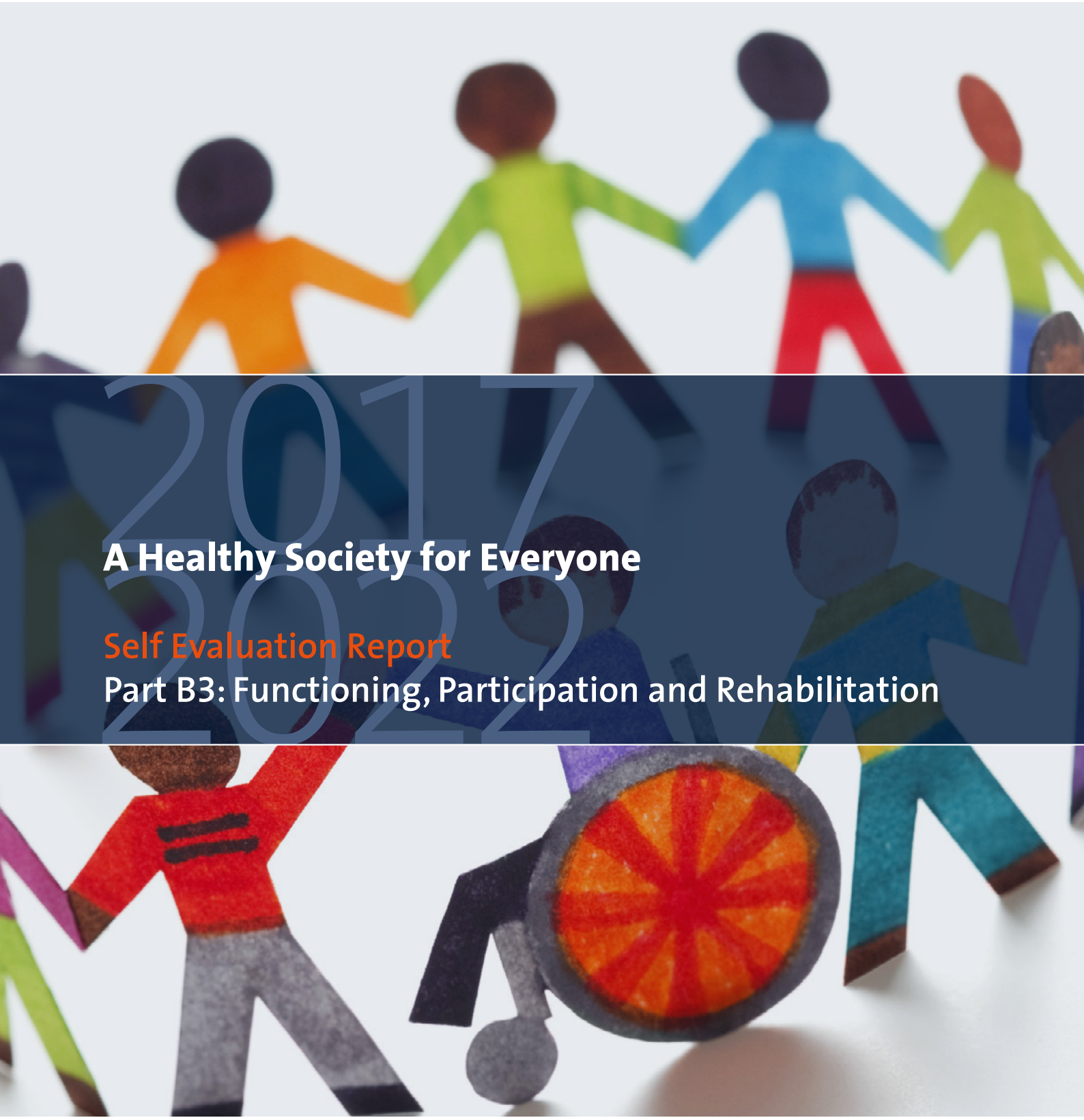
CAPHRI

Care and Public Health Research Institute



2017
2022

A Healthy Society for Everyone

Self Evaluation Report

Part B3: Functioning, Participation and Rehabilitation

Maastricht University | Maastricht UMC+

1 Mission, strategy and ambition

The Research Line (RL) 'Functioning, Participation & Rehabilitation' (FPR) hosts four core disciplines: Orthopaedics, Rheumatology, Rehabilitation Medicine and Epidemiology, each with their own research focus but also with an overarching goal, namely to conduct high-quality research in care and public health with societal relevance aiming at fostering and improving patient social and labour participation and well-being.

1.1 Vision, mission, and objectives

Our mission is to study the mutual relationships between health, well-being and functioning in order to understand and improve functioning, social role participation and well-being of individuals (general population, workers and patients), given their individual and soci(et)al context. Although research aims to address functioning and participation independent of the type of health condition, we mainly focus on healthy persons and persons with musculoskeletal, neurological or mental health complaints / conditions.

1.2 Strategy and Research Area

Within the research line Functioning, Participation and Rehabilitation fostering and improvement of patient participation and well-being will be obtained by combining expertise techniques and methodologies of different disciplines and by combining research in different settings, including basic research, pre-clinical and clinal research and research on social and labour participation (See figure 1).

Perspectives of functioning, activities and participation in relation to the personal and environmental context are studied throughout the entire lifespan of subjects with and without (risk for) illness, chronic diseases and/or functional restrictions. Prevention, cure including rehabilitation and care can be equally important depending on type and stage of the limitation or restriction.

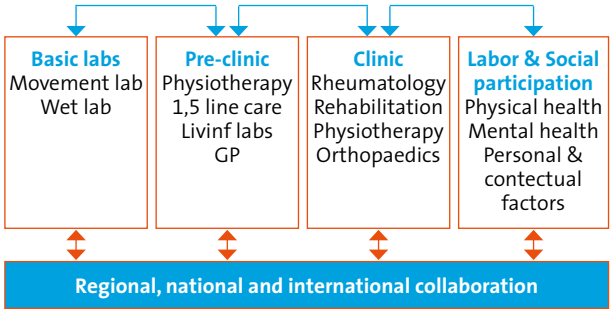


Figure 1.1: The different research settings and disciplines within the research line FPR.

The research line FPR covers research in each of these settings. Basic research in our labs contributes to improvement of diagnosis and treatment in Pre-clinic and Clinic. Knowledge obtained from pre-clinical research may reduce complaints and prevent the development of musculoskeletal complaints and disorders. Improvement of diagnosis and treatment in Clinic and Rehabilitation centers may improve clinical outcomes as well improve labour and social participation.
The research line FPR covers research in each of these settings. Social and labour participation is determined by patient health and contextual factors. Although several health conditions cannot be cured or remain ill understood and lack effective treatments yet, persons with a chronic disease or disability are expected by society to participate actively in all social roles, including labour participation. Since even in well diagnosed and established treatments, new challenges emerge, mostly driven by contextual factors, understanding the role of these contextual factors is crucial. Identifying and addressing potentially modifiable contextual factors, requires combining and integrating knowledge and expertise from different, but related, disciplines.

Our research line excels at this, by using evidence-based approaches and state-of-the-art methodologies, thus creating opportunities to prevent participation restrictions and preserve and improve sustainable functioning and participation of persons in the general (working) population independent of the presence of health-related restrictions, and while accounting specifically for the individual' personal and environmental context.

Basic and translational research help us discover innovations that can fundamentally change the course and impact of disease and may improve social role participation and well-being, while observational research can reveal the determinants of health and participation and enables to study the effectiveness of interventions. Since our research covers the chain of care - from primary prevention to cure to rehabilitation and reintegration - most of our research is embedded in (health care) networks and a Living Lab, which facilitate interaction of professionals with patients, and allow for data collection from patients, health care professionals and social security systems to develop and monitor innovations in relevant health domains.

This can be illustrated by a number of examples from our research:

- When understanding pathophysiology of degenerative musculoskeletal disorders and specifically explore phenotypes that are relevant for treatment options (metabolic, acute traumatic, mechanic), logical links to effectiveness, harms and cost-effectiveness of regenerative and restorative treatment options drive our common efforts.
- When unravelling the complexity of human movement as a main contributor to functioning and participation,

interventions to maintain or improve mobility, as well as assessing mobility on a biomechanical level are needed.
- When supporting (healthy) individuals and patients to maintain and improve their health participation and well-being, networks that link these persons to proven effective and tailor-made interventions are developed and evaluated
- When studying determinants of health and labour participation, development and evaluation of interventions to improve these, are studied in context of (a) outcome instruments to assess functioning and (work-) participation as well as (b) core contextual factors that influence or modify outcome.

Patient care is approached from a network organisation, enabling research and care links between society and 1st till 3rd line care. The research line FPR has the ambition to excel in each of the research areas as described in paragraph 1.2 and optimise links between these research areas. In this way, it will be possible to evaluate clinical treatment not only on the basis of clinical outcomes but also on participation outcomes. Also the impact of prevention can be evaluated on participation outcomes. Ultimately it will be even possible to evaluate basic research in terms of societal outcomes. Through this approach the clinical and societal impact of our research will be multiplied. To achieve our ambitions establishment and maintenance of care networks (oriented at health impairments, specific diseases or multimorbidity), that specifically link hospital care to primary care and public health, as well as the establishment and maintenance of our basic labs, data infrastructure / cohorts including patients, workers and the general population are prerequisite.

1.3 Specific targets of the past six years (2017-2022)

We have developed a number of initiatives given our societal and patient centred approach. The "beweeghuis and low back pain stadspoli", the "4-Limburg" programme to optimise labour and social participation, the work centered in-house clinic and the Living Lab Rehabilitation Adelante were set up. Also in house research collaboration with departments of physiotherapy and neurosurgery and with a regional orthopedic partner from Zuyderland hospital were established. They act as data and network resources and help us to define new patient approaches and to establish new evidence based therapies.

2 Description of the Research Line's organisation, composition and financing

2.1 Organisation and embedding of the Research Line

The Research Line FPR is one of six research lines within CAPHRI, each research unit is chaired by a full professor, the labs by an associate professor, and the Living Lab by a full professor. FPR is steered by a daily board consisting of Rob de Bie (chair), IJmert Kant (vice-chair), Annelies Boonen, Tim Welting and Jeanine Verbunt.
The daily board meets regularly to discuss (a) management issues, progress of our strategy, new research opportunities and career perspectives of current research staff.
Researchers of FPR are engaged in several networks and initiatives, see figure 1. In the past few years the MUMC+ physiotherapy and neurosurgery groups have joined (partly tenured positions) as well as researchers from FPR, and therewith Caphri, has a strong link with patient care, both local as well as regional.

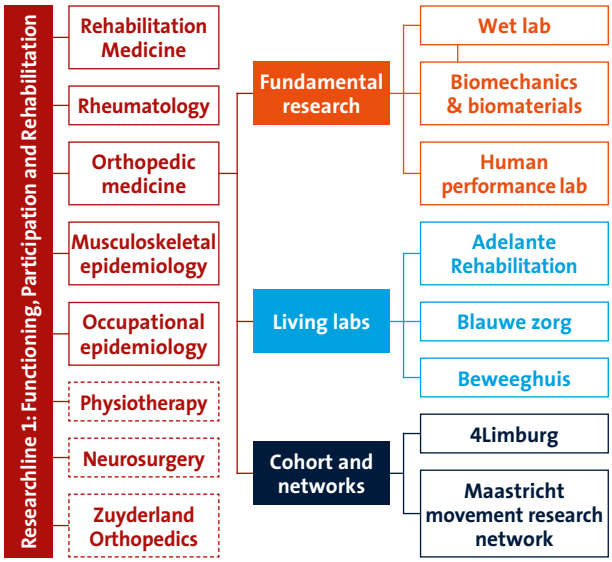


Figure 2.1: organisational diagram of FPR.

2.2 Composition

Table 2.2: Research staff at Research Line level (2017-2022)

	2017	2018	2019	2020	2021	2022
Research staff	**#/fte**	**#/fte**	**#/fte**	**#/fte**	**#/fte**	**#/fte**
Scientific staff FHML[1]	17/6.07	18/6.1	19/7.02	20/6.82	21/6.7	26/7.9
Scientific staff azM	8/2.50	8/2.5	8/2.50	7/2.0	6/1.50	6/1.4
Postdocs[2]	16/9.85	18/10	13/6.33	10/6.62	19/12.1	19/12.1
Internal PhD candidates[3]	14/11.80	19/16.3	18/16.30	18/16.1	17/14.6	13/11.3
	55/30.22	63/34.9	58/32.15	55/31.6	57/34.90	64/32.6
External PhD candidates[4]	72	79	73	66	72	65

[1] Categories Prof / Assoc. Prof / Assist. Prof; tenured and non-tenured staff appointed at the FHML.
[2] Category Researcher (1, 2, 3, 4), with completed PhD, not belonging to scientific staff (note [1])
[3] Standard PhD (employed)
[4] External PhD (externally or internally funded but not employed)

2.3 Financing

Table 2.3a: Funding at Research Line level (2017-2022)

	2017		2018		2019		2020		2021		2022	
Funding	**Fte**	**%[6]**	**Fte**	**%[6]**	**Fte**	**%[6]**	**Fte**	**%[6]**	**Fte**	**%[6]**	**Fte**	**%[6]**
Direct funding	6.37	23%	6.8	21%	6.45	23%	6.1	21%	6.0	18%	6.6	21%
Research grants[2]	5.50	20%	4.0	12%	5.13	17%	4.9	17%	5.3	16%	7.4	2%
Contract research[3]	13.35	48%	20.9	64%	14.30	48%	17.9	62%	21.3	66%	17.0	55%
Other[4]	2.50	9%	0.8	2%	3.35	11%	0	0%	0	0%	0	0%
Total funding[5]	**27.72**	**100%**	**32.5**	**100%**	**29.65**	**100%**	**28.9**	**100%**	**28.9**	**100%**	**30.9**	**100%**

[1] Direct funding by FHML/ Maastricht University ('basis financiering' / lump sum budget).
[2] Research grants obtained in national scientific competition (e.g. grants from NWO, ZonMw and KNAW)
[3] Research contracts for specific research projects obtained from external organisations, such as industry, governmental ministries, European organisations, including ERC, and charity organisations
[4] Funds that do not fit the other categories.
[5] The funding in fte includes the total research staff but excludes the academic hospital-staff
[6] The funding in % in the research programme should be compared to the total within each research programme

Table 2.3b Research Grants at Research Level (2017-2022)

Funding	Order	Grant title	Principal Investigator	2017	2018	2019	2020	2021	2022
Grants	30951611B	STW Welting	T. Welting	€265.749					
	30951612B	STW Emans	P. Emans	€166.130					
	30951617N	Optimizing osteo_IG	A. Boonen	€143.065					
	30951633N	ZonMw Werk-cooperatie	Y. Kant		€205.000				
	30951653N	ZonMw Doen of Laten	T. Boymans				€50.0000		
	30951654N	Dynamic bracing OVCF	P. Willems				€334.990		
	30951660N	ZonMw - Covid	R. de Bie				€120.692		
	30951658N	NWO-DARTBAC	J. Arts					€2.449.709	
	30951663N	KIEM	R. Smeets					€38.311	
	30951666N	ZonMw - TRAM studie	M. Witlox					€725.000	
	30951674N	KIEM SyncVR	R. Smeets					€40.000	
Grants Total				**€ 574.944**	**€ 205.000**	**-**	**€ 505.682**	**€ 3.253.020**	
Contracts	30951609N	Stichting Vooruit	R. Smeets	€39.554					
	30951610N	PhD Juraiby	Y. Kant	€78.680					
	30951614N	MUMC+ Gout	A. Boonen	€50.000					
	30951616N	4Limburg_2.1	Y. Kant	€45.846					
	30951618N	WhenCascade dries up	T. Welting	€51.202					
	30951619N	ADL-TTD_JFK	E. Rameckers	€37.350					
	30951620N	AZM-Weijerhorstproj	T. Welting	€1.038.000					
	30951621N	4Limburg_2.2	Y. Kant	€37.740					
	30951622N	4Limburg_4.1	Y. Kant	€75.479					
	30951623N	4Limburg_coh/gov	Y. Kant	€174.696					
	30951625B	InSciTe_BEAM	J. Arts	€26.600					
	30951627N	UHasselt MUMC+	A. Boonen		€71.250				
	30951631N	RF-LLP14-2018-2023	T. Welting		€50.000				
	30951634N	M-Brace	J. Arts		€20.000				
	30951637N	CIR Project	R. Smeets		€495.868				
	30951638N	BMP-7 peptide based	T. Welting		€64.564				
	30951639N	When cascade dries up	T. Welting		€188.795				
	30951640N	RF-LLP14-2018-2023	T. Welting		€450.000				
	30951641N	Netwerk pijnlijn	I. Huijnen		€262.783				
	30951642N	Eurekah	R. Smeets			€30.000			
	30951643N	MC Parent Empathy	A. Verbunt			€170.419			
	30951645N	Ex vivo Platform MRI	P. Emans			€150.000			
	30951646N	4Limburg_4.2	Y. Kant			€29.305			
	30951647N	AzM Pepoa	T. Welting			€666.192			
	30951649N	JKF ADL-TTD2	E. Rameckers			€65.000			
	30951652N	Telemonitoring Trial Spondyloartritis	A. van Tubergen			€152.713			
	30951655N	VIB Spartacus	A. Boonen				€102.600		
	30951657N	Litonderz Vermoeidh	A. Boonen				€30.000		
	30951665N	TKI - Ambition	J. Arts					€330.000	
	30951670N	TKI - PRIMO	P. Emans					€155.000	
	30951671N	COFUND_ Tim Welting	T. Welting					€260.000	

2 Description of the research Line's organisation, composition and financing

	41150318010N	DEMO-RA	A. van Tubergen						€129.000
	41150318011N	Kootstra Casper Webers	A. Boonen						€71.118
	41150318012N	T2T in rheumatology practice	A. Tubergen						€51.000
	41150320007N	LIME 2.0 Balansmeter	Y. Kant						€159.375
	41150321002N	TKI - Lift	B. Bongers						€30.400
	41150322034N	TKI - EMILIO	J. Arts						€231.000
	41150323011N	ADVANCE studie	R. Smeets						€64.981
	41150323012N	MER Project	A. Verbunt						€235.087
Contracts Total				**€ 1.655.149**	**€ 1.603.259**	**€ 1.263.630**	**€ 132.600**	**€745.000**	**€971.961**
Other	30951628B	SyCap 2 vervolg	P. Emans		€691.347				
	30951630B	PoSTuRE vervolg	P. Willems		€211.482				
	30951632B	Pilot Complexe Multi Morbiditeit	M. van Onna		€40.000				
	30951648B	Promotie te Kampe	A. Boonen			€135.000			
	30951650B	Pfizer ASPIRE	A. Boonen			€60.000			
	30951651B	SyCap-extention 2	P. Emans			€175.000			
	30951661B	Cerapedics	J. Arts					€60.000	
	30951664B	Duurzame inzetbaar-heid Brandweer	N. Jansen					€338.000	
	30951667B	Dierstudie_DePuy Syn	J. Arts					€91.051	
	30951668B	Fuji onderzoek	J. Arts					€35.000	
	41150322033B	DSM Biomedical	J. Arts						€29.500
Other Total					**€ 942.829**	**€ 370.000**		**€524.051**	**€29.500**
Grand Total				**€ 2.230.093**	**€ 2.751.088**	**€ 1.633.630**	**€ 638.282**	**€4.522.071**	**€1.001.461**

Note that the above financial overview is not complete. It only illustrates attracted research grants that are financially embedded within CAPHRI. Many projects run outside CAPHRI (but do deliver output and PhD defenses for the benefit of CAPHRI. As an example: the project Subsidie Zorginstituut Nederland i.h.k.v. Transparantie over de kwaliteit van zorg "Samen beslissen o.b.v. uitkomstinformatie in een multi-disciplinaire context" of 350,000 euros flows directly to the MUMC+ but has been atracted by one of our PI's. The same goes for the "TLIF vs PLF" project, of 600.000 euros, which stays at Zuyderland, but has been attracted by one of our PI's but holds a PhD for the benefit of CAPHRI. We estimate in our research line around 20 PhD's and some 80 scientific papers do benefit CAPHRI but are funded or registered outside CAPHRI.

3 Research Quality and Societal Relevance

3.1 Research quality

3.1.1 Research products for peers

Main categories of research output at Research Line level

Table 3.1a: Main categories of research output (2017-2022)
Since 2021 FHML is using the KUOZ categories for the P&C reports regarding publications. Publications classified as KUOZ category A 'Refereed journal article' are presented below. Please note that - in contrast to KUOZ reports - items do not have to be printed to be included for P&C reports; e-publications are also included.

Research output	2017	2018	2019	2020	2021	2022
Refereed articles	173	163	159	163	221	174
PhD theses involved/accounted	15/14.0	15/16.1	14/10.84	5/5	19/18.0	14/14

Most important scientific publications

Table 3.1b: Most important scientific publications (2017-2022, top-10)

Year	Scientific publication
2017	Effectiveness of Pelvic Physiotherapy in Children With Functional Constipation Compared With Standard Medical Care van Engelenburg-van Lonkhuyzen, M. L., Bols, E. M. J., Benninga, M. A., Verwijs, W. A. & de Bie, R. A. Jan 2017 In: Gastroenterology. 152, 1, p. 82-91 10 p
2018	Prevention and treatment of low back pain: evidence, challenges, and promising directions. Foster NE, Anema JR, Cherkin D, Chou R, Cohen SP, Gross DP, Ferreira PH, Fritz JM, Koes BW, Peul W, Turner JA, Maher CG; Lancet Low Back Pain Series Working Group. Lancet. 2018 Jun 9;391(10137):2368-2383. doi: 10.1016/S0140-6736(18)30489-6. Epub 2018 Mar 21. Review.
2018	What low back pain is and why we need to pay attention. Hartvigsen J, Hancock MJ, Kongsted A, Louw Q, Ferreira ML, Genevay S, Hoy D, Karppinen J, Pransky G, Sieper J, Smeets RJ, Underwood M; Lancet Low Back Pain Series Working Group. Lancet. 2018 Jun 9;391(10137):2356-2367. doi: 10.1016/S0140-6736(18)30480-X. Epub 2018 Mar 21. Review
2019	Eva Jacobs, Sander MJ van Kuijk, Johannes MR Merk, Mieke Vandewall-Peeters, Liesbeth MC Jütten-Brouwer, Lodewijk W van Rhijn, Paul C Willems "The implementation of patient reported outcome measures in appropriateness criteria of surgery for degenerative lumbar scoliosis" Spine J. 2019;19(4):655-661
2019	Nielsen SM, Tugwell P, de Wit MPT, Boers M, Beaton DE, Woodworth TG, Escorpizo R, Shea B, Toupin-April K, Guillemin F, Strand V, Singh JA, Kloppenburg M, Furst DE, Wells GA, Smolen JS, Veselý R, Boonen A, Storgaard H, Voshaar M, March L, Christensen R; Contextual Factors Working Group. Identifying Provisional Generic Contextual Factor Domains for Clinical Trials in Rheumatology: Results from an OMERACT Initiative. J Rheumatol. 2019 Sep;46(9):1159-1163. doi: 10.3899/jrheum.181081. Epub 2019 Jan 15. PubMed PMID: 30647174
2020	Meisters R, Putrik P, Ramiro S, Hifinger M, Keszei AP, van Eijk-Hustings Y,Woolf AD, Smolen JS, Stamm TA, Stoffer-Marx M, Uhlig T, Moe RH, de Wit M, Tafaj, A, Mukuchyan V, Studenic P, Verschueren P, Shumnalieva R, Charalambous P, Vencovský J, Varvouni M, Kull M, Puolakka K, Gossec L, Gobejishvili N, Detert J,Sidiropoulos P, Péntek M, Kane D, Scirè CA, Arad U, Andersone D, van de Laar M,van der Helm-van Mil A, Głuszko P, Cunha-Miranda L, Berghea F, Damjanov NS, Tomšič M, Carmona L, Turesson C, Ciurea A, Shukurova S, Inanc N, Verstappen SM,Boonen A; Working group. EULAR/eumusc.net standards of care for rheumatoid arthritis: cross-sectional analyses of importance, level of implementation and care gaps experienced by patients and rheumatologists across 35 European countries. Ann Rheum Dis. 2020 Nov;79(11):1423-1431. doi:10.1136/annrheumdis-2020-217520
2021	Molto A, López-Medina C, Van den Bosch FE, Boonen A, Webers C, Dernis E, van Gaalen FA, Soubrier M, Claudepierre P, Baillet A, Starmans-Kool M, Spoorenberg A, Jacques P, Carron P, Joos R, Lenaerts J, Gossec L, Pouplin S, Ruyssen-Witrand A, Sparsa L, van Tubergen A, van der Heijde D, Dougados M. Efficacy of a tight-control and treat-to-target strategy in axial spondyloarthritis: results of the open-label, pragmatic, cluster-randomised TICOSPA trial. Ann Rheum Dis. 2021 Nov;80(11):1436-1444. doi: 10.1136/annrheumdis-2020-219585
2021	Boonen A, Putrik P, Marques ML, Alunno A, Abasolo L, Beaton D, Betteridge N, Bjørk M, Boers M, Boteva B, Fautrel B, Guillemin F, Mateus EF, Nikiphorou E, Péntek M, Pimentel Santos F, Severens JL, Verstappen SMM, Walker-Bone K, Wallman JK, Ter Wee MM, Westhovens R, Ramiro S. EULAR Points to Consider (PtC) for designing, analysing and reporting of studies with work participation as an outcome domain in patients with inflammatory arthritis. Ann Rheum Dis. 2021 Sep;80(9):1116-1123. doi: 10.1136/annrheumdis-2020-219523
2021	Marjolein M J Caron, Ellen G J Ripmeester, Guus van den Akker, Nina K A P Wijnands, Jessica Steijns, Don A M Surtel, Andy Cremers, Pieter J Emans, Lodewijk W van Rhijn, Tim J M Welting. Discovery of bone morphogenetic protein 7-derived peptide sequences that attenuate the human osteoarthritic chondrocyte phenotype. Mol Ther Methods Clin Dev. 2021 Mar 17;21:247-261. doi: 10.1016/j.omtm.2021.03.009.
2022	B A C Housmans, M Neefjes, D A M Surtel, M Vitik, A Cremers, L W van Rhijn, P M van der Kraan, G G H van den Akker, T J M Welting. Synovial fluid from end-stage osteoarthritis induces proliferation and fibrosis of articular chondrocytes via MAPK and RhoGTPase signaling. Osteoarthritis Cartilage 2022 Jun;30(6):862-874 doi: 10.1016/j.joca.2021.12.015.

3 Research Quality and Societal Relevance

3.1.2 Use of research products for peers

As can be seen from graph 1, the main output of FPR consists of articles, but noteworthy is the 10,6% (systematic) review articles, which is typical for our field and is also reflected in the fact that many of our researchers are also active in review boards, scientific committees and international guidelines committees.

72.6% articles
10.6% systematic reviews,
5.57% dissertations.
3.86% letter to the editor,
2.88% editorials,
1.6% book chapters.

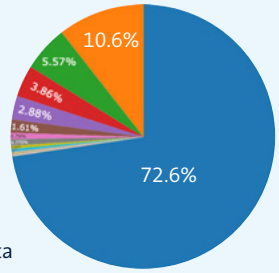


Figure 3.1: research output based on PURE data

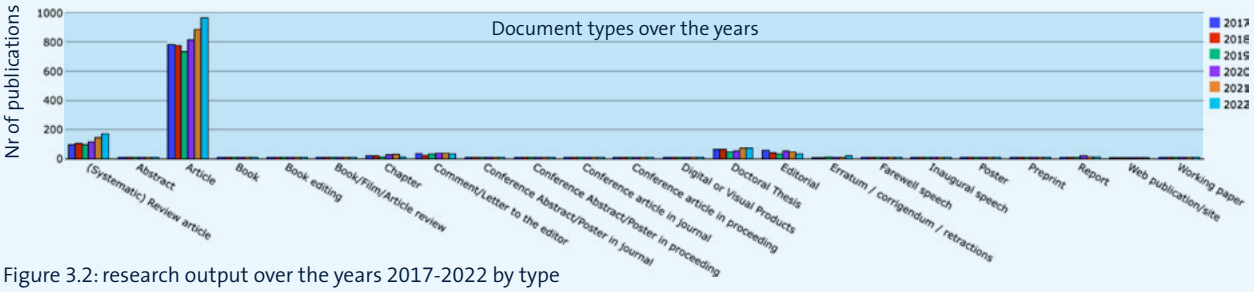


Figure 3.2: research output over the years 2017-2022 by type

3.1.3 Marks of recognition from peers

Scientific Awards

Table 3.1c: Most important scientific awards and public societal prizes (2017-2022, top-10)

Year	Name	Scientific Awards/Public Societal prizes
2018	Rob Smeets	Garry Pearce Lecture award. Rehabilitation Medicine Society of Australia and New Zealand
2018	Simone Gafner	Research prize Reha Rheinfelden 2018 for the paper "Hip Muscle and handgrip strength to differentiate between fallers and non-fallers, a cross-sectional study"
2019	Marlies den Hollander	PhD Award 2019 Dutch Association Physiatrists
2019	Eva Jacobs	Dutch Spine Society Award (beste international public) + NOV-award voor beste proefschrift 2019
2019	Carin de Brouwer	Nederlandse Vereniging voor Arbeids- en Bedrijfsgeneeskunde: Twee jaarlijkse prijs (Burger penning) voor het beste proefschrift op het terrein van de bedrijfs- en verzekeringsgeneeskunde
2019	Mirella Haartmans	Poster Award for Biology Young Investigator, Credits 19. EORS 2019.
2019	Sabrina Grossenbacher	Research Award Foundation for Physiotherapy Science Switzerland 2019 for her article: Effects of early combined endurance and resistance training in mechanically ventilated critically ill patients, a randomised controlled trial
2020	Inge Timmers	Marie Skłodowska-Curie Actions (MSCA) award, The European Commission
2020	Andreas Rothgangel	Best Thesis Award 2020, Royal Netherlands Society for Physiotherapy (KNGF)
2021	Simone Sep	George Beusmans wetenschapsprijs Kennisnetwerk CVA Nederland

Research grants

Table 3.1d: Research grants awarded to individuals (2017-2022)

Year	Name	Type of grant
2017	-	-
2018	-	-
2019	Inge Timmers	Marie-Curie fellowship (Global fellowship gehonoreerd)
2019	Inge Caelers	ZonMW: 446001051 "Risicofactoren voor iatrogene spondylolisthesis, data substractie en analyse van de Schulthess Klinik te Zurich, Zwitserland". (gehonoreerd)
2019	Annelies Boonen	Consortium grant Vlaams Instituut BioTechnology (als partner)
2020	-	-
2021	-	-
2022	Charlotte van Laake	ZonMW klinische fellow ronde 2022
2022	Casper Webers	Koostra fellowship 2022
2022	Casper Webers	Rheumatology Grant Of the Dutch Society for Rheumatology
2022	Chloe Schorderet	PhD grant prize Foundation PT Wissenschaften Switzerland 2022. Title "Walking out of the hospital"

Invited lectures

Table 3.1e: Most important invited lectures (2017-2022 top-10)

Year	Name	Which organisation	Name event	Name lecture/workshop
2017	Ludovic van Amelsvoort	EPICOH2017; 2017 30-8-2017; Edinborough	EPICO2017	Advancing the prevention of long-term sickness absence: Considering the impact of the context of legislation in effective preventive strategies"
2017	Jeanine Verbunt	Pain in Childhood/International Symposium Pediatric Pain, Kuala Lumpur Maleisia (July 2017)	Workshop ISPP International Symposium Pediatric Pain,	Tailoring multidisciplinary chronic pain management for children with symptomatic hypermobility
2018	A Boonen	UCB Education in Immunology International Consortium	9th immunolgy summit, Pragiy	Should work participation be a treatment goal in clinical practice
2018	Jeroen de Jong	International Association for the Study of Pain (IASP)	IASP World Congress on Pain	The how and when of in-vivo Exposure in Chronic Pain
2018	Eva Jacobs	Annual meeting North American Spine Society (NASS), Los Angeles, CA, 26-28 sept 2018		The implementation of health-related quality of life instruments in appropriateness criteria of surgery for degenerative lumbar scoliosis
2019	Albere Köke	Pijn Alliantie	EFIC Pain in Europe congres Valencia	Een visie op interdisciplinaire zorg voor mensen met chronische pijn.
2019	Rob Smeets	Pain Science in Motion	Pain Science in Motion	Improving the timeliness and effectiveness of rehabilitation of individuals with chronic musculoskeletal pain.
2019	Ton Lenssen	KNGF	Dag van de Fysiotherapeut	Hospital based Physiotherapy
2019	Esther Janssen	Eurospine, Helsinki, 16-18 oktober 2019		Predicting inpatient functional recovery in patients undergoing lumbar spinal fusion: the importance of objective physical performance measures
2020	Tim Welting	6-11-2020 Keynote lecture	Dutch Society for Matrix Biology (NVMB)	When chondrocytes get lost in translation.

3 Research Quality and Societal Relevance

Memberships of scientific committee, board, or editorship

Table 3.1f: Most important memberships of scientific committees, boards or editorships (2017-2022 top-10)

Year	Name	Which organisation	Which role
2017	Jeanine Verbunt	European Journal of Pain	Editorial board member
2017	Astrid van Tubergen	National quality registry for spondyloarthritis in the Netherlands (SpA-Net) Steering committee "Update European League Against Rheumatism (EULAR) recommendations for the basic and advanced role of the nurse in the management of chronic inflammatory arthritis"	Chair Chair and methodologist
2017	Annelies Boonen	Working Group Economic Evaluations in Rheumatology of the Dutch Society of Scientific Committee: Rheumatology (Nederlandse Vereniging voor Reumatologie)	Chair
2017	Paul Willems	Dutch Spine Society (spine surgeons)	President
2018	IJmert Kant	Health Council Netherlands	Member of the advisory committee on "extended working careers and Health
2018	Tim Welting	ReumaNederland	Member of the scientific advisory board of the Dutch Arthritis Foundation
2018	Jeanine Verbunt	ZonMW; VENI commission	Member
2020	Astrid van Tubergen	Dutch Rheumatology Scociety	Chair scientific Committee
2020	Annelies Boonen	European guideline work and rheumatic diseases-Eular	Chair
2020	Marielle Goossens	ZonMW doelmatigheid (tot 2020)/ NWOVENI/ ZonMW GGZ (vanaf 2021)	Member

3.2 Relevance to society

3.2.1 Research products for societal target groups

Public events

Table 3.2a: Public events: lectures/workshops for health care professionals and/or general public/patients (2017-2022, top-10)

Year	Name	Type of event
2017	IJmert Kant	Themabijeenkomst "De 'maatschappelijke' waarde van participatie" georganiseerd door de sociale advies raad Peel en Maas. Lezing + discussie leider Themabijeenkomst duurzame economische ontwikkeling in Beekdaelen . Lezing 4Limburg programma + discussie leider
2018	Astrid van Tubergen	Organizer and chair Post-EULAR symposium. Post graduate course for rheumatologists
2019	Astrid van Tubergen	Several lectures Reumacafé Maastricht
2019	Albere Köke	Bewegen met pijn! Kan dat, mag dat, moet dat? Themadag Bewegen & Pijn FES symposium Ede
2019	Marloes van Onna	"Presentation seminar pharmacy assistants terug naar de schoolbanken."
2021	Various researchers rehabilitation medicine	Series of webinars: " Ik en mijn gezondheid". : About improving selfmanagement and living with a chronic disease/impairment in functioning
2021	Henk Seelen	Innovation and implementation of complex rehabilitation technology: state-of-the-art ideas and solutions/ products. Interreg EMR i2-CoRT project closing symposium (Online). Hoensbroek, April 20, 2021
2022	Yvonne Janssen-Potten & Eugene Rameckers	Symposium "An overview of the occurrence of muscle weakness and motor fatigability of the upper limb in children with UCP, new testing methods and its impact on clinical reasoning"
2022	Rob Smeets	Series of 8 podcasts (PIJNCAST)
2022	Rob Smeets	Exposure in vivo as a treatment approach to target pain-related fear: theory and new insights from research and clinical practice. During the workshop Understanding Fear-Avoidance in Patients with Acute, Subacute, and Chronic Pain, in the combined Sessions Meetings of the American Physical Therapy Association, San Antonio, US, 2-5 February 2022

Cohorts based within the Research Line

The RL is involved in:

- The Maastricht Study. The contact persons are Dr. Koster and Prof. H. Bosma. Both work at the department of social medicine. (owner pain data: A Boonen; owner osteorthritis data: A Boonen and T Boymans)
- SpA Net cohort: Astrid van Tubergen
- Semfire cohort: IJmert Kant Maastricht cohort study: IJmert Kant
- Cohort SCK-CEN: IJmert Kant and Ludovic van Amelsvoort

Most important societal publications/outputs

Table 3.2b: List of the most important societal publications per year of the research programme (2017-2022, top-10)

Year	Publications/outputs
2017	Implementing the ICF in Occupational Health; building a curriculum as an exemplary case. de Brouwer CPM, van Amelsvoort LGPM, Heerkens YF, Widdershoven GAM, Kant I. Work. 2017;57(2):173-186. doi: 10.3233/WOR-172548.
2017	Telemedicine for management of inflammatory bowel disease (myIBDcoach): a pragmatic, multicentre, randomised controlled trial. Marin J de Jong, Andrea E van der Meulen-de Jong, Mariëlle J Romberg-Camps, Marco C Becx, Jeroen PMaljaars, Mia Cilissen, Ad A van Bodegraven, Nofel Mahmmod, Tineke Markus, Wim M Hameeteman, Gerard Dijkstra, Ad A Masclee, Annelies Boonen, Bjorn Winkens, Astrid van Tubergen, Daisy M Jonkers, Marie J Pierik. The Lancet, September 2017. 10.1016/s0140-6736(17)31327-2
2017	Reconsideration of the scheme of the international classification of functioning, disability and health: incentives from the Netherlands for a global debate. Yvonne F. Heerkens, Marjolein de Weerd, Machteld Huber, Carin P. M. de Brouwer, Sabina van der Veen, Rom J. M. Perenboom, Coen H. van Gool, Huib ten Napel, Marja van Bon-Martens, Hillegonda A. Stallinga, Nico L. U. van Meeteren. Disability & Rehabilitation, January 2017 10.1080/09638288.2016.1277404
2018	Prevention and treatment of low back pain: evidence, challenges, and promising directions: Nadine E Foster, Johannes R Anema, Dan Cherkin, Roger Chou, Steven P Cohen, Douglas P Gross, Paulo H Ferreira, Julie M Fritz, Bart W Koes, Wilco Peul, Judith A Turner, Chris G Maher, Rachelle Buchbinder, Jan Hartvigsen, Dan Cherkin, Nadine E Foster, Chris G Maher, Martin Underwood, Maurits van Tulder, Johannes R Anema, Roger Chou, Stephen P Cohen, Lucíola Menezes Costa, Peter Croft, Manuela Ferreira, Paulo H Ferreira, Julie M Fritz, Stéphane Genevay, Douglas P Gross, Mark J Hancock, Damian Hoy, Jaro Karppinen, Bart W Koes, Alice Kongsted, Quinette Louw, Birgitta Öberg, Wilco C Peul, Glenn Pransky, Mark Schoene, Joachim Sieper, Rob J Smeets, Judith A Turner, Anthony Woolf. The Lancet, June 2018. 10.1016/s0140-6736(18)30489-6
2018	What low back pain is and why we need to pay attention. Jan Hartvigsen, Mark J Hancock, Alice Kongsted, Quinette Louw, Manuela L Ferreira, Stéphane Genevay, Damian Hoy, Jaro Karppinen, Glenn Pransky, Joachim Sieper, Rob J Smeets, Martin Underwood, Rachelle Buchbinder, Jan Hartvigsen, Dan Cherkin, Nadine E Foster, Chris G Maher, Martin Underwood, Maurits van Tulder, Johannes R Anema, Roger Chou, Stephen P Cohen, Lucíola Menezes Costa, Peter Croft, Manuela Ferreira, Paulo H Ferreira, Julie M Fritz, Stéphane Genevay, Douglas P Gross, Mark J Hancock, Damian Hoy, Jaro Karppinen, Bart W Koes, Alice Kongsted, Quinette Louw, Birgitta Öberg, Wilco C Peul, Glenn Pransky, Mark Schoene, Joachim Sieper, Rob J Smeets, Judith A Turner, Anthony Woolf. The Lancet, June 2018 10.1016/s0140-6736(18)30480-x
2018	Low back pain: a call for action. Rachelle Buchbinder, Maurits van Tulder, Birgitta Öberg, Lucíola Menezes Costa, Anthony Woolf, Mark Schoene, Peter Croft, Rachelle Buchbinder, Jan Hartvigsen, Dan Cherkin, Nadine E Foster, Chris G Maher, Martin Underwood, Maurits van Tulder, Johannes R Anema, Roger Chou, Stephen P Cohen, Lucíola Menezes Costa, Peter Croft, Manuela Ferreira, Paulo H Ferreira, Julie M Fritz, Stéphane Genevay, Douglas P Gross, Mark J Hancock, Damian Hoy, Jaro Karppinen, Bart W Koes, Alice Kongsted, Quinette Louw, Birgitta Öberg, Wilco C Peul, Glenn Pransky, Mark Schoene, Joachim Sieper, Rob J Smeets, Judith A Turner, Anthony Woolf. The Lancet, June 2018. 10.1016/s0140-6736(18)30489-6
2018	Bevordering arbeidsparticipatie oudere werknemers (1). Overzicht van bevindingen uit de Maastrichtse Cohort Studie naar de determinanten van (langer) doorwerken op oudere leeftijd Nicole Jansen, Dave Stynen, Andries de Grip, IJmert Kant. Tijdschrift voor Bedrijfs- en Verzekeringsgeneeskunde jaargang 26 | nr.10 | december 2018
2019	Paul Willems, Brigitte Brouwer, Nelleke de Meij, Dion Branj. "Win-win voor patiënten met lagerugklachten" Medisch Contact, 30 januari 2019
2022	Gwinnutt JM, Wieczorek M, Balanescu A, Bischoff-Ferrari HA, Boonen A, Cavalli G, de Souza S, de Thurah A, Dorner TE, Moe RH, Putrik P, Rodríguez-Carrio J, Silva-Fernández L, Stamm T, Walker-Bone K, Welling J, Zlatković-Švenda MI, Guillemin F, Verstappen SMM. 2021 EULAR recommendations regarding lifestyle behaviours and work participation to prevent progression of rheumatic and musculoskeletal diseases. Ann Rheum Dis. 2023 Jan;82(1):48-56. doi: 10.1136/annrheumdis-2021-22202
2022	Boonen A, Webers C, Butink M, Barten B, Betteridge N, Black DC, Bremander A, Boteva B, Brzezińska O, Chauhan L, Copsey S, Guimarães V, Gignac M, Glaysher J, Green F, Hoving JL, Marques ML, Smucrova H, Stamm TA, Wiek D, Wilkie R, Woolf AD, Burmester GR, Bijlsma JW, Verstappen SMM. 2021 EULAR points to consider to support people with rheumatic and musculoskeletal diseases to participate in healthy and sustainable paid work. Ann Rheum Dis. 2023 Jan;82(1):57-64. doi: 10.1136/ard-2022-222678

3 Research Quality and Societal Relevance

3.2.2 Use of products by societal groups

Advisory reports

Table 3.2c: Advisory reports for policy makers and/or clinical guidelines (2017-2022, top-10)

Year	Name	Advisory report
2017	Verbunt	CBO Richtlijn SOLK kinderen
2017	M Poeze, C Donken, J hoogeboom, A Lenssen, L vd Plaat,T Schepers, A Steenbakkers, A Warners, G Zemack	multidisciplinary guideline on Ankle fractures NVVH
2017	D Meuffels, R Brouwer, R Diercks, E Goedhart, R Hoogeslag, R Janssen, P Leenhouts, A Lenssen	multidisciplinary guideline on anterior cruciate ligament injuries NOV
2017	Nicole Jansen and Ijmert Kant, on behalf of project team	Eindrapportage Onderzoeksprogramma Bevordering van de arbeidsparticipatie van oudere werknemers : Een cohort studie naar de determinanten van (langer) doorwerken op oudere leeftijd (Final report Research programme Facilitating labour participation of older workers : a cohort study on the determinants of (prolonged) work careers at older age) Instituut Gak
2017	Ph.J. van der Wees, A.F. Lenssen, Y.A.E.J. Feijts, H. Bloo S.R. van Moorsel,R. Ouderland, K.W.F. Opraus, G. RondhuisA. Simons, R.A.H.M. Swinkels, P. V a e s, E., Verhagen, H.J.M. Hendriks, R.A. de Bie	KNGF richtlijn enkelletsel 2017
2017	Paul Willems, Marja Molag, Wilco Jacobs, et al.	Richtlijn geïnstrumenteerde spinaalchirurgie bij degeneratieve aandoeningen van de thoracolumbosacrale wervelkolom. Nederlandse Orthopaedische Vereniging, Bruistensingel 128 5232 AC 's-Hertogenbosch; www.orthopeden.org
2018	Albère Köke	EULAR recommendations for the health professional's approach to pain management in inflammatory arthritis and osteoarthritis
2022	Rob Smeets, Jeanine Verbunt	Richtlijn FMS pijnrevalidatie
2022	Albère Köke	KNGF-Standpunt Fysiotherapie bij patiënten met pijn
2022	Eugene Rameckers	CP Richtlijn

Collaborative projects

Table 3.2d: Collaborative projects implemented with/for professionals, non-scientific organisations, companies or public entities (2017-2022, top-10)

Year	Project	Non-scientific partner organisation
2017	4Limburg, thema 2.2 project: Screening en vroegtijdige inverventie bij werknemers in het MKB	Provincie Limburg, MKB Limburg
2017	Cohort 4Limburg	Provincie Limburg, CBS
2017	4Limburg, thema 2.2 project: Screening en vroegtijdige inverventie bij werknemers in het MKB	Provincie Limburg, MKB Limburg
2017	Onderzoeksprogramma Bevordering van de arbeidsparticipatie van oudere werknemers: Een cohort studie naar de determinanten van (langer) doorwerken op oudere leeftijd (Research programme Facilitating labour participation of older workers: a cohort study on the determinants of (prolonged) work careers at older age)	Instituut Gak
2017	Netwerk pijnrevalidatie Limburg; doelmatigheid zorgketen chronische pijn	CZ, VGZ en Achmea subsidiegevers
2017	PoSTuRE - project on the development of medical devices for patient-specific treatment of scoliosis	Chemelot Institute for Science and Technology
2018	4Limburg, thema 4.2: Effectiviteit gemeentelijk beleid arbeidsreintegratie	Provincie Limburg, Beesel, Bergen (L.), Gennep, Horst aan de Maas, Peel en Maas, Venlo, Venray
2019	Effectiviteit van een coöperatieve, integrale samenwerking als innovatief re-integratie instrument	ZonMw, Provincie Limburg, Beekdaelen, Landgraaf
2021	Samen sterk voor hersenletsel	Adelante, SGL, patiëntenvereniging Hersenletsel.nl, Limburgse ketenzorgpartners CVA
2022	Multidisciplinaire Eerstelijns Revalidatie (MER) chronische pijn	CZ, VGZ en Achmea subsidiegevers

Patents or spin-offs

Table 3.2e: Patents or spin-offs (2017-2022)

Year	Name	Describe patent/spin-off	Title patent/spin-off	Status patent/spin-off
2017	-	-	-	-
2018	-	-	-	-
2019	T. Lenssen	building the hospital fit+ app 1.0	hospital fit+ 1.0	research finished in 2020 implementation in usual care
2019	T. Lenssen	building hospital fit+ app 2.0	hospital fit+ app 2.0	clinical research ongoing
2020	-	-	-	-
2021	T. Welting, L. van Rhijn, G. van den Akker, L. Schurgers	Means and methods for the treatment of calcium crystal deposition diseases; PCT/EP2022/067584		https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2023280615&_cid=P21-LF6EQU-69271-1

3.2.3 Marks of recognition by societal groups

Memberships of civil society advisory bodies

Table 3.2f: Memberships of civil society advisory bodies (2017-2022, top-10)

Year	Name	Which advisory body	What kind of membership
2017	IJmert Kant	IJ.Kant/Health Council Netherlands. Member of the advisory committee on "extended working careers and Health" Member	Member
2017	Annelies Boonen	KNMG-commissie: Zorg die werkt. Naar een betere arbeidsgerichte medische zorg voor (potentieel) werkenden	Member
2018	Ludovic van Amelsvoort	EU. DG research expert evaluation of Horizon 2020 grant	Evaluation Expert
2018	Paul Willems	Advisory committee for Zorginstituut Nederland, in collaboration with IQ Health care Radboud UMC Nijmegen	Postoperatieve oefentherapie Lage rugklachten
2019	Astrid van Tubergen	Co-Chair an methodologist in several task forces that formulate European recommendations for rheumatologists	Euopean League against Reumatism
2019	Astrid van Tubergen	Member committee on guideline for medication use during pregnancy and lactation in women with rheumatic disorders	Dutch Society for Rheumatology
2019	Paul Willems	Member advisory board	Nederlandse Vereniging van Rugpatiënten (NVVR)
2019-2020	Rob Smeets	Werkgroeplid	Zorginstituut Nederland werkgroep zinnige zorg rugklachten
2022	Jeanine Verbunt	Commission Member Health council of the Netherlands (Gezondheidsraad): Commission fibromyalgia (2022-2023) Commission post COVID syndrome (2021-2022)	Member
2022	Rob Smeets	Member advisory board	Nederlandse Vereniging van Rugpatiënten (NVVR). Nederlandse vereniging voor HME/MO patiënten

3.3 Case studies

		Reasons for selection
FPR	Personal health information made accessible, complete, neutral and comprehensible; 360°CHILDoc[01]	Good example of an evidence based innovative tool that can facilitate youth health care workers in social medical counseling
FPR	"It's about how people deal with their pain"; Researchers & practitioners in rehabilitation care working closely together[02]	Good example how collaboration of research and health practitioners can lead to innovate treatments on dealing with pain
FPR	200,000 people sitting on the sidelines in Limburg; Towards a strong, sustainable and inclusive labour market. The 4Limburg project[03]	Good example of collaboration between UM, Province of Limburg, companies, organisations and municipalities on improving labour participation

[01] | www.maastrichtuniversity.nl/research/360°childoc
[02] | www.maastrichtuniversity.nl/research/caphri/our-research/functioning-participation-and-rehabilitation/"it's-about-how-people
[03] | www.maastrichtuniversity.nl/research/caphri/our-research/functioning-participation-and-rehabilitation/200000-people-sitting

4 Collaborations, strategic partnerships and infrastructure

The programme knows many viable partnerships and collaborations, on an institutional as well as on the national and international level. It is not well possible to discuss all our links also given the many disciplines embedded in our research line, but below a number of the partnerships and collaborations are illustrated.

Examples of institutional collaboration:
FPR is linked to the Maastricht Movement Research Network in which researchers of the MUMC+ and research schools NUTRIM and MERLIN together discuss projects and research opportunities as well as collaborate in joint projects and grant proposals as well as direct links and collaboration with the MUMC+ Centrum voor Bewegen of which our staff member Adjambo Witlox is director. Another project that links UM faculties with the region is 4Limburg (also decribed as a case study elsewhere in this portfolio). The 4Limburg programme is an initiative of 5 UM professors of 4 faculties (Zijlstra (FPN), de Grip (SBE), Klosse (Law), Janssen (FHML) and Kant (FHML). This multidisciplinary team is essential to include the different perspectives on a sustainable and inclusive society. The programme offers Communities, Educational institutes, companies and Care institutions, as well as citizen organisations the methodology and methods to start, implement and evaluate initiatives to improve social and labour participation as well initiatives to as labour market.
The programme was granted by the Province of Limburg and by several grants from ZonMw. CAPHRI is the coordinating research institute for this initiative.

Examples of regional collaboration
- The Living Lab of Adelante closely collaborates with Zuyd University of Applied Sciences - in which our staff member Ivan Huijnen was recently appointed as lector 'suitable rehabilitation care'. Our staff member Albere Köke is appointed as coordinator of the network pain rehabilitation the Netherlands (nPn).
- The collaboration with Zuyd University of Applied Sciences is further substantiated in joint projects in Lime (Limburg Meet).
- Collaboration with Zuyderland hospital has established a research environment in which clinic, research and education flourish (10 PhD students) and in which our orthopedic, neurosurgery and epidemiology colleagues work closely together. Two research staff members of Zuyderland Hospital have been added to the FPR/CAPHRI research staff on a part -time basis.

Examples of national collaboration
On the care given by allied health professionals in the Covid-19 pandemic a national multiuniversity project (Radboud, UM, Utrecht university, Amsterdam University) is running, together with the professional organisations from occupational therapy, physiotherapy, speech and language therapy, dietetics and exercise therapy as well as the NIVEL and ZonMW. Leading researcher at UM is Rob de Bie. In the Netherlands, both employers and (representatives of) employees recognise that firefighters face high physical, mental and emotional demands in their work. This raises the question of how staff in the repressive fire department function can be employed in a sustainable way, how they can continue to perform their work throughout their career while maintaining good health, well-being and productivity? With a large-scale survey of over 25,000 firefighters in 25 national regions, Maastricht University is investigating what are impeding and promoting factors. The name SEmFire, which stands for Sustainable Employability Firefighters, was coined for this research. The client for this study is the Employers' Association of Collaborating Safety Regions (WVSV), while Prof. Dr. Kant and Dr. Jansen from the research programme Labour Epidemiology, School CAPHRI, Maastricht University leads this research.

Examples of international collaboration
FPR has long standing working relations with Swiss partners (HESSO, Unispital Zurich, ETH, Bern University, Klinik Valens and Balgrist hospital). A PhD network and their supervisors meet regularly (live and online). Together we are able to answer research questions relevant to FPR, with the added benefit of an international perspective and new topics. Regarding laboratory research on cartilage identification and repair fruitful collaboration exists with the University of Liverpool. Leading research is Prof. Welting. Our research infrastructure - closely linked but to some extent separate fields of expertise - facilitates easy network collaboration. Part of our research infrastructure exist of large databases, but also clinics, laboratories, offices and online facilities.

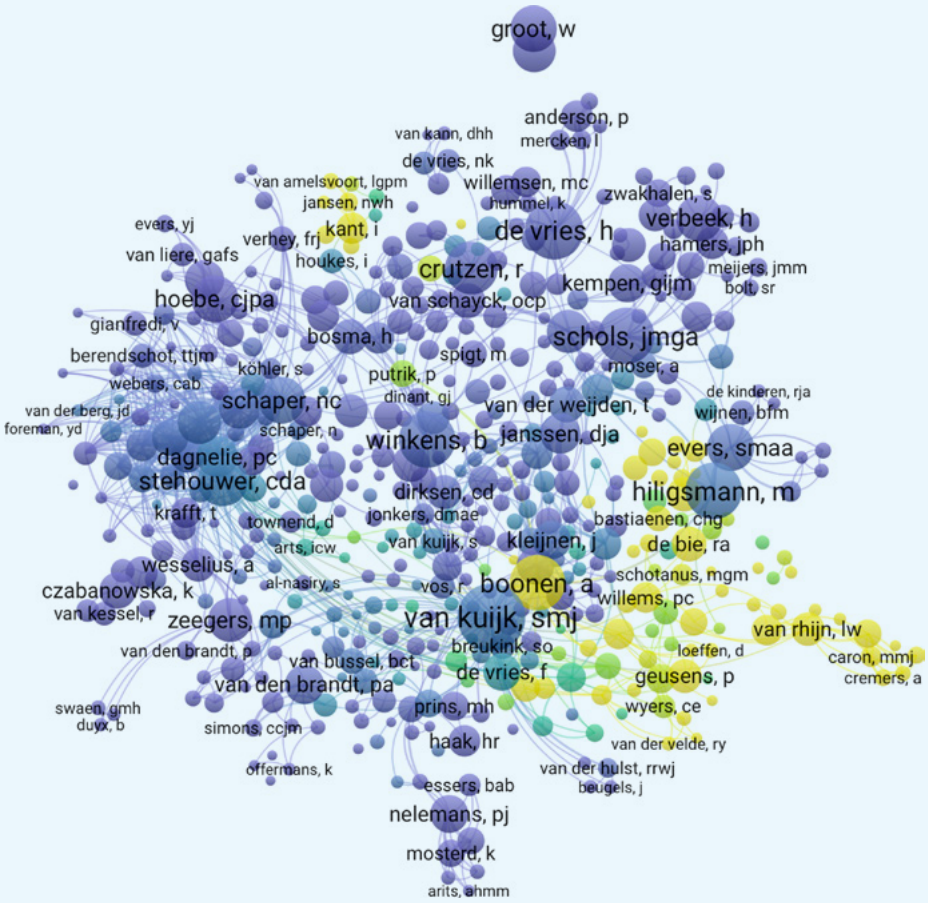


Figure 4.1: illustration of the FPR network - the yellow dots represent our network and covers the regional, national and international collaboration. The green dots are overlapping collaborations with other research lines.

5 Trends, SWOT, strategic plans and viability

The research line follows the CAPHRI policy concerning the PhD programme, talent policy, scientific integrity and diversity. Traditionally, the RL has a strong PhD program, with a high number of PhD graduations each year.

5.1 Trends, SWOT and strategic plans

5.1.1 Trends

Trends from the past six years in the FPR field

Past research was mainly focused on specific diseases and their outcomes, and available fundamental and theoretical research was rarely translated into interventions or programs for patients and/or the general population. Research was mainly performed within local or (inter)national networks of each programme with limited interdisciplinary cross-fertilisation and local implementation. Personalised medicine concentrated mainly on the role of biomarkers and while some studies successfully focused on the role of personal and environmental factors, this focus was not common practice for most of our studies.

We realised that this tradition of research silos of diseases is not 'future-proof' given the changes in society. Furthermore, it does not align with our wish to conduct high-quality research on health and well-being with societal relevance, in which the patient and the patient functioning are our central focus.

Future trends and challenges

Several future trends challenge our research, including demographic changes (aging), increasing unhealthy lifestyles, and the health paradox of improved diagnostic and treatment opportunities resulting in a higher number of people with (risk of) limitations in functioning and restrictions in (work) participation in almost all countries. Moreover, the slow but steady progression towards personalised health adds to the complexity of health care for providers and (potential) patients. At the macro-level, these trends threaten the sustainability of the health and social security systems. While many European countries try to provide equal care to all people, access remains unequal, and both over- and underuse of health care resources pose relevant challenges. While investments in new technologies are predicted to be offset by improved work participation, this accessibility has not reached expected levels of the targeted groups. The global need for sustainable health care, and increased (labor) participation, remains.

From the paradigm "think global - act local," we decided to strengthen our multidisciplinary care and research networks and cross-fertilise within our research groups and with partners outside the university.

Basic and translational research enable us to discover innovations that can fundamentally change the course and impact of diseases and may improve social role participation and well-being, while observational research can reveal the determinants of health and participation and enables to study the effectiveness of interventions.

Therefore, our clinical and public health researchers will be expected to focus on socially relevant questions, the results of which should be readily implemented when proven effective and cost-effective. The added value of innovations in terms of health improvement as well as return of intervention costs (through keeping a person active in the labour force) will be important.

Since our research covers the chain of research from the laboratory to patient and the continuum of care from prevention to cure and reintegration, most of our research is embedded in (care) networks and Living Labs. These networks and Living Labs give valuable input to different phases of the circles of innovation: from problem definition, determinant analysis, intervention development, implementation and evaluation. Moreover, they facilitate interaction of professionals with patients, and allow for data collection from healthy subjects, patients, health care professionals, organisations and social security systems to develop and monitor innovations in relevant health domains.

Within the shift from disease-based approaches, towards approaches based on molecular profiling combined with functional, personal and environmental phenotyping of individual subjects, our research line has two areas of special interest.

First, measurement of 'human mobility' as part of a functional classification of individuals, and development of core sets for assessment and monitoring 'personal traits and characteristics' as well as the 'living environment' (since these contribute to social and labour participation of people independently from the presence of a chronic condition) are at the core of our research line.

Understanding, maintaining and improving functioning, participation and well-being of individuals (given their individual and soci(et)al context) are therefore the focus of our research. Innovations will be translated into applicable (pharmacological or non-pharmacological) interventions while proving added value for health and functioning. As it is estimated that about 80% of avoidable health impact can be found in society, a stronger link to the public health arena (including the workplace), is self-evidently necessary. When translating findings into the health care system, under-use and over-use should be further monitored and should be one of the new goals and requirements of health care and public health researchers.

If proven effective, findings are implemented in research and in daily practice through health care, research networks, the public domain of the (local) government and the Living Lab rehabilitation. The WHO's framework of extended health and the International Classification of Functioning and Health serve as the main theoretical models to understand functioning and health in their context.

5.1.2 The SWOT analysis

Table 5.1: SWOT analysis of the Research Line

Strengths	Weaknesses
• Broad and complementary expertiseContext-driven/holistic knowledge, research and expertise in relation to health, well-being and participation • Presence of translational research in subunits with infrastructural facilities; human performance labs, regenerative lab, Living Lab • Cohort facilities across all subunits • Methodological expertise (mixed methods; choice experiments; n-of-one-trials; Bayesian approaches; multilevel analyses) • Established patient participation in research • Continuum from the home till 3rd line setting • Relevance of research at societal level (work participation, mobility) • In all programmes a broad and context-related evidence base • Collaborations - Regional: Existing regional collaborations (Adelante; VieCuri regional hospital; Zuyderland hospitals; general practitioners, 4-Limburg) - National and international networks (including collaborations across research lines in CAPHRI) • CAPHRI administrative and financial support	• Broadness of the research scope may be a threat for coherence of the research • Lack of critical mass in some research areas • FPR hosts researchers from different organisations (UM, MUMC+, Zuyderland, Adelante) with their own priorities regarding health care and research, which hinders quick decision-making and decisional latitude. • FPR researchers work on different locations, which sometimes hinders communication
Opportunities	**Threats**
• Optimisation of links between research areas within the research line will multiply our scientific output and societal relevance • Strengthening the collaboration with regional partners will increase opportunities for collaborative research within all our research areas	• FPR hosts researchers from different organisations (UM, MUMC+, Zuyderland, Adelante) with their own priorities regarding health care and research - this sometimes leads to "competition" within and between research lines and units • Management burden of the programme (relatively large overhead given the management time available for managing FPR) • Lack of career attractiveness for current and new young/talented researchers since hardly no new vacancies are available • Maintaining data infrastructure and facilities • Maintaining fundamental research labs by CAPHRI

5.1.3 Strategic plans

Strategic plans based on current research, trends and SWOT analysis:

1 Improve and expand regional collaboration with relevant clinics

2 Build and expand (temporary) research and care networks in the local community and in the province (regional networks) with care organisations, schools of higher education, universities, non-scientific organisations, companies and public entities

3 Develop and define the function of the Living Labs with a permanent character and structure in and outside the setting of the MUMC+

4 Build, facilitate and maintain data cohorts enabling a firm link between health care and public health- therewith linking data from e.g. GP, physiotherapy, hospital resource utilisation, pharmadata, social insurance, tax, mortality, occupational health registries, company data - and therewith set up regional (and national) systems to evaluate quality of care and implementation of research innovation

5.2 Viability

We have made a significant change for the better over the last few years, integrating fundamental and clinical research, linking it with patient-centred and societal aims, and establishing a Living Lab Rehabilitation. We started up local and regional collaborations and initiatives and contribute significantly to the scientific and public health community. Our notion to think global and act local is being appreciated, and in tune with societal developments and leads to a viable and thriving research line. Moreover, being a network organisation, backed up by cohort studies that allow for data collection from patients, health care professionals and social security systems to develop and monitor innovations in relevant health domains, gives us a competitive edge. For the coming years, research themes and lines will be further integrated by linking prevention, pre-clinical and clinical themes through long-term participation outcomes. To reach this goal it is important that all freefalling research capacity due to retirement or job change is reallocated to FPR. The programme leader and vice-programme leader of FPR will set up a plan for this reallocation process of research capacity for the coming years.

Maastricht University | Maastricht UMC+

Maastricht University
Care and Public Health Research Institute
Universiteitssingel 40, 6229 ER Maastricht
P.O. Box 616, 6200 MD Maastricht, The Netherlands
T: +31(0)43 388 2314, E: secretariaat-caphri@maastrichtuniversity.nl

www.caphri.nl

Our aim is to create a healthy society for everyone. We are doing this by providing high quality research to improve the individual quality of life and innovate healthcare and public health. Building a bridge between our research and society has our highest priority.