	"Cognitive and physical functioning in old age" <i>Lars Bäckman, Laura Fratiglioni</i>	2003-2005	3 900 000
The Swedish Research Council (VR)	"Brain and memory in aging and dementia" <i>Lars Bäckman</i>	2002-2004	1 100 000
The Bank of Sweden Tercentenary Foundation	"Cognitive aging: The role of dopamine functions" <i>Lars Bäckman</i>	2003-2005	3 400 000
The Bank of Sweden Tercentenary Foundation	"Cognitive aging" <i>Lars Bäckman</i>	2003-2005	1 000 000
The Swedish Research Council (VR)	"Study of age and sex differences in the neuronal underpinnings of emotion" <i>Håkan Fischer</i>	2002-2006	2 500 000
The Swedish Research Council (VR)	"Brain imaging" <i>Håkan Fischer</i>	2005-2007	1 500 000
The Swedish Research Council (VR), longitudinal studies	"SNAC in Kungsholmen" <i>Laura Fratiglioni</i>	2001-2004	4 400 000
The Swedish Research Council (VR), Medicine	"The relationship between blood pressure, cognitive impairment and dementia in aging" <i>Laura Fratiglioni</i>	2002-2004	640 000
Swedish Council for Working Life and Social Research (FAS)	"Psychosocial factors in relation to cognitive disturbances and dementia in the elderly" <i>Laura Fratiglioni</i>	2004-2007	2 300 000
		2005-2006	900 000
The Swedish Research Council (VR)	"Sex differences in cognitive functions: the impact of age, education, and cultural setting" <i>Agneta Herlitz</i>	2004	420 000
		2005	695 000
		2006	430 000

Swedish Council for Working Life and Social Research (FAS)	“How have the living conditions for the elderly (77+) changed during 1992-2002?” <i>Ingemar Kåreholt</i>	2003 2004	600 000 600 000
Swedish Council for Working Life and Social Research (FAS)	“Social similarities and intergenerational relations (Social likhet och intergenerativa relationer)” <i>Carin Lennartsson</i>	2001 2002 (extended to 12-2005)	571 000 586 000
Swedish Council for Working Life and Social Research (FAS)	“Understanding and measuring disability in the aging population” <i>Marti Parker</i>	2004 2005	800 000 700 000
Stockholm County Council’s Research Programme “Arts in Hospital and Care as Culture” (Kultur i vården och vården som kultur)	“Staying active (Aktiv hela livet)” <i>Marti Parker</i>	2004 2005	150 000 160 000
Swedish Council for Working Life and Social Research (FAS)	“Formal and informal care among elderly people” <i>Mats Thorslund</i>	2002 2003 2004	130 000 260 000 130 000
Swedish Council for Working Life and Social Research (FAS)	“The development of diversity and inequalities among the oldest old” <i>Mats Thorslund</i>	2003 2004 2005	1 300 000 1 300 000 1 300 000
The Swedish Research Council (VR)	“Health, disease and cognitive aging” <i>Åke Wahlin</i>	2003-2005	800 000
The Swedish Research Council (VR), longitudinal studies	“The Kungsholmen Project database on aging and dementia. Maintenance of the 13 years long database” <i>Bengt Winblad, Laura Fratiglioni</i>	2003-2005	1 300 000
The American Alzheimer Association	“Exploring the hypothesis that an active life and rigorous health control in late-life decrease the risk of Alzheimer’s disease and dementia” <i>Bengt Winblad, Laura Fratiglioni</i>	2004-2006	USD 221 000

Other funding

Karolinska Institutet, Anna-Karin Berger, Erika Jonsson Laukka, Tiia Antilla, graduate position, six months each

The Foundation for Geriatric Diseases at Karolinska Institutet, Eva von Strauss (75 000 kr)

Solstickan, Gunilla Nordberg, 3-months scholarship

Swedish Council for Working Life and Social Research (FAS), travel grants

The Vårdal Institute, Neda Agahi, graduate student position, half-time

Loo & Hans Osterman, Miia Kivipelto (75 000 kr), Eva von Strauss (75 000 kr), Chengxuan Qiu, 1 year post doc

Activities planned for 2005

The goals for 2005 are summarized in the following points:

Organisation

- Number one activity will be to find new premises where all staff working in the House of Aging Research can be together!
- To establish a creative and active network among the post docs and the students by implementing special meetings and social events.
- To promote better health at work by supporting physical and relaxing activities.

New collaborations

New collaborations are planned with the Center for Lifespan Psychology, Max Planck Institute for Human Development, Berlin, Germany.

Education

- To create a research education program that includes four one-week courses in epidemiology, pharmacology, social gerontology and cognition.
- Weekly seminars in collaboration with Äldrecentrum, and practice seminars for half time examinations and disputations.
- Continuation of our "Brain-Storm" meetings at ARC on the subject "Frailty in the elderly"; organisers: *Marti Parker, Hui-Xin Wang, and Åke Wahlin.*
- To create "International Forum" inviting international speakers or various research topics; organisers: *Zarina N Kabir, Stuart MacDonald, Chengxuan Qiu, and Eva von Strauss*

Information

- To continue the seminars where invited journalists meet with researchers on a specific topic.

Research

- Four disputations are planned for the spring of 2005 and one for the autumn. At least three half-time examinations will also be carried out.
- Planned projects within the Pharmacoepidemiology research group: 1) Finalise the database for drug use in SNAC-K baseline; 2) A collaboration with Beställaravdelning Stockholm (BAST) at Stockholm County Council, initiating education and instruments for drug utilisation reviews; 3) Evaluating drug use at Hökarängens "Närvårdscentral", in collaboration with ÄC; 4) A collaborative project between ÄC and the Stockholm County Council auditors, examining drug use in elderly with multiple diseases; and 5) Participating in a EBM-project on drug use in the elderly at SBU.
- Data collection for the SNACK project 1st follow-up will continue.
- Data analysis and reporting of results to the research community and the public will continue as before in 11 main research areas:

Dementia: risk factors, early detection, and natural history	Cognitive aging	Health economics
Pharmacoepidemiology in the elderly	Gender differences in cognition	Well-being in the elderly
Functional decline in the elderly	Health and cognitive functioning in the elderly	International aging research
	Brain imaging in emotion and cognition	Formal/informal care

Finances

- Applications will be sent to the major Swedish research councils.
- Strategies for receiving donations from companies and private person will be implemented.
- Possibilities to obtain financing from abroad will be investigated.