

# Annual Report 2020

**LIFE COURSE EPIDEMIOLOGY OF CHRONIC COMMON DISEASES**  
[WWW.EPIDEMIOLOGYGRONINGEN.NL](http://WWW.EPIDEMIOLOGYGRONINGEN.NL)



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# Preface

June 1, 2021

Dear colleagues and research friends,

This is the 2020 Annual Report of the Department of Epidemiology, University Medical Center Groningen, the Netherlands.

This report reflects a very strange and difficult year, in which the COVID-19 pandemic led to a number of lockdowns and we were urged to work from home during most of the year to prevent the spread of the virus. Nevertheless, a few members of our department did get infected, but fortunately recovered well.

As a department, we were able to deal with the consequences of the lockdowns, showing a huge amount of resilience and flexibility, and we were able to maintain our research and teaching activities at our usual high level, and even beyond that. I am proud to see how we managed to do this, while keeping in close contact with each other, and maintaining distance.

I hope you will enjoy reading about our work by clicking on the links in the report and gaining a full interactive experience as you scroll through it.

I look forward to hearing from you and to discussions on possible research and teaching collaborations with our experts. Let's hope you can visit us in person in 2021 in the department, to meet up and interact with our staff.

We hope you all remain in good health.

Best wishes,

Prof. Marike Boezen  
Head of department

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# Summary and highlights of 2020

2020 has been a very strange and memorable year due to the COVID-19 pandemic. In mid-March we were just getting used to working in our new open-plan and flexible office spaces, and making an inventory of what changes needed to be made to optimize our new working environment, when the first lockdown was imposed and we were urged to work from home. This of course was an unprecedented challenge to adapting our working style. We had to switch to online meetings and get used to sitting at home behind a computer all day.

It was a difficult year: difficult because we could not visit our family and friends, in the Netherlands or abroad; and it was hard because we missed our colleagues and friends at work, and the normal daily and social interactions working life brings. Nevertheless, as a department, we dealt with the consequences of the lockdown well.

We got used to ways of online communication and proceeded with our research and teaching not only to the best of our efforts, but more than that; our staff's strong internal drive and motivation meant all the department's teaching activities were adapted to online courses. This showed the immense flexibility and commitment of all those involved in teaching. We even started up some new courses and worked further on developing our e-learning modules.

In addition, although some PhD defenses had to be postponed, we had 18 PhD students who successfully defended their thesis in 2020. Unfortunately, the majority of the graduation ceremonies had to take place in a hybrid physical-online form, with just a few people being allowed to be present in the University's hall, and with no or very limited possibilities for a party or festivities thereafter. Given the difficult circumstances, the finalization of these high-quality PhD trajectories makes us even more proud than usual.

And last but not least, our research in 2020 led to 286 peer-reviewed publications, maintaining our high scientific level and societal qualities.

As a department, we tried to keep in close contact with each other, while maintaining distance. We organized digital social meetings like coffee-breaks, the annual Christmas drinks, and a pub quiz. Small gifts were also sent to all our department members. We did our best to keep up spirits and reduce anxiety, while looking forward to meeting each other again in person in the department.

We do hope you can visit us in person in 2021 in the department. Until then, please visit our website – [www.epidemiology Groningen.nl](http://www.epidemiology Groningen.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.epidemiology Groningen.nl](http://www.epidemiology Groningen.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](http://www.lifelines.nl)

The **Vlagentwede-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](http://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](http://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](http://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 top to bottom, from left to right:

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



# Chronic airway diseases epidemiology

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## PLANS

Our unique studies on genetics and epigenetics in COPD will lead further into functional studies.

We will continue our focus on asthma remission, a rare phenomenon in which a patient spontaneously outgrows the disease. In addition, we will lead or co-lead a number of international genome- and epigenome-wide association studies on COPD, asthma and related phenotypes. We will further investigate risk factors for the development and the severity of COVID-19 in the Lifelines COVID-19 project, focusing on individuals with chronic respiratory diseases.

The unit has a strong international track record in the epidemiology of chronic airway diseases (asthma and COPD). We study the role of common and rare genetic variants, epigenetics, environmental risk factors, and gene-by-environment interactions in the onset and progression of chronic airway diseases. We play a leading role worldwide in the identification of common and rare genetic variants that underlie COPD in smokers and non-smokers. We lead, or participate in, many international genetic and epigenetic studies on lung function, COPD and asthma. Uniquely, we are linking genetic and epigenetic studies with functional studies.



MARIKE BOEZEN, HEAD OF THE UNIT

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

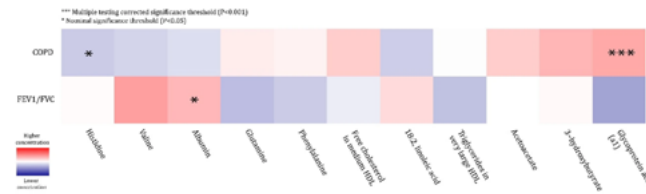
*Ultimately helping to unravel the etiology of chronic airway diseases and find ways to prevent, cure, or reduce their burden.*

## HIGHLIGHTS

### Metabolomics in COPD

Our Lung Foundation Consortium performed a metabolome-wide discovery analysis that identified 11 metabolites associated with COPD or lung function levels. The strongest signal was for Glycoprotein acetyls (GlycA), an acute phase protein involved in the chronic inflammatory response. Future studies should reveal if GlycA can serve as an earlier predictive biomarker for COPD.

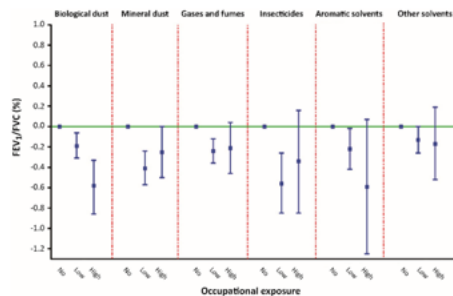
<https://bmcpulmed.biomedcentral.com/articles/10.1186/s12890-020-01222-7>



### Occupational exposures and lung function levels in Lifelines

We found several types of occupational exposures are associated with lower lung function levels in active workers in the Lifelines cohort study. This indicates that people may become less healthy as a result of their job and that protective measures should be taken to prevent workers being exposed.

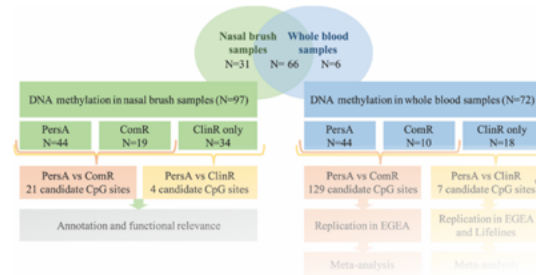
<https://doi.org/10.1513/AnnalsATS.201909-678OC>



### Differential DNA methylation in asthma remission

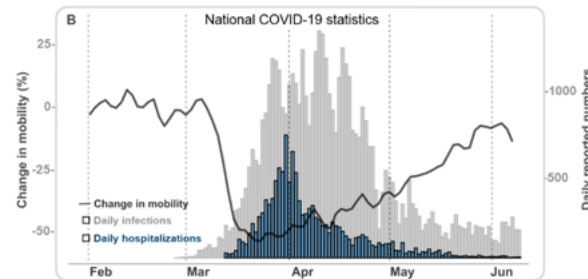
Epigenetics (structural changes to the DNA without alterations to the DNA sequence) may play a role in the onset and remission of asthma. In a large collaborative study, we identified differences in DNA methylation between active asthma and asthma-in-remission in whole blood and nasal epithelium samples.

<https://ctajournal.biomedcentral.com/articles/10.1186/s13601-020-00365-4>



### The COVID-19 pandemic and Lifelines

We are playing a key role in coordinating the Lifelines Corona Research and its ongoing data collection and analysis. The aim is to identify risk factors for susceptibility to COVID-19 and severe infection, and to assess the psychological and societal impacts of the COVID-19 pandemic in the prospective Lifelines population cohort.



## SENIOR STAFF

NAME	FUNCTION	TOPIC
H.M. Boezen (Marike)	Full professor, Unit chair	Genetics and epigenetics of chronic airway diseases
G.J. van den Berg (Gerard)	Full professor	Econometrics
J.M. Vonk (Judith)	Assistant professor	Longitudinal data analyses; asthma; Lifelines
N. El-Baz (Noha)	Lecturer	Education coordinator
N. Veeger (Nic)	Senior researcher	Research coordinator, Medical Center Leeuwarden
K. de Jong (Kim)	Postdoc	Medical Center Leeuwarden
M. de Vries (Maaïke)	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
H.J.L. Koefoed (Hans Jacob)	Lung function development from childhood to young adulthood	Pediatric Pulmonology, UMCG
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 an individual's 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 is on the development of dietary patterns and in-depth analyses of daily patterns of physical activity. We will contribute to shaping lifestyle education for 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, major chronic diseases, and mortality. We look at associations between these factors from different perspectives: how do such associations change with age, or with severity of 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

### Third International Transplant Symposium, Leuven, Belgium

In early 2020, we helped organize 'Time to Move', an international symposium on transplants. This unique symposium integrated expertise from doctors, testimonials from patients, and scientific evidence from research. Together we are passionate about bringing lifestyle into the transplant treatment plan. Exercise = Medicine!

<https://kuleuvencongres.be/its2020/home>



### Physical activity benefits over the life course

We developed a model explaining how physical activity benefits health over the life course. Physical activity can benefit health at any age, but has different health outcomes at different ages. For example, in young adults, it may help prevent obesity, whereas later in life, it is important in helping to prevent type 2 diabetes.

<https://hdl.handle.net/11370/cdeb1cbc-43cc-4835-b9b8-648306282fe9>

### Lifelines Physical Activity Score

For the Lifelines cohort study, we worked on the SQUASH questionnaire. This is a Dutch questionnaire to estimate daily moderate-to-vigorous physical activity. We critically re-assessed the data processing protocol and, based on changes we proposed, we developed the Lifelines Physical Activity Score, reflecting moderate-to-vigorous activity in leisure time and whilst commuting.

[https://www.rug.nl/research/portal/files/112903517/Chapter\\_7.pdf](https://www.rug.nl/research/portal/files/112903517/Chapter_7.pdf) (download)

### Sugar-sweetened beverages: snack or drink?

Obesity starts developing at an early age. In the GECKO Drenthe cohort, about 25% of children drink sugary drinks more than 5 times a day. Sugar-sweetened drinks are used to quench thirst rather than enjoyed as treats. We showed that this habit is strongly related to weight gain and future overweight.

<https://kennisinzicht.umcg.nl/Paginas/Oppassen-met-vloeibaar-snoep-.aspx>

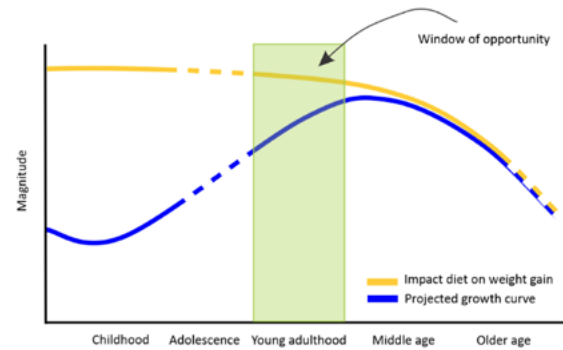




### Tackling weight gain in young adults

Based on data from the Lifelines and GECKO Drenthe cohorts, we showed that unnoticed or unintended weight gain is higher at a younger age (blue line). The influence of a weight-reducing diet is strongest in children and young adults (yellow line). The figure shows that prevention is most effective when performed early in adult life.

<https://www.lifelines.nl/researcher/publications/nutrition-beyond-the-first-1000-days-diet-quality-and-7-year-change-in-bmi-and-overweight-in-3-year-old-children-from-the-dutch-gecko-drenthe-birth-cohort>



## 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 University of Applied Sciences
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

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## PLANS

We aim to adapt our screening model for cervical cancer and colorectal cancer. The participation rate in screening and related determinants will be an important topic this year. In 2021, apart from expanding our cohort, the OncoLifeS cohort will be expanded to include patients from other hospitals.

Our unit studies the early detection of cancer and evaluation of health-related quality of life after cancer. To assess and optimize screening strategies, we identify populations at risk for cancer using systematic literature reviews, analyses of cohorts and cancer registries, and modeling. We study not only the benefits of screening, but also the negative effects of over-diagnosis, tumor-induction, and false-positive results. A UMCG oncology data biobank, OncoLifeS, was initiated to evaluate outcomes after cancer in a systematic way.



TRUUSKE DE BOCK, HEAD OF THE UNIT

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

## HIGHLIGHTS

### Frailty and quality of life

For two years, we followed 288 patients in OncoLifeS who were treated for head and neck cancer. Frail patients are at an increased risk for decline in health-related quality of life, and for further deterioration during follow-up.

<https://pubmed.ncbi.nlm.nih.gov/33045628/>

### Digital breast tomosynthesis in population screening

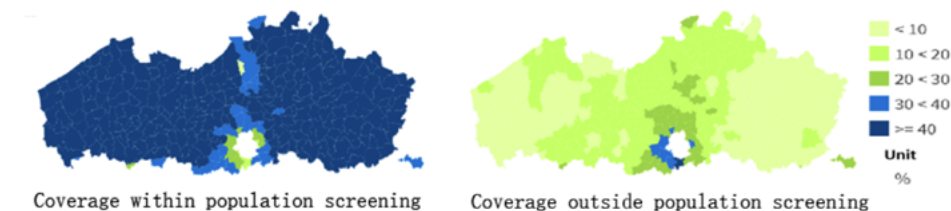
In the population screening for breast cancer, digital breast tomosynthesis is more likely to be a cost-effective alternative to mammography in women with dense breasts (composition C and D) compared to women without dense breasts (composition A and B). Whether digital breast tomo-synthesis could be cost-effective in the general population depends largely on the costs involved.

<https://pubmed.ncbi.nlm.nih.gov/32382844/>

### Breast cancer screening in Flanders

Women with a lower socio-economic status, younger age, living in a high population density area, in crowded households, or having low dental care, are less likely to be screened for breast cancer in Flanders. If they are screened, it is more likely to take place outside the breast cancer screening program.

<https://pubmed.ncbi.nlm.nih.gov/33246477/>



### Lung cancer screening

Lung cancer screening with low-dose computed tomography in a high-risk population was shown to be cost-effective. The optimal strategy for men is annual screening from the age of 55 to 80 years, while for women biennial screening from the age of 50 to 80 years is the optimal strategy.

<https://pubmed.ncbi.nlm.nih.gov/32563896/>

### Symptoms in long-term breast cancer survivors

Various long-term symptoms can manifest after breast cancer treatment. After a median follow-up of 10 years, concentration difficulties, forgetfulness, dizziness, and nocturia were more frequent among breast cancer survivors compared with controls. The symptoms are mainly related to the therapies received (chemotherapy and/or radiotherapy).

[https://www.youtube.com/watch?v=VK55Mhr6e\\_w&t=57s](https://www.youtube.com/watch?v=VK55Mhr6e_w&t=57s)



## 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
P.C. Vinke (Petra)	Senior researcher	Quality of life after immunotherapy
M. Vonder (Marleen)	Senior researcher	Lung cancer and cardiac screening
J. Nagel (Janny)	Project coordinator	OncoLifeS data biobank

## PHD STUDENTS

NAME	TOPIC	COLLABORATION
J. Cai (Jiali)	Lung nodules and lung cancer screening	Radiology, UMCG
K.M. Castañeda Vanegas (Melisa)	Cervical cancer screening	Pathology; Gynecologic Oncology, UMCG
L. Ding (Lilu)	Breast cancer screening	Radiology, UMCG; Epidemiology, Antwerp, Belgium
J. Du (Jing)	Cancer in diabetes patients	Langerhans Medical Research Group, Zwolle
Y. Du (Yihui)	Screening for lung cancer	Radiology, 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
F.O. Cortes Ibañez (Francisco)	Preventable factors in cancer	-
L.T. Jonker (Leonie)	Home monitoring after surgery	Oncological Surgery, UMCG
E.A. Kop (Emiel)	Predictive markers for local control in early stage laryngeal cancer	Otorhinolaryngology; Pathology, 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
Y. Mao (Yifei)	Evaluation in lung cancer screening	Radiology, UMCG
L.B. van der Oever (Daan)	Machine learning and cardiovascular disease	Radiology, UMCG
M. Plas (Matthijs)	Inflammation after treatment for cancer in the elderly	Oncological Surgery, UMCG
N. Sadok (Nadia)	Breast reconstructions	Plastic Surgery, Oncological Surgery, UMCG
A. Stuursma (Anniek)	Preventive oophorectomy	Gynecology, UMCG
J. de Waard (Jolien)	Cervical cancer screening	Pathology; Gynecologic Oncology, 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 for outcome after surgical oncology	Oncological Surgery; Radiology, UMCG
H.J. Wisselink (Rik)	CT biomarkers for emphysema	Radiology, UMCG
X. Yang (Xiaofei)	COPD and lung nodules in screening	Radiology, UMCG
F. Zhang (Fan)	Breast cancer and diabetes	-
S. Zheng (Senshuang)	Colon cancer screening	Radiology, UMCG; Epidemiology, Tianjin University, China
A.T. Zwart (Aniek)	Skeletal muscle mass as predictor for outcome head and neck cancer	Head and Neck Oncology; Radiology, UMCG

# Medical statistics & decision making

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## PLANS

We will develop a new course focused on machine-learning methods that are relevant for medical research, and launch several new e-learning modules for statistics courses. We will also explore how our risk assessment software, ADDIS, can support UMCG staff. Our research efforts in 2021 will focus on developing methods to identify hidden patterns in Lifelines and UK Biobank data.

Our research focuses on developing methods for statistical modeling in clinical and epidemiological studies and analyzing large cohort data. We also develop decision analysis techniques to support benefit-risk assessments of medicines and medical decision-making. In addition to these research activities, our unit teaches statistical methods to undergraduate and postgraduate students through a range of basic and advanced courses. We provide statistical support to other researchers through the Clinical Research Office and through short- and long-term collaborations with various clinical departments in the UMCG.



GERTON LUNTER, HEAD OF THE UNIT

*To develop and apply statistical and machine learning methods for analyzing ever-larger and complex data in collaboration with epidemiological and clinical researchers.*



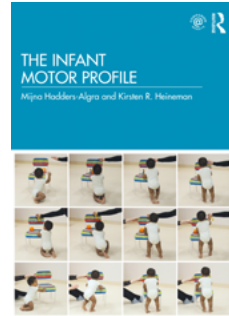
*“In god we trust, all others must bring data”  
(W. Edwards Deming).*

## HIGHLIGHTS

### Early detection of motor development problems

We created percentile norms for the Infant Motor Profile (IMP) and Alberta Infant Motor Scores (AIMS); these are reliable summary scores developed for the early detection of motor development problems in infants.

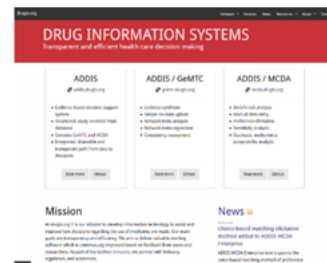
<https://books.google.nl/books?id=pWTZzQEACAAJ>



### Medical decision-making

We developed an enterprise version of the ADDIS software, as part of our efforts to make this software platform financially self-sustaining.

<https://drugis.org>



## SENIOR STAFF

NAME	FUNCTION	TOPIC
G.A. Lunter (Gerton)	Full professor, Unit chair	Statistics and machine learning
H. Hillege (Hans)	Full professor	Clinical epidemiology
S. la Bastide (Sacha)	Assistant professor	Causal inference
H. Burgerhof (Hans)	Lecturer	Teaching; study design
D. Postmus (Douwe)	Senior researcher	Medical decision-making
J. de Keijser (Joris)	Software engineer	Decision support systems
D. Reid (Daan)	Software engineer	Decision support systems
K. Zālīte (Kārlis)	Software developer	Decision support systems

## PHD STUDENTS

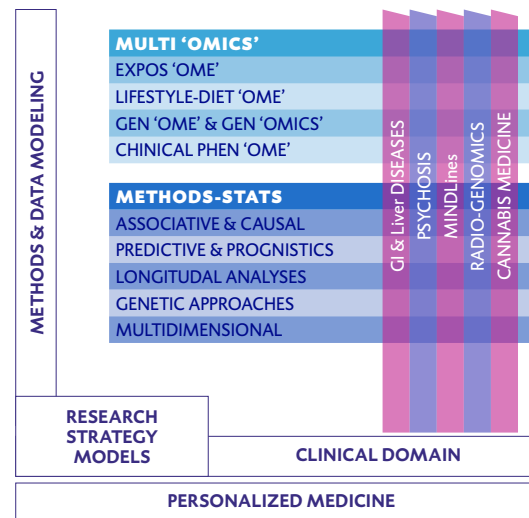
NAME	TOPIC	COLLABORATION
A. Baxhaku (Aida)	Re-design of the study data import process of the ADDIS software	-
Y. Chen (Yuntao)	Advanced survival analysis techniques	-
D. Huisenga (Darlene)	Developmental outcomes of infants born with severe congenital heart disorder	Developmental Neurology, Pediatrics, UMCG
S.R. Munoz (Sonia)	Preference heterogeneity in benefit-risk assessment	-
K. de Vries (Klazien)	Improved survival analysis using machine learning	Mathematics, Oncology, UMCG

# Digestive system diseases

## PLANS

We will focus on appraising and implementing patient-centered care by studying four main domains relevant to the clinic and mostly at the individual level (Figure). We will integrate and analyze heterogeneous data from genomics, exposome, clinical and para-clinical measurements, medications, and patient-reported outcomes. In particular, we will increase our efforts to study the genomics of inflammatory biomarkers, using genome-wide association studies. Two other topics will be the genome-exposome association with the course of inflammatory bowel diseases, and the relationships with patient-level outcomes in psychosis care and their prediction.

The unit's vision is to implement personalized medicine in routine clinical practice. We focus on understanding and predicting the (causal) factors associated with the clinical course and outcome of complex diseases of the digestive system, psychosis, cancer, and radiotoxicity (Figure). To this end, and to pinpoint patient-centered therapies, this unit conducts international population-based cohort studies, patient-based clinical studies, and randomized clinical trials. The unit collaborates with international cohorts and has co-leaders in several international consortia.



BEHROOZ ALIZADEH, HEAD OF THE UNIT

*To unravel the causes and underlying mechanism of complex diseases, and to appraise and implement personalized prediction and therapy in practice.*

## HIGHLIGHTS

### Longitudinal data modeling in personalized medicine

We implement longitudinal data analysis to understand the trajectories of disease course for each patient, for example, in psychosis, and hence seek to understand the factors associated with the disease course. The patients' trajectories can be applied for individually tailored therapy in personalized psychiatry.

Disease course - Personalized medicine - Psychosis

<https://pubmed.ncbi.nlm.nih.gov/32694510/>



### Genetic and environmental factors in psychosis

Schizophrenia involves a strong genetic susceptibility in interplay with environmental exposures. In a large EU consortium, we found a strong and significant interaction between genetic and environmental risk scores for schizophrenia. The next step is to understand whether such genetic underpinnings and environmental exposures can be applied to providing tailored-therapy in schizophrenia.

Genome-Exposome\_in Psychosis

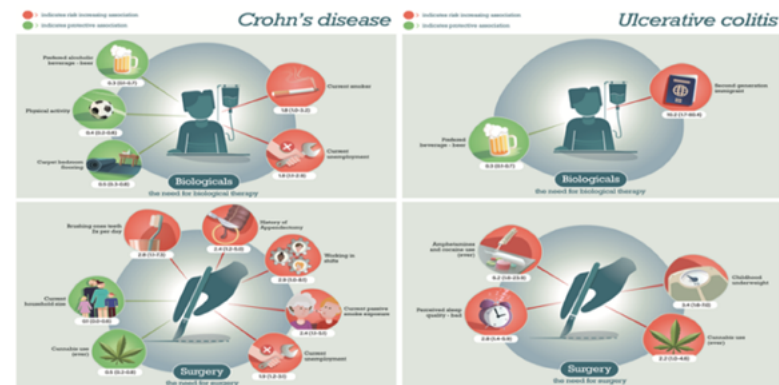
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7681168/>

## Exposome and personalized medicine

Our large, population-based study identified 20 exposomic factors for the risk of inflammatory bowel disease and 16 factors for a severe disease course. The identification of exposomic factors leads to better stratification of patients at high risk for disease complications, which contributes to the implementation of personalized management and disease prevention.

### Personalized-Medicine-IBD

<https://www.ecco-ibd.eu/publications/ecco-news/item/the-exposome-and-personalised-medicine-in-ibd.html>



## Radiogenomics in personalized radiotherapy

The complications caused by radiotherapy in individual patients can be better avoided by understanding the genetic causes of such complications. In the first two-stage genetic study of 1,780 patients with head and neck cancers, we discovered several genetic variations associated with painful inflammation and ulceration of the mucous membranes after radiotherapy in two European populations.

## SENIOR STAFF

NAME	FUNCTION	TOPIC
B.Z. Alizadeh (Behrooz)	Assistant professor, Unit chair	Genetic epidemiology & personalized medicine
T. Habtewold (Tesfa)	Researcher (Started Sept 2020)	Modeling disease course; causal analyses

## PHD FELLOWS

NAME	TOPIC	COLLABORATION
M.R. Abdollahi (Reza)	The disease course in autoimmune hepatitis in patient-centered therapy	-
S. Abedian (Shifteh)	Pharmacogenetics factors in the course of diabetes and inflammatory bowel diseases	-
S. Amoui (Sina)	The efficacy of cannabinoid medicines in chronic diseases	-
K. Kist Bakof (Karstyn)	Genetic underprint of disease course and response in Schizophrenia	Psychiatry, UMCG
S. Bauman (Silke)	Hidradenitis Suppurativa: epidemiology, course, and its tailored therapy	Dermatology, UMCG
S. Farhang (Sara)	Predictors of the course and outcome of first-episode psychosis at the patient level	Psychiatry, UMCG
T. Habtewold (Tesfa)	Latent class analyses to distinguish personal clinical and cognitive course of schizophrenia	Psychiatry, UMCG
S. Moazzen (Sara)	Dietary patterns associated with gastrointestinal cancers	-
E. Naderi (Elnaz)	Genetic based prediction of radio-toxicity in head and neck cancer; personalized therapy	Radio-oncology, UMCG
M. Nomden (Mark)	Seasonal clustering and space of biliary atresia	Liver Transplantation, UMCG
V. Peter (Victor)	Genetic causes of drug adverse effect in type II diabetes: Pharmlines study	Clinical Pharmacy, RUG
V. Peters (Vera)	The (non)sense of dietary patterns susceptibility and disease course in inflammatory bowel disease	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



# Genetic epidemiology

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Annual Report Epidemiology 2020

## PLANS

The focus will be on building prediction models, including genetic risk scores and gene-environment interaction models for (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. Furthermore, we will explore machine-learning algorithms to facilitate precision medicine in intensive care. We lead the UMCG Genetics Lifelines Initiative (UGLI), with the goal of performing genome-wide genotyping for the entire Lifelines study.

The unit plays a key role in teaching and in the genetic data analysis of all the major cohort studies in the UMCG. Our training activities include involvement in Epidemiology B registration, and providing introductory and advanced courses in genetic epidemiology, and introductory courses in R and how to handle Lifelines data on the high performance computer cluster. We coordinate the genetic studies performed in the Lifelines, TRAILS and GECKO cohorts. The unit staff are active members, leaders or co-leaders of consortia performing (epi)genome-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.*



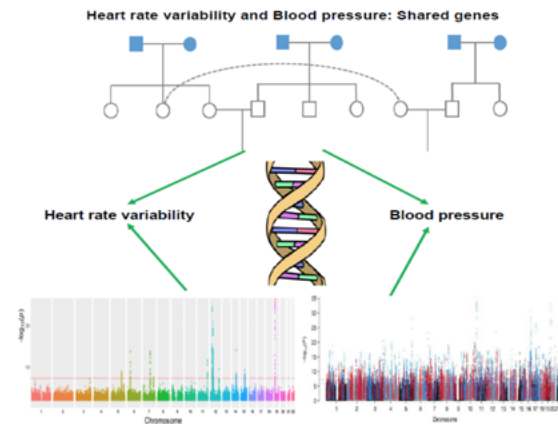
*Identifying genes, environmental exposures, and their interactions in common complex diseases of aging, and developing innovative analytical methods and software tools.*

## HIGHLIGHTS

### Blood pressure and autonomic function in Lifelines

Information on over 29,000 families in Lifelines showed that genetic factors contribute substantially to blood pressure and autonomic nervous system function and that their genetic pathways partly overlap.

<https://www.ahajournals.org/doi/10.1161/HYPERTENSIONAHA.120.15227>



### Family history of chronic kidney disease (CKD)

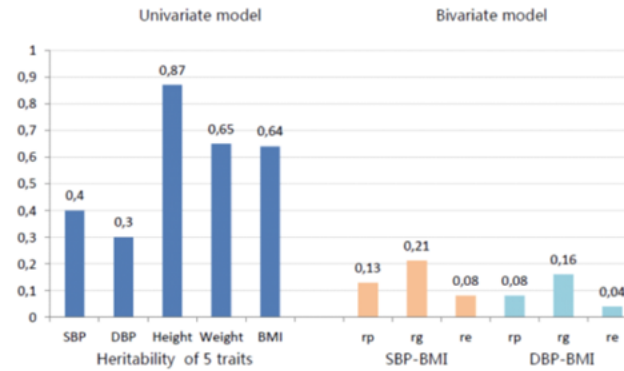
We observed that a positive family history was associated with a three-fold increased risk of chronic kidney disease and found moderate to high heritabilities of kidney traits and related biomarkers. These results indicate an important role of familial factors in CKD risk.

[https://www.ajkd.org/article/S0272-6386\(20\)31162-8/fulltext](https://www.ajkd.org/article/S0272-6386(20)31162-8/fulltext)

### Heritability of blood pressure in the World War II Veteran Twin Study

In the largest twin study on blood pressure ever conducted, we found genetic contributions of between 30–40% to systolic and diastolic blood pressure. Correlations with obesity were mainly explained by common genes, but there was no evidence of a gene-obesity interaction on blood pressure.

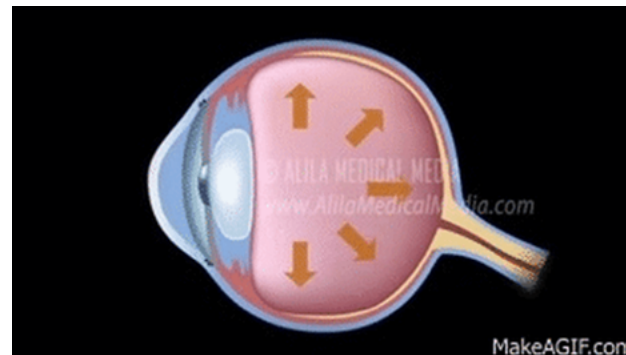
<https://www.ahajournals.org/doi/full/10.1161/HYPERTENSIONAHA.120.15232>



### A questionnaire-based proxy for glaucoma

After developing a questionnaire-based proxy for glaucoma, we applied this to show that glaucoma is associated with autonomic dysfunction and blood pressure.

<https://www.nature.com/articles/s41433-020-0882-4>



### Genetic risk scores in adolescents

We calculated genetic risk scores (GRS) for 20 disease-related traits and applied them in adolescents of the TRAILS cohort. A more than six-fold increased risk for overweight/obesity and an almost three-fold increased risk for hypertension were found in individuals with a high GRS compared to those with a low GRS.

<https://www.ahajournals.org/doi/10.1161/CIRCGEN.119.002775>

## 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
C.H.L. Thio (Chris)	Postdoc	Causal inference modeling

## PHD FELLOWS

NAME	TOPIC	COLLABORATION
A. Ani (Alireza)	Bioinformatics tools and pipelines for genome-wide data analysis	University of Isfahan, Iran
N. Asefa (Nigus)	Heritability of eye diseases	Ophthalmology, UMCG
Z. He (Zhen)	Risk factors for new onset hypertension in perimenopausal women	Shantou University, China
Z. Kamali (Zoha)	Genomics of blood pressure	University of Isfahan, Iran
X. Lu (Xueling)	(Epi)genetic determinants of type 2 diabetes and endocrine disrupting chemicals	Endocrinology, UMCG; Shantou University, China
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
E. Walaszczyk (Eliza)	Epigenetics and the development of type 2 diabetes	RIVM; Endocrinology, UCMG
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
S. Wang (Siqi)	Mendelian randomization and drug target prioritization in CVD	Cardiology, UMCG
T. Xie (Tian)	Early (epi)genetic and environmental origins of obesity and hypertension	Lifestyle Medicine

# Patient-centered Health Technology Assessment (HTA)

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Annual Report Epidemiology 2020

## PLANS

We have run a large study in the USA to collect patient responses based on our new generic health outcome measure. The first results seem promising, but detailed analyses are in progress and publications will follow.

In our multidisciplinary team, we apply statistical, epidemiological, economic, psychometric and other methods to evaluate the health 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. We have 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 public, and the needs of policymakers.*

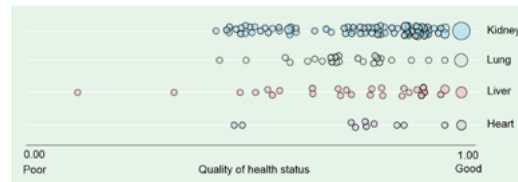
## Showing the value of health interventions.

### HIGHLIGHTS

#### First results of novel measurement tool

Based on a novel measurement method, we developed an electronic patient-reported outcome measure (ePROM) for transplant recipients and used it in a small UMCG study. Scores on nine different health factors were weighted and combined into a single value (larger circles represent the same value reported by multiple recipients).

<https://www.chateau-sante.com/healthsnapp>



#### Health economics course

The unit's staff developed a HTA course (5 ECT) for the Faculty of Economics & Business, University of Groningen; the course is open to students from other faculties as well.

<https://www.rug.nl/masters/business-administration-health/>

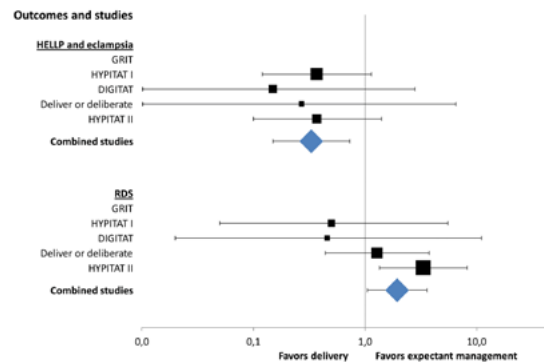
#### Explore preferences and experiences in screening

Our HealthFan software was used to identify preferences and experiences of women regarding the use of the self-sampling device in the screening for cervical cancer. The next step is to include the items selected as most important in a special ePROM and the final results may be used to improve screening attendance.



### National guidelines

The results of an individual patient data meta-analysis were used in national guidelines drawn up by the Dutch Society for Obstetrics and Gynecology. The results support treatment policy regarding the choice between induction of labor and expectant management in women with hypertensive disorders of pregnancy.





## SENIOR STAFF

NAME	FUNCTION	TOPIC
P.F.M. Krabbe (Paul)	Associate professor, Unit chair	Health outcome measurement
E. Buskens (Erik)	Full professor	Health technology assessment (HTA)
H. Groen (Henk)	Assistant professor	Fertility medicine and obstetrics
A.D.I. van Asselt (Thea)	Senior researcher	Economic evaluation
M.M.H. Lahr (Maarten)	Senior researcher	E-health and stroke
A.T. Lettinga (Ant)	Senior researcher	Process-oriented action research
K.M. Vermeulen (Karin)	Senior researcher	Economic evaluation and quality-of-life

## PHD FELLOWS

NAME	TOPIC	COLLABORATION
H. Dijk (Hermien)	Economic evaluation of child psychiatry	Economics & Business, University of Groningen
W.M. van Dorst (Pim)	True value of diagnostics	Health Sciences (Global Health), UMCG
S. Elyan (Saif)	Economics of informal caregiving	Economics & Business, University of Groningen; Bangor University, Wales
O. Fisher (Oliver)	Migrant labor care workers in informal caregiving	Economics & Business, University of Groningen; University of Ancona, Italy
N. Fitria (Tia)	Economic studies into hyperglycemia in pregnancy, gestational diabetes	PTEE, DIKTI, Indonesia
R. Freriks (Roel)	HTA tool for children's mental health	Economics & Business, University of Groningen
S. Holterman (Sander)	Business models in e-health	Windesheim, University of Applied Science, Zwolle
A. Viska Icanervilia (Icha)	Health technology assessment of mammography screening in Indonesia	Health Sciences (global health), UMCG; LPDP, Indonesia
L.T. Jonker (Leonie)	Measuring physical activity in oncological patients	Surgery, General Practice, UMCG

M. Karsten (Matty)	Follow-up of women and children after preconception lifestyle intervention	Reproductive Medicine, AMC
W.J. Maas (Willemijn)	Collaborations for new treatments in acute stroke	Economics & Business, University of Groningen; Neurology, UMCG
C.P. Nguyen (Chi)	Economic evaluations in innovative acute stroke treatments	Economics & Business, University of Groningen; Neurology, UMCG
M.J. Meijboom (Marjan)	Cost effectiveness of influenza vaccination	FSE, University of Groningen
K. Haile Misgina (Kebede)	Transgenerational malnutrition in early life in Northern Ethiopia	Pediatrics, UMCG; Danone
I. van Oostrum (Ilse)	Disease modeling, survival modeling	PTEE, Utrecht University
A. Shahabeddin Parizi (Ahmad)	Patient-centered solid-organ transplant instrument	Internal Medicine, UMCG
S. van der Pol (Simon)	Health economics of diagnostics	Health Sciences (Global Health), UCMG
C. Schey (Carina)	MCDAs for informing resource allocation decisions	Global Market Access Solutions, Switzerland
M. Slagter (Martian)	Change management and implementing innovation in social care	Economics & Business, University of Groningen
E.D. Tutuhaturunewa (Eric)	Evaluation 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; GSMS
E. Veldhuijsen (Edith)	Equity and ethics of expensive medicines in rheumatology	Medical Ethics, UMCG; PTEE, University of Groningen
J. Venema (Janine)	Effectiveness and Implementing Innovation in social care	Spatial Sciences, University of Groningen
Z. Wang (Zheng)	Optimization of fertility treatment	Reproductive Medicine, UMCG
R. Wasir (Riswandi)	HTA and cardiovascular drug reimbursement policy in Indonesia	PTEE, Utrecht University
X. Zhang (Xin)	Diabetes ePROM design	-
E. Zwertbroek (Eva)	Prediction hypertensive disease in pregnancy	Obstetrics, UMCG

# Health behavior epidemiology

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## PLANS

In the summer of 2021, we will start recruitment for FINGER-NL, a multicenter, randomized, controlled trial to investigate the effectiveness of a multi-domain intervention for optimal cognitive health in individuals aged 60–80 years. Within Lifelines, we will set up a senior-cohort (AgeingLines) to identify biomarkers of biological aging. We also aim to develop a PhD course on Life Course Epidemiology.

Health behaviors, such as physical activity, diet, alcohol consumption and smoking, have a major impact on healthy life expectancy. The determinants of health behaviors are complex and multifaceted, including individual, social, and environmental factors. Our research is aimed at understanding the development of health behaviors over the life course and to identify periods of increased susceptibility for behavioral change. We evaluate lifestyle interventions focusing on disease risk reduction to improve the healthy life expectancy of the general population. We analyze data from large, population-based cohort studies, such as Lifelines.



NYNKE SMIDT, HEAD OF THE UNIT

*Our mission is to increase the healthy life expectancy by generating scientific and policy-relevant knowledge on the determinants of health behaviors.*

*Improving knowledge of health behaviors is crucial for increasing healthy life expectancy.*

## HIGHLIGHTS

### Psychological impact of COVID-19 pandemic on students

We conducted a survey among Bachelor and Master students to investigate the psychological impact of the Netherlands' intelligent lockdown regulations to control the COVID-19 pandemic. The severity of social isolation was associated with severe depressive symptoms. Both national and international students were equally affected.

### SHARE Societal Relevance Award 2020

The book 'Actief oud is Goud: Vrijwilligers in beeld' (An active old age is golden: profiles of volunteers) was awarded the SHARE Societal Relevance Award 2020.

<https://kennisinzicht.umcg.nl/Paginas/Oudere-vrijwilligers-willen-anderen-helpen-en-zelf-iets-nieuws-leren.aspx>



**Conference on ‘Who volunteers, and why?’**

We held a conference on ‘Who volunteers, and why?’ with national and international keynote speakers on Monday 12th October, in Groningen.

**Lifestyle and dementia**

During the crowd-funding campaign ‘A fitter Christmas: online activity and board games’ (Fitter Kerst: online beweeg- en damevent), we gave an interview about the importance of a healthy lifestyle, including cognitive activities such as checkers, for brain health. More than €1000 was collected for the UMCG Alzheimer’s Fund.

**The digital RFFT has been validated as a reliable cognitive test**

The Ruff Figural Fluency Test (RFFT) is a paper-and-pencil test for evaluating cognitive function, but its assessment is labor-intensive and time-consuming. We validated a digital RFFT that can be filled in by people independently on an iPad, and in which the results can be uploaded automatically.

## SENIOR STAFF

NAME	FUNCTION	TOPIC
N. Smidt (Nynke)	Associate professor, Unit chair	Health behavior from a life course perspective
A.C. Liefbroer (Aart)	Full professor	Life course demography
J. Niebuur (Jacobien)	Postdoc	Active and healthy aging

## 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, Institute for Medical Education, IBM
C.L. van Erpecum (Carel-Peter)	How obesogenic are Dutch neighborhoods?	Health Sciences, UMCG
M. Feenstra (Marlies)	Functional recovery trajectories in hospitalized older adults: Towards problem definition, actors, and measurements.	Internal Medicine/ Geriatrics, UMCG
L.A. Hoveling (Liza)	Unraveling the mediating pathways between socio-economic status and health	Health Sciences, Netherlands Interdisciplinary Demographic Institute (NIDI)
J.S. Muller (Joanne)	Socio-economic background, family life course and later life economic outcomes	Netherlands Interdisciplinary Demographic Institute (NIDI)
M.A. Pouw (Maaïke)	Hospital at home care for elderly patients with cognitive impairment	Internal Medicine/ Geriatrics, UMCG
L. Mangot Sala (Lluís)	Life-course transitions, socio-economic status and health behaviors	Netherlands Interdisciplinary Demographic Institute (NIDI)

W. Vermeulen (Willem)	Understanding differences in divorce rates between municipalities	Netherlands Interdisciplinary Demographic Institute (NIDI)
J. Vrijzen (Joyce)	Attitudes towards dementia risk reduction among individuals with a parental family history of dementia	Internal Medicine/ Geriatrics, UMCG
D. van Wijk (Daniel)	Job insecurity and family formation	Netherlands Interdisciplinary Demographic Institute (NIDI)

# 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 2019-2020. 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 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 wide 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.

## HIGHLIGHTS

- Despite the COVID-19 pandemic and how it has affected normal educational activities, we have managed to move 80% of the Epidemiology and Statistics education online.
- The E-learning platform of Epidemiology and Statistics was made available to students in the different programs (Medicine, Dentistry, Movement Science). It provides the epidemiological and statistical concepts to students at bachelor, master, research master and PhD level. It is accessible to all UMCG and UG students and employees. Furthermore, the E-learning platform has played a crucial role and contributed to the shift to online education. The e-learning platform models, in combination with interactive videos, are being used together with webinars and online workshops.
- One of our postdocs has joined the Junior teacher training trajectory (Junior Docenten Scholingstraject, JUDO). The aim of this trajectory is to prepare junior staff to give high quality teaching and to obtain their basic teaching qualification (Basiskwalificatie Onderwijs, BKO).

# Business management

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Annual Report Epidemiology 2020

*To support the department's staff and contribute to the efficiency of the department's primary processes.*

## Personnel management

The Department of Epidemiology welcomed 14 new employees in 2020, of whom eight are PhD students.

## Financial management

An overview of the department's expenses for 2020 is presented below.

EXPENSES IN 2020 (X € 1.000):

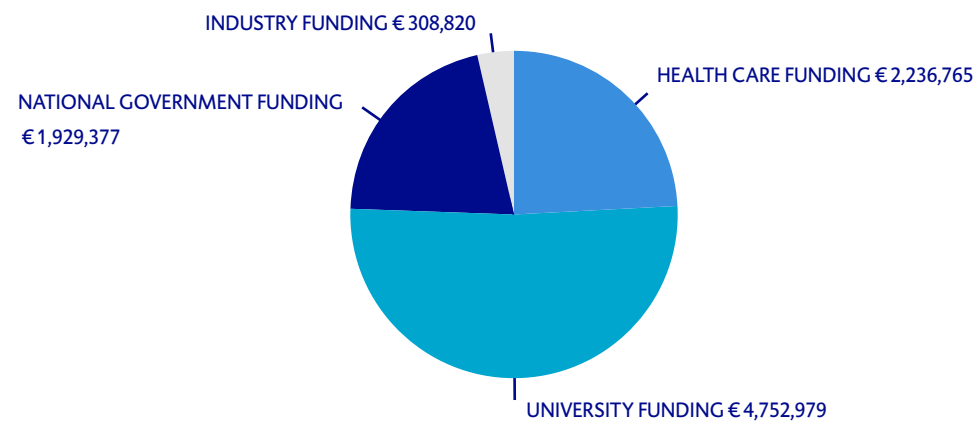
	RESEARCH & TEACHING
PERSONNEL	3,208,239
PROJECT RELATED AND MATERIAL COSTS	639,870
TOTAL	3,848,109

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 2020.



ERWIN KORT, BUSINESS MANAGER

## PROJECT PORTFOLIO 2020



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

TABLE. RESEARCH GRANTS AWARDED TO DEPARTMENT OF EPIDEMIOLOGY STAFF IN 2020

PRINCIPAL INVESTIGATOR	FUNDING BODY	TITLE	BUDGET (€)
Truuske de Bock	Astra Zeneca UK	Epi AstraZeneca cohort	308,820
Marieke Boezen	NWO	Fast track Covid-19	49,754
Erik Buskens	ZonMw	Baanbrekende professionals (Groundbreaking professionals)	99,995
Nynke Smidt	NWO	Mocia (Maintaining optimal cognitive functioning in aging)	359,454
<b>TOTAL</b>			<b>818,023</b>

## Facts & Figures



### SENIOR STAFF

NAME	FUNCTION
E. Kort (Erwin)	Business manager
A. Vermue-Gels (Anita)	Secretary
A. van der Zee (Aukje)	Secretary
L. Kuil (Lisette)	Secretary
K. Huizinga (Kevin)	Project controller

# Appendix

## PhD graduations

The University of Groningen maintains an archive of all PhD theses at

<https://research.rug.nl/en/publications/>

PROF. H.M. BOEZEN

Y. Wang

Effectiveness and safety of medicines used in COPD patients.  
Pharmacoepidemiological studies. Groningen, UMCG.  
March 30, 2020, University of Groningen.

N. Spinder

Maternal occupational exposures and congenital anomalies.  
Groningen, UMCG.  
November 18, 2020, University of Groningen.

DR. E. CORPELIJN

O. Byambasukh

Physical activity and cardiometabolic health. Focus on domain-specific associations of physical activity over the life course. Groningen, UMCG.  
February 17, 2020. University of Groningen.

DR. E. CORPELEIJN, PROF. R.P. STOLK

C. Lu Physical activity and health in Dutch and Chinese children.  
Groningen, UMCG.  
September 16, 2020. University of Groningen.

S.I. Brouwer Motor milestones, physical activity, overweight and cardiometabolic risk. From birth to adolescence. Groningen, UMCG.  
September 21, 2020. University of Groningen.

DR. E. CORPELEIJN, PROF. D. KROMHOUT

P.C. Vinke A life course perspective on diet quality and healthy ageing.  
Groningen, UMCG.  
November 2, 2020. University of Groningen.

PROF. G.H. DE BOCK

L. Boerman Long-term cardiovascular effects of breast cancer treatment.  
Groningen, UMCG.  
February 12, 2020 University of Groningen.

F.J. van der Sluis Risk estimation in colorectal cancer surgery. Groningen, UMCG.  
September 9, 2020 University of Groningen.

L. de Munck Breast cancer: screening, stage, and outcome: Studies based on the Netherlands Cancer Registry. Groningen, UMCG.  
November 30, 2020. University of Groningen.

PROF. G.H. DE BOCK, DR. B.Z. ALIZADEH

S. Moazzen Nutrients and diet quality in gastrointestinal cancers.  
Groningen, UMCG.  
December 9, 2020, University of Groningen.

PROF. H. SNIEDER, DR. B.Z. ALIZADEH

S. Abedian      Genotype-phenotype relationships and their clinical implications in inflammatory bowel disease and type 2 diabetes. Groningen, UMCG.  
November 25, 2020, University of Groningen.

PROF. H. SNIEDER

C.H.L. Thio      Chronic kidney disease. Insights from social and genetic epidemiology.  
Groningen, UMCG.  
October 7, 2020, University of Groningen.

DR. H. GROEN

M.D.A. Karsten      Women's lifestyle and sexual function - the effects of a preconception intervention in women with obesity. Groningen, UMCG.  
June 10, 2020, University of Groningen.

E.F. Zwertbroek      Hypertension in pregnancy - timing of delivery and early screening.  
Groningen, UMCG.  
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**Photography cover**

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**Photography**

Foto Meilink, Emmen

p.10 IMAZZO

p.24 en 50 eigen foto

**Design**

Designdays, Nynke Visser

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