

# CENTRE FOR EPIDEMIOLOGY

## 10 YEAR IMPACT REPORT



**RESEARCH  
VERSUS  
ARTHRITIS**

# THE POWER OF EPIDEMIOLOGY

10 years ago, it was unclear how many people in the UK had arthritis, why the disease progressed more severely in certain individuals, and what the future held in store for patients receiving different types of treatment. Epidemiology research is fundamental to addressing these gaps in our knowledge.

Epidemiology is the science of studying large groups (cohorts) of people to identify the causes, risk factors and consequences of disease. The Centre for Epidemiology is led by the University of Manchester in collaboration with the University of East Anglia. The Centre was established in 2013 and has since received over £4.5 million of infrastructure funding from Versus Arthritis to build capacity, address unanswered scientific questions, seek additional funding, embed patient and public involvement, build networks, and create a legacy that will continue the push against arthritis.

The University of Manchester has a longstanding history of conducting arthritis research. Versus Arthritis first funded the University to open an Epidemiology Research Unit in 1954, and has funded epidemiology research in Manchester ever since. That Research Unit propelled Dr Jonas Henrik Kellgren to become England's first ever Professor of Rheumatology.

The Centre for Epidemiology is at the cutting edge of musculoskeletal epidemiology in the UK.

**CENTRE FOR  
EPIDEMIOLOGY  
VERSUS  
ARTHRITIS**



Professor William Dixon  
– Director of The Centre  
for Epidemiology

## The Centre for Epidemiology has pushed the boundaries of science even further to tackle three research themes:

### 1. How many people in the UK have different forms of arthritis and other musculoskeletal conditions?

From generating new estimates of how many people in the UK live with psoriatic arthritis and fibromyalgia and juvenile idiopathic arthritis, to discovering the declining incidence of Paget's disease, the Centre is spearheading our current knowledge on the occurrence and progression of musculoskeletal conditions.

### 2. How do arthritis and other musculoskeletal conditions progress over time?

The Centre for Epidemiology has improved our understanding of how conditions, such as rheumatoid arthritis and juvenile idiopathic arthritis, affect different groups of people in a different way and may predispose them to other conditions. Centre analysis of real-world information from those living with these conditions consistently show that treatments for these conditions are safe.

### 3. How effective and safe are treatments for arthritis and other musculoskeletal conditions?

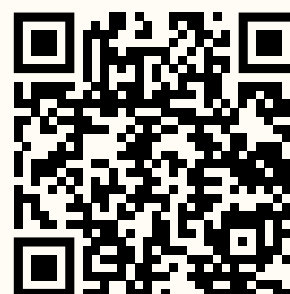
The Centre for Epidemiology has scrutinised and weighed up the risks and benefits of drug therapies such as biologics, methotrexate, opioids and steroids, as well as non-drug therapies such as knee-braces. For example, they showed that people taking methotrexate can enjoy drinking alcohol within NHS guidelines without affecting their medication.

## These important questions have been investigated by focussing on three important areas of methodology:

**1. Harnessing digital data:** The Centre for Epidemiology is at the forefront of studying musculoskeletal epidemiology in a novel and pioneering way by harnessing digital data and using mobile technologies such as smartphones and smartwatches. Using these types of technology generates extremely rich data because it is accessible to people everywhere. People can self-report data more regularly than if they were using traditional research methods. One standout example of this is the Cloudy with a Chance of Pain study.

**2. Statistical design and analysis:** Analysing big data appropriately is crucial to make a strong and confident conclusion. The Centre for Epidemiology has incorporated complex statistical methods in all their research to collate, prepare and analyse big data so that all true trends, predictions and associations can be revealed. From handling potential bias using propensity scores (the probability that a given person will receive treatment) to validating existing clinical prediction models that identify patients most likely to respond (or not) to a particular treatment, the Centre's expertise on this topic has earned them an international reputation as leaders in epidemiological statistical analysis.

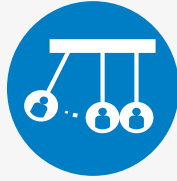
**3. Research into practice:** The Centre for Epidemiology is dedicated to catapulting its research out into the real world to make a positive change for people with arthritis. They are achieving this by embedding patients in all parts of their research. One example of this is when patients worked with researchers to produce a guidance video, now endorsed by the British Society for Rheumatology, that trains people with rheumatoid arthritis on how to self-examine for tender and swollen joints. This video was produced as part of the REMORA2 project and has since been viewed over 50,000 times.



# OUR RESEARCH IMPACT AREAS



New Knowledge



Influence on Policy & Practice



New IP, Products & Services



New Networks



Increased Capacity to Conduct Research



Leveraged Funding



Patient and Public Involvement

## £4.5 MILLION VERSUS ARTHRITIS FUNDING



**950**  
publications  
cited more than  
26,000 times



**OVER  
£25 MILLION**  
leveraged funding



**OVER 225**  
staff and students

# RESEARCH ACHIEVEMENTS

At the Centre for Epidemiology



● **1954**

Epidemiology Research Unit opened at the University of Manchester with funding from Versus Arthritis.



● **1989**

World's largest long-term study into inflammatory arthritis, the Norfolk Arthritis Register, began.

● **2001**

BSRBR-RA Register started to collect information about the long-term safety of rheumatoid arthritis biologics.

● **2004**

The UK JIA Biologics Register began. This is the world's first register collecting information about the long-term safety of juvenile idiopathic arthritis biologics.

● **2010**

CAPS, a biobank cohort of more than 1,800 children, reveals several genetic loci linked to juvenile idiopathic arthritis.



● **2015**

Anti-TNF therapy found not to be associated with increased rates of melanoma, a serious skin cancer.

● **2015**

Incidence of Paget's disease shown to have declined three-fold since 1999.

● **2015**

CCP2 antibodies shown to play a significant role in the development of inflammatory arthritis.

● **2013**

The Centre for Epidemiology Versus Arthritis opened.

● **2011**

Norfolk Arthritis Register revealed that the TRAF1/C5 genetic region is associated with a higher risk of developing severe, erosive rheumatoid arthritis.





## 2015

Biologic called etanercept shown to help children with juvenile idiopathic arthritis achieve normal growth and development, enabling them to live all aspects of their life to the full.

## 2016

World's first smartphone-based study to investigate the association between weather and chronic pain began, called 'Cloudy with a Chance of Pain'.

## 2016

Centre research contributed to a European-wide statement about the safety of steroids for treating inflammatory rheumatic diseases.

## 2016

Recommendations for children with juvenile idiopathic arthritis transitioning to adults' services implemented into national health and social care guidelines.

## 2018

BSRSR-RA safety data used to support licensing of tofacitinib (Xeljanz®) across Europe.

## 2017

*Work Matters* report, which provides employer guidance for supporting their employees with rheumatoid arthritis, presented at Houses of Parliament.

## 2017

Primary care data from approximately 12,000 patients taking methotrexate analysed. Consuming alcohol in moderation shown to not adversely impact the medication and implemented in international guidelines.

## 2016

Icelandic company Össur built a patented leg brace based on Centre research that proved knee supports should not be discouraged for those with knee osteoarthritis.

## 2019

Statins shown to be just as safe and beneficial in people with rheumatoid arthritis as in the general population.

## 2019

CAPTURE-JIA, the first ever dataset with the mission of improving clinical care for children and young people with juvenile idiopathic arthritis, began.

## 2020

Opioids prescriptions for non-cancer pain at an all-time high. UK Government notified to curb over-prescription and misuse.

## 2021

Centre research contributed to European lifestyle recommendations that clinicians use to plan treatment for patients with arthritis.

## 2022

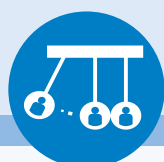
Centre led a national, roundtable report on the future of smartphones for UK population health research.

**THE FUTURE!**

# COHORTS AND REGISTERS

Being diagnosed with arthritis can lead to uncertainty and anxiety. Understandably, people have many questions, “Am I the only one?”, “What treatment is out there?”, “Will it work?” and “What are the side-effects?” Cohorts and registers collect the long-term and real-world data needed to answer these questions.

The Centre for Epidemiology manages many world-leading cohorts and internationally renowned registers. Cohort studies provide long-term insight into a group of people. In a similar way, registers provide long-term, ongoing information into patients receiving treatments for a disease.



## Policy and practice impacts

- Demonstrating that targeted biologic therapies are extremely effective, and that they are worth the expense for most patients.
- Transforming British prescribing guidelines through research showing that anti-TNF drugs are not associated with elevated cancer risk, despite initial concerns.



## TOFACITINIB IS NOW AVAILABLE

for adults with RA thanks to data from one of the Centre's registers



## New treatment launched

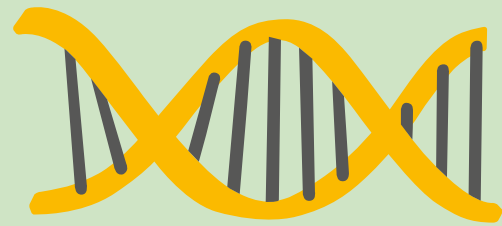
Tofacitinib (Xeljanz<sup>®</sup>), a treatment for rheumatoid arthritis, is now used by over 300,000 adult patients across Europe. BSRBR-RA data supported the approval of tofacitinib as a therapy option for patients with severe rheumatoid arthritis.





## HIGHER INTAKE OF FRUIT AND VEGETABLES

are shown to reduce the risk of RA



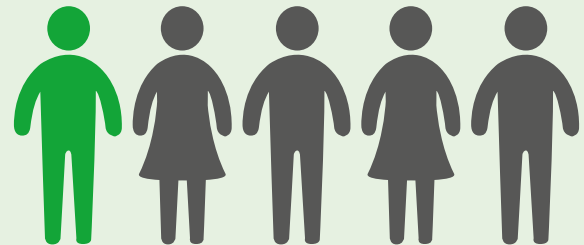
## OVER 90 GENES

are linked to developing RA



## LOWER RISK OF INFLAMMATORY ARTHRITIS

for mothers who breastfeed their infants



## ONE IN FIVE CHILDREN

with JIA need biologic drugs within the first 3 years



### New knowledge discoveries

- A higher intake of fruit and vegetables reduces the risk of rheumatoid arthritis.
- Over 90 genes are linked to developing rheumatoid arthritis.
- Smoking doubles, and obesity triples, the risk for inflammatory arthritis.
- Mothers who breastfeed their infants have a lower risk of developing inflammatory arthritis.
- 14 genes linked to developing juvenile idiopathic arthritis, and several are linked to higher levels of disability.
- One in five children with juvenile idiopathic arthritis who start methotrexate will also need biologic drugs within the first three years of disease.
- Successful remission is possible. One in five people with juvenile idiopathic arthritis achieve remission on biologic therapy after two years: over half of those will be able to remain off treatment for at least two years.
- A drug called etanercept shown to reduce a common issue of delayed or restricted growth in children who have juvenile idiopathic arthritis.
- Early treatment, early referral to specialist care, and physical activity all found to lead to improved health outcomes for people with arthritis.

## Four of the Centre's World-Leading Cohorts and Registers



### **The Childhood Arthritis Prospective Study (CAPS):**

In 2001, the Epidemiology Unit at the University of Manchester, in collaboration with Versus Arthritis, launched CAPS. This is one of the world's largest studies of juvenile idiopathic arthritis, following more than 1,800 children and young people from the point of first presentation to a paediatric rheumatologist until discharge or transfer to adult rheumatology. The vast information collected has been used to understand how genetics, personal characteristics, different types of disease and psychological factors can predict both the short and long-term effects of juvenile idiopathic arthritis.



### **The British Society for Rheumatology Biologics Register for Rheumatoid Arthritis (BSRBR-RA):**

In 2001, the Epidemiology Unit at the University of Manchester, in collaboration with the British Society for Rheumatology, launched BSRBR-RA. This national register captures clinical data from hospital records for over 30,000 people who are living with rheumatoid arthritis and receiving medications – including biologics, biosimilars or disease-modifying anti-rheumatic drugs (DMARDs).

The register provides long-term monitoring of medications. This helps patients, researchers and health professionals to better understand the long-term effectiveness of these medicines and uncover any side-effects which did not appear in trials. Filling this knowledge gap is essential to enable patients and clinicians to make better informed decisions about the right treatment option for individuals.



**Norfolk Arthritis Register (NOAR):** In 1989, the Epidemiology Unit at the University of Manchester began NOAR, the world's largest long-term study into inflammatory polyarthritis and other forms of arthritis. GPs and rheumatologists across Norfolk have recruited 4,736 patients and followed them over many years. Recruiting this large group of people with different disease severities has enabled scientists to investigate lifestyle and genetic risk factors for developing inflammatory arthritis.



**UK JIA Biologics Registers:** The Centre for Epidemiology manages the UK JIA Biologics Registers. This is a national database that combines hospital records and blood samples. This register is one of the largest of its kind in the world. Representing over 3,000 children and young people aged under 18 diagnosed with juvenile idiopathic arthritis and taking biologics, biosimilars or targeted disease-modifying anti-rheumatic drugs.

There are many therapies available for the treatment of arthritis, but how well each one works and what side-effects they cause in children is less well known. Data from this register can fill this knowledge gap and give patients and clinicians more confidence when deciding what medications may be best for each child and young person.

## **Why are these cohorts and registers important for people with arthritis?**

These world-leading cohorts and registers are our best chance of being able to predict those who are most at risk of developing more severe forms of arthritis, as well as those most at risk of medication side-effects, potentially preventing both these outcomes. They are an invaluable source of information that will over time generate even more ground-breaking insights into how arthritis can best be treated. This opens a doorway to the development of new treatments which will lead to drugs that have maximum benefit for patients.



“*The Centre, with their longstanding reputation, involvement with Versus Arthritis... knowledge base, and infrastructure... allows this work to be done seamlessly.*”

**ROSS**

**How is Ross connected to these registers and cohorts?**

Ross is the Head of Registers and Research Management at the British Society for Rheumatology (BSR).

**Why are these registers so important to people with arthritis and the arthritis research community?**

The BSRBR-RA register is an impartial and comprehensive dataset that captures data surrounding most of the currently available biologic and biosimilar treatments, even those rarely prescribed. The register is ever-growing with real-life data which helps pharmaceutical companies and the research community monitor the safety and efficacy of drugs post-approval. These rich insights cannot be captured through clinical studies alone.

**What makes these registers so impactful?**

Quality of life data is also collected through the registers. This means that patient benefit is captured to build as full a picture as possible towards understanding, and potentially predicting, the best treatment option for everyone living with arthritis.

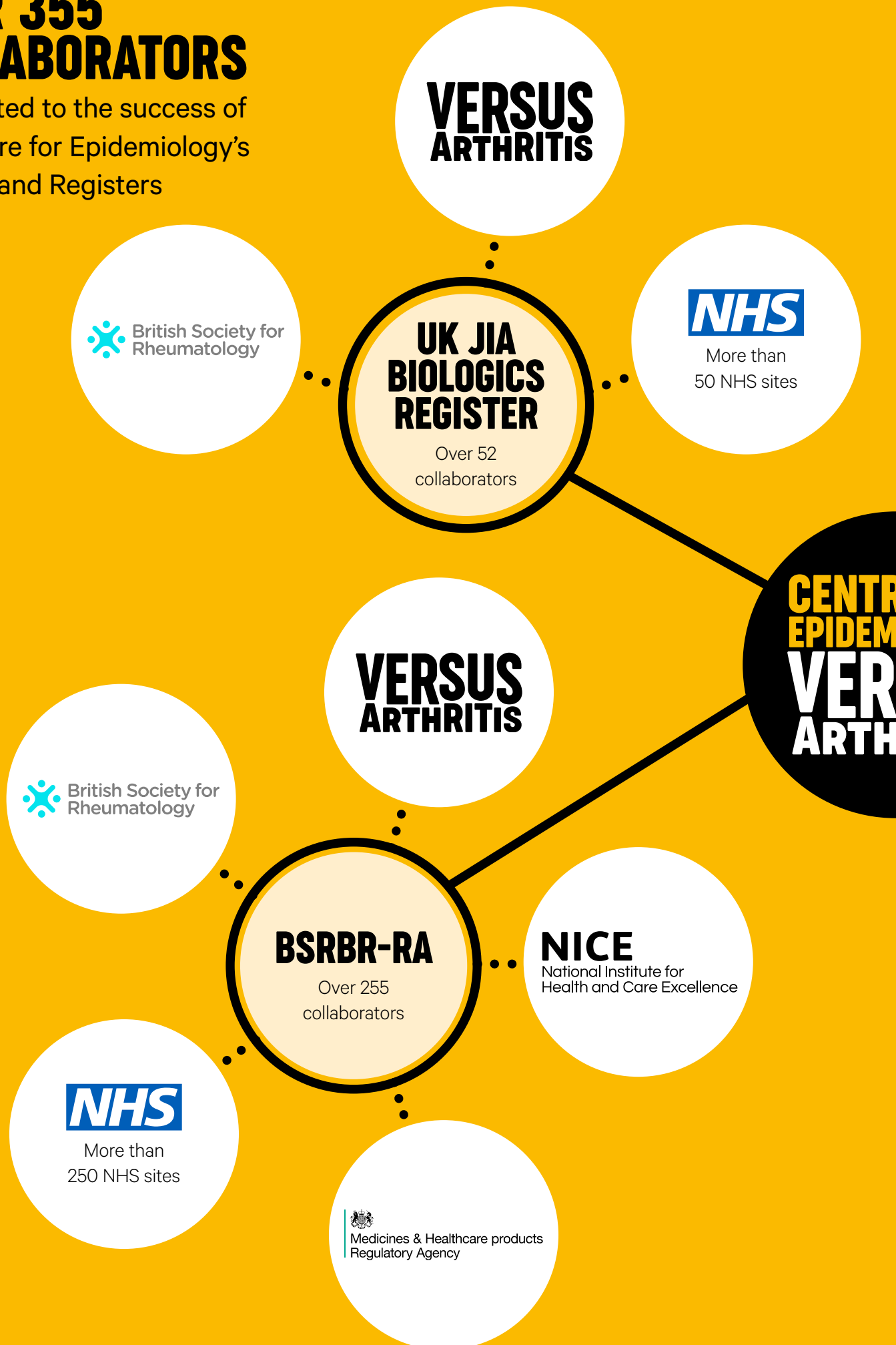
The BSRBR-RA and UK JIA Biologics Registers interact in capturing data from individuals from paediatric through to adult services. Collectively, they tell the unique story of these individuals through time whilst they manage their condition(s).

**Why are these registers so important to the BSR?**

The registers serve as an invaluable and attractive dataset for the BSR and their members. BSR is the world-leading point of call in the rheumatology community for accessing the large-scale data needed by researchers to generate valid and accurate conclusions.

# OVER 355 COLLABORATORS

contributed to the success of the Centre for Epidemiology's Cohorts and Registers



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SUS  
RITIS**

**NHS**  
Alder Hey Children's  
NHS Foundation Trust

**NHS**  
Great Ormond Street  
Hospital for Children  
NHS Foundation Trust

**NHS**  
Lothian  
Royal Hospital for  
Sick Children

**NHS**  
University College London Hospitals  
NHS Foundation Trust

**CAPS**  
9 collaborators

**NHS 75**  
Manchester University  
NHS Foundation Trust

**NHS**  
Greater Glasgow  
and Clyde  
Royal Hospital  
for Children

**VERSUS  
ARTHRITIS**

**NHS**  
The Newcastle upon Tyne Hospitals  
NHS Foundation Trust  
Royal Victoria  
Infirmary

**NOAR**  
38 collaborators

**VERSUS  
ARTHRITIS**

**NHS**  
General practices  
across 36 locations

**NHS**  
Norfolk and Norwich  
University Hospitals  
NHS Foundation Trust

# CLOUDY WITH A CHANCE OF PAIN



## Why was this research needed?

People with chronic pain often attribute changes in their pain levels to the weather. However, prior studies were unable to collect enough data to reach a definitive conclusion because they had too few participants or ran for too short a time. The Centre for Epidemiology identified a novel approach to address this by conducting a large-scale study using technology accessible to people everywhere: smartphones. Cloudy with a Chance of Pain was the world's first smartphone-based study to investigate the association between weather and chronic pain.

## What did the research involve?

Over 13,000 residents, spanning every postcode area in the UK, took part in the study for 15 months by rating their daily pain intensity on a smartphone app. A total of 5.1 million symptoms were analysed in conjunction with 12 million local weather reports derived from smartphone-embedded GPS. Five weather variables (temperature, relative humidity, pressure, precipitation and wind speed) were compared with the pain reports.



### New knowledge discoveries

- Days with higher humidity, lower pressure and stronger winds are associated with days where pain increased significantly. The richness and versatility of the study data is continuing to drive other research studies at the Centre so that pain, and how it interacts with other factors such as mood and sleep, can be better understood and potentially predicted.
- Smartphone apps can be more effective than traditional research techniques to involve and engage large numbers of people, enabling more powerful conclusions to be made. In this study, 7,000 people were recruited in the first week, with more than one in seven people still reporting symptoms daily six months later.



### New collaborations formed

- A team of epidemiologists, meteorologists, biostatisticians, and computer scientists at the Centre for Epidemiology, University College London, the London School of Hygiene and Tropical Medicine, IBM Research (Israel), and the University of British Columbia Vancouver.
- Contributions made by Dr Malcolm Maclure, from the University of British Columbia Vancouver, were fundamental to conducting the analysis using a method called the case-crossover design. He invented this method in 1991. Cloudy with a Chance of Pain applied the case-crossover analysis method for the very first time to a digital health study.

## What do these findings mean for people living with pain?

This study helps raise awareness that weather conditions really do have an impact on some people's pain levels. The study had widespread press and media uptake both nationally and internationally. It was broadcast on BBC's 'Trust Me I'm a Doctor' programme, BBC Breakfast, ITV News and three dedicated BBC World Service radio programmes. The study was also featured by The New York Times and The Washington Post, as well as at public engagement events like the British Science Festival and the Manchester Day Parade. Understanding what influences pain is important so that those affected by it are equipped to better understand their condition, better self-manage their illness, and live well.



**“This study has helped me appreciate that sometimes external factors are at play for triggering my pain so I shouldn’t worry and blame myself for doing something ‘wrong’.”**

## CAROLYN

### **How was Carolyn linked to the Cloudy with a Chance of Pain study?**

I have ankylosing spondylitis and previously worked at the University of Manchester’s Arthritis Research User Group. I first found out about the study through an opportunity to co-design the smartphone app for an exciting, world-first study.

### **What impact did patients and public make to the study?**

Patients and the public were involved from the get-go. The smartphone app was co-designed and tested through a focus group so that it was easy and meaningful for people with arthritis to use. They scrutinised all aspects of the app including its look, functionality, questions and pain-scoring system. Without their involvement, fatigue wouldn’t have been embedded as a symptom to monitor.

Patient partners were invited to every meeting to help steer research delivery. They supported and assisted in developing the idea to create an interactive data map so that the public could interact with the raw, interim data in real time.

Patients and the public were consulted after the study finished to identify the best ways for sharing the research. With our help, people from all walks of life were exposed to the results through festivals,

primetime TV, radio, newspapers, and social media channels. Worldwide interest was generated after I launched the study on BBC Breakfast. I was invited back three and a half years later alongside Professor William Dixon to present the study results.

### **Why was the study a success?**

The study was a patient involvement success because all patient partners were respected by the entire, multidisciplinary research team. I felt as though my feedback was listened to and valued rather than being used as a ‘window-dressing exercise’ for researchers to do whatever they already had in mind.

### **How has being involved with the study benefitted Carolyn?**

I found it empowering to say “ankylosing spondylitis” on BBC Breakfast. Raising awareness of this condition was a special moment that validated my personal experience of living with a painful, invisible condition.

I used the app to share pain symptoms with my doctor. Doing so, led the doctor to diagnose me with a new condition called occipital neuralgia.

# PATIENT AND PUBLIC INVOLVEMENT

Involving people with lived experience as equal contributors to a research project is one of the best ways to ensure that research has real-world benefit. In 2009, the University of Manchester established one of the first Patient and Public Involvement (PPI) groups of its kind in the country, placing public and patient involvement (PPI) at the heart of its research. In 2019, the Centre for Epidemiology launched a strategy to demonstrate its bold, sustained and united commitment to patient and public involvement. This strategy is driven by inclusivity, accessibility and diversity.

Two projects that exemplify how the Centre embraces involvement include:

## 1. Co-defining research – Juvenile onset rheumatic diseases: education, vocational readiness and employment

Professor Suzan Verstappen's research project explores the many ways that juvenile onset rheumatic and musculoskeletal diseases may impact on the education, career choices, aspirations, employment prospects and well-being of teenagers and young adults.



**PPI:** Members of national youth advisory group called YourRheum were involved to help decide which research questions they believe are important to answer as part of the project, and the ways in which they would like to be involved in the project – including by helping to write the application.



**Leveraged funding:** The application was awarded, and its strong PPI approach was noted as one reason for its success. £402,000 was funded from the Nuffield Foundation and Versus Arthritis through the Oliver Bird Fund.

## 2. Co-designing research – The Manchester Pain Manikin

Pain is a common symptom for people with arthritis. The Manchester Pain Manikin project has two aims. Firstly, to help better understand why pain is more commonly reported among ethnic minority groups in Greater Manchester than among White British people. Secondly, to develop a way of enabling people to report their levels of pain to their clinician more accurately.



**PPI:** Underserved populations from ethnically diverse backgrounds were recruited to co-design and test the app to provide feedback on how to make it more acceptable to them. As a result, sustained engagement with the app was achieved during the study. This proved the tool is feasible for everybody to self-report pain, regardless of their cultural background.



**New product:** A smartphone app built to enable daily self-reporting of pain. This tool was designed to be a cross-culturally accepted tool which can overcome language barriers and the complexity of typical questionnaire-based pain reporting.

## Why is patient and public involvement important for people with arthritis?

Patient and public involvement is a powerful way to make sure that research happens with patients in mind, and that it will bring maximum benefit to their lives. The Centre for Epidemiology's patient-first mindset incentivises research that is done with or by patients and the public, not 'about' or 'for' them. The Centre for Epidemiology has led through example, making a valuable addition to the evidence base that supports the value of involving people in rheumatology research. This has encouraged other universities and research departments to follow suit.





“***I find it very uplifting to be involved in research that I know may benefit my life, and others, in the future.***”

”

**PAUL**

### **How is Paul linked to the Centre for Epidemiology?**

I was diagnosed with rheumatoid arthritis in 2015 and since then have been actively involved in several research projects taking place through National Rheumatoid Arthritis Society (NRAS), BSR and the Centre for Epidemiology. I am a patient partner for a project being delivered out of the Centre for Epidemiology called REMORA. REMORA is developing and piloting a symptom tracking smartphone app for people with rheumatoid arthritis. REMORA is developing and piloting a symptom tracking smartphone app for people with rheumatoid arthritis. Patient-reported data from the app is uniquely reported into their electronic health record.

### **What impact does patient and public involvement bring to research at the Centre for Epidemiology?**

Patients and the public provide a unique perspective which in turn boosts the accessibility, engagement, and overall quality of the research. The patient and public involvement team benefitted the REMORA study by:

- Improving the accessibility of patient-facing materials by working with Centre staff to identify and define relevant jargon for this study. Patient partners are transforming the Centre's long and generic glossary into a prompt 'bingo card' of keywords.
- Boosting engagement with the research by producing a step-by-step guide for gaining access to the REMORA app. This helped reduce a potential digital barrier for less digitally savvy study participants.
- Spearheading the idea for a high-quality training video that enables people with rheumatoid

arthritis to self-examine their joints. The video has since been viewed over 50,000 times, is endorsed by NRAS, and has received excellent feedback from patients and clinicians.

### **Why is patient and public involvement at the Centre for Epidemiology a success?**

Patient input is embraced in all parts of their research projects and the Centre communicate with their patient partners really well. Communication is fundamental to enabling patients and the public to contribute as much as they want, and can, amidst all their other responsibilities in life.

There is transparency surrounding what is expected from patient partners from the get-go. The Centre presents a terms of reference document which clearly outlines the standard return time for documentation review, as well as the remuneration process for expenses. This document is currently not standard practice for patient and public involvement. I believe that having this document demonstrates that the Centre for Epidemiology go above and beyond to value and protect patients' time and knowledge.

I regularly chair the Centre's patient partner working group meetings. I believe these are a success because there is excellent patient representation in terms of size and diversity. A whole group of patients are invited, as opposed to just one or two individuals, so that those attending don't feel pressurised to be the voice for the whole rheumatoid arthritis community. Additionally, focus groups have been held in different languages to involve underrepresented communities.

# CAREER DEVELOPMENT

The Centre for Epidemiology has provided significant training and development opportunities for students and early career researchers, increasing the capacity to conduct research:



## DR ANNA BEUKENHORST

“  
*I loved the collaborative atmosphere and the cutting-edge epidemiology. My PhD supervisors were generous in their advice and coaching.*  
”

### **Anna's involvement with the Centre**

PhD student between 2016-2019.

### **What did Anna work on?**

Cloudy with a Chance of Pain study and a smartwatch study of knee osteoarthritis called KOALAP. Her thesis was on epidemiological methods for research into musculoskeletal diseases that use mobile health technologies for data collection.

### **What has Anna achieved since then?**

Anna moved to a postdoc role at Harvard University. She now works as Director of Scientific Data at Leyden Labs, which develops intranasal sprays against respiratory diseases.



## DR MEGHNA JANI

“  
*The Centre has helped provide a supportive environment to grow as a researcher myself, but also to now help nurture the researchers within my team.*  
”

### **Meghna's involvement with the Centre**

NIHR Academic Clinical Lecturer (2016-2019), leading to a Presidential Fellowship (2019-2021) and an NIHR Advanced Fellowship (2021-present).

### **What has Meghna achieved at the Centre?**

2018 UK recipient of the Farr Institute/Institute for Clinical and Evaluative Sciences Canadian Fellowship. 2019 recipient of the British Society for Rheumatology Young Investigator Award.

### **What is Meghna doing now?**

Meghna now leads her own group studying the use of opioids. She serves on several national and international arthritis drug assessment committees.



## Capacity building

The Centre has attracted great minds to conduct musculoskeletal epidemiology, increasing the likelihood of more breakthrough discoveries in the future. A total of 75 students have been associated with the Centre for Epidemiology and nearly one-third of those students (28%) have progressed their career to become Centre staff. Other PhD students have been recruited to a variety of senior and prestigious posts.



## DR JULIE GANDRUP HORAN

“*I gained an invaluable skillset in digital innovation and epidemiology that I continue to use every day.*”

### Julie's involvement with the Centre

PhD student between 2019-2022.

### What did Julie work on?

REMORA, a remote symptom monitoring platform that collects frequent patient-generated health data on a smartphone app from people with rheumatoid arthritis.

### What is Julie doing now?

Julie is a Real-World Evidence Expert in Digital Care Transformation at UCB, a global biopharma company.



## DR STEPHANIE SHOOP-WORRALL

“*My time in the Centre has taught me everything I currently know about rheumatology and epidemiology... to the point where I'm now running modules on these topics and being invited to speak internationally on the subjects.*”

### Stephanie's involvement with the Centre

PhD student 2014-2018, Research Associate 2018-2022, Research Fellow 2022-present.

### What did Stephanie work on?

Exploring remission and treatment response for children and young people with JIA.

### What is Stephanie doing now?

A new fellowship in the Centre for Epidemiology studying children and adults with psoriatic arthritis.



## New Knowledge

### In-house training in musculoskeletal epidemiology

The Centre for Epidemiology's in-house training includes introductory and applied epidemiology and biostatistics courses, statistical modelling courses, journal clubs, and digital epidemiology monthly meetings with external speakers.

The Centre for Epidemiology has also hosted an annual three-day Summer School in Digital Epidemiology covering topics such as the use of electronic health records and patient-generated data using smartphones, sensors, and social media for population research. Since 2018, over 145 participants have attended from across Europe and North America.



## New Network

### UK Research in Musculoskeletal Epidemiology (UK-RiME) network

The Centre for Epidemiology leads the UK Research in Musculoskeletal Epidemiology (UK-RiME) network, a collaborative group of eight leading centres of research interested in musculoskeletal epidemiology.



Since the network's inception in 2013, the network has coordinated innovative training and mentoring programmes led by national experts. These inspire students to pursue a research career in musculoskeletal epidemiology and make new contacts with potential collaborators.

Each year, UK-RiME hosts an annual research showcase. Junior researchers and PhD students from across the discipline present on the wealth of musculoskeletal epidemiological research being carried out across the network. Additionally, they can network, seek career advice, and share knowledge. Since 2013, over 450 people from across UK-RiME have attended.

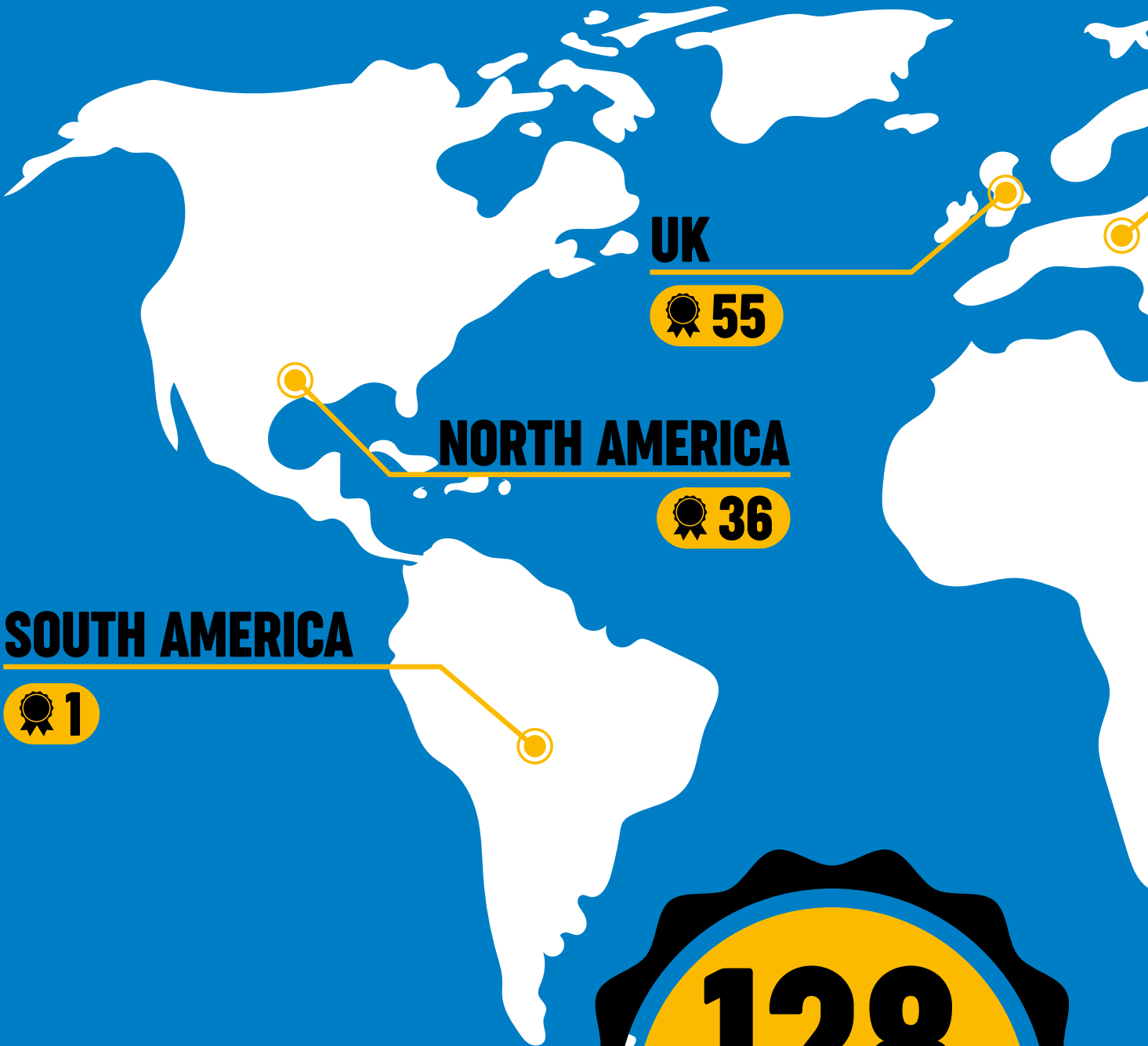
### UK-RiME Partners:



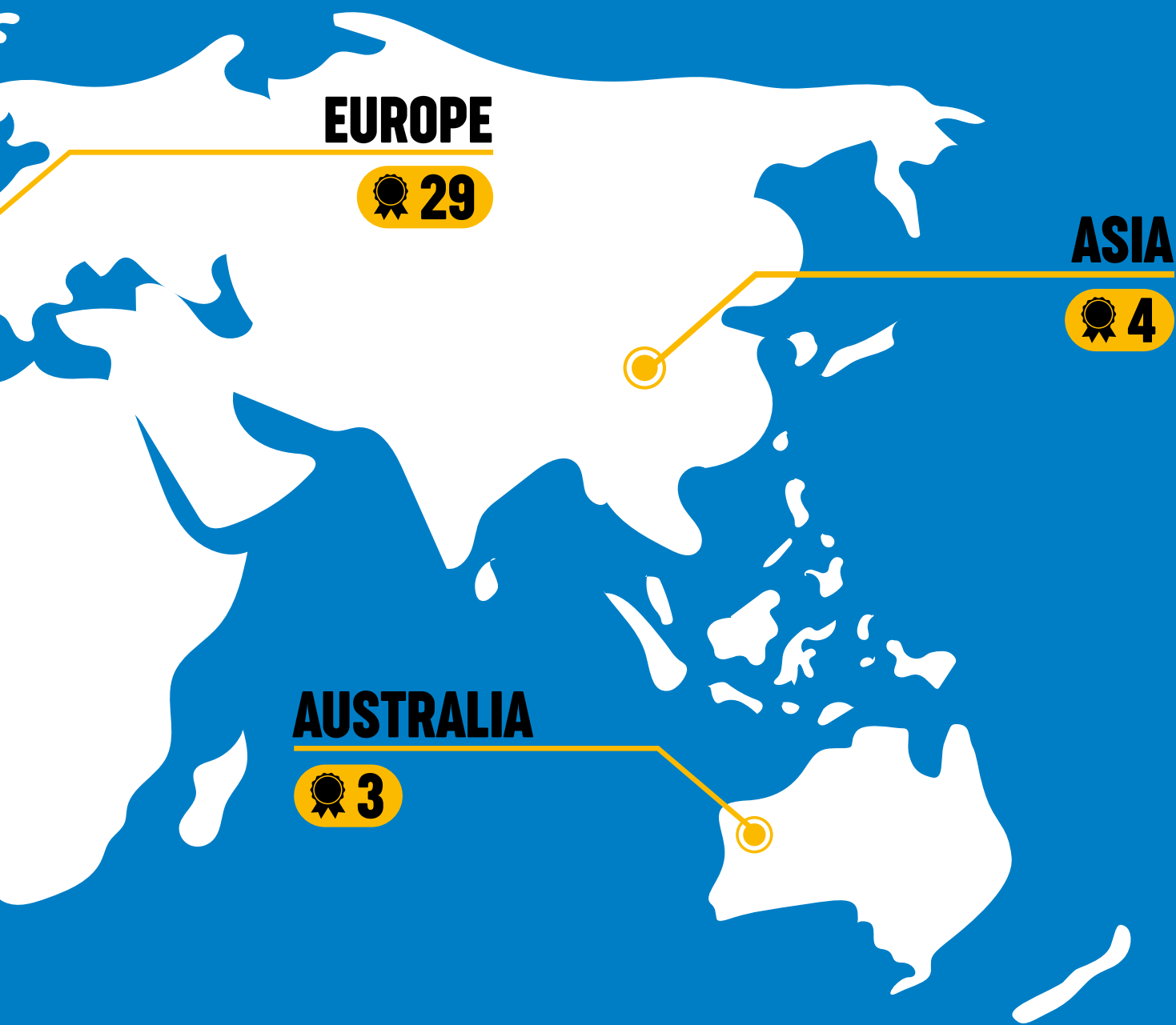
## Why is Career Development of researchers important for people with arthritis?

The Centre for Epidemiology has provided the infrastructure to nurture a stronger, more knowledgeable and collaborative research community. To improve the lives of people living with arthritis, it is essential that we have highly-skilled researchers leading the way to new discoveries and solutions.





# RESEARCH REACH



The figures represent academic collaborations defined as having five or more co-authored publications between the Centre and another academic institution.

For more information please visit our website  
[versusarthritis.org](http://versusarthritis.org)

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