MANCHESTER 1824
The University of Manchester

GLOBAL FUTURES

Driving Innovation for Improved Global Health

Faculty of **Biology, Medicine & Health**

CONTENTS

GREATER MANCHESTER, GLOBAL MANCHESTER

In a world shaped by rapid change, rising pressures on health systems, and widening inequalities, the pursuit of health equity has never been more urgent. *Global Futures 2.0* sets out our bold vision for how we can harness discovery and innovation - technological, scientific, and social - to create fairer, healthier outcomes for all.

Across continents and communities, stark inequalities in access to quality healthcare persist. Yet from these challenges, remarkable advances are emerging. From AI that sharpens diagnostics, to community-led care models and data-driven prevention that identifies risks before they escalate, innovation is redefining what is possible.

A HOME FOR INNOVATION

Innovation - rooted in strong discovery science and deep biological insight - is essential to transforming health systems. It enables earlier diagnosis, more personalised care, and greater opportunities for prevention, whilst expanding access for people too often overlooked. When paired with accessible education and improved health literacy, innovation empowers individuals and communities to take charge of their health. Above all, when guided by equity, it shifts us from reacting to illness towards proactively designing systems that support wellbeing for all.

This publication is rooted in places where innovation already thrives, Manchester foremost among them. The City unites research, education, clinical excellence, and industry to accelerate the adoption of new healthcare technologies. As the first UK region with a devolved health and social care budget, Greater Manchester has streamlined the innovation pathways.

Manchester City Region's leadership is strengthened by the University of Manchester's groundbreaking and intentionally interdisciplinary research. Its research platforms unite bio-scientists, clinicians, engineers, data scientists, and social scientists to solve complex health challenges, leading to pioneering advances that are reshaping survival and transforming clinical practice. They range from early diagnostic methods for Parkinson's disease to new breast cancer prevention therapies and breakthrough trials in Hunter Syndrome.

Alongside innovation, collaboration forms the bedrock of our approach. Globally relevant research can only thrive when time, ideas, resources, and data are shared across boundaries. Progress flows both ways – we learn as much as we contribute, and our partnerships strengthen all involved. Personally, I am indebted to Manoah Esipisu (pictured on the right), former Kenyan High Commissioner to the UK, for all his support, advice and guidance during our work in Kenya, which is highlighted in the first edition of *Global Futures*.

UN SUSTAINABLE DEVELOPMENT GOALS AT THE HEART OF EVERYTHING WE DO

We champion SDG 3, advancing innovations that improve health outcomes and reduce persistent inequities. We support SDG 4, ensuring that education, digital literacy, and workforce skills keep pace with technological progress so communities can benefit fully from new tools and approaches. And through SDG 17, we emphasise the power of partnership - cross-sector collaboration, global knowledge-sharing, and inclusive research ecosystems that accelerate progress and ensure solutions reach those who need them most.

Our commitment to the SDGs reflects the essential role they play in shaping equitable global progress. The SDGs provide a shared language and a common framework that unites governments, researchers, communities, and industry behind measurable action. They matter because they help align innovation with purpose - ensuring that scientific and technological advances effect change in people's lives. By grounding our work in SDG 3, 4 and 17, we ensure that health innovation, and our contribution to SDG 9, is not only cutting-edge, but also inclusive, ethical, globally relevant, and designed to reduce inequalities rather than deepen them.

But innovation alone is not enough. Transforming global health requires breakthroughs designed for equity - accessible, affordable, and responsive to the lived realities of the people they aim to serve. That means centring diverse voices, investing in inclusive research, and ensuring technology narrows rather than widens existing divides. It calls for shifting from systems that only treat illness to systems that proactively support wellbeing. Global Futures 2.0 showcases emerging solutions and highlights where equity gaps persist, offering a roadmap for leaders committed to a healthier, more equitable future for all.

OUR WISH FOR THE FUTURE

As we look ahead, our task is clear: to champion innovations that uplift the many, not the few. By aligning creativity with compassion, discovery with justice, and interdisciplinary expertise with global solidarity, we can follow our North Star and chart a course toward a future where equitable health is not aspirational but a lived reality.

Professor Keith Brennan
Vice Dean for Internationalisation,
Faculty of Biology, Medicine & Health.

The Sustainable Development Goals (SDGs) which map to the research projects on each page.

GOOD HEALTH AND WELLBEING
Ensure healthy lives and promote well-being for all at all ages.

GENDER EQUALITY
Achieve gender equality and empower all women and girls.

REDUCED INEQUALITIES
Reduce inequality within and among countries.

INDUSTRY, INNOVATION AND INFRASTRUCTURE
Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.

CLEAN WATER AND SANITATION
Ensure availability and sustainable management of water and sanitation for all.

ECONOMIC GROWTH
Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

PEACE, JUSTICE AND STRONG INSTITUTIONS
Promote peaceful and inclusive societies for sustainable development.

SUSTAINABLE CITIES
Make cities and human settlements inclusive, safe, resilient and sustainable.

RESPONSIBLE CONSUMPTION AND POLLUTION
Ensure sustainable consumption and production.

CLIMATE ACTION
Take urgent action to combat climate change and its impacts.

PARTNERSHIP FOR THE GOALS
Strengthen the means of implementation and revitalise the Global Partnership for Sustainable Development.

QUALITY EDUCATION
Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

1 DISEASE UNDERSTANDING

Improving disease understanding is vital for improving global health. It supports earlier detection, stronger prevention, and better targeted health policies that help countries respond to and mange population health. International collaboration is key, by sharing data and expertise across borders, discovery is accelerated and large scale analyses that no single nation could achieve alone, can be delivered.

AT A GLANCE

- Non communicable diseases (NCDs) form the largest share of global disease burden, overtaking communicable diseases.
- Cardiovascular diseases, cancer, chronic respiratory disease and diabetes account for 80% of all premature NCD deaths globally.
- Communicable, maternal, neonatal & nutritional diseases remain the heaviest burden in Sub Saharan Africa and South Asia.

A NEW APPROACH TO PREVENTING BREAST CANCER IN YOUNGER WOMEN

Breast cancer is the most common cancer affecting women, and for those with a strong family history, the fear of developing the disease can start early in life. Before the menopause, options to reduce risk are limited: women can choose major preventative surgery or long-term hormone therapy, both of which can have a significant impact on physical and emotional wellbeing. There is growing need for safer, less invasive ways to protect women who are at higher risk.

A new study has revealed that a medicine already approved for other conditions could be repurposed to help prevent breast cancer in pre-menopausal women. The research explored the effects of ulipristal acetate, a drug that blocks the hormone progesterone. Progesterone plays a key role in the development of breast cancer by encouraging the growth of certain breast cells that can later turn cancerous. It can also influence the structure of breast tissue, making it easier for healthy cells to begin transforming into cancer.

To test whether blocking progesterone could reduce risk, 24 women aged 34–44 with a family history of breast cancer took ulipristal acetate for 12 weeks. Before and after treatment, they underwent breast scans, blood tests and biopsies to see how the drug affected their breast tissue.

The results were highly encouraging, demonstrating measurable improvements in several key indicators that scientists believe contribute to breast cancer risk. MRI scans showed that breast tissue became less dense, an important finding as high breast density is one of the strongest known risk factors for breast cancer. Under the microscope, the researchers observed a reduction in the number of "luminal progenitor" cells, cells that can develop into aggressive cancers, and a softening of breast tissue caused by changes to collagen, the protein that helps give tissue its structure.

These findings suggest that a short course of an existing drug could one day offer women a new, non-surgical way to lower their breast cancer risk. By making breast tissue less susceptible to cancer developing, this approach could provide a much-needed alternative for women wanting more control over their future health.

SPOTLIGHT ON: RARE DISEASE DIAGNOSIS

Improving disease understanding is vital for global health. It supports earlier detection, stronger prevention, and better targeted health policies that help countries respond to and mange population health. International collaboration is key, by sharing data and expertise across borders, discovery is accelerated and large scale analyses that no single nation could achieve alone, can be delivered.

AT A GLANCE

- Rare diseases consist of thousands of conditions, but the majority fall into genetic disorders (most common), cancers, autoimmune and inflammatory diseases, rare infectious diseases and congenital and metabolic disorders.
- 72–80% of rare diseases are genetic in origin.
- Over 6,000 rare diseases have been identified worldwide as of 2025.
- They affect an estimated 300–400 million people globally, representing 3.5–5.9% of the world's population.
- Prevalence is roughly 4% of the global population.

Although each rare disease affects a small number of individuals, collectively they impact over 300 million people worldwide - more than the population of the United States. There are over 7,000 known rare diseases, and this number continues to grow as science advances.

Over 90% of rare diseases have no approved treatment and pharmaceutical companies often lack financial incentives to develop therapies for small patient populations, leading to a significant gap in care and innovation.

Rare diseases pose a global health challenge - one marked by delayed diagnoses, few effective treatments, and serious lifelong consequences for patients and families.

At the heart of efforts to tackle this are Professors Sid Banka and Bill Newman, two researchers driving advances that are transforming how rare diseases are understood, diagnosed, and ultimately treated. Their work, spanning fundamental genetic discovery and practical clinical innovation, is bringing clarity to conditions that have long gone undetected and untreated.

WHY RARE DISEASES NEED URGENT SOLUTIONS

Rare diseases often have a genetic cause and start early in life. Yet, for many, the journey to diagnosis takes years - if it happens at all. These conditions are frequently complex, involving multiple systems of the body, and because they affect relatively small numbers, research funding and resources are limited.

> *"There's an enormous unmet need in the rare disease community,"* says Professor Sid Banka, Professor of Genomic Medicine and Rare Diseases at The University of Manchester. "*A diagnosis can change everything - not just medically, but emotionally and socially. It gives families answers and direction, and it allows clinicians to make more informed care decisions.*"

What makes tackling rare diseases particularly challenging is the limited data available. The rarity of each condition means no single centre can collect enough information to study them effectively. This is why international collaboration, open genomic datasets, and advanced technologies are crucial.

DISCOVERY TO DIAGNOSIS

Manchester is helping to close this diagnostic gap through world-leading research. At the NIHR Manchester Biomedical Research Centre and Manchester Centre for Genomic Medicine, Professor Banka's team has been decoding areas of the genome once dismissed as 'junk DNA'. Their studies have shown that mutations in non-protein coding regions, specifically, those forming structures called R-loops, can disrupt brain development and lead to previously undiagnosed neurodevelopmental conditions.

> *"These are genes we didn't previously understand or even look at,"* explains Banka. *"But we now know they play a crucial role in how the brain and other systems develop. It opens a whole new category of genetic conditions, and crucially, new routes to diagnosis."*

Meanwhile, Professor Bill Newman, Consultant in Genomic Medicine and Professor of Translational Genomic Medicine at The University of Manchester, has taken a different but complementary approach, bringing cutting-edge genetic testing to the bedside. His team led the development of a world-first rapid genetic test that identifies whether newborn babies are at risk of deafness from a commonly used antibiotic.

> *"This is personalised medicine in real time,"* says Newman. *"The test allows clinicians to make safer decisions for babies within the 'golden hour' of treatment. It's already being used across Greater Manchester and is now being trialled nationally. This is the future of genetic testing in acute care."*

These advances sit within a wider ecosystem of rare disease expertise, including the Manchester Rare Conditions Centre, which connects research and clinical care to improve outcomes for patients and families across the region.

GLOBAL REACH, GLOBAL RESPONSIBILITY

Both researchers emphasise that their work extends far beyond Manchester. Banka leads global partnerships, including long-standing collaborations with clinicians and researchers in India, including the Kasturba Medical College (KMC) in Manipal. Such partnerships build local capacity, accelerate diagnosis, and improve care in regions where access to advanced testing may be limited.

> *"We simply can't do this work in isolation,"* says Banka. *"Rare disease research must be global. The more we collaborate, the faster we can understand these conditions and help more people- wherever they live."*

For Newman, international relevance comes from the test's potential to prevent avoidable disability in newborns- an issue not confined to the UK.

> *"We're generating evidence that could support implementation in neonatal settings around the world,"* he explains. *"Ultimately, it's about equity in healthcare access."*

RARE TO THE REMARKABLE

What unites both researchers is a clear vision: to reduce the lengthy path to diagnosis, to drive down health inequities, and to create systems where no one is left behind because their condition is too uncommon to understand.

> *"Every rare condition we study deepens our knowledge of human biology,"* says Banka. *"And often, those insights help us better understand more common diseases too."*

Their combined work is a powerful reminder that investing in rare disease research isn't niche science, it's essential.

FROM GENOME TO GP: MAKING PERSONALISED MEDICINE ROUTINE

Across the world, healthcare systems are generating vast amounts of genomic data, promising a revolution in personalised medicine. Yet much of this data remains unused - stored in repositories without ever influencing real-world decisions about patient care. The real challenge lies not in sequencing genomes, but in translating that information into actionable insights that improve health outcomes.

Research in this field is focused on bridging that final, crucial step: embedding genomics directly into everyday healthcare. The goal is to ensure that genetic data can inform diagnosis, treatment, and prevention at the point of need - whether in hospitals, GP surgeries, or community pharmacies. One key area of innovation is pharmacogenomics, which uses an individual's genetic profile to predict how they will respond to specific medicines. This approach helps clinicians choose the safest and most effective treatments, reducing side effects, avoiding wasted prescriptions, and improving recovery times.

Recent advances have demonstrated how this can work in practice. Rapid, point-of-care genetic tests are now being used to guide treatment for conditions such as stroke, enabling doctors to tailor medication within minutes. These tests, developed through close collaboration between clinicians, laboratory scientists, data specialists and health economists, have been approved by national regulators for implementation across the NHS. Alongside this, new digital infrastructure has been created to make genomic data appear seamlessly within patients' electronic health records, so that clinicians receive real-time prescribing guidance without needing specialist training in genetics.

This work is helping redefine how healthcare systems think about personalised medicine—not as a distant future goal, but as part of routine care. The approach emphasises feasibility, rapid turnaround times, and measurable patient benefit, supported by early consideration of regulation, health economics and implementation science.

The implications are global. Many nations have invested heavily in population-wide genome sequencing, from the UK and Europe to the Middle East and Asia, yet few have the frameworks to apply this data effectively. The development of point-of-care genomic technologies and scalable digital systems offers a model that could be adopted worldwide, including in settings with limited laboratory infrastructure. By unlocking the value of existing data and enabling faster, more precise treatment for millions of people, this research is bringing the promise of personalised medicine within reach for health systems everywhere.

Rapid, point-of-care genetic tests are now being used to guide treatment for conditions such as stroke, enabling doctors to tailor medication within minutes.

TRANSFORMING TREATMENT: A WORLD-FIRST GENE THERAPY

Hunter syndrome (MPS II) is a rare, inherited childhood disorder caused by a faulty gene that prevents the body from producing an essential enzyme. Without this enzyme, complex sugars accumulate in tissues and organs, leading to joint stiffness, breathing and heart problems, developmental delays and progressive neurological decline often described as childhood dementia. Life expectancy is typically between 10 and 20 years.

The only licensed drug, Elaprase, requires weekly three-hour infusions for life and costs around £375,000 per patient per year. While it reduces physical symptoms, it cannot reach the brain and therefore does not prevent cognitive deterioration – the condition most distressing for families.

Researchers have developed a pioneering, one-off stem cell gene therapy designed to stop the disease at its source. The treatment removes a child's stem cells, replaces the faulty gene and adds a short tag, enabling the missing enzyme to cross the blood–brain barrier. The modified cells are re-infused so the child's body can produce the enzyme for life, at levels hundreds of times higher than current treatment.

By using the child's own cells, the therapy avoids donor risks associated with stem cell transplants and delivers far more enzyme to both body and brain, aiming to prevent the devastating cognitive decline.

In February 2025, three-year-old Oliver (Ollie) Chu from California became the first person in the world to receive this treatment, as part of a Manchester-led clinical study at Royal Manchester Children's Hospital and the Manchester Centre for Genomic Medicine. Only months later, Ollie no longer needs weekly infusions and is producing very high levels of the enzyme, with significant improvements in speech, movement and learning.

The study will treat five children worldwide. Developed at Manchester and funded in partnership with LifeArc, with specialist laboratory support from the University of Edinburgh and Great Ormond Street Hospital, this breakthrough has global potential.

Manchester's approach is now being explored for other conditions, offering hope for children with rare genetic diseases across the world.

PROTECTING HEARTS, IMPROVING LIVES

Cardiovascular disease remains the world's leading cause of death, yet many of its severe impacts are preventable with better diagnosis, treatment and long-term support. Across research and clinical practice, new approaches are being developed that change how patients are treated every day- speeding up emergency care, improving chronic disease management and reducing avoidable health inequalities. These solutions are not confined to laboratory experiments. They are being embedded into hospitals, community services and healthcare policy, improving outcomes and reducing costs for health systems worldwide.

TRANSFORMING GLOBAL CARE FOR HIGH BLOOD PRESSURE

More than one billion people live with high blood pressure, the biggest cause of preventable death worldwide. Although treatments are available, international differences in diagnosis and management still lead to widespread uncontrolled hypertension.

Manchester researchers helped reshape how hypertension is managed internationally by leading the development of the 2018 European guidelines, now the most widely used framework for treatment and prevention.

These recommendations champion simpler therapy through single-pill combinations, greater use of home monitoring and tailored approaches that tackle inequality in access to care. Their influence reaches across entire populations: they underpin national strategies in Central and Eastern Europe, where over 150 million people are affected, and inform policy in China, India, South Africa and Colombia. They have also changed prescribing practice for Black communities in Europe and the USA, helping reduce long-established disparities in cardiovascular outcomes. Manchester's work demonstrates how clear, evidence-based guidance can improve heart health on a global scale.

FASTER HEART ATTACK DIAGNOSES

Around 5% of emergency patients worldwide present with chest pain, yet only a small minority are ultimately diagnosed with a heart attack. Until recently, the uncertainty meant that hospitals admitted most of these patients for observation, placing enormous pressure on emergency units and delaying care for those in greatest need. Manchester clinicians changed this by showing that high-sensitivity troponin blood tests, which detect tiny levels of heart damage, could safely rule out a heart attack within hours- and often within just one hour of arrival.

They went further by creating T-MACS, a decision-support tool that combines troponin levels with ECG readings and symptoms to guide rapid clinical decisions. These developments have transformed emergency cardiac care in Greater Manchester, where over 30,000 patients have already benefited, saving around £2,000 per person while avoiding unnecessary admissions. Endorsed by NICE (National Institute for Health and Care Excellence) and the European Society of Cardiology, this approach is now used internationally - from Sweden and Argentina to New Zealand and the United States - setting a new standard for safe, swift diagnosis.

SAVING LIVES AFTER BRAIN HAEMORRHAGE

Intracerebral haemorrhage (ICH), a stroke caused by bleeding in the brain, accounts for just 10–15% of UK strokes but causes half of all stroke deaths worldwide. Although treatments exist, hospitals struggle to deliver them quickly and consistently, and delays cost lives. Manchester researchers tackled this challenge by redesigning the care pathway itself. The ABC-ICH bundle brings together three proven interventions - rapid reversal of anticoagulation (blood-thinning medication used to prevent clots), intensive blood pressure reduction and urgent neurosurgical assessment- ensuring they are delivered immediately and in the right sequence.

When the pathway was introduced at Salford Royal Hospital, deaths within 30 days fell by 44%, saving an estimated 29 lives per year. To support wider adoption, the team co-developed a clinician-facing app and a real-time performance dashboard, helping hospitals deliver timely treatment even in the busiest settings. Rollout is now underway across 25 hospitals in northern England, serving around 10 million people, offering a practical model that can be scaled in stroke units worldwide.

REVOLUTIONISING CARE FOR VENOUS LEG ULCERS

People with certain cardiovascular issues are more likely to develop venous ulcers, likely due to impaired venous pressure, fluid overload, or compromised circulation. Venous leg ulcers affect between 1.5 and 2.2 per 1,000 people, predominantly in older adults and in communities facing socioeconomic disadvantage. These painful wounds are slow to heal, frequently recur and require extensive nursing care. Standard multilayer compression bandages, though effective, are cumbersome and require specialist application, limiting access for many patients.

Manchester research offered a simpler way forward by rigorously testing lightweight two-layer compression stockings that people can apply themselves. The results matched traditional bandaging for healing, but with fewer recurrences and far greater comfort and independence. This change has had major clinical and economic benefits, saving the NHS an estimated £7 million in 2018 alone. Because stockings require less specialist expertise, they are particularly valuable in countries with stretched healthcare workforces. Today, Manchester's findings underpin clinical guidelines and shape wound-care services from the UK to New Zealand, improving quality of life for patients while significantly reducing pressure on community healthcare.

FUNGAL DISEASE: DIAGNOSING A GLOBAL BLIND SPOT

AT A GLANCE

- **3.8 million** deaths annually from fungal disease globally.
- **6.5 million** invasive fungal infections per year.
- **Leading killers:** Aspergillus, Candida, Pneumocystis, Cryptococcus.
- **World Health Organization (WHO) formally**formally recognises fungal infections as a high priority global health threat.

Fungal infections remain one of the most under-recognised global health threats. Despite causing more deaths than tuberculosis or malaria, fungal diseases receive a fraction of the research funding, diagnostic investment and policy attention allocated to other infectious threats. In many health systems, they are misclassified under broader categories such as respiratory failure, HIV-related illness, cancer complications, or sepsis, leading to a substantial global burden that is consistently underestimated and poorly addressed.

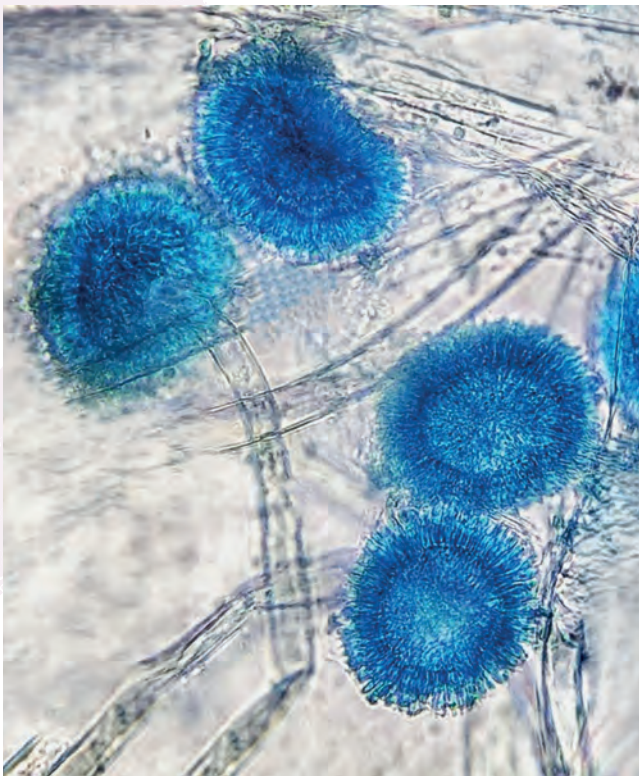
Going Unseen

Only about thirty fungal species commonly infect humans, but their impact is significant. These infections often affect people with weakened immune systems or existing lung conditions - such as those undergoing cancer treatment, organ transplants or long-term steroid therapy. Others develop fungal disease after illnesses like tuberculosis, asthma, or chronic obstructive pulmonary disease (COPD). Because symptoms resemble other health problems, fungal infections are rarely the first diagnosis, even when effective treatments are available.

A major challenge is that fungal diseases often look like other conditions. Fungal lung infections can be mistaken for tuberculosis or bacterial pneumonia, and fungal bloodstream infections can appear similar to bacterial sepsis. Without specific tests, patients may receive incorrect treatments - sometimes repeatedly - while the real infection worsens.

Manchester's Contribution

Improving fungal disease outcomes requires stronger diagnostics, training, and system-wide awareness. Manchester-led partnerships have advanced global diagnostics, treatment, and policy by building sustainable local capacity within national health systems. Under The University of Manchester leadership, this work has transformed global understanding and management of fungal diseases.



Key Research Breakthroughs

- Establishment of the UK's National Aspergillosis Centre – the world's only national centre dedicated to a fungal disease, expanding diagnostic and treatment capacity for chronic pulmonary aspergillosis.
- Definition of new clinical entities, including the first coherent description of Aspergillus bronchitis, improving disease classification and clinical management.
- Global transformation of antifungal treatment – Manchester-led research enabled worldwide approval of voriconazole, now a WHO Essential Medicine used in more than 115 countries.
- Major contributions to antifungal drug development, including itraconazole, amphotericin B, caspofungin and micafungin, supported by over 800 research publications shaping global treatment guidelines.
- Influence on global health standards – Manchester research integrated into WHO International Classification of Diseases 11th Revision (ICD 11), improving global surveillance and diagnostic coding for fungal disease.
- Innovation in diagnostics through the founding of F2G Ltd and Myconostica, whose molecular tests were commercially adopted.
- Shaping global policy by founding and leading the Global Action Fund for Fungal Infections (GAFFI), elevating global recognition of fungal disease burden and the need for improved diagnostics and treatment access.

A global contribution from Manchester

By linking patient care with research and international collaboration, Manchester has helped reshape understanding of fungal disease from a rare complication to a widespread and preventable cause of illness. Its work demonstrates that meaningful global impact is achieved not through isolated discoveries, but through coordinated systems that enable recognition, diagnosis and treatment at scale.

- Establishment of the UK's National Aspergillosis Centre
- Definition of new clinical entities
- Global transformation of antifungal treatment
- Major contributions to antifungal drug development
- Influence on global health standards
- Innovation in diagnostics
- Shaping global policy

2 COLLABORATION

The WHO states that partnerships, spanning governments, multilateral bodies, civil society, academia and the private sector are vital for achieving equitable, effective health systems worldwide. Our partnerships are local and global; span research and teaching collaborations, and are designed to support the global effort to improve better health outcomes for more people.

AT A GLANCE

Types of international collaboration that improve global health outcomes include:

- **Data sharing** to strengthen disease monitoring and support evidence based health policies.
- **Improved health information systems** to close data gaps and enhance outbreak detection and response.
- **Joint research and large scale analysis** to deepen understanding of global disease trends.
- **Capacity building support** through shared expertise, training, and technical assistance for low resource countries.
- **Coordinated cross border emergency response** for faster, more effective management of health threats.

REDEFINING CANCER CARE

Cancer remains one of the world's major health challenges. Around 20 million new cases were diagnosed in 2022, according to the WHO. As populations age and exposure to key risk factors such as alcohol, obesity and pollution increases, cancer rates continue to rise. This makes effective prevention, early detection and innovative treatments more important than ever.

Our researchers are deepening understanding of cancer biology, improving disease diagnosis and developing cutting-edge therapies to transform patient outcomes locally, nationally and globally.

RARE CANCERS

Biliary tract cancers (BTCs) are rare but aggressive cancers with high mortality affecting the bile ducts of the liver and gallbladder. In high-income countries like the UK, only around 2,500 people are diagnosed each year. This low incidence has historically made progress slow - limiting research funding, trial recruitment, and the development of standardised treatments.

However global incidence of biliary tract cancers (BTCs) is rising, driven largely by population growth and aging and the rising burden is especially felt in low- and middle-income countries, including Thailand and China.

Recognising a lack of collaboration in BTC research was a major barrier to progressing disease understanding, UoM researchers have built a UK-wide research network that has now grown into a global collaboration - bringing together clinicians, researchers, and institutions to accelerate progress through the sharing of data and coordination of trials, which has established global standards of care.

Practice-Changing

These landmark trials that have defined international standards of care and have:

- Accelerated international collaboration, reducing duplication and improving trial design.
- Set the global first-line treatment for advanced BTC. This UK-wide trial proved that BTC research is possible even in low-incidence countries.
- Informed clinical guidelines in countries including the US, France, and Japan.
- Improved patient outcomes by establishing evidence-based standards of care.

CHILDHOOD BRAIN CANCER

Brain tumours are the second most common cancer in children worldwide, with nearly 25,000 new cases diagnosed annually. However, incidence rates vary significantly globally, from 3.6 cases per 100,000 children in North America to just 0.67 in Africa. These disparities reflect differences in healthcare infrastructure, diagnostic capabilities, and access to advanced treatments.

While survival rates are improving, treatments like radiotherapy can cause long-term side effects, including memory loss, hormonal disruption and other cognitive challenges that affect a child's education, independence, and overall quality of life. To address this, the BRAINatomy project, is working with international partners to reduce treatment-related harm.

Led by the University of Manchester, in collaboration with The Christie NHS Foundation Trust, Royal Manchester Children's Hospital, and international partners at St Jude Children's Research Hospital (USA) and the University of Groningen (Netherlands), the BRAINatomy project is tackling one of the most pressing challenges in paediatric oncology: how to reduce the harm caused by radiotherapy while maintaining its life-saving benefits.

Reviewing data from hundreds of children treated across three countries, researchers have identified sensitive regions of the brain that are particularly vulnerable to radiation damage. This work has led to the development of a brain "atlas" that can guide clinicians in planning safer treatments. The team is also exploring how Proton Beam Therapy, a more targeted form of radiotherapy, might reduce these risks even further.

These findings are already influencing treatment approaches worldwide, helping clinicians deliver more targeted therapies and improve quality of life for survivors. The next phase of research will expand to include children treated with Proton Beam Therapy across three countries, aiming to develop predictive tools and tailored treatments that minimise long-term effects.

Ultimately, this work could lead to fewer learning disabilities, greater independence, and better outcomes for children affected by brain cancer - no matter where they live.

CHANGING LUNG CANCER RADIOTHERAPY

Radiotherapy is a cornerstone of lung cancer treatment worldwide. However, traditional randomised controlled trials (RCTs) are slow, selective, and often exclude older adults and those with comorbidities- limiting their relevance to the diverse patient populations seen in everyday clinical practice.

The RAPID-RT (Real-world Analysis of Patient Impact from Dose-limiting Radiotherapy Techniques) study, led by the University of Manchester and The Christie NHS Foundation Trust, is redefining how radiotherapy is evaluated and improved. By using real-world data, artificial intelligence, and inclusive study design, RAPID-RT allows researchers to test small refinements in radiotherapy and rapidly assess their impact on survival, side effects, and quality of life.

This approach delivers faster, safer, and more personalised lung cancer treatment, and importantly, it creates a model that can be implemented across diverse healthcare systems. Because RAPID-RT does not rely on the extensive infrastructure required for large-scale RCTs, it provides a particularly valuable pathway to improvement in low- and middle-income countries, where conventional trials are often impractical or unaffordable. This means patients globally, including those in under-resourced settings, stand to benefit from timely evidence and safer radiotherapy techniques.

Lung tumours often lie close to the heart, and traditional radiotherapy can inadvertently expose sensitive cardiac regions, contributing to poorer survival. RAPID-RT introduced a new method to limit radiation exposure to the top of the heart- an area strongly associated with survival outcomes. Early results show a 4% improvement in 12-month survival, demonstrating how a small change in planning can have a meaningful clinical impact. Because this cardiac-sparing approach can be implemented with existing technology, it offers a practical, scalable way for radiotherapy centres worldwide to improve outcomes without compromising tumour control.

Overall, RAPID-RT has the potential to transform how radiotherapy is evaluated and delivered globally. By combining real-world evidence, AI-driven analysis, and adaptable trial methodology, it accelerates the pace at which patient-centred improvements reach clinics. This ensures that patients, regardless of geography, resources, or healthcare infrastructure, can benefit from safer, more effective lung cancer radiotherapy.

SPOTLIGHT ON: INDIA

India offers vast learning opportunities and distinct health challenges for UK research teams. Collaboration between Indian and UK researchers is enabling large-scale engagement with diverse communities, generating insights that are beneficial for both partners. By addressing varied health issues together, discoveries are delivering research outcomes with global relevance.

AT A GLANCE

- **Population:** More than 1.5 billion
- **Health drivers:** Demographic shifts, environmental pressures, systemic gaps
- **Disease trend:** From infectious diseases to NCDs
- **Impact:** NCDs (e.g., diabetes, cancer) cause 66% of deaths

TRANSFORMING AUTISM CARE

Autism care in India faces major challenges, including limited specialist services. Partnering with Sangath, a Goa-based non-profit organisation, research led by Professor Jonathan Green adapted parent-led autism interventions which he had created, for low-resource settings, empowering families and training local health workers. This includes the Preschool Autism Communication Trial (PACT), the first UK parent-led therapy proven to reduce early autism symptoms, now extended globally through this collaboration.

Key Initiatives

- PASS Plus and COMPASS: Based on Manchester's PACT model, these programs train non-specialist health workers to deliver parent-led autism interventions in Goa, Kolhapur, and Delhi, improving access where specialists are scarce.
- NAMASTE Project: A major National Institute for Health and Care Research (NIHR) - funded Global Health Research Unit initiative creating a detection-to-care pathway for neurodevelopmental conditions across India, Sri Lanka and Nepal. The project combines WHO's Caregiver Skills Training with digital tools and community engagement to enable scalable early intervention.

Impact

- Global Relevance: Findings informed WHO guidelines and shaped autism policy for low- and middle-income countries.
- Delivered Solutions: Inclusive and scalable interventions for children and families worldwide - combining scientific rigor with cultural sensitivity to make a lasting impact.
- Empowering Parents: Families become active partners in therapy, improving social communication and reducing autism symptoms.
- Building Local Capacity: Training community health workers ensures sustainability and reach in underserved regions.

CHILDHOOD CANCER

Childhood cancer survival rates in India have lagged behind those in high-income countries due to limited diagnostics, treatment protocols, and research infrastructure. Acute Lymphoblastic Leukaemia (ALL), the most common childhood cancer, was especially affected.

Professor Vaskar Saha, from The University of Manchester, partnered with the Tata Translational Cancer Research Centre (TTCRC) in Kolkata to introduce biomarker-driven treatment protocols. Inspired by European models, this collaboration created the Indian Childhood Collaborative Leukaemia Group (ICICLE), delivering cost-effective, biomarker-led treatments for childhood cancers in India.

Benefits and Impact

- Improved Survival Rates: By adapting Manchester's clinical trial protocols, survival rates for childhood ALL in India have increased by around 10%, meaning 1,500 more children survive each year.
- Capacity Building: The partnership has strengthened India's clinical research infrastructure, trained local teams, and introduced advanced diagnostics.
- Equity in Care: Children in low-resource settings now have access to treatments previously limited to high-income countries.
- New Data and Insights: Working in diverse settings has generated unique genomic and clinical data, enriching global disease understanding to help inform future therapies.
- Strengthened Networks: The collaboration has opened doors for joint grants, publications, and innovations in cost-effective cancer care, knowledge that benefits both UK and global health systems.

MAKING MENTAL HEALTH ACCESSIBLE

Professor Vimal Sharma from The University of Manchester has forged multiple collaborations with Indian institutions to tackle mental health gaps in low-resource settings.

Meeting Need

India has a major mental health burden, with over 150 million people needing care but few specialist resources. To help close this gap, University of Manchester (UoM) researchers led by Professor Vimal Sharma adapted the Global Mental Health Assessment Tool (GMHAT) - a computer-assisted tool for quick, structured mental health assessments - originally developed in Manchester for global use

The GMHAT enables non-specialist health workers, GPs, and nurses to conduct mental health assessments in under 20 minutes. It screens for conditions such as depression, anxiety, PTSD, dementia, and neurodevelopmental disorders, making mental health care more accessible and integrated into routine health services.

What Collaboration Achieved

The UoM–India partnership transformed GMHAT from a research tool into a scalable, low-cost clinical solution.

Together, teams:

- Adapted GMHAT for Indian languages and cultural contexts.
- Developed specialised versions for intellectual and neurodevelopmental disabilities.
- Built training hubs to embed GMHAT in public health and education systems.

Impact in India

- **Early Detection in High-Stress Populations**

  Piloted with the Border Security Force in Rajasthan, GMHAT identified mental health issues early and streamlined referrals for personnel in high-pressure roles.

- **Empowering Non-Specialists**

  By training GPs and nurses, GMHAT brought mental health screening into primary care and rural clinics, reducing reliance on scarce psychiatrists.

- **Medical Education and Training**

  At SMS Medical College, Jaipur, GMHAT improved diagnostic skills among medical students and residents, strengthening mental health literacy.

- **Integrated Care for Chronic Illness**

  In a Mysore diabetes clinic, GMHAT detected mental illness in 39% of patients - highlighting its role in managing co-morbid conditions and improving holistic care.

GLOBAL TO LOCAL

In a connected world, community challenges cross borders. Global to local research applies learning from diverse countries, cultures and health systems to improve support in the UK, making it fairer and more culturally informed. By turning international evidence into local practice, University of Manchester researchers are helping build more equitable mental health systems.

IMPROVING MENTAL HEALTH AT HOME AND WORLDWIDE

Manchester researchers are using global to local approaches to understand and address mental health inequalities. Through the Researching African and Caribbean Health (ReACH) programme, they compare mental health experiences in African and Caribbean countries with those of diaspora communities in the UK. Their findings show that Black African and Caribbean people in the UK are more frequently diagnosed with schizophrenia and psychosis, highlighting the impact of migration, discrimination, racism and social disadvantage on elevated risk.

New Reveals

ReACH investigates how historical and political contexts shape health across the African and Caribbean diaspora and how these factors influence experiences after resettling in the UK. The programme is developing theories to explain similarities and differences across the diaspora, improving the cultural relevance and accuracy of local services. Working closely with communities, practitioners and families ensures the insights are grounded in lived experience and directly inform more culturally aware mental health pathways in Greater Manchester.

Practical Support

These findings underpin culturally grounded support models like the Culturally adapted Family Intervention (CaFI), co created with African and Caribbean communities to ensure support reflects their cultural beliefs, family structures and experiences. Drawing on global evidence that family based psychosocial interventions improve outcomes for people with psychosis, CaFI adapts these approaches for UK communities who face higher rates of diagnosis, compulsory treatment and poorer outcomes.

A key innovation is CaFI:Digital, an online platform supporting remote and hybrid therapy. It builds on international research showing digital approaches can reduce barriers such as workforce shortages, travel difficulties and disengagement. CaFI:Digital enables families to access culturally responsive support in familiar environments and reduces reliance on clinic based models that may feel inaccessible or unsafe.

Early findings show CaFI is more relevant, acceptable and effective for many families than standard services, strengthening communication and engagement within households. The model is also scalable and adaptable for other diaspora communities internationally.

SUSTAINABLE WORKFORCE DEVELOPMENT

STAND, (Sustainable Treatment of Anxiety and Depression in Indonesia), a major collaboration between The University of Manchester and Indonesian partners, is aiming to expand access to evidence based mental health care. To address high levels of unmet need and a limited mental health workforce, the Manchester team adapted low intensity psychological interventions - talking therapies that can be delivered by trained lay health workers. These interventions were then developed through extensive interviews, focus groups and co design workshops with Indonesian patients, families, community leaders, traditional healers and health workers, ensuring they are culturally appropriate and relevant.

In 2024, a national Train the Trainers programme prepared 76 clinicians to train 150 lay health workers across Java, creating a sustainable community based workforce.

Although rooted in Indonesia, STAND offers lessons for the UK, showing how culturally adapted, community delivered therapies can improve accessibility and relevance in diverse or underserved areas. The programme also strengthens Indonesia's mental health system through long term workforce development, community engagement and international partnership.

SHAPING SELF-HARM SURVEILLANCE

Researchers from the University of Manchester, working with partners in India on the South Asia Self-Harm Initiative (SASHI), focused on people who arrive at hospitals with self-harm and the care they receive. This collaboration generated practical insights that are now shaping self-harm surveillance in the UK.

By mapping patient pathways with clinicians and frontline staff, the team identified how people access emergency care, how information is recorded and where data gaps occur. Working in hospitals with limited emergency infrastructure and paper-based systems pushed the team to design a realistic, context driven data collection framework that also captured the social and economic factors.

These lessons now inform new work in Wales, where the same hands on, partnership focused approach is helping build a surveillance system grounded in real patient journeys and frontline experience.

SASHI shows how global collaboration strengthens local practice, demonstrating that solutions developed in diverse clinical environments can travel and spark innovation at home.

PARTNERING WITH INDUSTRY TO ADVANCE GLOBAL SKIN HEALTH

Solving complex health challenges requires more than academic excellence alone. It demands collaboration across disciplines, sectors and borders to translate discovery into solutions that reach people's lives. In dermatology, where scientific insight, clinical expertise and industry innovation must work together, partnership is essential to delivering inclusive, effective and scalable advances in skin health.

By working with industry, research teams can accelerate the journey from laboratory to real-world application. These collaborations provide access to specialist manufacturing, regulatory expertise and global supply chains, ensuring that research outcomes are not only scientifically robust but also practical, affordable and responsive to diverse populations worldwide.

Inclusive Dermatology

- Inclusive dermatology addresses long standing gaps in how skin conditions are taught, researched, and diagnosed across diverse skin tones.
- Historically, dermatology training has focused on lighter skin, lacking darker skin representation.
- People with darker skin face higher rates of misdiagnosis due to lack of research.
- Clinical trials often don't reflect diverse skin tones.
- Some conditions affect people with skin of colour disproportionately and require specialised care.
- Initiatives like diverse skin image atlases, improved skin colour terminology, and equity focused efforts are helping reduce disparities and improve care for all.

TOWARDS INCLUSIVE DERMATOLOGY

Skin colour is the most visible human characteristic, yet its primary functions - providing protection and responding to the environment - are universal. The pigment melanin, which determines skin tone, plays a vital role in shielding against ultraviolet radiation and influencing how skin ages. Despite this, dermatological research has historically focused on lighter skin tones, leaving darker skin underrepresented and limiting the inclusivity of skincare research and product development.

A major multi-million-pound partnership is addressing this imbalance by bringing together expertise in skin biology with leading industry partners Boots and No7 Beauty Company. The programme is investigating how skin structure, function and responses to environmental stress vary across the pigmentary spectrum, with the aim of building a more representative evidence base for skin health.

Building on more than 15 years of joint working and over 100 scientific publications, the collaboration is now extending its reach internationally. Findings will inform product development for global markets across Europe, Africa, Asia and the Americas, helping set new standards for inclusive dermatology and ensuring innovation reflects the diversity of people it aims to serve.

ADVANCING THE BENEFITS OF PROBIOTICS IN SKINCARE

Probiotics are widely recognised for their role in supporting gut health, where they strengthen biological barriers, promote healing and protect against harmful pathogens. Research has explored whether similar principles could be applied to skin health, leading to the development of a novel therapeutic platform focused on strengthening the skin barrier.

Founded in 2016, SkinBioTherapeutics is a spin-out company translating probiotic science into solutions for a range of dermatological challenges. Its specialist technology, SkinBiotix™, uses extracts of probiotic bacteria, known as lysates, to enhance the integrity of the skin barrier. By reinforcing the junctions between skin cells, these lysates help the skin retain moisture, defend against infection and support repair following injury.

The company's strategy spans cosmetic and medical skincare, infection control, pharmaceuticals and nutritional supplements. Since entering the market, SkinBioTherapeutics has secured patents in Australia, Russia and New Zealand, entered a manufacturing agreement with Croda Plc, and developed a probiotic food supplement shown to improve psoriasis symptoms in consumer studies.

GLOBAL PSORIASIS ATLAS: ADVANCING GLOBAL SKIN HEALTH

The Global Psoriasis Atlas (GPA) is an international research initiative providing the first comprehensive picture of the global burden of psoriasis. Delivered in partnership with international dermatology and patient organisations, the GPA brings together academic, clinical and lived-experience expertise to address one of the world's most prevalent yet under-recognised chronic skin diseases.

Psoriasis affects more than 60 million people worldwide and has far-reaching physical, psychological and social impacts. By mapping prevalence, incidence and lived experience, the GPA generates critical data to inform healthcare planning, policy and advocacy globally.

Recent work includes population-based studies in Malaysia, surveys exploring stigma and quality of life in Brazil, Ethiopia and Afghanistan, and analyses of comorbidities in patients across Europe. Training programmes are also being developed to support earlier and more accurate diagnosis, with pilot initiatives underway in South Africa and India.

Through international collaboration, the GPA is strengthening the global evidence base for this skin disease and helping drive progress towards more equitable, timely and effective care worldwide.

COLLABORATION IN HUMANITARIAN RESPONSE

Humanitarian crises are becoming more frequent, complex and protracted, driven by conflict, climate change, health emergencies and displacement. Effective responses require more than immediate relief. They depend on collaboration across disciplines and borders, long-term investment in people and institutions, and a commitment to protecting knowledge, education and health systems during times of crisis.

STRENGTHENING HUMANITARIAN HEALTH AND LEADERSHIP

The Humanitarian and Conflict Response Institute (HCRI) brings together researchers, practitioners and partners to address urgent global challenges. Established in 2008, HCRI works across the humanitarian–development–peace nexus to shape policy, strengthen partnerships and support innovative responses to crises. Its work is underpinned by an international network spanning humanitarian organisations, universities, governments and frontline professionals, enabling collaboration that delivers impact in complex and fragile settings.

A core focus of this work is humanitarian health and leadership. Through collaboration with UK-Med, the University contributes to strengthening emergency medical responses to epidemics, conflict and natural disasters, supporting health systems under extreme pressure through research, training and knowledge exchange. Leadership and capacity-building are equally central: in partnership with Médecins Sans Frontières (MSF) and the Liverpool School of Tropical Medicine, HCRI co-delivers the Leadership Education Academic Partnership (LEAP) programme, which since 2019 has supported humanitarian professionals from more than 40 countries to strengthen leadership, critical thinking and decision-making in high-risk environments.

PROTECTING EDUCATION AND EXPERTISE IN TIMES OF CRISIS

Humanitarian collaboration also extends to safeguarding education and professional capacity during conflict. As the war in Ukraine continues to disrupt institutions and displace communities, the University has strengthened its partnership with Ternopil National Medical University (TNMU) in western Ukraine. Despite being far from the frontline, TNMU faces significant challenges, including staff displacement, resource shortages and the risk of long-term skills loss.

In response to a request for support, colleagues in Manchester and Ukraine have developed a multifaceted collaboration focused on sustaining medical education. Through the partnership, several staff development initiatives have been run to strengthen teaching resilience. Student engagement has been central, with TNMU students attending Manchester's Medicine Summer School and returning with new skills and perspectives. A jointly run English Speaking Club also supports language development vital for clinical practice and international exchange. The partnership is now expanding into clinical psychology and joint research, helping ensure medical education in Ukraine remains robust, resilient and future-focused.

SUPPORTING SCHOLARS AT RISK: HASSAN'S STORY

Humanitarian responsibility also includes protecting academic freedom. As a founding member of the Council for At-Risk Academics (CARA), the University has supported scholars facing persecution, conflict or repression for more than 90 years. Today, it welcomes up to ten CARA Fellows each year, providing sanctuary, financial support and tailored guidance on visas, accommodation and future planning. Fellows become part of a supportive academic community where they can continue their work safely and with confidence.

One CARA Fellow, Hassan, is researching breast cancer prevention - work with global relevance.

> *"Breast cancer is the most common cancer among women worldwide, affecting millions each year. While treatment has improved dramatically, prevention remains an underused strategy, particularly for women at high risk,"* he explains. His research focuses on identifying biological markers that predict who will benefit from tamoxifen, a drug proven to reduce breast cancer risk but it only works in 50% of women.

> *"By understanding why some women respond and others do not, we can ensure that preventive treatment is targeted to those most likely to benefit, improving outcomes while avoiding unnecessary side effects."*

Hassan's motivation is deeply personal. *"I have seen first-hand the devastation a breast cancer diagnosis brings to women and their families. Prevention offers a chance to stop cancer before it starts, but it must be precise to be effective."* He believes this work could transform prevention globally by enabling more personalised strategies, empowering women with clearer, evidence-based choices. He is also conscious that prevention vastly reduces the cost incurred, supporting the development of more sustainable healthcare

DELIVERING GLOBAL IMPACT

Across humanitarian health, leadership, education and academic protection, these collaborations demonstrate how sustained international partnerships can deliver meaningful, long-term impact. By supporting people as well as systems, and safeguarding knowledge during times of crisis, our work reflects a commitment to global responsibility and humanitarian action in its fullest sense.

OUR GLOBAL FACULTY

NORTH AMERICA

Our research includes the International Collaborative for Translational Digital Health (ICTDH), the International Alliance for Cancer Early Detection (ACED), and international research collaborations with institutions such as St Jude Children's Research Hospital to improve prediction of late treatment effects and cancer survivorship.

AFRICA

In addition to our strategic partnership with Kenya, our research includes understanding how changes in surface water influence zoonotic disease transmission, examining how air pollution exacerbates chronic disease in people living with HIV, and strengthening emergency healthcare systems in collaboration with partners in Kisii County.

OUR RESEARCH AND TEACHING PARTNERSHIPS ARE IN 1 OUT OF EVERY 5 COUNTRIES GLOBALLY.

OUR STAFF REPRESENT 2 OUT OF EVERY 3 COUNTRIES GLOBALLY.

OUR STUDENTS REPRESENT 4 OUT OF EVERY 5 COUNTRIES GLOBALLY.

SOUTH EAST ASIA

Our research includes strengthening health worker capacity, advancing genomic research into rare developmental disorders, improving cardiovascular health through the SMARThealth programme, and building clinical academic capacity through international medical education partnerships across Malaysia and Indonesia.

AUSTRALASIA

We have developed strategic partnerships with the Peter MacCallum Cancer Centre in Melbourne and the Princess Margaret Hospital in Toronto to harness our combined capacity in cancer research and treatment. We are also advancing research into cancers of unknown primary through genomic approaches, biomarker-driven early detection, and AI-enabled models to support diagnosis and personalised treatment.

3 HEALTH TECHNOLOGY

Technology is transforming global health research. Our researchers are developing and using advanced digital tools such as AI-driven diagnostics, digital health records and remote disease surveillance systems to accelerate discovery and drive global collaboration. By connecting experts in delivering health innovations that can reach communities worldwide.

AT A GLANCE

- **AI Diagnostics** – Predicts disease and supports precision medicine.
- **Disease Surveillance** – Uses big data and AI to track outbreaks worldwide.
- **Mobile Health & Wearables** – Enables early detection and chronic condition monitoring.
- **Digital Health Records** – Integrates data for better research and clinical decisions.

DECODING DISEASE

HOW CHEMICAL CLUES ARE TRANSFORMING DIAGNOSIS

Across the world, healthcare systems are under pressure to diagnose disease earlier, faster and more accurately. One emerging solution lies not in more invasive tests or complex machinery, but in the body's own chemistry. Our bodies constantly release tiny molecules as part of normal biological processes but during illness, the patterns of these molecules change. Researchers are learning to detect and interpret these shifts, which can reveal the earliest signs of disease, often long before traditional symptoms appear.

These molecular biomarkers can be found in everyday places such as the breath or the skin. By developing tools that identify how their chemical profiles change during illness, researchers are paving the way for diagnostics that are quicker, less invasive and more accessible across a wide range of healthcare settings. Two major projects are demonstrating how this approach could transform the diagnosis of both chronic and acute conditions.

EARLIER DETECTION OF PARKINSON'S USING SMELL

Parkinson's is a progressive neurological condition that primarily affects movement. It can be challenging to diagnose in its early stages and traditional diagnoses typically rely on identifying physical symptoms like tremors or muscle stiffness, which often emerge only after significant brain cell loss as the disease has progressed.

However, researchers discovered that small molecules contained in sebum (an oily substance on the skin) changes chemically in people with Parkinson's, creating a distinctive biomarker profile and a unique scent in people with the condition. This insight has led to the development of a non-invasive swab test that can detect Parkinson's in just a few minutes, with high levels of accuracy under laboratory conditions.

The swab test, which analyses volatile organic compounds (VOCs), tiny molecules our bodies naturally produce and release through the skin, could significantly improve treatment options and patient outcomes by identifying Parkinson's much earlier than is currently possible. Earlier diagnosis would enable faster access to care, reduce pressure on specialist services, and open the door to new approaches for managing or slowing the disease.

USING BREATH TO IMPROVE INTENSIVE CARE

Patients on ventilators in intensive care are at high risk of developing serious lung infections, known as ventilator-associated lower respiratory tract infections (VA-LRTIs). These infections are among the most common and dangerous complications in Intensive Care Units (ICU) settings. Because traditional tests can take several days to confirm whether an infection is present, clinicians often prescribe antibiotics as a precaution. While intended to protect patients, this leads to unnecessary treatment and contributes to the global rise of antimicrobial resistance (AMR).

Breath analysis is offering a promising new approach to diagnosing infection more quickly, safely and with far less disruption for patients, providing clinicians with crucial information at the moment they need it most. In the international BreathDx study, researchers analysed the breath of ventilated patients and discovered that certain chemical markers can signal whether an infection is present. The test proved highly effective at ruling out infection, allowing clinicians to avoid antibiotics when they are not needed.

As well as being completely non-invasive, breath analysis provides faster results than conventional diagnostic methods - a major advantage in fast-paced clinical environments like critical care. By helping to reduce unnecessary antibiotic use while improving patient safety, this innovation could play an important role in tackling AMR and transforming infection diagnosis in ICUs around the world.

A GLOBAL STEP FORWARD

Taken together, these projects reveal how molecular biomarkers could transform diagnosis across the world. By using simple samples such as breath or skin swabs, they offer routes to earlier and more accurate detection in places where traditional testing is difficult to access. They represent a meaningful step toward a future in which lifesaving diagnosis is faster, fairer and more accessible for all.

Breath analysis is offering a promising new approach to diagnosing infection more quickly, safely and with far less disruption for patients.

REIMAGINING HEALTHCARE THROUGH DIGITAL INNOVATION

Across the globe, digital technologies are transforming how we understand, monitor and support health. Wearable apps, once simple step counters, have evolved into sophisticated tools capable of detecting early signs of illness, predicting relapses, mapping environmental triggers and helping people manage long-term conditions. As health systems face growing pressure from rising chronic disease, mental health challenges and ageing populations, these continuous and responsive technologies offer a powerful alternative to the snapshot-based nature of traditional care. By capturing real-time data on movement, symptoms and lived experience, they provide researchers with unprecedented insight while giving individuals the means to make informed decisions about their wellbeing.

Researchers work reflects an advanced shift toward preventative, personalised healthcare rooted in everyday life. Drawing on expertise in clinical science, digital technology, public engagement and global collaboration, they are developing solutions shaped by local needs but informed by international insight. Together, these innovations demonstrate how digital tools can complement clinical care, reduce inequalities and support healthier lives worldwide - helping shape a future in which healthcare is more connected, proactive and human-centred.

Real-time data on movement, symptoms and lived experience is providing researchers with unprecedented insight, whilst giving individuals the means to make informed decisions about their wellbeing.

DIGITAL THERAPEUTICS OFFERING PROACTIVE MENTAL HEALTH SUPPORT

Severe mental illnesses such as psychosis and bipolar disorder remain among the most challenging conditions to manage. Traditional care relies on intermittent appointments that often miss the early signs of relapse, leaving individuals vulnerable to crises and unplanned hospital admissions. To address this gap, Manchester researchers have developed CareLoop, a digital therapeutic platform providing continuous, personalised support.

Built on over a decade of research and multiple clinical trials, CareLoop uses wearable-enabled symptom tracking and predictive analytics to identify subtle

changes that may indicate deteriorating mental health. This early insight enables clinicians to intervene sooner while helping individuals understand their own patterns and triggers. Integrated into existing NHS pathways, the platform complements traditional services and supports more proactive decision-making.

CareLoop's recommendation through NICE's Early Value Assessment signals its national impact and growing potential. Backed by new investment, it is expanding into additional clinical areas and being explored internationally. As a scalable, data-driven model, it highlights how thoughtful innovation can improve outcomes while reshaping mental health systems to be more anticipatory and person-centred.

YOUTUBE HEALTH: IMPROVING PHYSICAL WELLBEING FOR YOUNG PEOPLE WITH MENTAL ILLNESS

Globally, people with severe mental illness experience stark health inequalities, often dying 15-30 years earlier than the general population due to preventable physical conditions. Despite the clear interplay between mental and physical health, lifestyle support is rarely embedded into routine care.

To address this, Manchester researchers have partnered with YouTube Health to create the first evidence-based lifestyle channel specifically for young people with mental illness. Developed with service users, clinicians, fitness creators and nutrition experts, the platform offers practical, accessible content on exercise, diet and healthy behaviours, meeting young people in the digital spaces where they already seek information.

The channel is being incorporated into early intervention services across Greater Manchester, where clinicians use it to support physical wellbeing alongside mental health treatment. A companion AI system is also being designed to personalise guidance and signpost users to local opportunities, such as exercise classes or community activities.

By harnessing a platform used by billions worldwide, the project demonstrates how digital innovation can tackle health inequalities at scale. It offers a low-cost, engaging and adaptable model capable of reaching diverse communities both locally and globally.

CITIZEN SCIENCE REVEALING HOW WEATHER AFFECTS CHRONIC PAIN

Innovation also means rethinking how research is conducted. Chronic pain affects millions, yet for centuries the belief that weather influences symptoms remained unverified because traditional studies were too small or too short to capture the complexity involved. Manchester's Cloudy with a Chance of Pain project changed this by enabling people across the UK to participate in research through their smartphones.

More than 13,000 participants recorded daily symptom reports, automatically linked to GPS-specific weather data. Over 15 months, the project generated millions of data points, the largest dataset of its kind, providing deep insight into patterns previously impossible to examine. The results revealed clear associations: higher humidity, lower atmospheric pressure and stronger winds were all connected to increased pain, even when accounting for mood and activity.

For participants, the findings validated lived experience; for researchers, they opened new avenues for understanding environmental triggers and developing personalised pain-management strategies. The approach demonstrated how digital tools can make research more inclusive and reflective of everyday life, strengthening the case for citizen-led science in studying long-term conditions.

DIGITAL PROGRAMMES SUPPORTING HEALTHY AGEING

Ageing populations create enormous challenges for global healthcare systems, with falls remaining a major cause of injury, loss of independence and healthcare expenditure. Effective prevention requires accessible, sustained support - something that is often difficult for older adults to access.

Manchester researchers have developed a digital programme that brings fall-prevention support directly into people's homes. Delivered through a tablet-based app, the twelve-week programme combines proven strength-and-balance exercises with engaging educational content on hydration, nutrition and bone health. Users follow personalised routines at their own pace, supported by intuitive guidance and interactive features designed to build confidence and maintain motivation.

Clinical trials in the UK and the US show notable improvements in mobility and quality of life, with evidence suggesting the programme can reduce falls by up to 40%. Already adopted by community groups, hospitals and care homes, and freely available for individuals, it offers a scalable, cost-effective solution for promoting independence and reducing pressure on health systems. As populations continue to age, such digital approaches will play an increasingly important role in supporting healthy, active later lives.

A GLOBAL FUTURE SHAPED BY DIGITAL INNOVATION

Together, these projects illustrate how digital health innovation can help address society's most pressing challenges. They show how technology can deepen understanding of complex conditions, empower individuals to take part in their own care and create research models driven by real-world experience. At Manchester, these advances grow through collaboration - between researchers, clinicians, industry partners, public contributors and international networks - ensuring that solutions developed locally also contribute to global progress.

As wearable technologies and digital platforms evolve, they promise a future in which healthcare is more personalised, more equitable and more connected. Their continued growth has the potential to improve wellbeing across borders, helping build healthier, more resilient communities around the world.

SPOTLIGHT ON: ENVIRONMENTAL HEALTH INNOVATION

Around the world, environmental change is reshaping patterns of health and disease. Air pollution, plastic waste and artificial light are increasingly recognised as drivers of long-term health inequalities, with the greatest impacts often falling on underserved communities. As these pressures intensify, new technologies are opening up ways to monitor exposure, understand biological effects and design healthier environments. At The University of Manchester, researchers are working across disciplines and continents to develop tools that can protect populations, inform policy and support more sustainable futures.

UNDERSTANDING HOW AIR POLLUTION HARMS THE HEART

Air pollution is one of the most significant environmental threats to global health, contributing to an estimated seven million premature deaths each year. While its links to respiratory illness are well established, its role in cardiovascular disease is now a major focus of international research.

At Manchester, Professor Holly Shiels cardiac-pollution research has taken her to the Arctic, Hawaii, and Finland, where she has investigated species and techniques central to understanding how pollutants impair cardiac function. Her work uses advanced imaging and analytical tools to study how fine and ultrafine particulate matter, especially PM2.5, interacts with the body and heart tissue once it is inhaled. These tiny particles can bypass the body's natural defences, enter the bloodstream and reach the heart. The team is particularly interested in chemicals released during the burning of fuels, such as polycyclic aromatic hydrocarbons (PAHs), and how they may interfere with the heart's normal function.By combining detailed laboratory studies with real-world pollution measurements, researchers are building a clearer picture of how air pollution contributes to cardiovascular disease.

High-resolution imaging allows them to see how pollutant particles interact with heart tissue, revealing which chemicals are most damaging and why. This growing evidence base is helping to guide more effective public-health responses and strengthen efforts worldwide to reduce pollution exposure and better protect vulnerable communities.

ASSESSING RURAL PLASTIC POLLUTION AND CARDIOVASCULAR RISK IN INDONESIA

In rural Indonesia, many communities face dangerously high levels of air pollution caused by the open burning of plastic waste - a common practice where formal waste - collection systems are limited. Low-quality imported plastics are often burned close to homes or handled in informal recycling workshops, releasing thick, toxic smoke that residents inhale every day. This exposure is particularly concerning in small villages, where burning often takes place at the heart of residential areas.

Researchers working closely with Indonesian partners, including Dr Asri Maharani, are investigating how this pollution affects cardiovascular health. Air-quality sensors have been installed across several villages to capture real-time data, while health information from residents is being gathered to build a detailed picture of risk. Early results show particulate levels more than 60 times higher than international safety guidelines - levels associated with long-term harm. Samples are also being analysed for microplastics and dioxins, pollutants known to contribute to inflammation and cardiopulmonary disease.

The findings are informing Indonesia's national screening programme and supporting conversations about safer waste-management policies. As plastic pollution increases across the Global South, this collaborative approach offers a scalable model for assessing risk and protecting communities with limited environmental monitoring or healthcare resources.

Early results show particulate levels more than 60 times higher than international safety guidelines - levels associated with long-term harm.

REDEFINING LIGHT AS AN ENVIRONMENTAL HEALTH FACTOR

Artificial light at night is an often overlooked form of environmental pollution, yet its impact is growing rapidly with the widespread use of LED lighting. Too much artificial light in the evening, and too little exposure to bright daylight during the day, can disrupt the body's circadian rhythms. This disruption has been linked to sleep problems, fatigue, and increased risks of metabolic and cardiovascular disease. Crucially, exposure is not equal: people living in dense urban areas or lower-income neighbourhoods often experience far higher levels of disruptive night-time light, deepening existing health inequalities.

To address this, Professor Robert Lucas is rethinking how light should be measured and managed. Traditional lighting standards were designed around visibility, not biology. In response, the team helped establish a major innovation: α-opic equivalent daylight illuminance, a new global metric that measures light according to its circadian impact rather than brightness alone. They have also created low-cost wearable sensors and digital tools that track a person's daily light exposure, revealing how modern lifestyles often provide too little natural daylight and too much evening artificial light.

These insights are informing healthier lighting strategies in workplaces, schools, hospitals and urban planning, and are influencing global conversations about more equitable and sustainable lighting practices for both people and the environment.

A TECHNOLOGICALLY ENABLED PATH TO HEALTHIER ENVIRONMENTS

From tracking harmful pollutants to supporting communities facing plastic waste and redefining how we measure light, researchers are using technology to tackle complex environmental challenges. Their innovations offer practical ways to protect health today while helping shape more sustainable, equitable environments for the future.

4 INNOVATIVE TALENT

Advancing the knowledge, innovation, and leadership needed to improve global health depends on developing new talent. As emerging researchers and practitioners deepen their expertise, they drive discoveries that change practice, transform public-health strategies, and strengthen health systems for the future. In Manchester, we work with partners worldwide to identify and nurture talent through mentorship, training, and collaborative research. By investing in health talent today, we help build healthier, more resilient societies tomorrow.

AT A GLANCE

Identifying and nurturing health talent through mentorship, training and research:

- Builds a more skilled, confident and resilient workforce
- Increases retention and reduces burnout
- Strengthens system resilience and preparedness
- Reduces health inequities
- Supports innovation and future ready care
- Makes health systems more sustainable

NURTURING FUTURE RESEARCH LEADERS

Supporting early career researchers is central to the Faculty's commitment to developing the next generation of research leaders. By nurturing both UK-based researchers and those whose careers are shaped by international experience, the Faculty brings together a diverse range of perspectives that strengthen its research culture. This mix of home-grown and global talent creates an environment where ideas are shared, collaborations flourish, and early career researchers are supported to turn emerging potential into innovation and impact.

SPOTLIGHT: ERIC VENANT SAMWEL

CHANGING BEHAVIOURS TO COMBAT ANTIMICROBIAL RESISTANCE

"My research focuses on tackling antimicrobial resistance by addressing self-medication with antibiotics for dental pain and infections in Uganda. Antimicrobial resistance occurs when bacteria stop responding to medicines, making infections harder to treat, and one overlooked driver of this problem is the use of antibiotics without prescriptions.

My work explores why adults self-medicate with antibiotics and how behavioural science can help prevent this practice. Much antibiotic misuse happens at the community level, beyond the reach of hospital-based stewardship programmes, and dentistry is often an overlooked source of antibiotic use. By applying a behavioural lens, I aim to understand the everyday drivers of misuse and develop interventions that are grounded in local context.

I see my research as paving the way for locally tailored strategies to combat antimicrobial resistance. By combining evidence, community perspectives and behavioural insights, my work shows that change is possible when people are part of the solution. Ultimately, I hope this research helps people access safer, more effective care while preserving antibiotics for future generations and protecting global health."

SPOTLIGHT: SOPHIE SAXTON

RETHINKING OBESITY AND CARDIOVASCULAR HEALTH

"My research explores how obesity contributes to cardiovascular disease, a growing global challenge that is reshaping health systems worldwide. As rates of obesity continue to rise, so too does the burden of conditions such as high blood pressure and diabetes, yet the pathways linking excess weight to long-term cardiovascular damage remain poorly understood.

Rather than focusing on weight alone, my work looks at how obesity alters the body's internal environment, particularly the interaction between fat, blood vessels and the immune system. I study perivascular adipose tissue, a layer of fat that normally helps regulate blood pressure and metabolism, but which becomes inflamed and dysfunctional in obesity. Understanding how this shift occurs is key to identifying why cardiovascular risk increases and how it might be reversed.

By examining the role of immune cells in this process, my research is opening up new ways to think about treatment beyond diet, exercise or short-term interventions. The aim is to develop more effective and accessible therapies that address the underlying biology of disease. Ultimately, I hope this work contributes to fairer, more compassionate approaches to cardiovascular health, improving both life expectancy and quality of life for people living with obesity."

SPOTLIGHT ON: WORKFORCE DEVELOPMENT IN GLOBAL HEALTH

Around the world, health systems are under increasing pressure as demand for care grows faster than the workforce needed to deliver it. Ageing populations, rising non-communicable diseases, emerging infectious threats and rapid technological change are reshaping healthcare. These pressures however are not felt equally: the World Health Organization estimates a shortfall of 11 million health workers by 2030, with the greatest gaps in low- and lower-middle-income countries. Investing in the health workforce is essential to improving access, equity and system resilience, and to supporting sustainable social and economic development.

This approach underpins work led by Professors Lucie Byrne-Davis and Jo Hart, which strengthens how doctors and dentists are trained to meet local health needs while aligning with global standards of care.

SETTING NEW STANDARDS FOR HEALTHCARE TRAINING IN GHANA

In Ghana, growing disease burdens, workforce gaps and rising expectations for people-centred care are placing increasing strain on the health system. These pressures sit alongside wider global challenges, including professional migration and the need for healthcare workers who can operate confidently in rapidly changing clinical environments.

To respond, the Medical and Dental Council of Ghana partnered with the University of Ghana and The University of Manchester to modernise medical and dental education through a competency-based reform. The collaboration benchmarked curricula against international best practice while remaining firmly grounded in Ghana's health system needs.

A key outcome has been the development of Ghana's first national competency standards for medical and dental education, defining the core skills, knowledge and professional behaviours expected of every graduating doctor and dentist.

The reform was delivered in three phases: agreeing core competencies through national and international consultation; supporting educators across Ghana to adopt competency-based teaching; and embedding the standards through ongoing professional development and research.

By embedding these competencies nationally, Ghana is developing a workforce that is internationally competitive while remaining closely attuned to local community needs. The partnership offers a strong model for how sustained international collaboration can strengthen health systems and improve patient outcomes across regions.

BOOSTING EGYPTIAN MEDICAL EDUCATION THROUGH LONG TERM PARTNERSHIP

Health workforce challenges are also shaping medical education across the Middle East and North Africa. In Egypt, a long-standing collaboration between Mansoura University and The University of Manchester has focused on strengthening medical training while preparing graduates for work in a global health workforce.

The Mansoura–Manchester Medical Programme began in 2006, introducing integrated, competency-based approaches at a time when medical education in Egypt largely followed a traditional model. By combining Manchester's educational expertise with local knowledge, the partnership has enhanced training quality while remaining responsive to Egypt's healthcare context.

Since its first intake of 60 students, the programme has grown substantially and now enrols nearly 400 students each year, with around half coming from outside Egypt. Students from 45 countries, including those from crisis-affected regions, have accessed high-quality medical education through the programme, some supported by scholarships offered at Mansoura.

The curriculum promotes team-based learning, critical thinking and patient-centred care. Graduates are trained to internationally recognised standards, enabling them to contribute to healthcare systems both within Egypt and internationally.

Over time, the collaboration has expanded to include curriculum development, educational research and staff development, supported by regular visits and joint activity. By equipping graduates with skills that are globally transferable yet locally relevant, the programme contributes to addressing health workforce shortages identified by the WHO, particularly in regions facing acute gaps.

STRENGTHENING THE GLOBAL HEALTH WORKFORCE

Across Ghana and Egypt, these partnerships demonstrate how workforce development can act as a powerful lever for strengthening health systems and reducing global inequalities. By working with regulators, universities and educators, they support training models that respond to real-world health needs while preparing professionals to work confidently across diverse healthcare settings.

GLOBAL SOUTH FELLOWSHIP: BUILDING EQUITABLE RESEARCH PARTNERSHIPS

The Global South Fellowship supports early-career researchers from low and lower middle-income countries to develop internationally competitive research careers through partnership and collaboration. The fellowship provides pump-priming funding for clinical, applied health, pure science and methodological researchers working on non-communicable diseases, helping to bridge the critical gap between postdoctoral research and research independence. By enabling fellows to build strong intellectual links with Faculty researchers, develop new skills, and prepare applications for major funders such as UK Research and Innovation (UKRI), the Wellcome Trust and NIHR, the programme strengthens global research partnerships while promoting a more inclusive and sustainable research culture.

SPOTLIGHT: ADWOA AGYEMANG-BENNEH

COMMUNITY-DRIVEN HEALTH SYSTEMS

"My research focuses on health policies and interventions that can improve outcomes in resource-poor settings. I'm particularly interested in how evidence can be translated into practice in ways that are inclusive and sustainable.

During my PhD, I studied primary care networks in Ghana, which were designed to bring healthcare closer to communities. What I found, however, was that the voices of those communities were often missing from the design and delivery of care. With support from a Global South Fellowship, I expanded this work to Kenya, where similar networks are being introduced.

Using a strengths-based approach known as appreciative enquiry, I've built links with underserved communities. People have been able to identify what already works in their care, share their aspirations for the future, and plan how they might achieve these goals alongside health workers and policymakers. Together, we are developing community-driven models of care that put people at the centre of healthcare innovation.

My inspiration comes from growing up in Ghana and seeing firsthand the struggles communities face in accessing healthcare. These experiences left me convinced that the most effective care must be co-created with the people it serves. At its core, my research gives people agency. Communities know their needs, but too often their voices are absent from policy discussions."

SPOTLIGHT: BAHATY RIOGI

STRENGTHENING CANCER CARE THROUGH DATA AND LIVED EXPERIENCE

"My work focuses on strengthening cancer care in rural Western Kenya by elevating patient experiences and improving how cancer data is collected and used. Based in Kisii, a region where most patients present with advanced disease, I have seen firsthand how the absence of reliable cancer data limits effective planning, resource allocation, and broader system strengthening.

Despite the growing number of patients receiving surgery and chemotherapy locally, and surviving, there is no centralised cancer data system to guide decision-making. The Kenyan national cancer registry currently records fewer than 100 patients from Kisii, despite many more being treated in facilities across the county. This lack of data masks the true burden of disease and restricts opportunities for data-driven solutions.

My motivation comes from witnessing the determination of patients who persist through stigma, logistical challenges, and limited services to access care. Their resilience fuels my commitment to amplify their voices, challenge the perception that cancer is a death sentence, and address the myths and misconceptions that continue to shape community attitudes.

Collaborating with scientists and colleagues at the University of Manchester provides an invaluable platform to exchange knowledge, share context-specific insights, and co-create solutions that improve cancer care. Through these partnerships, I hope to establish sustainable data systems that elevate community perspectives and drive equitable, impactful cancer services in Kisii and beyond."

The Kenyan national cancer registry currently records fewer than 100 patients from Kisii, despite many more being treated in facilities across the county.

WOMEN IN STEM: SUPPORTING THE NEXT GENERATION

The Women in STEM Scholarships support talented women from across 30 countries and territories to pursue postgraduate study in science, technology, engineering and mathematics. Funded by the UK Government and delivered by the British Council, the initiative offers fully funded opportunities for women to complete a one-year master's degree in the UK. Since 2020, more than 500 scholarships have been awarded in partnership with leading universities. At Manchester, the programme plays an important role in developing a strong and inclusive research culture, supporting early-career researchers to thrive, build networks and contribute to the University's global research community.

By widening access to advanced STEM education, the scholarships help strengthen global research capacity and nurture the next generation of global research leaders, supporting women whose work addresses real-world challenges in health, sustainability and development.

SPOTLIGHT: RANA ADWINDA

BUILDING SMARTER HEALTH SYSTEMS WITH DATA

"I come from a public health background with a strong interest in health behaviour, which is why I am currently pursuing an MSc in Health Data Science. I'm learning how data and analytics can be used to understand health challenges and design evidence-based solutions that are more effective.

My interest began when I realised how many health problems could be better understood if we paid closer attention to what is already happening in society. Data can reveal patterns behind behaviours, access and outcomes, from screening attendance to medication use and chronic disease management. Rather than seeing health issues as purely personal, I became interested in the bigger picture — why people make certain choices, what influences those decisions, and how systems respond to them.

What drives my work is curiosity about how beliefs, habits and social environments shape behaviour. I don't see research as purely technical; I approach it with empathy and a genuine interest in lived experience, aiming to understand not just the numbers, but the stories behind them. By learning from past data, we can identify patterns, uncover opportunities and design smarter, more realistic health interventions.

Being part of the Women in STEM cohort has been a meaningful experience. It has given me confidence, connections and a strong sense of purpose, not only to progress in my own work, but to support others and demonstrate that science is stronger when diverse voices are heard."

CHINA SCHOLARSHIP COUNCIL: BUILDING GLOBAL RESEARCH CAPABILITY

As part of FBMH's commitment to strengthening research partnerships with China, The University of Manchester has built a longstanding collaboration with the China Scholarship Council (CSC) to support joint PhD and Clinical Research Fellowships. The CSC funds Chinese scholars to study abroad and international students to study in China, bringing together expertise and resources from both countries. This partnership accelerates global health research whilst training internationally connected researchers equipped to advance better treatments and improve patient outcomes worldwide.

Within this partnership, Professor Janine Lamb has worked closely with CSC-funded Clinical Research Fellows from Beijing and Shanghai through the Manchester Myositis Research Group. Her research focuses on understanding why some people are more susceptible to disease than others, including rare muscle conditions known as idiopathic inflammatory myopathies (myositis). These complex conditions vary widely between populations, making international collaboration essential to improving diagnosis, treatment and long-term outcomes.

Myositis poses a significant health burden in China, where severe subtypes and complications are more common. At the same time, the scale and clinical diversity of the population provide a unique opportunity to generate globally relevant, world leading datasets. Collaboration with clinicians embedded in the Chinese healthcare system has also brought new perspectives and approaches that have strengthened research in Manchester.

Through this partnership, two CSC funded Clinical Research Fellows became key members of the Manchester team, contributing to myositis research. Their work led to international conference presentations, peer reviewed publications and laid the groundwork for future collaborations. Both fellows continue to work closely with Manchester since returning to China, using fellowship generated data to secure funding and develop new research programmes, strengthening research culture and expertise on both sides.

SPOTLIGHT: CSC FELLOWS

Xia Lyu

"Supported by the CSC, I spent two years in Manchester analysing UK multicentre myositis cohort data and presenting our findings internationally. The experience transformed me from a clinician who 'did some research' into an independent investigator. Since returning to Shanghai, I've secured new funding to continue this work and apply the skills and standards I developed in Manchester to myositis research in China."

Yuhui Lui

"The fellowship gave me a strong platform to develop collaborative research focused on disease mechanisms and biomarkers. Just as importantly, it reshaped how I think about global research, strengthening my ability to work across cultures and disciplines and building connections that continue to shape my career."

LOOKING AHEAD

Reflecting on the work showcased in *Global Futures* reminds us how privileged we are to contribute to international partnerships across the Faculty of Biology, Medicine and Health at The University of Manchester. Research shows that individuals gain significant professional and personal benefits from working internationally, yet these are only a small part of our wider impact. With around 800 research groups and more than 3,000 staff, our faculty helps build long term, equitable partnerships with universities, health systems, research institutes and communities around the world.

This publication captures only a glimpse of the scientific, educational and social impact made possible through globally connected research and learning. John Donne's reminder that "no man is an island" holds true for science and society alike: progress in fungal disease diagnostics and treatment has depended on broad collaboration across diverse health systems, and no single centre could generate the genomic insights or technological capacity required to advance rare disease research. Our societal impact would be incomplete without working alongside countries where need is greatest, as shown in our cardiovascular health collaborations in China, India, South Africa, Colombia and underserved communities in the USA. Equally, we cannot hope to address the WHO predicted deficit of 11 million health workers by 2030 without international partnerships that support local training, as demonstrated through our work with Mansoura University and the University of Ghana.

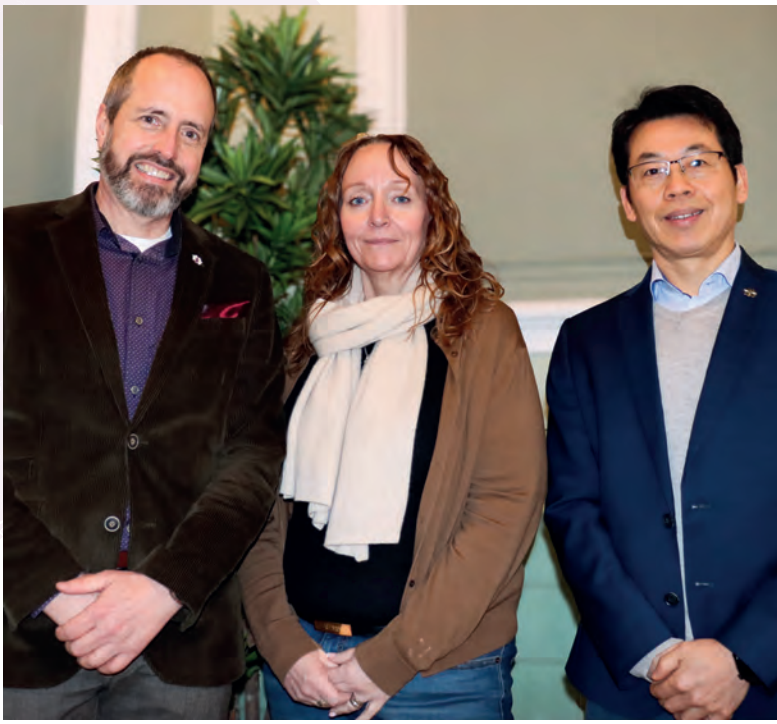
Yet looking back is only part of this publications purpose. Its greater value lies in inspiring what comes next. As we launch our new strategy, *Manchester 2035*, we look ahead with excitement. We will develop more tailored, locally adapted and culturally informed education and training programmes, co created with regional partners so that learners worldwide can benefit from a Manchester education rooted in local context. Discovery remains at the heart of our mission, and we will continue to collaborate with leading international partners to ensure our research stays at the forefront - addressing the most fundamental, challenge led questions in human health and wellbeing. We will also expand opportunities for students and staff to engage globally across science, industry, and the public and third sectors, enriching professional and personal growth.

We are proud that Manchester was the first UK University to place social responsibility alongside research and education as an equal priority. This commitment guides how we build partnerships founded on equity, reciprocity and respect for local knowledge.

Do you see yourself in these pages? If not, but would like to collaborate with us, we would love to hear from you.

Dr Ingo Schiessl, Professor Lucie Byrne-Davis, Professor Qing-Jun Meng

Associate Deans for Internationalisation, Faculty of Biology, Medicine and Health, The University of Manchester.



MANCHESTER 1824
The University of Manchester

FIND OUT MORE

For information about our global work visit:
https://uom.link/global-futures2.0

Produced by The Faculty of Biology, Medicine and Health
The University of Manchester
Oxford Road
Manchester
M13 9PL

Royal Charter Number RC000797

Faculty of **Biology, Medicine & Health**