Data for Science and Health at Wellcome

wellcome

Wellcome's new strategy

Infectious Disease

Climate and Health

Mental Health

Discovery Research

Wellcome supports science to solve the urgent health challenges facing everyone
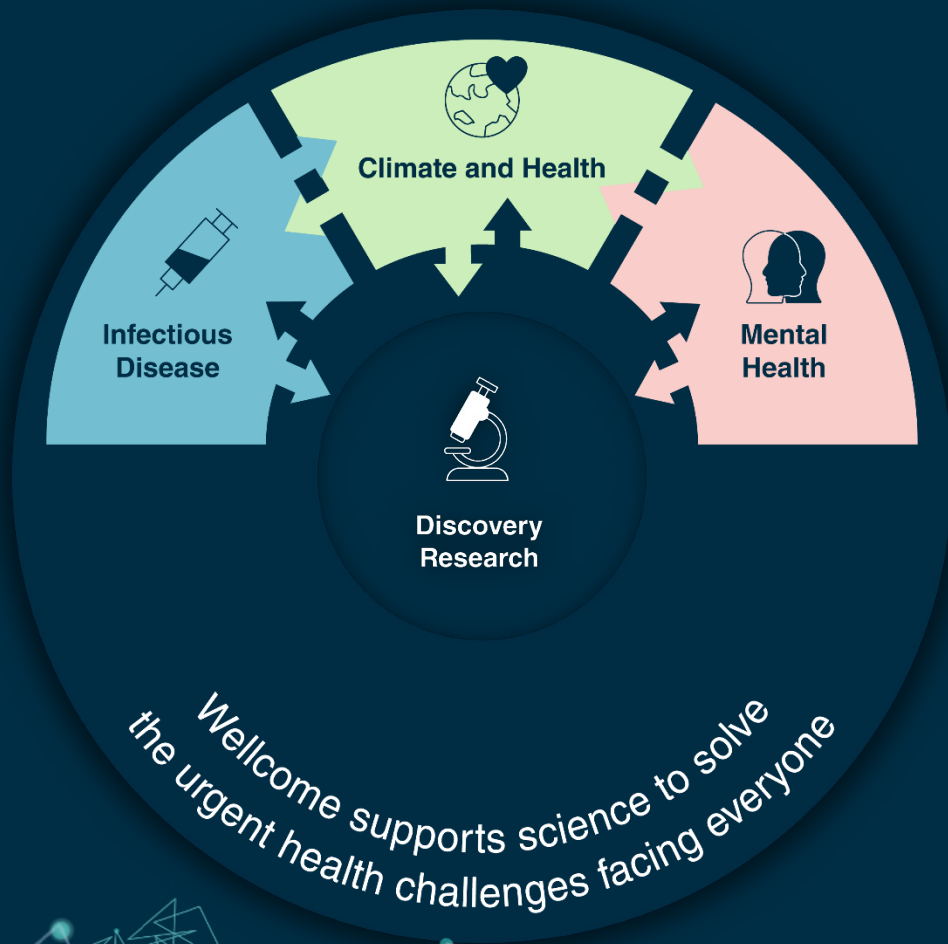
Wellcome funds curiosity-driven research into life, health and wellbeing.

We're taking on three urgent and interrelated global health challenges:

- Reducing the risk and impact of escalating infectious disease

- Putting health at the heart of climate change action

- Driving a step-change in early intervention for anxiety, depression and psychosis

Data for Science and Health (DSH) funds trustworthy data science to advance these goals.

Trustworthy data science to help solve urgent health challenges

The trustworthiness of datasets and digital technologies is determined by how they are conceived, built, used and evolved

Climate and health

The role of trustworthy data science

Better collaboration, standard practices and new tools

Training a new generation of climate-health data scientists, developing practices that support information exchange and tools to identify how climate change affects health.

Robust climate data at different spatial levels

Datasets, data platforms and prediction models that are representative of the areas most affected by climate change and can inform action at all scales – from local to global.

Closing the data to action gap

Turning climate and health data into useable information for decision makers, through new methods to synthesise evidence and new ways to engage stakeholders in the design of digital tools.

Improved data processes and governance

New approaches to data governance and sharing, to navigate the sensitivities of access to climate and health data and make more data available for research and decision-making.

Infectious diseases

The role of trustworthy data science

Standard practices and common tools for effective responses

Improving foundational datasets and regulatory infrastructure in the regions most affected by infectious diseases, to support better predictions and responses.

Giving policymakers the insight they need

New methods and tools that integrate research outputs with other types of data to inform robust policies and interventions.

Clear data processes and strong governance

Clear processes and strong governance to help build trust in the (responsible) use of sensitive data to manage infectious disease responses.

Better evaluation of digital technologies

Testing and monitoring of technologies that impact people's lives (e.g. early warning systems and track & trace apps), to assess their effectiveness before and during use.

Mental health

The role of trustworthy data science

Rich, longitudinal datasets to uncover new insights

New datasets for mental health research that are large, diverse and bring together biological, social and economic information.

Standard practices and new tools to understand and diagnose conditions

New methods and more effective tools for diagnosing and managing mental health conditions.

Bespoke data governance and sharing mechanisms

New methods to capture, store, govern and use data for research in ethical ways – as data about mental health is often considered sensitive.

A pipeline of rigorously evaluated digital interventions

Supporting the development of evaluation methods and regulatory guidance for digital mental health products, to understand the benefits and mitigate the risks.

Discovery research

The role of trustworthy data science

People, practices and tools to support scientific breakthroughs

Supporting the development of sophisticated data and technology practices in disciplines, institutions and regions that otherwise struggle to attract resources.

Connecting different research communities

Tools, methods and data platforms to help bridge disciplines and bring researchers from different fields together.

Increasing the diversity of data available for research

Improving access to different kinds of data to support scientific breakthroughs – including enhancing coverage of under-represented populations and expanding data access across regions in equitable ways.

Attracting diverse talent into data science or research software careers

Breaking down traditional academic career silos by changing what is valued in research funding and providing opportunities that support data science.

How Wellcome is supporting trustworthy data science

Digital tools

Funding effective data science methods and digital tools

Foundational data

Investing in new and existing datasets

Data diversity

Increasing the range of data available for research

Regulatory science

Influencing regulatory environments to facilitate trustworthy (data) science

Data governance

Supporting robust data governance for trustworthy access to data

Community engagement

Ensuring datasets and digital tools are co-created with communities

Skills and education

Providing opportunities for data scientists to work on health challenges

Responding to climate-sensitive infectious diseases

Climate change is having a profound effect on escalating infectious diseases.

Modelling tools already help predict and manage these changes, but more and better tools are needed.

Following a landscaping report to learn more about the gaps in the field, Wellcome is running a programme of work in this space with total investments exceeding £20 million.

This funding will support the development of new tools that will allow modelling to be done more accurately, efficiently and with greater impact on national and international policy.

Digital tools

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Open digital infrastructure and tools for infectious disease responses

Outbreak analytics is often performed rapidly, ad hoc, in response to an emergency – as seen with COVID-19.

More effective pandemic responses will require open-source digital infrastructure for use in countries that need it most.

Epiverse seeks to provide just that – whilst also addressing inequalities in access to data analysis tools by working with teams in low- and middle-income countries.

Run by data.org, Epiverse takes an open, collaborative approach, to avoid duplicative work and facilitate the development of more sustainable products.

Epiverse is supported by Wellcome in collaboration with other funders

Bringing new data into mental health research

Mental health problems are the result of a complex interplay of biological, psychological and social factors. A rich tapestry of information from these domains – and more – will be needed to learn how anxiety, depression and psychosis develop and resolve.

Wellcome funded a team based at King's College London to search the world for large, longitudinal datasets to help answer questions about mental health. The team identified over 3,000 datasets.

The goal of this work was to identify areas where funding and influence can increase the range of data sources available to mental health researchers.

Investigating the connective structure of brains

Mapping the connective structure and function of brains is a huge challenge, but could reshape our understanding of mental health and neurological conditions.

Progress in this field, known as connectomics, involves mapping the brains of increasingly complex organisms through electron microscopy.

The current challenge is constructing a connectome of the mouse brain, which is 500 times larger than anything previously imaged through this technique.

Wellcome commissioned a landscaping report in connectomics, which takes stock of the scientific, technological and organisational solutions required to generate mammalian connectomes.

Integrating climate data to drive research and action

Most of the best-curated climate data is from high-income countries. Climate data from low- and middle-income countries tends to be poor in coverage and granularity – and it is difficult to integrate it with health data.

Wellcome is funding the HARMONIZE project at the Barcelona Supercomputing Center, to develop cost-effective and reproducible digital infrastructure for stakeholders in climate change hotspots in Latin America and the Caribbean.

The team will gather, organise and process climate, environmental, socio-economic and health data from different sources, as well as collect new data using drone technology and low-cost weather sensors.

Work is starting with health ministries and research institutions in Peru, Brazil, Colombia and the Dominican Republic. The team will run public engagement in the regions where they are working.

Datasets for machine learning to improve health across the globe

Machine learning could be used to improve health – but there's also a risk it increases health inequalities, as datasets for machine learning tend to be concentrated in high-income settings and exclude certain communities.

To help efforts to address this, Wellcome has contributed to a call for machine learning-ready datasets, run by the Lacuna fund. Teams are investigating the potential of AI to help improve health across the globe.

Examples include:

- Reducing racial disparities in chronic pain in the United States, through machine learning on data about real patient outcomes

- Addressing childhood malnutrition in Chile through an integrated, multidimensional database

- Developing a machine learning-ready tuberculosis chest X-ray database for Uganda

This funding call was also supported by The Rockefeller Foundation, Google.org, and the Gordon and Betty Moore Foundation.

Regulating digital mental health tools

Digital mental health tools and apps are increasingly available. However, these products present regulatory challenges. For example, it is unclear whether they should be considered medical devices and, if so, how risk should be classified.

Wellcome is funding the UK Medicines & Healthcare products Regulatory Agency (MHRA) to help improve regulatory certainty and safety in this high-growth, high-impact area.

The funding will focus on producing guidance for appropriate, risk-proportionate regulation of digital mental health products.

The MHRA team will engage with and learn from people with lived experience, subject experts, patients and international partners.

Earning and maintaining trust in algorithmic decision-making

Autonomous systems are increasingly entrusted with life-changing decisions. These technologies carry ethical, legal, societal and economic risks, so it is crucial they are designed and implemented in trustworthy ways.

Wellcome is funding a team at the Oxford Internet Institute to investigate what it means for AI systems to be trustworthy and accountable.

The team will examine social and institutional norms, ethical values, and technical and legal constraints that guide the development of AI systems.

The team will develop a meta-toolkit for trustworthy and accountable AI, consisting of technical methods, best-practice standards and guidelines. They will also develop policy and regulatory proposals to set standards for effective use of accountability tools.

This work is funded by Wellcome, the Sloan Foundation, and NHS England.

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A collaborative approach to data on climate change

Right now, there isn't a universally recognised set of standards for reporting the impacts of the climate crisis on people's health.

There is no climate and health equivalent to 'GDP', 'inflation', 'R number' or 'maternal mortality rate'. This severely limits international monitoring and collaboration.

Wellcome is funding the UK's Office for National Statistics (ONS) to lead an international, collaborative effort to develop metrics and tools to monitor the health impacts of climate change.

ONS will work in partnership with two national statistics agencies in regions where the effects of the climate crisis are most likely to be felt.

Global, ethical integration of neuroscience data

Integrating neuroimaging data with other behavioural and cognitive data could support research that transforms our understanding of mental health.

Yet the fragmented data governance landscape limits the data available for research, and causes geographically siloed and redundant data collection.

Wellcome is funding the development of an international data governance framework, to provide clarity and direction for researchers, institutions and funders working across national borders.

The project will bring together global stakeholders to co-create the framework and develop best-practice principles.
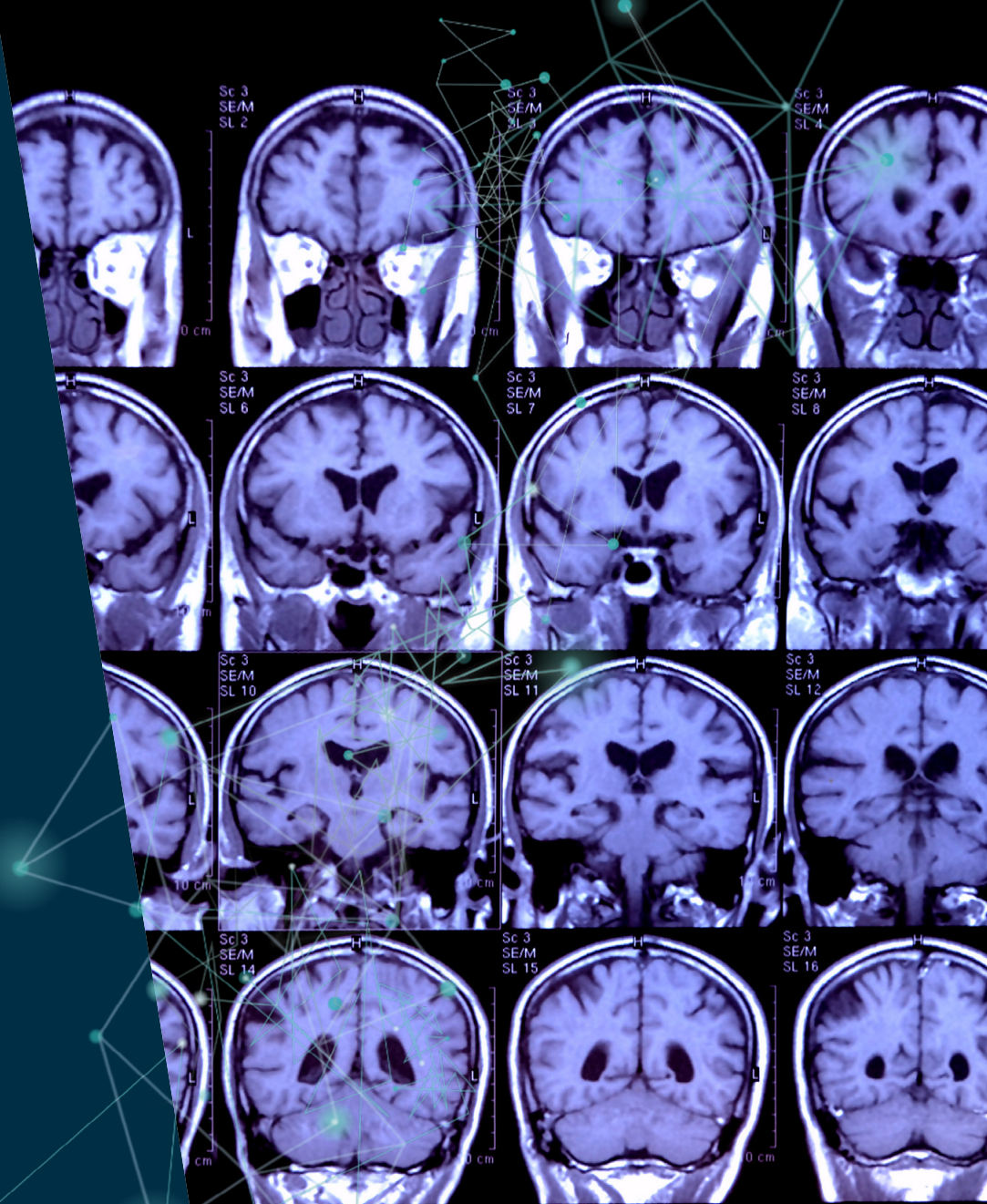
Prize funding for mental health data analysis and digital tools

Wellcome's Mental Health Data Prizes are supporting collaborative approaches to research into anxiety and depression in young people.

Teams are exploring existing data to find new insights and building digital tools to enable future research. We designed the prize to prioritise inclusivity, creativity and multidisciplinary working – including the involvement of people with lived experience.

We ran the first prize in the UK and South Africa, supporting teams working on:

- The impact on mental health of reading for pleasure, school connectedness and physical activity
- The socio-economic determinants of anxiety and depression in South Africa
- The disproportional use of stop and search powers by police and the impact on young Black people's mental health in the UK

Based on learnings from that first prize, Wellcome is now running a new data prize open to teams across the African continent, which will be co-created with research communities.

Community engagement

Investigating ethnicity categories in UK health data

Ethnicity categories in UK healthcare are inconsistent and not always accurate. This has real-world consequences for healthcare and policy decisions – like how we estimate the risks of Covid-19 for different groups. So Wellcome funded several research and engagement projects to investigate.

This research contributes to the ongoing debates about ethnicity data recording by:

- highlighting the challenges faced in capturing reliable data
- identifying the gaps and comparing different ways of handling ethnicity data
- emphasising the importance of data quality
- calling for immediate attention to improve the overall effectiveness of data collection in addressing health inequalities

Ultimately, our goal is to support the development of trustworthy practices for collecting and using ethnicity data.

Building hubs to educate and support new climate health data professionals

The intersection of climate and health represents a new, interdisciplinary scientific field. This field requires a new generation of data scientists with skills and knowledge that cross boundaries.

Wellcome is funding the creation of two hubs in India and sub-Saharan Africa, to generate data science professionals with the skills to work in this field.

Each hub will train 100-200 professionals and support 20-30 social impact or public sector organizations, through paid data science fellowships for graduates.

The programme also aims to train 30,000 data scientists online and will publish open-source resources to help to expand the impact.

Wellcome is funding data.org, the Global Partnership for Sustainable Development Data and J-PAL South Asia to setup these hubs.

Promoting collaboration across climate and infectious disease data communities

Climate change is having a profound effect on escalating infectious diseases.

Modelling tools already help predict and manage these changes, but their true potential to support evidence-based decision making is limited by a lack of collaboration between subject matter experts, modellers and decision makers.

Following a landscaping report into the field, Wellcome is now funding the creation of a community of practice around open-source climate-sensitive infectious disease modelling tools, so they can more effectively inform policy and practice in future.

Write to us at:

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