Annual Report 2019

LIFE COURSE EPIDEMIOLOGY OF CHRONIC COMMON DISEASES

WWW.EPIDEMIOLOGYGRONINGEN.NL

umcg

Preface

June 10, 2020

Dear colleagues and research friends,

This is the 2019 Annual Report of the Department of Epidemiology, University Medical Center Groningen, the Netherlands.

2019 was an eventful year for the department, with the Dutch Congress of Epidemiology held in Groningen, the audit of our training program for advanced epidemiologists, and the relocation of the department to another building.

Beside these major events, there were all the usual activities: the staff, postdocs, PhD and Masters students all performed their regular work in an excellent manner, leading to a large number of high quality publications, 14 successful PhD graduations, and several courses being taught at Bachelor, Master and PhD level.

We have continued to incorporate co-morbidity and multi-morbidities as research themes into our current and planned projects. This goal fits perfectly into the UMCG's broader perspective on healthy aging and with the department's wide-ranging epidemiological expertise on common chronic diseases and their risks factors.

I hope you will enjoy reading about our work by clicking on links in the report and thereby gaining an interactive experience as you scroll through it. I look forward to hearing from you and discussing possible collaborations with our department and its enthusiastic and expert members.

Best wishes,

Prof. Marike Boezen
Head of department

Contents

Summary and highlights of 2019

2019 was an eventful year for the department, with a major congress held in Groningen, an audit by a visitation committee, and a relocation to another building.

We organized the annual Dutch Congress of Epidemiology at the UMCG, 13-14 June, welcoming nearly 300 national and international participants. The theme of the congress was *Healthy Aging*, with six excellent keynote lectures related to this broad theme. Additionally, 72 talks and 113 posters led to many lively discussions, and four master classes offered deeper insights into specific themes. The four pre-conference courses held on June 12 were also well attended with great enthusiasm. The three-day event was, of course, topped-off by a lively social program, with good food and company.

One of the keynote lecturers at the congress was George Davey Smith MA MD MSc, who was appointed a UMCG Distinguished Visiting Professor 2019 in our department. He visited the department again in October to give two workshops and a lecture and meet with a large number of researchers from within and outside the department. They picked his brains on many topics, including methodological issues and future research collaborations.

In November, we were audited by the Visitation Committee of the Netherlands Epidemiological Society, which reviewed our training program for Advanced Epidemiologists (Senior Epidemiologist, PhD level). The committee was very positive about our program and we passed the audit with flying colors, resulting in the official recognition of our Advanced Epidemiologists training program.

Finally, we had to relocate to another building in December. This was a major upheaval, since our new, flexible environment is based on the concept of activity-related

workplaces. This means we have no fixed workplaces or desks and have adopted ‘paperless’ working. In practice, it meant we had to change and adapt to different working conditions, whispering on the work floor, and digitizing much of our archive before the move.

Despite being distracted by all these major events, our research in 2019 led to 286 peer-reviewed publications, maintaining our high scientific and societal qualities. In addition, we had over 50 PhD students working in the Department of Epidemiology, and 14 of them successfully defended their PhD thesis.

Jointly, we further worked on our five-year strategic plan, as determined in 2018. One of the goals in this plan was to explicitly incorporate co-morbidity and multi-morbidities as research themes into our current and future projects. This goal fits perfectly into the UMCG’s broader perspective on healthy aging (i.e. the absence of co-morbidity or multiple morbidities) and within the department we have wide-ranging epidemiological expertise on all the common chronic diseases and their risks factors.

The department’s many teaching activities focus on providing scientific training in the methodology of medical research, including medical statistics. The department is involved in nearly all of the UMCG’s teaching programs.

Please visit our website www.epidemiologygroningen.nl for more information on our staff and their projects.

Research focus

The Department of Epidemiology's mission is to build a future with Healthy Aging by conducting research and teaching, and providing research support. Research is the department's leading activity. Our goal is to study the patterns, causes and effects of health and disease conditions in both the general population and in clinical populations. Consistently over the past ten years, the department's overall focus has been on Life Course Epidemiology, which lies at the center of Healthy Aging, a main theme of both the UMCG and the University of Groningen.

Life Course Epidemiology can be defined as the study of the long-term effects of exposures during gestation, childhood, adolescence, young adulthood and later adult life on an individual's risk of chronic disease. In epidemiological practice, this means longitudinal research is required with follow-up over many years. We explicitly incorporate co-morbidity and multi-morbidities as research themes into our projects. The department has long experience with studies of both population-based cohorts and of various patient/clinical cohorts.

The department maintains a strong profile as a center of expertise on the methodology of cohort studies, including biobanking and Big Data studies. This is evident in its strong involvement in all the UMCG's major cohort studies. We have both the expertise (methodological and disease-specific) and the tools to facilitate and strengthen all the epidemiological, clinical and biobanking research performed in the UMCG. We are also eager to share our expertise with others, for example, in supporting research in nearly all the clinical and pre-clinical departments.

Overall, the Department of Epidemiology is a major driving force in initiating and conducting life course research and is instrumental to the clinical research within the UMCG's main theme of Healthy Aging.

Please visit our website www.epidemiologygroningen.nl for more information on our staff and their projects.

Cohorts

The Department of Epidemiology provides data management and methodological support and is scientifically involved in all major cohort studies of the UMCG:

Lifelines investigates universal risk factors and their modifiers for multifactorial diseases. Lifelines is a prospective population-based study among more than 167,000 inhabitants from the northern provinces of the Netherlands, using a three-generation family design. www.lifelines.nl

The **Vlagtwedde-Vlaardingen cohort study** is an extensive longitudinal population based study, which started in 1965. It examines the course of chronic pulmonary diseases in almost 8,500 people.
https://www.ncbi.nlm.nih.gov/pubmed/15879414

The **GECKO** birth cohort study is following almost 3,000 Dutch children to study the development of body weight and fat distribution and the influence of mother and child factors. www.geckodrenthe.umcg.nl

OncoLifeS. All patients with a newly diagnosed cancer are invited to participate in OncoLifeS. The main aim of this study is to evaluate the short and long term outcome of cancer and cancer treatment, with the perspective to improve the care for these patients and to increase the healthy ageing of a patient.
www.umcg.nl/EN/Research/Researchers/Healthyageing/geras/Paginas/oncolifes.aspx

The expertise of the Department of Epidemiology has also been recognized outside the Netherlands. Epidemiologists from Groningen are participating in several European and world-wide initiatives on cohort studies and biobanking like **CHARGE**
www.chargeconsortium.com

Research units of the Department of Epidemiology

Chronic airway diseases epidemiology
Lifestyle medicine in obesity and diabetes
Oncological epidemiology
Medical statistics & decision making
Digestive system diseases
Genetic epidemiology
Patient-centered HTA
Health behavior epidemiology

Unit leaders

The unit leaders of the department from left to right:

Truuske de Bock	professor of oncological epidemiology
Nynke Smidt	associate professor of health behavior epidemiology
Behrooz Alizadeh	assistant professor digestive system diseases epidemiology
Erwin Kort	business manager
Harold Snieder	professor of genetic epidemiology
Eva Corpeleijn	associate professor of life style epidemiology
Paul Krabbe	associate professor health technology assessment
Marike Boezen	professor of genetic epidemiology of chronic airway diseases, head of department

Chronic airway diseases epidemiology

PLANS

We will continue to maintain our focus on identifying factors associated with asthma remission. Our unique studies on genetics and epigenetics in non-smoking-related COPD in the general population will advance into functional studies. The current challenges are to develop and apply methods to identify rare genetic variants in COPD and to integrate the genetic, epigenetic and environmental factors underlying asthma and COPD.

The unit has a longstanding and international track record in the epidemiology of chronic airway diseases (asthma and COPD). In our studies on large, population-based epidemiological cohorts, we have identified several important individual risk factors (e.g. genetic susceptibility) and environmental risk factors (e.g. (passive) smoking, air pollution, occupational exposures) for the onset and course of chronic airway diseases.

We play a leading role worldwide in the identification of common and rare genetic variants that underlie COPD and of their interaction with the environment. Uniquely, we link genetics with functionality and we also lead and/or participate in many international genetic and epigenetic studies on lung function and COPD. In our asthma research, we focus on asthma remission, a rare phenomenon in which a patient spontaneously outgrows the disease. In addition, we are leading partners in several international genome-wide association studies on asthma.

MARIKE BOEZEN, HEAD OF THE UNIT

To unravel the role of genetics, epigenetics and environments in the onset and course of asthma and COPD

Our research will ultimately help to unravel the etiology of chronic airway diseases and find ways to prevent, cure, or reduce the burden of chronic airway diseases.

HIGHLIGHTS

Asthma studies in Uganda

We showed that asthma is common in Uganda, affecting 11.0% of the population; it is associated with smoking, biomass smoke exposure, urbanization, and allergic diseases. Rates of asthma exacerbations and mortality are high in Uganda and associated with poor asthma control. Healthcare systems need to be strengthened to provide care for asthma patients.

Figure. Our survey districts (in blue), based on a UN map of Uganda

https://thorax.bmj.com/content/73/10/983.long#DC1

https://www.ncbi.nlm.nih.gov/pubmed/30795752

Identifying rare genetic variants in COPD independent of smoking

We developed a novel approach for exome-wide identification of rare genetic variants and novel candidate genes for COPD that have arisen independent of exposure to cigarette smoke in the Dutch general population. The success of our approach is illustrated by the identification of three novel candidate genes for COPD.

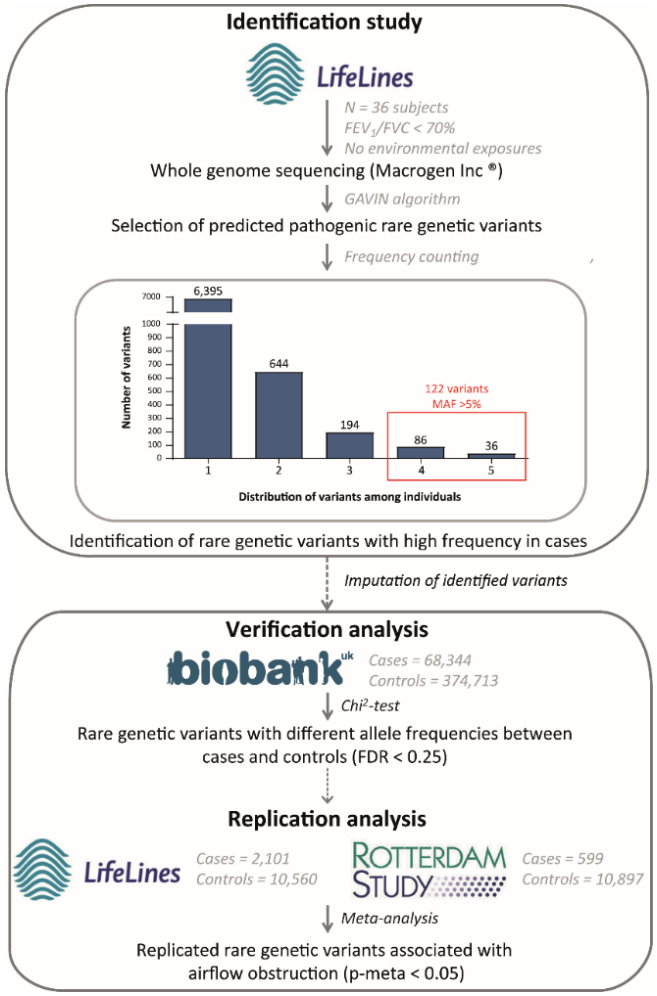


Figure. Flowchart explaining our approach to identify rare genetic variants in the general population.

https://www.atsjournals.org/doi/pdf/10.1164/rccm.201909-1868LE

Pesticide exposure and COPD in Lifelines

We found that occupational pesticides exposure is associated with a higher incidence of airway obstruction among active workers in the Lifelines cohort study. The association is more pronounced among ever-smokers and older active workers. Measures should be taken to prevent airway obstruction incidence in active workers who have been exposed.

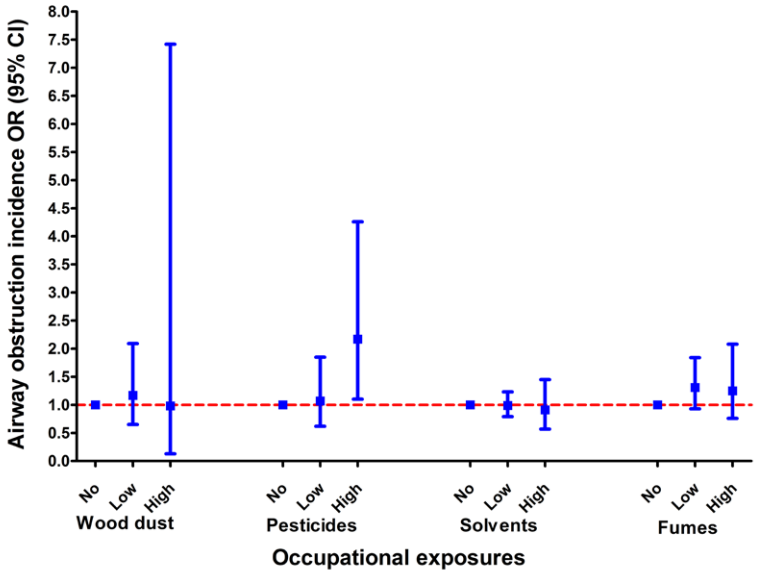


Figure. The association between occupational exposures and incidence of airway obstruction. The binary logistic regression models were adjusted for baseline age, sex, education, monthly income, height, smoking, and pack-years.

Personal factors predict asthma at birth

It is known that asthma has a strong genetic component. However, we discovered that, at birth, the incidence of asthma later in life can best be predicted by personal factors (such as parental asthma/allergy) and environmental factors (such as a mother smoking during pregnancy). The addition of a genetic risk score did not improve this prediction.

https://doi.org/10.1016/j.jaci.2019.05.017

SENIOR STAFF

NAME	FUNCTION	TOPIC
H.M. Boezen (Marike)	Full Professor, unit chair	Chronic airway diseases; genetic epidemiology, epigenetics, exposures
G. Davey Smith (George)	Distinguished UMCG Visiting professor 2019	Mendelian randomization; Triangulation of evidence
J.M. Vonk (Judith)	Assistant professor	Longitudinal data analysis: Etiology and course of asthma and COPD; Lifelines
N. ElBaz (Noha)	Lecturer	Education coordinator
N.J.G.M. Veeger (Nic)	Senior researcher	Research coordinator, Medical Center Leeuwarden
K. de Jong (Kim)	Postdoc	Epidemiologist, Medical Center Leeuwarden
M. de Vries (Maaike)	Postdoc	Genetics and epigenetics of COPD and aging
T. Wieringa (Thomas)	Postdoc	E-learning and education
R.P. Stolk (Ronald)	Professor, honorary appointment	Center for Information Technology, University of Groningen

PHD STUDENTS

NAME	TOPIC	COLLABORATION
Q. Chen (Qing)	Functional studies on novel COPD susceptibility genes for environmental exposures	Pathology, UMCG
C. A. Cox-de Wit (Claire)	Small airways in asthmatic smokers and ex-smokers	Pulmonology, UMCG
M.O. Faruque (Omar)	Occupational exposures and general health outcomes	Health Sciences, UMCG
B. Kirenga (Bruce)	Asthma prevalence and mortality in Uganda	General Practice and Elderly Care Medicine, UMCG
T.P.C.H. Pereira Bernardes (Thomas)	Risk of hypertensive pregnancy complications	Patient-centered HTA unit; Obstetrics, UMCG; AMC
N. Spinder (Nynke)	Occupational exposures and congenital anomalies in the offspring	EUROCAT, Genetics, UMCG
Y. Wang (Yuanyuan)	Effectiveness and safety of medication in COPD	Faculty of Science and Engineering, University of Groningen

Lifestyle medicine in obesity and diabetes

PLANS

A healthy lifestyle is important at any age, but relevant health outcomes may differ according to actual age. We will continue to combat obesity and type 2 diabetes by providing evidence that lifestyle is a critical factor in healthy aging. Our focus will be on the development of dietary patterns and in-depth analyses of daily patterns of physical activity. We will contribute to shaping lifestyle education to medical students and to the development of training programs for healthcare professionals.

Diet and physical activity can have a major impact on chronic diseases, in terms of prevention, delaying disease onset, or relieving the burden of disease. We study the role of these lifestyle factors primarily in humans using observational studies and lifestyle interventions. As outcomes, we study weight gain and obesity, glucose metabolism and diabetes type 2, and major chronic diseases and mortality. We look at associations between these factors from different perspectives: how do the associations change over age, or with severity of the illness? Are they influenced by gender, socio-economic status or region of residence?

EVA CORPELEIJN, HEAD OF THE UNIT

To discover how diet and physical activity can help to prevent, care and cure chronic diseases.

Lifestyle is at the core of healthy aging.

HIGHLIGHTS

What is a normal weight gain during pregnancy?

This question was answered in a large study on 25 cohorts, using data from 196,670 pregnant women and their pregnancy outcome. Weight gain charts can be found at https://tnochildhealthstatistics.shinyapps.io/pregnancyweight/.

A baby's age of achieving motor milestones is related to physical activity

A later age of achieving motor milestones as a baby is related to a lower level of physical activity in later life. It is unlikely that this will have consequences for weight status or blood pressure at 4–7 years of age.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6816144/

Physical activity at preschool age is not a strong predictor for obesity

We performed a meta-analysis that showed that physical activity or sedentary behavior in preschool children were not related to body mass index (BMI) or waist circumference, and only weakly to fat percentage. Physical activity may become more important for energy balance and preventing obesity later in childhood.
https://onlinelibrary.wiley.com/doi/full/10.1111/obr.12936

A good diet is related to less weight gain

Among women aged ≥70 years, a poor quality of diet was related to higher weight loss. Our study showed that a healthy diet is a promising target for avoiding undesirable weight gain or loss.

https://academic.oup.com/jn/advance-article/doi/10.1093/jn/nxz262/5613097

Physical activity and a fatty liver: stronger associations in older age

Higher levels of moderate to intense physical activity show dose-dependent associations with a lower risk of having a fatty liver. This association is stronger in people with diabetes and older adults.

https://insights.ovid.com/pubmed?pmid=30865013

SENIOR STAFF

NAME	FUNCTION	TOPIC
E. Corpeleijn (Eva)	Associate professor, unit chair	Lifestyle and metabolism
D. Kromhout (Daan)	Professor	Nutrition and cardiovascular disease
M. Cardol (Marloes)	Data manager	GECKO Drenthe birth cohort

PHD STUDENTS

NAME	TOPIC	COLLABORATION
S.I. Brouwer (Silvia)	Lifestyle and cardiometabolic health in children	Institute for Sports Studies, Hanze Hogeschool
O. Byambasukh (Oyuntugs)	Body composition and health over the life course	Health Sciences, University of Mongolia
G. Klaassen (Gerald)	Lifestyle in renal patients	Nephrology, UMCG
C. Lu (Congchao)	Physical activity and health in Chinese and Dutch children	Tianjin University, China
M. Osté (Maryse)	Diet and health in kidney patients	Nephrology, UMCG
P.C. Vinke (Petra)	Dietary patterns and health	Nephrology, UMCG
R. Wiersma (Rikstje)	Physical activity and obesity in young children	Movement Sciences, UMCG

Oncological epidemiology

PLANS

We will refine our screening model for lung cancer in order to better compare it to other models, and we plan to start a new screening model for colorectal cancer. The uptake of screening and related determinants will be an important topic. We will continue to expand our cohorts. Our main cohort is OncoLifeS, the UMCG's oncology data biobank. After informed consent has been obtained from a patient with a diagnosis of cancer, we include their clinical data and biomaterials in this database.

The research of our unit concerns the early detection of cancer and the improvement of outcomes after cancer treatment. To evaluate this in a systematic way, we set up OncoLifeS, the UMCG's oncology data biobank, recording quality of life as a main outcome. To assess and optimize screening strategies, we define which populations are at risk for cancer. We not only consider the benefits of screening, but also the negative effects of over-diagnosis, tumor-induction, and false-positive results. Our studies use systematic literature reviews, analysis of cohorts, and computer modeling.

TRUUSKE DE BOCK, HEAD OF THE UNIT

To improve early detection of cancer and the quality of life for patients with cancer.

Mindfulness-based stress reduction

Mindfulness-based stress reduction is an effective approach in improving the quality of life, in both the short- and the long-term, of patients with menopausal symptoms after risk-reducing salpingo-oophorectomy. However, mindfulness-based stress reduction is not effective in improving sexual functioning or sexual distress.

https://www.ncbi.nlm.nih.gov/pubmed/30222235

Yearly meeting with NELCINB3 team

To share the latest progress of a Chinese-Dutch project on the early detection of lung cancer, COPD and cardiovascular disease (the NELCINB3 project), we had a meeting with the whole team in Shanghai. All the centers are on schedule, and we look forward to sharing the first results in 2020.

Validate your tool before you apply your tool.

Breast cancer screening in women over the age of 60 with a BRCA1/2 mutation

For women with a BRCA1 mutation, annual mammography, which is the current approach for breast cancer screening, is cost-effective. However, for women with a BRCA2 mutation, it is more cost-effective to intensify this screening by alternating an annual MRI with annual mammography.

https://www.ncbi.nlm.nih.gov/pubmed/30904701

Frailty, dependence and quality of life in elderly women with ovarian cancer

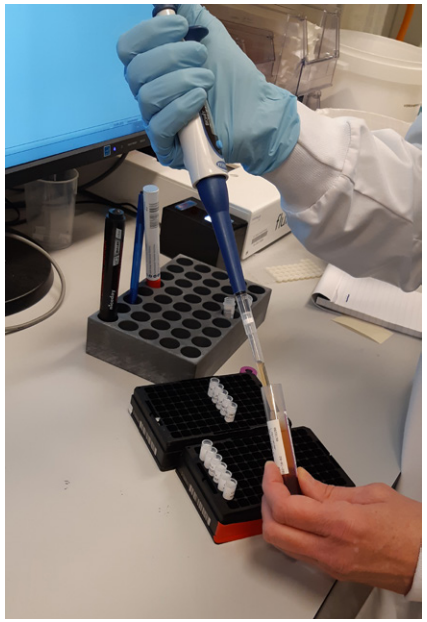
Frailty and dependency are significant determinants of health-related quality of life in elderly women diagnosed with ovarian cancer. In this study we concluded that functional status is a better determinant of health-related quality of life than age. Functional status has an impact on clinical outcomes and can be an important aspect for decision-making.

https://www.ncbi.nlm.nih.gov/pubmed/30935716

OncoLifeS: Living well as a cancer survivor

Embedding a data biobank in clinical care can ensure the collection of high-quality and specific data. The inclusion of longitudinal quality of life data allows us to incorporate patients' perspectives, while the inclusion of imaging data provides us with an opportunity to analyze raw imaging data using artificial intelligence (AI) methods, thus adding new dimensions to the database.

https://www.ncbi.nlm.nih.gov/pubmed/31727094



SENIOR STAFF

NAME	FUNCTION	TOPIC
G.H. de Bock (Truuske)	Full professor, unit chair	Screening and follow-up
B.A.C. van Dijk (Boukje)	Senior researcher	Head and neck oncology
M.D. Dorrius (Monique)	Senior researcher	Lung cancer screening
M. Heuvelmans (Marjolein)	Senior researcher	Lung cancer screening
G.W.D. Landman (Gijs)	Senior researcher	Cancer in diabetes patients
G. Sidorenkov (Grigory)	Senior researcher	Lung cancer screening
M. Vonder (Marleen)	Senior researcher	Lung cancer and cardiac screening
J. Nagel (Janny)	Project coordinator	OncoLifeS data biobank

PHD STUDENTS

NAME	TOPIC	COLLABORATION
L.M. Boerman (Liselotte)	Long-term cardiac outcome in breast cancer	General Practice, UMCG
J.M. Briët (Justine)	Laparoscopy in endometrial cancer	Oncological Gynecology, UMCG
F.O. Cortes Ibañez (Francisco)	Preventable factors in cancer	
L. Ding (Lilu)	Breast cancer screening	Radiology, UMCG; Epidemiology, University of Antwerp
C.M.G. van Driel (Catheleine)	Psychosocial effects of risk-reducing salpingo-oophorectomy	Oncological Gynecology, Clinical Genetics, UMCG
J. Du (Jing)	Cancer in diabetes patients	Langerhans Medical Research Group, Zwolle
Y. Du (Yihui)	Screening for lung cancer	Radiology, UMCG
Y. Eltahir (Yassir)	Quality of life after breast reconstruction in women with breast cancer	Plastic Surgery, UMCG
N.C. te Grootenhuis (Nienke)	Predictors for local recurrent disease in patients with vulvar cancer	Oncological Gynecology, Pathology, UMCG
J.R. Hilberink (Jacobien)	Decitabine in the treatment of AML	Hematology, UMCG
L.T. Jonker (Leonie)	Home monitoring after surgery	Oncological Surgery, UMCG

T. Koopman (Timco)	HER2 and Ki67 in solid tumors	Pathology, UMCG
E.A. Kop (Emiel)	Predictive markers for local control in early stage laryngeal cancer	Otorhinolaryngology, Pathology, UMCG
E.A.G. Lammerink (Ellen)	Sexual outcomes after gynecological cancers	Oncological Gynecology, UMCG
M. Leimkühler (Maleen)	Predictors for peritoneal carcinomatosis in colorectal cancer	Oncological Surgery, UMCG
S.W. Maass (Saskia)	Long-term depression and anxiety in breast cancer	General Practice, UMCG
L. de Munck (Linda)	Population screening in breast cancer	Research and Development, IKNL, HTSR, University of Twente
L.B. van der Oever (Daan)	Machine learning and cardiovascular disease	Radiology, UMCG
M. Plas (Matthijs)	Inflammation after treatment for cancer in elderly	Oncological Surgery, UMCG
N. Sadok (Nadia)	Breast reconstructions	Plastic Surgery, Oncological Surgery, UMCG
D. Schrijnders (Dennis)	Cancer in diabetes patients	Langerhans Medical Research Group, Zwolle
F.J. van der Sluis (Fabian)	Predictors of outcome in surgical oncology	Oncological Surgery, UMCG
A. Stuursma (Anniek)	Preventive oophorectomy	Gynecology, UMCG
M.A.C. Versluis (Marco)	Pathological and immunological parameters in endometrial cancer	Oncological Gynecology, Pathology, UMCG
J. Wang (Jing)	The optimal screening for breast cancer in China	Radiology, UMCG; Epidemiology, Tianjin University, China
L.B.M. Weerink (Linda)	Sarcopenia as predictor of outcome after surgical oncology	Oncological Surgery; Radiology, UMCG
H.J. Wisselink (Rik)	CT biomarkers emphysema	Radiology, UMCG
J.M. Woolderink (Jorien)	Screening in women with Lynch syndrome	Oncological Gynecology, UMCG

S. Zheng (Senshuang)	Colon cancer screening	Radiology, UMCG; Epidemiology, Tianjin University, China
A.T. Zwart (Aniek)	Skeletal muscle mass as predictor of outcome in head and neck cancers	Head and Neck Oncology, Radiology, UMCG

Medical statistics & decision making

PLANS

The unit will continue to work on improving methodological approaches and statistical analyses in its research areas.

The unit's research activities focus on methods for statistical modeling and support for medical decision-making. Emphasis is placed on longitudinal and time-to-event analyses, as well as on causal inference techniques, which are core topics in the Life Course Epidemiology research program. Other research topics are techniques for decision analysis that are designed to support benefit-risk assessments of medicines. The unit is also heavily involved in the teaching of medical statistics in the UMCG. In basic and advanced courses, we teach statistical methods to students at bachelor, master and postgraduate levels. In addition to research and teaching in methodology, we collaborate with other units of the Department of Epidemiology, and with various clinical departments in the UMCG. In joint research projects, we offer tailored statistics for epidemiological and medical research and provide statistical support in the design and analysis of clinical studies.

To develop, improve and disseminate advanced statistical methodology, and its applications, in clinical and epidemiological research.

To develop, improve and disseminate advanced statistical methodology to foster excellence in medical research.

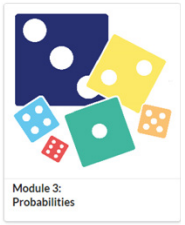
HIGHLIGHTS

Course given at WEON

At the WEON 2019 congress, our unit organized and hosted the pre-conference course *'Introduction to causal inference in observational research: DAGs, causal mediation and propensity scoring'*. The congress was held in June in Groningen.

Statistics courses for UMCG

We have continued making statistical theory available online through Versatest, a program for self-study accessible for the UMCG's bachelor and master students.



Lunchtime lectures

In 2019, our unit organized five courses on advanced statistics for PhD students and gave several lunchtime lectures - *'Help! Statistics!'* - for all UMCG staff. These were very well attended and much appreciated.

Software for assessing treatment benefit-risk

Several partners from the GetReal Initiative, part of the Innovative Medicines Initiative (IMI), participated in pilot projects with the ADDIS suite of software for treatment benefit-risk decision making www.drugis.org . In addition, the software was presented at several scientific conferences and used in training sessions with clinical assessors.

SENIOR STAFF

NAME	FUNCTION	TOPIC
C.H. zu Eulenburg (Christine)	Full professor, unit chair (until January, 31)	Statistical modeling
J.L. Hillege (Hans)	Full professor	Clinical epidemiology
S. la Bastide (Sacha)	Assistant professor	Causal inference
J.G.M. Burgerhof (Hans)	Lecturer	Teaching; study design
D. Postmus (Douwe)	Senior researcher	Medical decision-making
J. de Keijser (Joris)	Software engineer	
D. Reid (Daan)	Software engineer	

PHD STUDENTS

NAME	TOPIC	COLLABORATION
M. Angsupaisal (May)	Adaptive seating and adaptive riding in children with cerebral palsy	Developmental Neurology, Pediatrics, UMCG
M. van den Broek (Merel)	Outcomes after bariatric surgery	Medical Center Leeuwarden
T. Brouwer (Tammo)	Anesthesia	Medical Center Leeuwarden
Y. Chen (Yuntao)	Advanced survival analysis techniques	
K. Donkelaar (Karlijn)	Subarachnoid hemorrhage	Neurosurgery, UMCG
T. Elling (Tessa)	From Vitamin K antagonists to novel oral anticoagulants	Hematology, UMCG
D. Huisenga (Darlene)	Developmental outcomes of infants born with severe congenital heart disorder	Developmental Neurology, Pediatrics, UMCG
J.H.A. van Miert (Jasper)	Optimal anticoagulation therapy	Hematology, UMCG
D. Mitrovic (Darko)	The use of novel oral anticoagulants in daily practice	Medical Center Leeuwarden
A. van Ojik (Annette)	In-hospital anticoagulation	Medical Center Leeuwarden
S. Roldan Munoz (Sonia)	Preference heterogeneity in regulatory benefit-risk assessment	Clinical Pharmacy & Pharmacology, UMCG

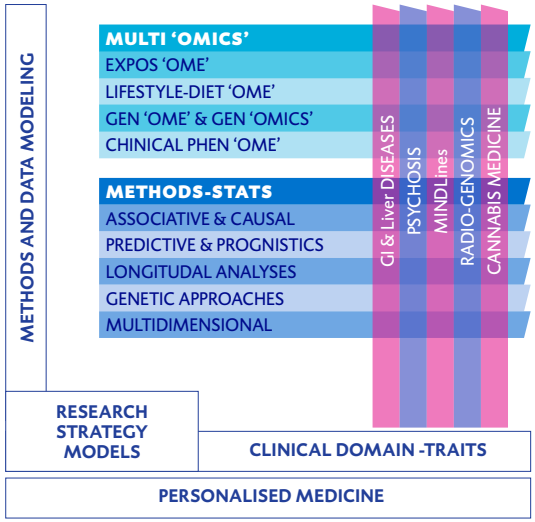
Digestive system diseases

PLANS

The unit's plan is to implement patient-centered care in four main clinical domains (see figure), by studying the longitudinal course of health status, and disease course in individuals. We will implement advanced genetic and epidemiological methods, multivariate data reduction techniques, growth curve modeling, and many other methods. In addition, we will identify the factors associated with disease course by integrating and analyzing Big Data: heterogeneous, multi-omics data from environmental- (exposome), lifestyle-, diet- and genetic factors, clinical and para-clinical measurements, and patient-reported outcomes.

The unit's vision is to implement personalized medicine in routine clinical practice. We continue to focus on understanding the (causal) factors associated with complex diseases of the digestive system, psychosis, cancer and radio-toxicity and on trying to predict their clinical course. To this end, and to identify patient-centered therapies, we conduct international population-based cohort studies, patient- based clinical studies, and randomized clinical trials.

Organizationally, the unit is involved in several large cohorts like Lifelines, IBD4EU, MIND-Lines, GROUP, ARAS and AZAR, and in consortia like IBDGC, RgC, CHARGE and IAIHG.

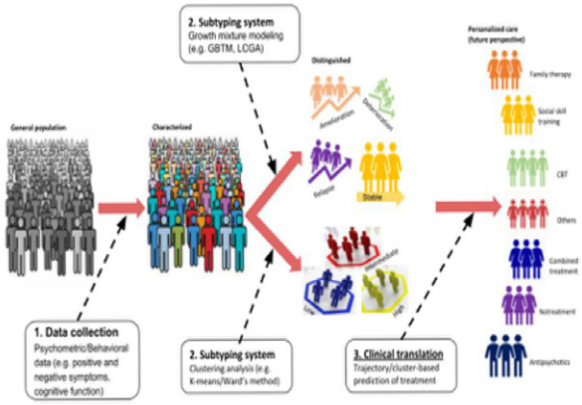


BEHROOZ ALIZADEH, HEAD OF THE UNIT

To unravel the causes and underlying mechanisms of complex diseases of the digestive system, and to contribute to implementation of personalized prediction and cure.

Longitudinal data modeling in personalized medicine

Longitudinal analyses have been set up to understand the course of diseases. We inspected 50 studies and found up to five courses (trajectories) of positive and negative symptoms, and cognitive deficits, in patients with schizophrenia spectrum disorder. We identified 57 predictors. The patient trajectories can be used to determine tailored therapy for personalized psychiatric treatment.

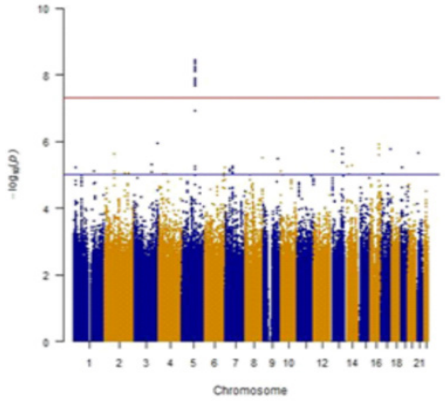


Tailored medicine in IBD

We conducted the largest population-based study to date to identify environmental factors related to Inflammatory Bowel Disease (IBD). We identified 11 novel exposome factors and verified nine previously described factors. These new insights contribute to understanding IBD etiology and offer a way towards finding potentially modifiable targets, which are essential for implementing personalized prevention or treatment in IBD.

Radiogenomics in individualized radiotherapy

In cancer therapy, the performance of NTCP models can be improved and even personalized by supplementing the relevant genetic factors. We performed the first GWAS for radio-toxicity in cancer patients. We identified several genetic variants associated with acute and late radio-toxicities. We concluded genetic susceptibility may explain up to 60% of the variation observed in radio-toxicity.



Genome-exposome in schizophrenia

Patients with schizophrenia have a strong genetic susceptibility that interplays with environmental exposures. In a large EU consortium (EUGEI), we found schizophrenia showed an interaction of the polygenic risk score with regular cannabis use and with exposure to early-life adversities. The next step is to understand whether such genetic factors and environmental exposures can be applied to determine tailored therapy for patients with schizophrenia.

https://www.ncbi.nlm.nih.gov/pubmed/31508804

SENIOR STAFF

NAME	FUNCTION	TOPIC
B.Z. Alizadeh (Behrooz)	Assistant professor, unit chair	Genetic epidemiology & personalized medicine
A. Isalm (Atique)	Associate professor, honorary appointment	Statistics, analysis of complex data
A. Abbasi (Ali)	Senior researcher	Causal inference and prognostic modeling

PHD FELLOWS

NAME	TOPIC	COLLABORATION
S. Abedian (Shifteh)	Pharmacogenetics factors in the course of diabetes and inflammatory bowel diseases	
M.R. Abdollahi, (Reza)	The disease course in autoimmune hepatitis and its response to second-line therapy	
S. Farhang (Sara)	Predictors of the outcome of first episode psychosis in the Iranian ARAS-cohort	Psychiatry, UMCG
T. Habtewold (Tesfa)	Latent class analyses to distinguish subgroups in patients with schizophrenia	Psychiatry, UMCG
M. Huq (Mahmudule)	Neural network analysis to dissect underlying genetic links between IBD and schizophrenia	
S. Ioannou (Solomon)	Unsupervised statistical modeling of multi-dimensional data	Medical statistics, UMCG
N. Khalilian (Neda)	Epidemiology and multimorbidity of GI disorders and liver diseases in Lifelines	Dermatology, UMCG
K. Kist Bakof (Karstyn)	Genetic underprint of disease course and response in schizophrenia	Psychiatry, UMCG
S. Moazzen (Sara)	Dietary patterns associated with gastro-intestinal cancers	
E. Naderi (Elnaz)	Genetic-based individualized prediction of radio-toxicity in head and neck cancers	Radio-oncology, UMCG
M. Nomden (Mark)	Seasonal clustering	Liver transplantation, UMCG
V. Peter (Victor)	Genetic causes of drug adverse effect: Pharmlines study	Clinical Pharmacy, UMCG
V. Peters (Vera)	The sense and nonsense of dietary patterns, genetic susceptibility, and disease course in IBD	Gastroenterology, UMCG

L.H. Rodijk (Lyan)	The trajectory and outcome of psycho-motor development in biliary atresia	Liver transplantation, UMCG
K. van der Sloot (Kim)	Exposome-genome interaction in the development and course of inflammatory bowel disease	Gastroenterology, UMCG
N. Tiles-Sar (Natalia)	Causes and courses of social recovery in psychosis	Psychiatry, UMCG

Genetic epidemiology

PLANS

The unit will focus on building prediction models, including genetic risk scores and gene–environment interaction models for common chronic diseases of aging such as (early) development of type 2 diabetes, chronic kidney disease, glaucoma, obesity and hypertension. These studies increasingly involve epigenetics as a molecular interface between genes and the environment. Together with the Department of Genetics, we lead the UMCG Genetics Lifelines Initiative (UGLI), which aims to perform genome-wide genotyping for the entire Lifelines cohort.

The unit plays a key role in the department's teaching and in the genetic data analysis of all the UMCG major cohort studies. Activities include giving training courses for Epidemiology B registration, and giving introductory and advanced courses in genetic epidemiology and an introductory course in R. We also coordinate genetic studies in the Lifelines, TRAILS and GECKO cohorts. In addition, the unit has and have been an active member, lead or co-lead of consortia studying genome- and epigenome-wide association studies on blood pressure, kidney function, inflammatory factors, heart rate variability, fertility and birthweight.

HAROLD SNIEDER, HEAD OF THE UNIT

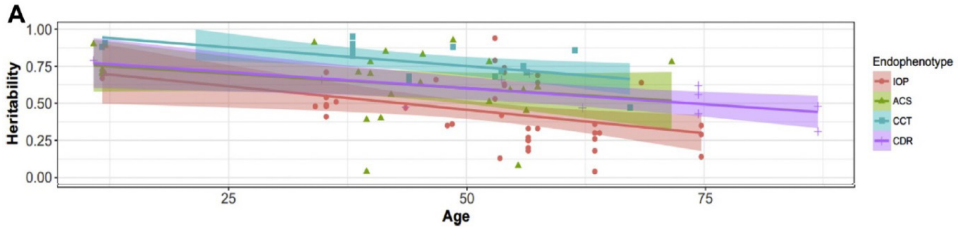
To investigate the genetic and environmental influences on the etiology, prediction and prognosis of cardiometabolic, renal and other common chronic complex diseases.

Identifying genes, environmental exposures, and their interactions on cardiometabolic, renal and other common complex diseases of aging. Developing innovative analytical methods and software tools to do this.

HIGHLIGHTS

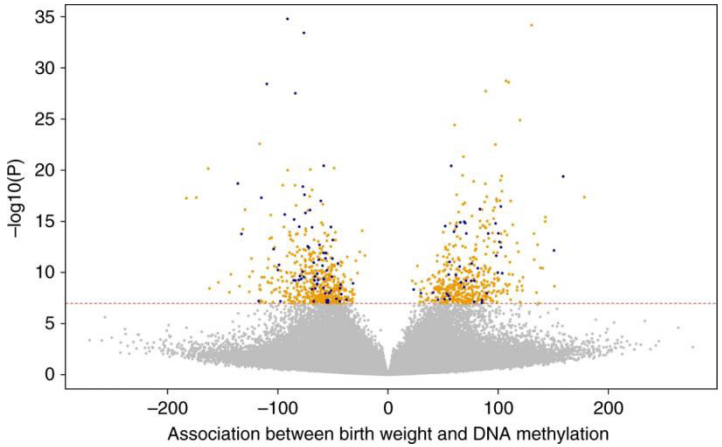
Heritability of glaucoma

In a meta-analysis of 53 studies on the heritability of glaucoma and related endophenotypes, we confirmed the strong effect of genetic factors in this major eye disease. The effect reduced with increasing age.



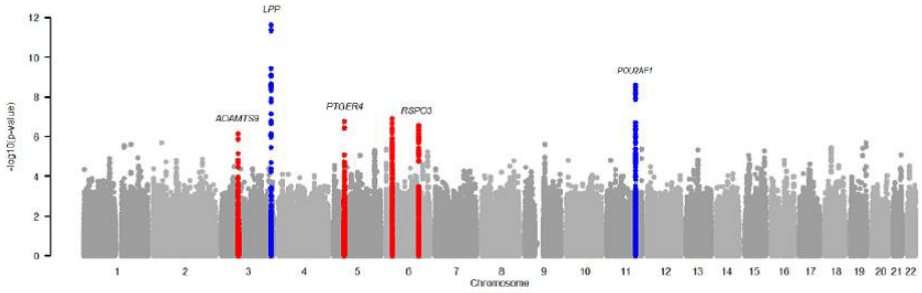
Birth weight and health life course

Birth weight is associated with health outcomes throughout the life course; DNA methylation may be an underlying mechanism. We performed the first ever meta-analysis of epigenome-wide association studies of 8,825 newborns and found that DNA methylation in neonatal blood is associated with birth weight at 914 sites.



Kidney function in Lifelines

Serum urea is a product of protein metabolism and a commonly used marker of kidney function. We performed a genome-wide association study on this trait in the Lifelines cohort, and independent replication in the NESDA, PREVEND and EGCUT cohorts. We identified associations at six genetic loci, of which two were novel findings (POU2AF1 and ADAMTS9-AS2).



Genetic risk scores and childlessness

We examined an association study of multiple genetic risk scores with childlessness. Genetic risk scores for age at first childbirth and number of children ever born were associated with remaining childless, but genetic risk scores for biological fertility outcomes, such as endometriosis and age at menopause, were not.

https://pdfs.semanticscholar.org/ba19/778c9da534932c8651fd84fofc2ddbf77d47.pdf?_ga=2.88099099.164339912.1580822118-366921380.1580138670

SENIOR STAFF

NAME	FUNCTION	TOPIC
H. Snieder (Harold)	Full professor, unit chair	Genetic epidemiology of cardiometabolic disease
I.M. Nolte (Ilja)	Senior researcher	Statistical genetics
P. van der Most (Peter)	Postdoc	Genetic and bioinformatic analyses
A. Vaez (Ahmad)	Postdoc	Bioinformatics and post-GWAS analyses
J. van Vliet-Ostaptchouk (Jana)	Postdoc	Genetic epidemiology of obesity & type 2 diabetes
J. Vehof (Jelle)	Research fellow	Genetic epidemiology of eye disease

PHD FELLOWS

NAME	TOPIC	COLLABORATION
A. Amare (Azmeraw)	From genome-wide pleiotropy to prediction modeling of depression	Psychiatry, UMCG
N. Asefa (Nigus)	Heritability of eye diseases	Ophthalmology, UMCG
Y. van der Ende (Yldau)	Heart disease in women and men	Cardiology, UMCG
A. Leonte (Anna)	The gene, the eye and the brain	Ophthalmology, UMCG
X. Lu (Xueling)	Association between genetic and epigenetic determinants of type 2 diabetes and endocrine-disrupting chemicals	Endocrinology, UMCG
T. Man (Tengfei)	Heart rate variability and blood pressure regulation	Merck, Beijing, China
A. Neustaeter (Anna)	Glaucoma screening driven by genetic and other risk factors	Ophthalmology, UMCG
K. Pärna (Katri)	Prediction models for type 2 diabetes	University of Tartu, Estonia
P. Poursafa (Parinaz)	Metabolic syndrome: the neglected role of air pollution	University of Isfahan, Iran
S. Riesmeijer (Sophie)	Genetics of Dupuytren's disease	Plastic Surgery, UMCG
B. Tegegne (Balewgizie)	Genetic and environmental influences on heart rate variability and its association with hypertension	Psychiatry, Vascular Medicine, Cardiology, UMCG
C. Thio (Chris)	Socio-economic status, genetic predisposition and the risk of chronic kidney disease	Nephrology, Health Sciences, UMCG
E. Walaszczyk (Eliza)	Epigenetics and the development of type 2 diabetes	RIVM, Endocrinology, UMCG
B. Wang (Bin)	Estimating genetic and environmental contributions to complex traits and diseases. Use of migration, twin, candidate gene, and genome-wide association designs	Beijing University, China

R. Wang (Rujia)	Shared genetic and environmental influences on major depressive disorder, anxiety disorder, obesity and substance use disorder	Psychiatry, UMCG
T. Xie (Tian)	Early genetic/epigenetic and environmental origins of obesity and hypertension	Lifestyle medicine, UMCG

Patient-centered Health Technology Assessment (HTA)

PLANS

We have developed a class of ePROMs with qualities that are new to the field. We also added a new 'Drop-Down' response mode so that our ePROMs is even more simple for patients to use. Our software developers are now programming this novel approach. Another interesting development is that, together with others, our electronic health records have been made accessible for integration with e-health applications, allowing patients to leave hospital while remaining under surveillance ("safe at home").

In our multidisciplinary team, we apply statistical, epidemiological, economic, psychometric and other key methods to evaluate the benefits of healthcare interventions and medical treatments. Our studies often focus on cost-effectiveness analyses and we use computer simulations to combine evidence and extrapolate observed short-term disease effects to meaningful long-term outcome measures, including 'quality-adjusted life years' and 'life years gained'. We have acquired special expertise in the development of 'smart' electronic patient-reported outcome measures (ePROMs).

PAUL KRABBE, HEAD OF THE UNIT

To bridge the gap between scientific evidence and stakeholders based on the judgment of health professionals, the views of patients and the general public, and the needs of policymakers.

Showing the added value of health interventions.

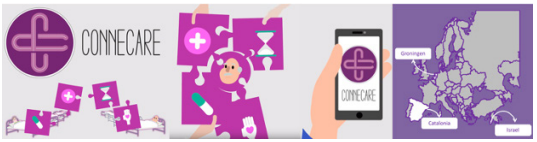
HIGHLIGHTS

HealthFan

To identify the most important health items in a smart, easy and efficient way, we have developed special methods and software (HealthFan). Patients determine what the most important health items are for them personally. These items are included in our ePROMs. The first results have been evaluated with solid organ transplant recipients.

Completion of Connecare project

Connecare is a large EU consortium that has demonstrated the benefits of an IT management system to support integrated care delivery in chronically ill patients. This system has resulted in significant improvement in patient health outcomes and, compared to care-as-usual, it reduces healthcare costs by preventing unnecessary hospitalizations, thereby creating value-for-money.



Hi Netherlands

With many other parties, we are involved in Health Innovation Netherlands, a public-private infrastructure to evaluate, implement and upscale valuable innovations in healthcare technology. Supported by the Dutch Ministry of Health, the first steps to build this organization were taken in 2019. Its range of services will be expanded in 2020.

https://www.healthinnovation.nl/bringing-health-innovation-next-level

HEALTH
INNOVATION
NETHERLANDS

Labor management in women with hypertension – Spin-off

As part of an international collaboration, we performed an individual patient data meta-analysis to compare induction of labor versus expectant management in women with pregnancy-induced hypertension at or near term. As a spin-off, an initiative has been started to expand the analysis with data from researchers at King's College, London.

SENIOR STAFF

NAME	FUNCTION	TOPIC
P.F.M. Krabbe (Paul)	Associate professor, unit chair	Health outcome measurement
E. Buskens (Erik)	Full professor	Population health, organization of care
T.L. Feenstra (Talitha)	Assistant professor	Simulation models
H. Groen (Henk)	Assistant professor	Fertility medicine and obstetrics
A.T. Lettinga (Ant)	Senior researcher	Process-oriented action research
A.D.I. van Asselt (Thea)	Senior researcher	Economic evaluation
K.M. Vermeulen (Karin)	Senior researcher	Economic evaluation and quality-of-life
M.M.H. Lahr (Maarten)	Postdoc	E-health and stroke
L. Sierkstra (Linda)	Researcher	Reintegration and rehabilitation after acquired brain damage

PHD FELLOWS

NAME	TOPIC	COLLABORATION
R. Botes (Riaan)	Functioning and quality-of-life at old age: expectation and appreciation	
H. Dijk (Hermien)	Economic evaluation of child psychiatry	Economics & Business, University of Groningen
S. Emamipour (Sajad)	Economic evaluation of personalized treatment in diabetes	PTEE, Global Health, UMCG
N. Fitria (Tia)	Economic studies into hyperglycemia in pregnancy, gestational diabetes	PTEE, DIKTI, Indonesia
R. Freriks (Roel)	HTA child tool for mental health	Economics & Business, University of Groningen
K. Füssenich (Koen)	Regional public health modeling	RIVM
G. de Graaf (Gimon)	Cost effectiveness of biomarkers in diabetes mellitus	
S. Holterman (Sander)	Business models for e-health	Windesheim University of Applied Sciences, Zwolle
L.T. Jonker (Leonie)	Measuring physical activity in oncological patients (MANHATTAN)	Surgery, General Practice, UMCG
K. Kan (Kaying)	IMPROVE: Tailored treatment in depression	Psychiatry, UMCG

M. Karsten (Matty)	Follow-up of women and children after preconception lifestyle intervention	Reproductive Medicine, AMC
S. Konings (Steef)	IMPROVE: Understanding heterogeneity in Schizophrenia Spectrum Disorders	RGOC; Economics & Business, University of Groningen
W.J. Maas (Willemijn)	Collaborations for new treatments in acute stroke (CONTRAST)	Economics & Business, University of Groningen; Neurology, UMCG
M.J. Meijboom (Marjan)	Cost-effectiveness of influenza vaccination	Faculty of Science and Engineering, University of Groningen
K.H. Misgina (Kebede)	Transgenerational malnutrition in early life in Northern Ethiopia	Patient-centered HTA unit: Pediatrics, UMCG; Danone
I. van Oostrum (Ilse)	Disease modeling, survival modeling	PTEE
C. Schey (Carina)	MCDA for informing resource allocation decisions	Global Market Access Solutions
A. Shahabeddin Parizi (Ahmad)	Patient-centered solid-organ transplant instrument	Internal Medicine, UMCG
E.D. Tutuhatunewa (Eric)	Evaluation of midshaft clavicle fractures	Orthopedics, Sport Medicine, UMCG
A. Tuvdendorj (Ariuntuya)	Economic studies into the burden of non-communicable diseases in Mongolia	Ministry of Health, Mongolia
E. Veldhuijsen (Edith)	Equity and ethics of expensive medicines in rheumatology	Medical Ethics, PTEE
A. Viska Icanervilia (Icha)	Health technology assessment of mammography screening in Indonesia	Health sciences, LPDP, Indonesia
Z. Wang (Zheng)	Optimization of fertility treatment	Reproductive Medicine, UMCG
R. Wasir (Riswandi)	HTA and cardiovascular drug reimbursement policy in Indonesia	PTEE, Utrecht University
J. Yauw (Josan)	DIAMANT: dynamic prediction in type 2 diabetes	UMCU, VUMC, RIVM
X. Zhang (Xin)	Diabetes ePROM design	
E. Zwertbroek (Eva)	Prediction in hypertensive disease in pregnancy	Obstetrics, UMCG

Health behavior epidemiology

PLANS

In the MOCIA project, we will conduct a multicenter, randomized controlled trial to investigate the effectiveness of a multidomain intervention among individuals aged 60–77 years. We also aim to develop a course for PhD students on Life Course Epidemiology, and in the summer of 2020, we will organize a symposium on 'Active Aging: the importance of voluntary work'.

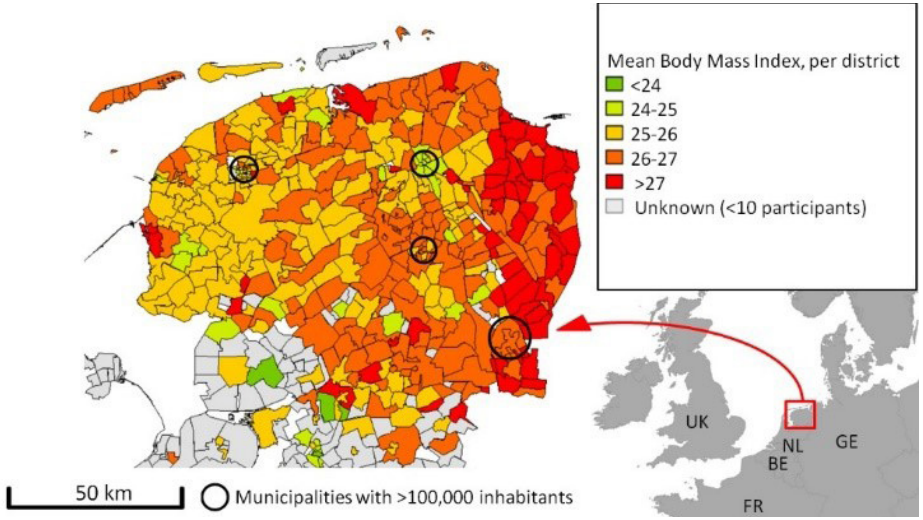
Health behavior has a major impact on our healthy life expectancy, but its determinants are complex and multifaceted, including individual, social, and environmental factors. This makes it difficult to change health behaviors. It is therefore important to prevent unhealthy behavior and to maintain healthy behavior. We investigate the development of health behavior over the life course and identify periods of increased susceptibility for behavior change. We analyze the data of large population-based cohorts, such as Lifelines. www.lifelines.nl

NYNKE SMIDT, HEAD OF THE UNIT

To investigate the determinants that shape our health behavior over the life course.

Netherlands Society for Epidemiology Student's Award

During the Dutch Epidemiological Congress, held in Groningen in 2019, one of our students, received the Student's Award from the Netherlands Society for Epidemiology (VvE) for a talk he presented on his research on 'The association between fast-food outlet density and proximity and Body Mass Index within Dutch urban and rural areas: evidence from a population-based cohort study'.

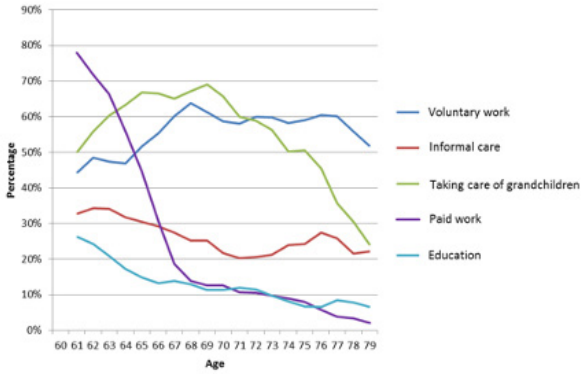


Understanding health behavior change is a major challenge due to the complex interplay of individual, social and environmental factors.

Volunteer Functions Inventory Scale – translated and validated

The Volunteer Functions Inventory (VFI) is an instrument for assessing volunteers' motivations. We translated and validated this scale for the Dutch general population aged 60+. Then we adapted the Dutch VFI to apply it to comparing volunteer motivations between older Dutch volunteers and non-volunteers.

https://www.rtvnoord.nl/nieuws/amp/216478/Vrijwilligerswerk-houdt-60-plussers-actief



NWO Crossover grant

We are participating in a large study: 'Maintaining Optimal Cognitive Function in Aging: a personalized lifestyle prevention approach (MOCIA)', financed by NWO's new Crossover program. The project is a collaboration between eight academic institutions in the Netherlands and eight co-financing partners.

https://www.umcg.nl/NL/UMCG/Nieuws/Nieuwsberichten/Paginas/Crossover-subsidie-voor-onderzoek-naar-leefstijl-en-ouder-wordend-brein-.aspx

SENIOR STAFF

NAME	FUNCTION	TOPIC
N. Smidt (Nynke)	Associate professor, unit leader	Health behavior from a life course perspective
A.C. Liefbroer (Aart)	Full professor	Life course demography

PHD STUDENTS

NAME	TOPIC	COLLABORATION
S. Bosman (Sjanne)	Pharmacotherapy of sleeping problems among older hospitalized patients	Internal Medicine/ Geriatrics, UMCG
R. Broekstra (Reinder)	Big data and the dilemma of innovative knowledge versus threats to personal integrity	Social Psychology, UMCG; Institute for Medical Education, IBM
C.P. van Erpecum (Carel-Peter)	How obesogenic are Dutch neighborhoods?	Health Sciences, UMCG
M. Feenstra (Marlies)	Functional recovery trajectories in hospitalized older adults	Internal Medicine/ Geriatrics, UMCG
L. Hoveling (Liza)	Unraveling the mediating pathways between socio-economic status and health	Health Sciences, UMCG; Netherlands Interdisciplinary Demographic Institute
J.C. Koops (Judith)	Socio-economic background and fertility decisions	Netherlands Interdisciplinary Demographic Institute
L. Mangot Sala (Lluis)	Life-course transitions, socio-economic status and health behaviors	Netherlands Interdisciplinary Demographic Institute
J.E. Mooyaarts (Jarl)	Socio-economic background and the transition to adulthood	Interdisciplinary Demographic Institute
J.S. Muller (Joanne)	Socio-economic background, family life course and later life economic outcomes	Netherlands Interdisciplinary Demographic Institute

J. Niebuur (Jacobien)	Determinants of participation in voluntary work	Sociology, UMCG; Netherlands Interdisciplinary Demographic Institute
M.A. Pouw (Maaike)	Hospital at Home care for elderly patients with cognitive impairment	Internal Medicine/ Geriatrics, UMCG
W. Vermeulen (Willem)	Understanding differences in divorce rates between municipalities	Netherlands Interdisciplinary Demographic Institute
J. Vrijsen (Joyce)	Attitudes towards dementia risk reduction among middle-aged people with a family history of dementia	Internal Medicine/ Geriatrics, UMCG
D. van Wijk (Daniel)	Job insecurity and family formation	Netherlands Interdisciplinary Demographic Institute

Teaching activities

The Department of Epidemiology organizes and performs a wide range of teaching activities. These include courses for the regular curriculum of the medical school, the research masters' program for epidemiology, postdoctoral training, and courses for UMCG staff and interns. At the heart of the department's activities are the training courses in scientific methodology and statistics for medical research. Staff also share their own specific disease- and methodological expertise with medical students (in bachelor and master's courses), students (masters and PhD level), and with other staff and interns in the UMCG. In total, departmental staff undertook around 6,000 hours of teaching in the academic year 2018-2019. Teaching therefore constitutes an important and crucial activity for the department, and this emphasis is illustrated by the fact that all our staff (100%) have a basic teaching qualification (BTQ). Moving forward, we have created an advanced e-learning platform in collaboration with the UMCG's e-learning unit to provide interactive educational material on epidemiology and statistics to all UMCG students and staff.

Beyond meeting the needs of future doctors in general, we also recognize the need to train the epidemiologists of the future. To this end, the department has established a specific training trajectory, called Epidemiologist B (PhD level). This training trajectory is suitable for those aiming at formal registration as an epidemiologist with the Netherlands Epidemiological Society and SMBWO (Foundation for the training of medical and biological science researchers). This trajectory was subjected to an audit, which it passed with flying colors, and our certification by the Netherlands Epidemiological Society was therefore renewed.

Different staff also organize a range of established and well-attended, general postdoctoral courses on epidemiology, medical statistics, mixed models, methodology for phase II/III clinical trials, and genetic epidemiology. Additionally, courses are given on more specific themes related to epidemiology, such as our useful course on *'Introduction to R and bioinformatics'* and, at an advanced level, *'Advanced Clinical Epidemiology'*,

'Applied Longitudinal Data Analysis', and *'Advances in Genetic Epidemiological Research and Data Analysis'*. Our monthly lecture series on *'Help Statistics'* is ongoing; it covers common statistical methods and questions. All these activities contribute to the training of PhD students, UMCG staff, and interns, so that they can conduct medical research to the highest standards.

Overall, staff from the Department of Epidemiology are involved in a range of teaching activities at all levels – bachelor, master and postdoctoral – and contribute a breadth and depth of knowledge and expertise, as well as a large dose of enthusiasm.

Teaching activities hours and BTQ held by staff

BTQ Basic university teaching qualification; GSMS Graduate School for Medical Sciences; CPE Clinical and Psychosocial Epidemiology; FSE Faculty of Science and Engineering, University of Groningen, GNK Medical School (Geneeskunde).

Business management

To support staff and contribute to efficient primary processes in our department.

ERWIN KORT, BUSINESS MANAGER

Personnel management

The Department of Epidemiology welcomed 14 new employees in 2019, of which five were PhD students. As a result of an internal reorganization, 18 employees of the Research Data Support department were embedded in the UMCG's central IT department in January 2019.

Financial management

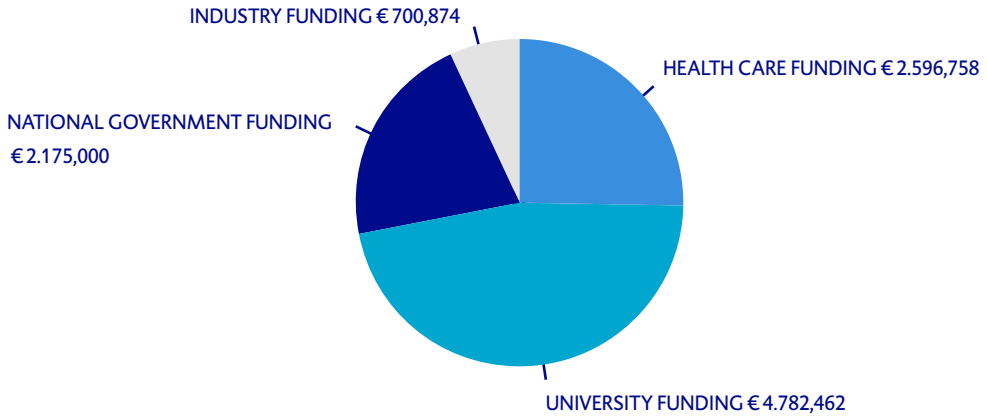
An overview of the department's expenses for 2019 is presented below.

EXPENSES IN 2019 (X € 1.000):

	RESEARCH & TEACHING
PERSONNEL	3.589,369
PROJECT RELATED AND MATERIAL COSTS	573,433
TOTAL	4.162,802

The department's project portfolio was expanded with university-funded PhD projects, while several externally funded projects (healthcare funds, industry funding and UMCG funding) were completed in 2019.

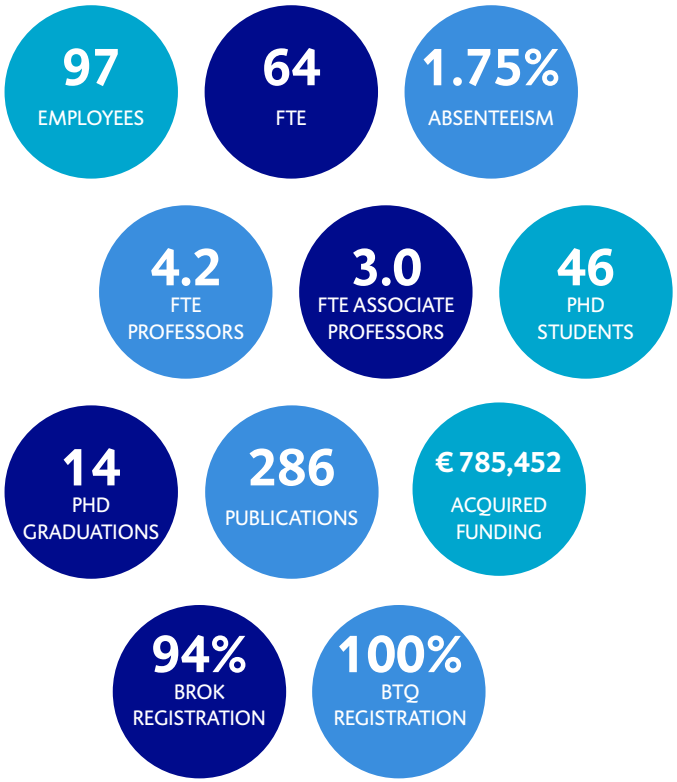
PROJECT PORTFOLIO 2019



The department also received four grants for new research projects (see table).

TABLE. RESEARCH GRANTS AWARDED TO DEPARTMENT OF EPIDEMIOLOGY STAFF IN 2019

PRINCIPAL INVESTIGATOR	FUNDING BODY	TITLE	BUDGET (€)
Behrooz Alizadeh	Medcolcana Organics Inc.	Personalized Cannabidiol Medicine (PCM)	104,964
Douwe Postmus	Alzheimer's Research UK	Survey to understand dementia patients' benefit-risk preferences	29,200
Maarten Lahr	ZonMw	Citrien 2 E-Health	294,538
Truuske de Bock	CEU	Qualitop	356,750
TOTAL			**785,452**



SENIOR STAFF

NAME	FUNCTION
E. Kort (Erwin)	Business manager
R. Geuze (Roelian)	Staff assistant, Finance and Quality Assurance
A. Vermue-Gels (Anita)	Secretary
A. van der Zee (Aukje)	Secretary
L. Kuil (Lisette)	Secretary

Appendix completed PhD projects

PROF. H.M. BOEZEN

B.J. Kirenga	Asthma prevalence and mortality in Sub Saharan Africa: The case of Uganda. Groningen, UMCG. November 27, 2019. University of Groningen.

PROF. H.M. BOEZEN, DR. H. GROEN

T.P. Bernardes	Hypertensive disorders of pregnancy. Groningen, UMCG. November 6, 2019. University of Groningen.

PROF. G.H. DE BOCK

C.M.G. van Driel	Risk reducing surgery: uptake and menopausal consequences. Groningen, UMCG. February 4, 2019, University of Groningen
T. Koopman	HER2 and Ki67 in solid tumors. Groningen, UMCG. April 3, 2019, University of Groningen
M.A.C. Versluis	Immunological, molecular and therapeutic mechanisms in endometrial cancer. Groningen, UMCG. October 2, 2019, University of Groningen
J.M. Woolderink	Gynaecological malignancies in Lynch Syndrome: surveillance and cancer characteristics. Groningen, UMCG; November 27, 2019, University of Groningen

D. Schrijnders — Oral glucose lowering agents and cancer in type 2 diabetes mellitus: focus on sulphonylurea derivatives. Groningen, UMCG. December 18, 2019, University of Groningen.

DR. S. LA BASTIDE-VAN GEMERT

M. Angsupaisal — Adaptive seating and adaptive riding in children with cerebral palsy. Groningen, UMCG. May 6, 2019, University of Groningen.

PROF. H. SNIEDER

R.M. Verweij — Understanding childlessness: Unravelling the link with genes and socio-environment. Groningen, Sociology. January 31, 2019, University of Groningen

A.A. Sas. (Genetic) — Epidemiology of Inflammation, age-related pathology and longevity. Groningen, UMCG. February 11, 2019, University of Groningen.

M.Y. van der Ende — Heart disease in women and men: insights from Big Data. Groningen, UMCG. December 18, 2019, University of Groningen

PROF. A.C. LIEFBROER

J.E. Mooyaart — Linkages between family background, family formation and disadvantage in young adulthood. Groningen, UMCG. April 24, 2019, University of Groningen

PROF. E. BUSKENS, DR. K.M. VERMEULEN

R. Botes — Aging and wellbeing: investigating elderly preferences and values. Groningen, UMCG. October 28, 2019, University of Groningen

PROF. E. BUSKENS, DR. D. POSTMUS

G. de Graaf — Eyes on the prize: early economic evaluation to guide translational research: examples from the development of biomarkers for type 2 diabetes. Groningen, UMCG. November 13, 2019, University of Groningen

Colophon

Editor

Paul Krabbe

Photography cover

Shutterstock

Photography

Foto Meilink, Emmen

p. 10 IMAZZO

p.52 eigen foto

Design

Designdays, Nynke Visser