

SUSTAINABLE DEVELOPMENT GOALS – CASE STUDY THREE

**Contributing to the Sustainable Development Goals
through science**



DENGUE VACCINE RESEARCH – MEXICO

Dengue is a tropical disease transmitted by mosquitos which mainly affects people in coastal and low-lying areas. Infected patients develop a sudden high fever, usually accompanied by generalised body pain and a skin rash. The pain can be very severe.

Across the world, about 2.5 billion people are at risk of contracting dengue. The disease is consuming vast amounts of resources, with 50–100 million clinical cases and 500,000 hospitalisations each year.

Despite the large numbers of people affected, the risks of dengue and the associated chikungunya virus have been neglected because the disease is often thought not to put lives at risk and to have fairly benign effects. But it can kill elderly and weak people, causing 22,000 deaths each year. Many patients are so badly affected they are unable to work.

Researchers at the Nuffield Department of Medicine at Oxford University have been studying how infected cells respond to the virus as the basis for developing a vaccine. They wanted to make links with laboratories and universities in Mexico, in order to build a partnership to take forward the work.

This case study looks at the way that the support of the Newton Fund* facilitated the creation of a network of researchers in Oxford and Mexico and how this in turn is contributing to achieve several of the United Nation's Sustainable Development Goals (SDGs), despite this not being a specific aim of the funding. It highlights elements of the project that link to the SDGs. Many of the British Council's aims are echoed in the SDGs and the way in which projects are designed and run reflect an ethos of inclusion and partnership which are also at the heart of the SDG agenda. There is much that the British Council can do to progress this agenda. There is also much that the British Council and its partners can learn from the issues the SDGs set out.

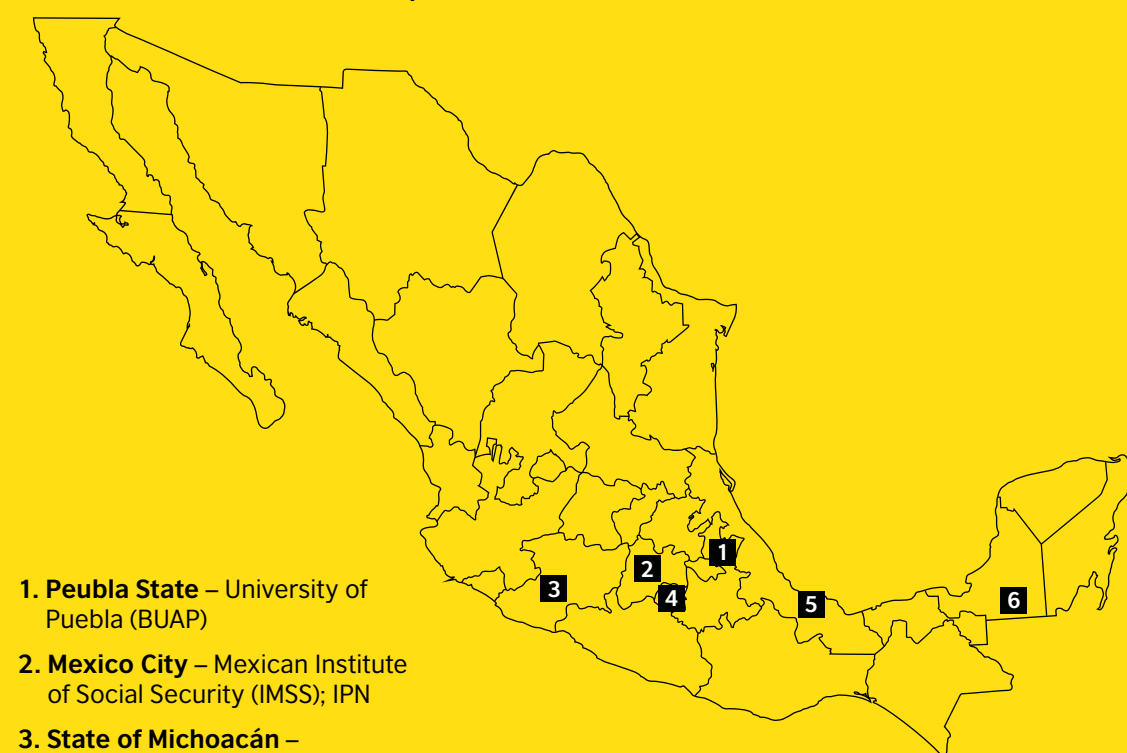
* The Newton Fund builds scientific and innovation partnerships with 16 partner countries to support their economic development and social welfare, and to develop their research and innovation capacity for long-term sustainable growth. It has a total UK Government investment of £735 million up until 2021, with matched resources from the partner countries. It is managed by the UK Department for Business, Energy and Industrial Strategy (BEIS), and delivered through 15 UK Delivery Partners, which include the Research Councils, the UK Academies, the British Council, Innovate UK and the Met Office.

The **Newton Fund** grant for developing institutional links to support work on a dengue vaccine has led to the development of an exciting network of public, academic and business organisations that are all keen to be part of the initiative.

The project built strong, sustainable, systemic relationships with partner country institutions, including state public health laboratories and universities. Resources were obtained to improve equipment and provide training in sample collection and preservation.

The strength of this network has led to the formation of a consortium for vaccine development.

A consortium on vaccine development Newton Fund Institutional Links



1. **Puebla State** – University of Puebla (BUAP)
2. **Mexico City** – Mexican Institute of Social Security (IMSS); IPN
3. **State of Michoacán** – U. De Colima; Health Laboratory (LESP-1); Lázaro Cárdenas; University Of Michoacán (UMSNH); ISSTE
4. **Cuernavaca** – INSP; Institute of Biotechnology (UNAM)
5. **State of Veracruz** – University of Veracruz
6. **Tuxtla Gutiérrez and State of Campeche** – Ecosur (CONACyT)

Meeting local needs

Dengue and other tropical diseases represent a major public health challenge for Mexico but one that is often overlooked. There is limited infrastructure, for example for safely storing samples from patients who have been infected and a lack of trained staff. Laboratory facilities in major cities are more common and better equipped than in regions where the virus is most prevalent.

Professor Arturo Reyes Sandoval of the Jenner Institute at Nuffield Department of Medicine (NDM) who led the institute's dengue and vivax malaria vaccine development group, recognised that there was an opportunity for NDM to work with universities, public health institutions and private companies in Mexico to develop responses to these diseases and that this would have benefits for all those involved.

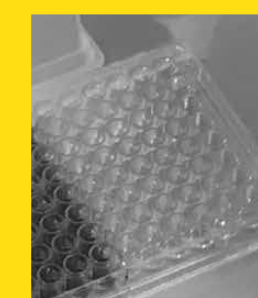
He obtained a grant from the Newton Fund's Institutional Links programme which funds projects to build UK–partner country research and innovation collaborations, which involve shared research to develop innovative approaches to challenges which have direct relevance to social welfare and economic development.

An important feature of the project was that it built collaboration with Mexican laboratories and institutions and at the same time gave UK researchers access to patients in Mexico to develop their understanding of the behaviour of the disease. These features ensured the project was successful and gave it a greater impact. There were also academic links: Mexican researchers were trained in Oxford and three UK researchers travelled to Mexico to train staff there.

Professor Martha Eva Viveros Sandoval of the San Nicolas Hidalgo University of Michoacan said *'This is a huge opportunity for us – it has provided training, contact with researchers in the UK and given us one master's student in 2015 and two in 2016.'*

The project has resulted in:

- The creation of a UK–Mexico consortium for vaccine development.
- New research collaborations over other vaccines: HPV, Typhoid vaccien, Chikungunya, Zika.
- Economic benefits
 - capacity for development of research skills
 - capacity for new businesses.
- Academic research and Innovation.
- Increase in the participation of Mexican researchers in NMD summer internship programme: 2013= 0% -> 2016 = 39%.



Link between the Newton Fund’s activities and the Sustainable Development Goals

The Newton Fund is incorporating contributions to the SDGs as a criterion for assessing funding proposals. The selection of projects is through expert panels. These look at two types of criteria: the quality of the research and, separately, its developmental relevance. A project needs to meet both criteria: a project that is relevant to the SDGs must also be of good quality and vice versa.

There are two selection panels, one in the partner country and one in the UK. They make their assessment separately and then the results are looked at together to come to a final selection. Partners are also co-funders.

Liliana Carral, the Newton Fund’s Programme Manager in Mexico, reports that the Fund has supported projects contributing to the SDGs on poverty alleviation, clean energy, climate change, health and education.

‘It is not difficult for the British Council to work towards the SDGs as we are familiar with this kind of target. Some researchers are very aware of sustainable development. The story of the dengue vaccine is a good example.’

Liliana Carral

For the researchers leading the programme, the SDG 3 on health and well-being and SDG 17 on partnerships are implicit in all their work, not something that they have had to tailor their projects to match.

Martha Eva Viveros points out that health and well-being is an enormously important goal for Mexico but that those affected by ‘neglected’ diseases like dengue sometimes feel it is ignored. International recognition of the importance of health through the UN SDGs and funding programmes like the Newton Fund are useful reminders.

Leaving no one behind is a core principle of the SDGs and of the Newton Fund

The Newton Fund monitors the way that the projects it supports are distributed across the different SDGs so that it can target its resources effectively. It has also been looking at gender equity in funding and taking measures to remove obstacles to women’s participation. Two changes were made specifically to remove barriers to the involvement of women researchers:

- The minimum length of study trips has been reduced. Previously study trips lasted for between three and six months. Now researchers can apply to go for shorter periods or to make more than one trip within a single grant. This makes it easier for women with children to participate as they don’t have to be away from home for long periods.

- The funding now includes an allowance for childcare, which is available for either parent.

The Newton Fund’s own monitoring shows that women represented 35 per cent of researchers receiving funding in the Newton Fund’s first year and 45 per cent in the second year. While there is no data to demonstrate exactly what caused this increase in the percentage of women obtaining research funding, it seems likely that the two changes to funding have had an influence.

Examples of the Dengue virus research project’s contribution to the SDGs

DENGUE RESEARCH GOALS	DENGUE RESEARCH ACTIVITIES	SDG TARGETS MET
Develop dengue vaccine testing on humans	<ul style="list-style-type: none">• Progress towards clinical trials.• Building local capacity.• Extending research to other viruses.	Goal 3 Good health and well-being 3.5 By 2030,end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases.
Capture the economic benefits of dengue research	<ul style="list-style-type: none">• Involvement and increased awareness on the part of Ministry of Health.• Creation of local consortium for vaccine development.	Goal 8 Decent work and economic development 8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation.
Build collaboration between research teams in the UK and Mexico	<ul style="list-style-type: none">• Network on neglected and emerging infectious diseases extended.• Increased participation of Mexican researchers in international programmes.	Goal 17 Partnerships for the goals 5.1 End all forms of discrimination against all women and girls everywhere. 5.5 Ensure women’s full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life.



<p>Additional goals to be addressed</p> <p>Claire McNulty, Director of Science and Research at the British Council, sees the Newton Fund's Institutional Links funding as a catalyst:</p> <hr/> <p><i>'It supports the first steps on the journey of translation of research into benefits. The aim is to get research used to tackle development needs and challenges in partner countries.'</i></p> <p>Claire McNulty</p> <p>The Institutional Links collaborations carried out in the first year of the Newton Fund have been mapped against the SDGs. This showed that across the funded projects, all the SDGs were being addressed. It became clear that relevance to the SDGs was not limitation on innovation and the SDGs are now mentioned in communications to applicants. It is suggested that applicants think about the SDGs and how their research supports them. Having the goals has been important in the evolution of the programme.</p> <p>Science, technology and innovation (STEM) projects are crucial for achieving all of the SDGs, but aren't enough on their own. They need the support of social science disciplines. There needs to be more interaction and collaboration between social scientists and STEM scientists.</p> <p>There is also a need for support for the whole research ecosystem – including schools, research management and technicians on the one side and on the users of the research outputs on the other side – businesses, community organisations etc., to ensure that science is really contributing effectively to the SDG agenda.</p>	
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<p>Challenges in demonstrating how projects are contributing to the SDGs</p> <p>While the Newton Fund research covers most of the SDGs, it is easiest to see where the links are in the Institutional Links strand which involves collaboration between institutions. It is useful to map the Institutional Links activities to the SDGs, to be able to show the relationships.</p> <p>The SDGs are not used as performance indicators: the performance indicators are drawn from evaluation frameworks used by the research institutions that the Newton Fund is working with and there is a tendency not to try to measure impact because it is so difficult.</p> <p>However, there always needs to be a long-term plan for research, which means that as well as outputs, there does need to be some method for collecting longer-term outcomes and impacts. One way that the Newton Fund is addressing the need for information on longer-term outcomes is Researchfish, an online facility that enables research funders to track the impacts of their investments and researchers to log the outputs, outcomes and impacts of their work and to attribute their academic achievements. Specifically, the service enables funders access to reporting by the global research community on the outcomes of their work and gain a broader and deeper understanding of research activities that helps them to identify pathways to research impact to inform future funding strategies.</p> <p>The Newton Fund is a complex programme: the focus on innovation means that there is a long period from idea to product and through to use, making evaluation more difficult.</p>	
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<p>Summary</p> <ul style="list-style-type: none"> • The Newton Fund's support for the Dengue vaccine research programme has facilitated the start of a process by which research is being translated into social and economic benefits for areas affected by the dengue virus in Mexico. The work has potential to provide far-reaching benefits to other countries as well. • The emphasis on institutional links has borne fruit with the creation of a consortium of public sector, academic and private sector partners. This consortium continues to grow both in terms of the number of partners and the research areas it is addressing. This creates the potential for further contributions to the SDGs. • For the researchers working on the Dengue vaccine project, the requirement to demonstrate the relevance of their work to the SDGs was not seen as an imposition but merely confirmed the implicit focus of their work. • It is important to look for evidence of the longer-term impacts of research funding. Facilities for sharing the results of research activities and developments from them over time may provide some potential for monitoring and evaluation in other fields. 	
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