Opinion: Sharing rare data for a common cause

Can big data mend a broken heart?
It is encouraging to see recent government commitments to increase funding for science. The Industrial Strategy: Building a Britain fit for the future white paper sets out a long-term plan ‘to boost the productivity and earning power of people throughout the UK’.

As a first step, the government has confirmed an additional £2.3bn of support over the next five years. This investment is essential to ensure discoveries, breakthrough treatments, innovative medical research and technologies, and high skilled jobs are created in the UK.

I welcome this extra funding, and I’m particularly pleased to see the government recognise the importance of life sciences. The life sciences industry strategy aims to ensure the UK builds on its exceptional reputation for science and research, genomics and clinical trials. It presents real opportunities for research, especially in the fields of data for early diagnosis and precision medicine.

Even with these excellent new schemes, we cannot underestimate the importance of maintaining and building on core research funding. Core funding gives us the flexibility to fund the best basic science. And it is basic science that encourages a continuous pipeline of ideas and discoveries, which are key to ensuring new treatments and technologies reach the people who need them.

Sir John Savill
MRC Chief Executive
Read more: mrc.io/industrialstrategy
Shaping mental health research in the UK

In December the government published a ‘Framework for Mental Health Research’, which the MRC helped to shape along with other public and charity funders of mental health research.

The document sets out 10 recommendations to improve the impact of mental health research over the next decade. It focuses on prevention and early intervention, increased patient and public engagement, user-led research and stronger connections between physical and mental health research. The framework also points to harnessing advances in technology, broadening the skill base and encouraging the wider life-science community to invest in mental health research.

Chiming well with the MRC Strategy for Lifelong Mental Health it aims to support the growing momentum of research in this field.

Jeremy Hunt, the Secretary of State for Health, said: “We’re investing in mental health more than ever before and have started one of the biggest expansions of mental health services in Europe but we know when it comes to research, we can and should do better. ‘This framework will ensure we can make the lives of those living with mental health problems better and push us further towards our goal of becoming the world leader in research.”

Find out more: mrc.io/shaping-mental-health

Read the MRC Strategy for Lifelong Mental Health: www.mrc.ac.uk/mentalhealth

Superbugs in the spotlight


Partnered by the UK’s seven research councils it highlights the urgent need to tackle antimicrobial resistance (AMR).

The exhibition explores the causes of AMR, such as the overuse and misuse of antibiotics, what the solutions might be, and how we can all get involved in preserving the effectiveness of antibiotics. It also celebrates research teams from different disciplines who are working together to find solutions.

The exhibition runs until Spring 2019. Find out more: mrc.io/superbugs-exhibition

Read more about how the MRC is tackling antibiotic resistance: www.mrc.ac.uk/amr
Leading researcher chosen as MRC Executive Chair

Professor Fiona Watt FRS is the government’s preferred candidate for the Executive Chair of the MRC, when it becomes a constituent part of UK Research and Innovation (UKRI) in April.

Fiona is currently Director of the Centre for Stem Cells and Regenerative Medicine at King’s College London where she leads a team of 80 academic researchers. Internationally recognised in her field, she studies the stem cells of healthy and diseased skin.

Sir Mark Walport, UKRI CEO Designate, said: “Professor Watt is a distinguished biomedical scientist who will be an outstanding leader of the MRC. I am delighted she has been selected as the government’s preferred candidate for the role of MRC Executive Chair.”

Sir John Savill, who will step down from his role at the end of March 2018 before UKRI is launched, said: “Fiona is an outstanding scientist and will bring many new ideas to the MRC and UKRI, strengthening still further the MRC’s commitment to discovery science for human health. She is a wonderful role model for many younger biomedical scientists in the UK medical research community.”

Find out more: mrc.io/mrc-exec-chair

Chairman appointed to lead UK Dementia Research Institute

Mr William Rucker is the first Chairman of the UK Dementia Research Institute (UK DRI).

Mr Rucker is the CEO of Lazard in the UK (part of the Lazard Group), an investment bank that specialises in Asset Management and Advisory businesses.

As Chairman of the UK DRI Board, he will lead its collective responsibility for the effective governance and development of the institute, setting its strategic direction and major policies in line with the institute’s objectives.

The UK DRI is a joint £250m investment into dementia research led by the MRC alongside founding charity partners Alzheimer’s Society and Alzheimer’s Research UK. The institute will be catalytic in the UK’s research efforts to diagnose, treat, care for and prevent dementias.

Commenting on his appointment, Mr Rucker said: “Helping create a world-class institute, dealing with one of the most serious diseases of our time, is critical. Dementia has touched many of our lives through relatives who have suffered and finding ways to make a positive impact could not be more important.”

Find out more about the UK DRI: ukdri.ac.uk
Getting festival ready

Do you have what it takes to be a scientist? Come and talk to our researchers at the next MRC Festival of Medical Research to find out.

The MRC Festival will take place between 14-24 June 2018. It’s an annual event held across multiple locations where MRC-funded researchers showcase and discuss their work through public events and activities.

For researchers who are planning public engagement activities, check out our online toolkit which provides ideas, templates, activity packs and more: www.mrc.ac.uk/engage

Find more information at: www.mrc.ac.uk/mrcfestival

A deserving science-writing winner

Congratulations to MRC-funded PhD student Kirstin Leslie, from the Institute of Health and Wellbeing at the University of Glasgow, winner of the 2017 Max Perutz Science Writing Award.

Kirstin received the first prize of £1,500 for her article: ‘Can big data mend a broken heart?’. Three runner-up prizes went to Nadine Mirza from The University of Manchester, Lara Morley from the Leeds Institute of Cardiovascular and Metabolic Medicine, and Sophie Quick from the MRC Centre for Regenerative Medicine at the University of Edinburgh.

The award is named in honour of one of the UK’s most outstanding scientists and communicators, Dr Max Perutz. It encourages MRC-funded PhD students to communicate their work to a wider audience by explaining why their research matters in 800 words.

Commenting on the competition, MRC Chairman and Chair of the judging panel Mr Donald Brydon said: “Again young scientists have shown they can communicate their passion for science to a wide audience. The standard of entries was very high and the winner strikes just the right chord in tune with our increasingly data-driven world.”

Turn to page 10 to read the winning article.

Read all shortlisted articles at: mrc.io/maxperutz2017

From left to right: Sophie, Lara, Kirstin and Nadine with all shortlisted writers at the awards ceremony. 
Prize for life-saving diagnostic device

An MRC Newton-funded project won the Newton Prize in India, worth £200,000, for testing the introduction of a new vital sign device for maternity care in hospitals in India and Africa.

Developed at King’s College London, the CRADLE Vital Signs Alert is a hand-held semi-automated device which measures blood pressure and pulse. It can detect hypertension and circulatory shock with an early warning system. It is affordable, easy-to-use, and portable with low power requirements.

More than 3,300 devices are being used in routine care in hospitals and clinics, across eight different countries. Results show that its traffic light system strongly predicts the risks of complications and that its introduction into maternity care will help save lives.

Professor Andrew Shennan, the UK lead for the project, said: “To be able to have an impact on care in those parts of the world where it is desperately needed has been our most fulfilling research experience.”

The Newton Prize is a £1m fund awarded for the best research or innovation that promotes the economic development and social welfare of developing countries.

Find out more: mrc.io/newtonprize2017

Virtual 360° tour of mouse house wins award

MRC Harwell is one of five winners of an Openness Award from Understanding Animal Research for encouraging the widespread sharing of best practice in animal research communications.

They shared the best Public Engagement Activity award with the Pirbright Institute, the University of Bristol and the University of Oxford, for opening their labs to 3D cameras to create a 360° virtual Lab Animal Tour.

The Lab Animal Tour is a ‘street view’ into the four animal research facilities. Viewers can direct themselves through the rooms of the Mary Lyon Centre at MRC Harwell, giving them a 360° vision of where the mice are cared for and where scientific procedures take place.

Take a 360° tour: www.labanimaltour.org/harwell
£15m boost to mental health research

Two new schemes worth £15m will stimulate expertise, innovation and collaboration in mental health research.

£10m awarded to the MRC as part of the government’s National Productivity Investment Fund will help researchers harness the power of health data for mental health research.

In addition, £5m has been dedicated by the MRC for finding new therapeutic targets, to help improve the hunt for better treatments for a wide range of mental health conditions.

Mental health problems have a huge impact on the UK’s health, wealth and wellbeing. An estimated one in six of us are affected by mental illness each year in the UK and it costs the economy £70-£100bn annually as a consequence of lost productivity, time off work, social benefits and health care. Strengthening mental health research to minimise its burden on us as individuals and as a society is a key priority for the MRC.

Sir John Savill said: “Most of us at some point during our lives will be affected by mental illness, either personally or through family and friends. By taking advantage of new scientific opportunities and tools, such as health data research, we can transform this research field and offer real hope of new and more effective interventions.”

Read more: mrc.io/15m-mental-health

Calling African Research Leaders

The MRC and the UK Department for International Development invite proposals for the prestigious African Research Leader awards.

This jointly funded scheme aims to strengthen research leadership across sub-Saharan Africa by attracting and retaining exceptionally talented individuals who will lead high quality programmes of research on key global health issues pertinent to the region.

The African Research Leader should be supported by an enthusiastic local research environment and by a strong linkage with a UK partner.

The deadline is 27 February.

Find out more: mrc.io/arl-2018
People

New Year’s Honours

Congratulations to the following people, closely connected with the MRC, recognised in the 2018 New Year’s Honours list:

Sir Keith Peters, lately Regius Professor of Physic at the University of Cambridge, was appointed Knight Grand Cross of the Order of the British Empire (GBE) for services to the advancement of medical science. Interim director of the MRC’s National Institute for Medical Research from 2006 to 2008, he was instrumental in the development of the original idea behind the Francis Crick Institute.

Dr Robin Lovell-Badge, Senior Group Leader, Francis Crick Institute, was awarded a CBE for services to genetics, stem cell research and the public understanding of science.

Professor Christl Donnelly, Professor of Statistical Epidemiology, Imperial College London, was awarded a CBE for services to epidemiology and the control of infectious diseases.

Professor Andrew Morris, Director, Health Data Research UK, and Vice-Principal of Data Science at the University of Edinburgh, was awarded a CBE for services to science in Scotland.

Professor Philip Nelson, Chief Executive Officer, Engineering and Physical Sciences Research Council (EPSRC), and Chair, Research Councils UK, was awarded a CBE for services to UK engineering and science.

Professor Margaret Frame, Director, MRC Institute of Genetics and Molecular Medicine (IGMM) at the University of Edinburgh, and Science Director, Cancer Research UK Edinburgh Centre, was awarded an OBE for services to cancer research.

Joan Flynn, lately Senior Receptionist, MRC Head Office, has been awarded a BEM for services to the MRC.

Read more: mrc.io/honours-2018

First board members for Health Data Research UK

HDR UK, the new data science and health research institute harnessing the power of health data, has appointed the following non-executive board members:

- Dr Graham Spittle CBE (Chair)
- Professor Sir Alex Markham
- Professor Jonathan Montgomery
- Professor Sir Jim Smith
- Professor Dame Janet Thornton
- David Zahn

HDR UK aims to develop and apply cutting-edge data science tools and techniques to address the most pressing health research challenges facing patients and the public.

Chair of the Board Dr Graham Spittle said: “The emerging HDR UK Board brings together a wealth of knowledge and expertise. In tandem with the executive team, the board will bring passion and vigour to the goal of maximising health benefits from data science.”

Read more: hdruk.ac.uk
MRC scientist wins Nobel Prize

2017 saw Dr Richard Henderson of the MRC Laboratory of Molecular Biology (LMB) awarded the Nobel Prize in Chemistry, with Professor Jacques Dubochet and Dr Joachim Frank (LMB alumnus).

The trio won the prize “for developing cryo-electron microscopy (cryo-EM) for the high-resolution structure determination of biomolecules in solution.” Cryo-EM is a technique which fires a beam of electrons at frozen biomolecules, allowing researchers to take magnified images and see the structure of molecules in atomic detail.

Richard has helped to advance the technique of electron microscopy throughout his career. His drive and determination over two decades led to the development of better detectors for electron microscopes and better software to analyse the images, which have revolutionised cryo-EM.

‘Cryo’ refers to the way that researchers flash-freeze molecules in a thin layer of aqueous solution before imaging them, a crucial method invented by Jacques Dubochet and his colleagues in the early 1980s. Computational processing of the images is a key step, to which Joachim Frank made major early contributions.

In the last few years, there has been a huge leap forward in cryo-EM. Researchers can now view the atomic structures of proteins and other complex molecular machines that were previously difficult or impossible to decipher.

Studying the structure of proteins in humans is critical to understanding how they interact in the body and for developing better drugs for diseases. Cryo-EM is already producing advances in our ability to understand proteins that are critical in many diseases, including Alzheimer’s disease.

On winning the prize, Richard said: “I am delighted for everybody in the field that the Nobel Prize for Chemistry has been awarded to acknowledge the success of cryo-EM.

“I am particularly pleased that Jacques Dubochet has been recognised as the key person who kick-started the field in the early 1980s with his method of rapid freezing to make a specimen of amorphous ice, a crucial advance.”

Sir John Savill said: “The MRC is proud to have funded Richard since 1973 and his research is a testament to the MRC’s strategy for long-term investment in basic research at the MRC Laboratory of Molecular Biology which has already attracted 10 Nobel prizes.”

The prize brings the total number of Nobel prizes awarded to MRC-funded scientists up to 23.

More information is available at: mrc.io/nobelprize-2017

Watch Richard’s Nobel lecture (8 December) at: mrc.io/nobel-lecture-17
Kirstin Leslie, MRC PhD student at the Institute of Health and Wellbeing at the University of Glasgow, won our 2017 Max Perutz Science Writing Award. In her winning article she explains how she’s trying to find out why people stop taking drugs for preventing heart disease, and why this matters.

“When you do things right, people won’t be sure you’ve done anything at all”. That’s actually a quote from the TV show Futurama but it’s also a clear way of explaining why people are not always good at taking their medications.

Imagine: you’re taking a drug to prevent yourself from having a heart attack. But if you don’t feel any different after taking the drug, how can you know it’s even worked? Maybe you weren’t going to have a heart attack anyway? Maybe the drug you’re taking is giving you side-effects and besides, it isn’t worth it because you felt fine before.

You don’t want to bother your doctor getting a new prescription and your blood pressure wasn’t that high anyway... So you stop taking your drugs and you hope for the best.

But heart disease is the leading cause of death worldwide. And it’s preventable.

This is particularly bad news if you happen to live in Scotland, where we lead the way in the number of heart attacks, strokes, and more-or-less everything that can go wrong with your heart. But why? We have access to lots of different types of drugs for your heart, and in each of these groups there are a range of specific drugs to choose from, so there should be something that works for everyone.

Shouldn’t there? Unfortunately the problem isn’t that simple.

Once your doctor has identified high blood pressure, high cholesterol, or anything else that might increase your risk of a heart attack, a few steps have to happen to reduce that risk:
• Step 1 is prescribing a drug.
• Step 2 is taking the drug.
• Step 3 is the hard one.

Step 3 is taking the drug at the right time and continuing to take it for as long as you need to. And that’s hard. It’s hard because for the drugs we’re talking about, ‘as long as you need to’ can mean ‘for the rest of your life’. And the rest of your life can be a long time.

So my research project will look at: how well people in Scotland manage to stick to Step 3, who is and who isn’t sticking to Step 3, and whether sticking to Step 3 does actually improve your chance of avoiding a heart attack or stroke.

To do this, I’m going to be using patient data from across Scotland to look back over the years and see whether or not people are picking up their medications from the pharmacy on time. This might sound straightforward before you remember that there are over 5 million people in Scotland. And, as I said before, we are not the healthiest bunch.

So that’s a lot of people, with a lot of unhealthy hearts, and a lot of drugs prescribed by their doctors. To do this I’m going to have to enter a world that has always seemed distant, complicated, and honestly a little bit intimidating: the world of big data.

Firstly: what is big data? Is it Facebook working out your personality based on the number of cat pictures you like? Or apps predicting the next flu pandemic based on the number of people tweeting about a runny nose? Or targeted adverts based on your google history? The answer is, in a way, yes. Big data is all those things and more. Big data is what it says on the tin: data, but a lot of it.

For me, big data is looking at everyone in Scotland who has ever been prescribed a cardiovascular drug – or more simply, drugs for their heart – and looking to see if they picked up their next lot of drugs around about the time their first prescription should have run out. If they don’t, it means they are more likely to be skipping days, having gaps, or they might have stopped taking them altogether. By linking this to medical records I can see if people who aren’t taking their medications are statistically more likely to have a heart attack, stroke, or even die.

And by looking across the whole country I can also see if people are more likely to take their drugs if they fall into different groups: if they are older or younger, male or female, or if they are living in wealthier areas or not. By doing so, I will be able to see if certain groups of people are more likely to miss their medications, and with that information, I might be able to work out who needs help at sticking to Step 3. If we know who is at risk, we know who we can help.

And if we know who we can help, maybe we can mend a heart before it breaks.

Read this article on our MRC Insight blog: mrc.io/maxp2017

Quickfire questions for Kirstin

What did you learn from entering the competition?
It was a really useful exercise to get you to think about your research in a way that’s relatable and entertaining. I tried to reference things that people could relate to when I was talking about big data, like Facebook and Twitter.

Why should others enter?
My research uses patient data, so I feel it’s really important to explain why I’m using people’s data and how it can help advance medicine. Before the competition, science writing wasn’t something that I’d thought much about. I always liked writing but I hadn’t believed that I’d be able to do it well. Winning the competition is quite validating and humbling.

A tip for budding science writers?
Read around a lot. You’ll learn techniques from other writers without even realising it.
Community-based screening can reduce hip fractures in women

The risk of hip fractures in women could be reduced by a community screening programme, according to a new study.

Scientists from the MRC Lifecourse Epidemiology Unit at the University of Southampton, in collaboration with the Universities of East Anglia and Sheffield, compared a screening approach – which involved a questionnaire, bone mineral density measurements in some patients, fracture risk calculated using the online “FRAX” tool and subsequent treatments – to routine care.

The study, involved 12,483 women aged 70 to 85 years, identified from primary care. It found that there was a 28% reduction in hip fractures over five years in older women who took part in the screening programme.

The researchers believe the low-cost strategy could prevent thousands of women from suffering hip fractures each year.

Professor Lee Shepstone, of the University of East Anglia, led the study: “Given that the number of costly and debilitating hip fractures are expected to increase with an ageing population, the results of this study have important public health implications.”

Published online at: www.lancet.com, 18 December 2017.

Discovery speeds up cell production in lab

Researchers at the MRC Centre for Regenerative Medicine at the University of Edinburgh have discovered how two molecules can boost the reprogramming of cells – where cells of one type are converted to another.

This could help the study of diseases such as multiple sclerosis and Parkinson’s disease by speeding up cell production in the lab.

The research pinpointed two molecules, called SMAD2 and SMAD3, and revealed how they improve the efficiency of converting skin cells into induced pluripotent stem cells – cells which can become any type of cell found in the body.

The same molecules halved the time required to generate functional brain cells directly from skin cells in a dish, which usually takes around 50 days.

The molecules also boosted direct conversions between immune cells, from B cells to macrophages, and from muscle cells to fat cells.

The research team hope the discovery could help to boost supplies of cells for use in drug discovery research and could eventually aid production of cells for use as new treatments and therapies.

Published online at: www.cell.com, 22 November 2017.
How protein machinery drives healthy gene expression

By deciphering the structure of a protein complex, scientists have revealed how it creates the machinery needed for healthy gene expression, vital for fighting disease and infection.

Dr Lori Passmore and her team at the MRC Laboratory of Molecular Biology in Cambridge used cryo-electron microscopy (cryo-EM) – the 2017 Nobel Prize-winning technique (see page 9) – to study a large protein complex called ‘cleavage and polyadenylation factor’ or CPF.

In revealing the scaffold element of CPF’s structure they also uncovered important details of gene expression, or how the instructions encoded in DNA are turned into proteins.

Viral infections like influenza are known to disrupt normal gene expression by targeting the human version of CPF. Detail of the structure will now enable research into how CPF works in healthy cells, how it interacts with the flu virus and whether it plays a role in cancer.

Lori said: “This was a huge technical challenge because very few structures have been built entirely from scratch using cryo-EM data. We were very excited to finally determine the first atomic model of the structure of part of CPF.”

Published online at: www.science.org, 26 October 2017.

Scanner predicts if breast cancer will spread to the lung

A new imaging technique shows promise for predicting if breast cancer will spread to the lungs.

Researchers at King’s College London, University College London and the University Hospital Muenster in Germany, have developed a non-invasive imaging method that detects changes in the lungs, signalling that breast cancer may spread, before cancer cells are visible.

Before cancer spreads, a special type of immune cell gathers in the lung and secretes molecules that prepare this organ for the arrival of tumour cells. The team developed a radioactive tracer, or ‘tag’, that attaches to these molecules and can be tracked with a 3D gamma-ray scanner. Using the tracers in mice, the scientists spotted pre-cancerous sites in the lungs before any breast cancer cells arrived.

Lead author Dr Fabian Flores-Borja said: “By combining cell biology and imaging techniques, we have established a method to predict, at an early time-point during tumour development, whether tumour invasion will occur.”

Further research is needed to develop a tracer suitable for patients. A non-invasive hospital scan would allow earlier diagnosis aimed at preventing breast cancer spread.

Published online at: www.thno.org/v07p2392, 16 August 2017.
Dr Pauline Williams leads global health research and development at GlaxoSmithKline (GSK) and recently became an MRC Council member. Here she tells us about mixing science with business, and the satisfaction of making a life-saving gel from an antiseptic mouthwash.

It was the rigour and excitement of early drug development that tempted me away from medicine. I did a stint at a Phase I Clinical Pharmacology Unit after my medical training – and following that I was enticed by an offer to join Glaxo (now GSK) where I've worked ever since. My first role was a full immersion in the design, conduct and reporting of experimental medicine studies which has stood me in good stead throughout my career.

I realised how much I enjoyed working with experts from academia when I was leading a project to develop medicines for pain and depression. This was at a time when the potential was just emerging for brain imaging in drug development, allowing us to see in real time what is going on in response to treatment. If I had my time again I would have gone into academic research before joining the industry. Sometimes I am mystified by the politics in academia, but maybe that isn't a bad thing!

After moving to a new job following one of several company reorganisations I realised I hadn’t really ‘owned’ my career. I had just been going with the flow. So I wrote my ideal role spec and pitched it to a ‘Dragons Den’ in GSK. My proposition was to lead a new unit to develop medicines in partnership with academic researchers in a model of shared risk and shared reward. I was awarded three years’ funding to create a small team and give it a go. Thankfully it was successful and evolved into Discovery Partnerships with Academia, which has since formed more than 20 collaborations.

I was struck by the need for better healthcare in the developing world for newborn babies and their mothers while I was leading a project for treatment of pre-term labour. I made the case to work in this area and this has recently expanded to a role looking after all of GSK’s Global Health research and development.
A defining moment in my career was leading a project to reformulate a mouthwash antiseptic into a gel to prevent sepsis in newborns. I’ve worked for years in cutting-edge drug discovery, yet this simple, not-for-profit project is probably the most impactful thing I will ever achieve. We reformulated the antiseptic, chlorhexidine, into a gel for use on newly-cut umbilical cord. Studies have shown that this can prevent sepsis in babies born in poorer countries with limited healthcare resources, and could prevent an estimated one in six newborn deaths. The gel was granted accelerated review by the European Medicines Agency and has now been used in over 17,000 babies in Kenya in a programme run by Save the Children. It is undergoing registration in countries where newborn mortality is highest.

My working days are a mixture of science and business. I might spend the day reviewing the scientific rationale for a new drug discovery effort and seeing the results of preclinical experiments. Other days might be completely business-focused, meeting with collaborators, writing strategy documents or looking at budget forecasts.

I particularly enjoy mentoring, and encouraging female scientists to reach their potential. But nothing can beat the thrill of evaluating new clinical data and seeing the promise of an exciting new medicine. My recent appointment to the MRC’s Council is a huge honour – it is a chance to be part of a world-class research organisation and to help guide the MRC into a new era of cross-disciplinary research within UK Research and Innovation (UKRI).

Believing in myself has been one of the biggest challenges of my career to date. It took a long time for me to stop talking myself out of new opportunities because of lack of confidence.

Empathy is the trait I most value in myself and others. If people can see that your decisions are ultimately in the best interests of patients then you will get the support you need.

The best piece of advice I have ever been given was that you don’t need to be an expert in an area in order to be an effective leader, you just need to surround yourself with experts. And don’t take yourself too seriously – being able to laugh at yourself is a valuable skill. Someone who inspires me in this regard is Patrick Vallance, the President of GSK R&D. He is a great scientist, genuinely cares about people and has a wicked sense of humour. He has also done a lot to break down the barriers between industry and academia.

Looking forward, I’d like to explore how pharma companies can join forces to tackle some of the world’s toughest diseases. We shouldn’t be competing against each other in this space, and our combined resource and innovation could have amazing impact.

As told to Sarah Harrop

Read this article on our MRC Insight blog: mrc.io/paulinewilliams
Read GSK’s “Health for all” commitment: www.gsk.com/en-gb/responsibility/health-for-all/
Find out more about Discovery Partnerships with Academia: www.dpac.gsk.com
Early in the 20th Century, the world’s deadliest and most prolific killer was identified – the mosquito responsible for spreading malaria, Anopheles gambiae. Almost half a century later, in the country that gave this killer its name, work began on a research unit near The Gambia’s Atlantic coast. And not without just cause; at the time, malaria was rife and child mortality rates were almost 42% – 417 deaths in every 1,000 births.

Fast forward 70 years and the situation has changed beyond recognition: the unit has become an internationally recognised and world-renowned centre of excellence in global health research. Not only are malaria rates significantly lower than in 1947, child mortality has plummeted by 90%, to 48 deaths per 1,000 births.

Speaking at the symposium Professor Joy Lawn, Director of MARCH Centre at the London School of Hygiene & Tropical Medicine (LSHTM), praised the unit’s achievement: “In preventing child malaria deaths, MRC Unit The Gambia has probably contributed more than any other institution in the world.”

More work to be done

But this wasn’t an exercise in ‘Haven’t we done well?’. Speakers and delegates alike recognised how much is still to be done and shared their insights and ideas on issues yet to be tackled. Professor Lawn impressed on early career researchers the need for new avenues of research with a sobering statistic: “Soon the number of babies dying in the womb as stillbirths due to malaria will be more than the number of under five deaths due to malaria. Yet stillbirths are often uncounted in research.”

Time and again over the course of the event two groups were recognised for their invaluable contributions to the unit’s research. Professor Sir Brian Greenwood, LSHTM and former director of the unit, spoke for many delegates when he observed: “The support of the people of The Gambia has been remarkable and none of the achievements of the last 70 years would have been possible without them.”

Unit Director Professor Umberto D’Alessandro added: “No one can deny what has been achieved, in particular new knowledge and new tools to combat disease, but this wouldn’t have been possible without the strong support and partnership of The Gambian Government.”

A symposium in November 2017, to mark the 70th anniversary of MRC Unit The Gambia, revealed how much progress has been made in global health – and how much remains to be done. Pauline Mullin, MRC Head of Corporate Communications, was there to find out.
A reputation for excellence

As well as scientific achievements, the symposium revealed the ingenuity and humour of the many researchers who have helped build the unit’s reputation for excellence over the past 70 years.

Among excellent sessions on disease control and elimination, vaccines and immunity, and nutrition – the unit’s three research themes – delegates heard tales of an ill-fated mosquito deterrent known affectionately as ‘The Great Wall of Gillies’, a 1.5m high fence designed by Professor Gillies to stop mosquitoes which fly about 1m above the ground (needless to say the mosquitoes just flew over the top). Also of engineers from the Large Hadron Collider now turning their attention to mosquito-proof doors for Gambian homes. Who knew? Certainly not me.

Professor Paul Moss, Chair of the MRC’s Infections and Immunity Board, expressed the mood well when he summed up the symposium: “I’ve been immensely impressed by the quality of the research, but it’s the impact of that research that’s been outstanding and makes this simply one of the best research units around.

“There’s still a lot of work to do, on infections, non-communicable diseases, training and capacity-building, and climate change. With its strong leadership, clear themes and high quality science, it’s clear to me that MRC Unit The Gambia will lead the way.”

And so the work continues to solve the problem not only of malaria, but of the infections and other diseases which continue to blight lives both in developing countries and around the world.

Find out more about MRC Unit The Gambia at www.mrc.gm

Read this article on our MRC Insight blog: mrc.io/mrcgambia70
Sharing rare data for a common cause

The information that gathers in our wake as we move through life and health centre or hospital waiting rooms is a powerful tool for medical research. Cecily Berryman tells us how a health emergency brought discussions about data science to the heart of her family.

Three years ago my husband suddenly became very ill. He needed emergency surgery to fix a tear in his aorta, the huge artery that carries blood as it pumps away from the heart. Afterwards the surgeon called it an ‘acute aortic dissection’ and mentioned it was likely to be a connective tissue disorder that has a genetic cause. Extensive testing revealed it was not a known disorder.

We have three sons so there was a lot of discussion in our house about if, and when, they should find out if they have the same health problem as their Dad. Tests eventually revealed our two eldest children are definitely affected. Our youngest son doesn’t appear to show any signs but it’s possible there’s a genetic component we don’t know about yet and that uncertainty has been challenging to live with.

What we can do is share our health data

Our conversations with geneticists in Exeter led us to the 100,000 Genomes project and I feel we are lucky to have joined. I know health research that collects data about an individual’s genome, their personal genetic information, is a long-term process but even if it doesn’t find answers soon I’m glad our information is still in the pot. It’s possible we’ll never find an exact cause for the aorta condition that affects our family but sharing our health data is a way that we can try to find answers.

I’m on the patient participant panel for 100,000 Genomes and the project’s access review committee. That’s how I was introduced to the MRC and the new Health Data Research UK organisation that aims to use data science to learn more about what influences human health. As a member of a lay interview panel I helped to recruit Professor Andrew Morris to be HDR UK’s first Director.

Pooled data has phenomenal potential

Health data has to be the future of medicine. As I understand it, data just has so much potential – it can reveal causes of ill health, suggest preventative measures and direct more certain treatments. What has been most interesting so far is seeing the calibre of researchers that want to lead health data research, their ideas and skill are just incredible.

Taking part has helped me to cope with the impact on my husband and children because really all I can do is be an observer. If there’s a genetic cause for their aorta condition waiting to be found, then it helps me to know that we’ve done all we can to help discover it. Hopefully by sharing our data we’ve also played a small part in helping other families.
Data is shared but participation is personal

I firmly believe that making a decision to share your health data for research is a personal one. People who are willing to share need to have absolute trust that their data can be made anonymous, securely protected and only available to permitted researchers. My three sons all had different opinions on how much they wanted to know about their potential future health and on what they wanted to share.

As a family we chose to contribute to the rare diseases element of 100,000 Genomes because we would like to see researchers come up with answers that help better understand and treat the aorta condition. I can see many advantages for mass sharing of health information too.

For anyone who is thinking of taking part in a data project but is unsure I’d say think about not only what it could mean for you but how your data could help other people. My hope is that by sharing my own family’s health data we’ll have contributed to healthy outcomes for future families and that’s a decision I’m very happy with.

Read this article on our MRC Insight blog: mrc.io/sharing-rare-data

Find out more about the 100,000 Genomes Project: www.genomicsengland.co.uk/the-100000-genomes-project

Explore Health Data Research UK: hdruk.ac.uk
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We are keen to receive feedback on Network and suggestions for new features from our readers. To share your views email network@headoffice.mrc.ac.uk

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