GLOBAL REPORT
FOR RESEARCH ON
INFECTIONIOUS DISEASES
OF POVERTY

A summary of the key findings and supporting materials

WITH FINANCIAL SUPPORT OF
European Union
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TDRO
For research on diseases of poverty
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The *Global Report for Research on Infectious Diseases of Poverty* was initiated and facilitated by TDR, the Special Programme for Research and Training in Tropical Diseases, based on wide contributions from stakeholders at various stages of the work. Under the leadership of the TDR Stewardship function, high level experts from around the globe were brought together for research, analysis and consultations. The result is an independent publication comprising different viewpoints written by expert authors in each chapter.

The first chapter sets the context and outlines ten areas where research on infectious diseases of poverty can make major improvements; these form the framework for the rest of the report. The next three chapters take these ten areas forward by focusing on specific themes: the environment, health systems, and innovation and technology. A fifth chapter discusses the research funding landscape while the final sixth chapter considers the issues and evidence presented in the rest of the report to propose high level actions, including the best research strategies against infectious diseases of poverty.
A paradigm shift is necessary – this report was written to challenge the perspectives of researchers, funders and decision-makers. It offers new ways of improving public health in poor countries, with research as the compelling foundation and driver for policies.

Infectious diseases remain key agents of the debilitating poverty afflicting so much of the world today. Each year these diseases kill almost nine million people, many of them children under five, and they also cause enormous burdens through life-long disability. Stepping up research into their causes and how to effectively treat them and prevent them from spreading could have an enormous impact on efforts to lift people out of poverty and to build a better world for future generations.

The Global Report for Research on Infectious Diseases of Poverty provides a rich review of the issues that have developed and suggests ways of tackling the problems from a more multi-disciplinary, systems-based approach.
Ten compelling reasons for research

1. **Break the vicious cycle of poverty and infectious disease.** The interrelationships between health, infectious diseases and poverty are dynamic and complex. Timely, targeted research will prevent infectious diseases from driving more people into poverty.

2. **Forge an escape for the poor and vulnerable.** Poor people living in the areas most affected by environmental factors are least able to respond to the challenges of environmental and climate change. Interactive, interdisciplinary research can identify ways to mitigate risk factors, establish the potential impact of interventions on the environment and direct future interventions to minimize risk.

3. **Tackle multiple problems.** Research will help understand both causes and consequences of poly parasitism, coinfection and comorbidities with non-communicable diseases on people, societies and systems. An integrated understanding of the complex relationships underpins effective integrated health system delivery and effective disease control programmes.

4. **Commute the life sentence.** Many people must live with the long-term debilitating effects of past or current infection. Research can find ways to mitigate the consequences of chronic and persistent lifelong infection and its secondary complications and associated stigma.

5. **Be prepared – forewarned is forearmed.** Surveillance is essential at all levels to understand patterns of emergence, including the spread of drug and insecticide resistance. Mapping, monitoring and evaluation of these trends are critical. Access to such surveillance data allows us to anticipate and respond to emergent, re-emergent and drug-resistant diseases.
6. **Reach the hardest to reach.** By identifying ways to strengthen health infrastructure and better deliver services in impoverished areas, we can reach disenfranchised populations who continue to struggle with the burden of poverty and disease. Health systems research can create positive synergies between disease control and wider health systems in poor regions.

7. **Prevent loss in translation.** Progress along the route from basic research to clinical and public health practice is slow and patchy. Integrated multidisciplinary research programmes should aim to anticipate and avoid potholes along the route to the introduction of more effective interventions.

8. **Identify small changes that can make a big difference.** Relatively low levels of investment in evidence-based interventions can have a big impact. Small modifications in where and how we deliver treatments and care can achieve dramatic improvements. Effective research that demonstrates positive effects from small modifications should be rapidly scaled up in poor communities.

9. **Stay focused on the light at the end of the tunnel.** Much has been achieved to date and even the most difficult situations are not irreversible. Significant progress will continue to be made if investment in coordinated research programmes is expanded and sustained.

10. **Act quickly on what we know.** Policy-makers and global funders need to have access to the right information at the right time to inform decisions that draw on the evidence of what works, and feed “best buys” into health policy, health budgets and the operations of health systems. Research data must therefore be rapidly translated into effective tools for policy-makers.
Authors grouped by chapters

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“THE CHALLENGES TO INFECTIOUS DISEASES FROM ENVIRONMENTAL CHANGES ARE WELL DOCUMENTED HERE, AND THE RESULTING IDEAS OFFER WAYS TO CREATE A MORE SUSTAINABLE DEVELOPMENT APPROACH.”

Mr Jeffrey O’Malley, Director, HIV/AIDS Group, Bureau for Development Policy
United Nations Development Programme (UNDP)

“THE GLOBAL PLATFORM SUGGESTED HERE TO TRACK HEALTH RESEARCH RESOURCES COULD STRENGTHEN NATIONAL SYSTEMS IN DISEASE ENDEMIC COUNTRIES AND INCREASE THE EFFECTIVENESS OF INTERNATIONAL FUNDING FOR RESEARCH FOR HEALTH.”

Dr Marie-Paule Kieny, Assistant Director-General of Innovation, Information, Evidence and Research
World Health Organization (WHO)
Research strategies for infectious diseases of poverty: Five options for actions

The authors of the *Global Report* have developed a call for five high level actions to be considered by researchers, funders, policy-makers, civil society organizations and their communities.

These actions place research as the compelling foundation and driver for policies, and if implemented appropriately, they will set the stage for improved public health interventions that will have a measurable impact on the lives of the people who suffer the most from infectious diseases of poverty.
Summary of key findings

Managing sleeping sickness will increase agricultural productivity

The number of workdays lost in agricultural work has been linked to the incidence of sleeping sickness, according to the Infectious Diseases of Poverty (IDP) Index. The latest release of the 2014 data clearly showed the relationship between the greatly reduced income of farmers in Country X and the incidence of sleeping sickness, which has been endemic there for many years. As a result, both the national government and two international funders are putting resources into research for new ways to control the tsetse flies that carry the disease, as well as developing new diagnostic test and treatments.
Despite the fact that infectious diseases of poverty are typically among the most critical factors limiting a country’s economic development, there is at present no simple, easily understood composite index or rating system that includes the status of the control and elimination of these diseases. In a global society that is driven by flows of information across borders and into major capitals, the lack of such an index may explain why these diseases have such low visibility in the international health and development community.

An index of infectious diseases of poverty that is based on the prevalence and incidence of infectious diseases can act as a barometer of health and development. Countries can monitor their progress in the control of these diseases with an index like this that is updated at regular intervals. The index can also generate major interest from the media, other stakeholders and the general public that in turn persuades policy-makers, funders and researchers that investments in improving health also improve socioeconomic prosperity. This is particularly important as infectious diseases of poverty lost much of their visibility during the first ten years’ implementation of the MDGs.

An infectious diseases of poverty index could also influence the MDGs in their next iteration (e.g. through identification of target diseases among target populations), and so influence future global action.

The creation of the Index of Infectious Diseases of Poverty will require a concerted effort among health and development stakeholders, in a process aimed at identifying readily available indicators that can be deployed for this purpose. The index could be used to quickly monitor and evaluate trends in relation to infectious diseases of poverty and the impacts of interventions. The index could be disaggregated according to local, national or regional criteria to allow policy-makers in disease endemic countries to monitor and evaluate their own efforts in tackling infectious diseases. Funders could use the index to prioritize areas of research so that funding is geared according to need.
Summary of key findings

there is a compelling new paradigm for research on infectious diseases of poverty that requires a broader, more holistic approach. it includes linkages between climate, agriculture, natural resources, the environment and health, as well as the milieu for emerging diseases. the challenges of zoonotic diseases transmitted from animals to humans have been built off a “one health” concept, but the global report calls for another dimension to be added to this – a “one world” concept – to incorporate ideas of development and delivery and the synergies between control programmes and health systems. a ‘larger table’ is needed for policy-makers, funders and researchers to fully address these new complexities.

Governments in disease endemic countries should work towards increasing interactions between

Policy-makers, funders and the academic community need to embrace a “one health, one world” strategy, to foster essential multi-disciplinary and multi-sectoral approaches for a full continuum of research.

Option 2

Implement a “one health, one world” strategy in relation to research for infectious diseases of poverty

There is a compelling new paradigm for research on infectious diseases of poverty that requires a broader, more holistic approach. It includes linkages between climate, agriculture, natural resources, the environment and health, as well as the milieu for emerging diseases. The challenges of zoonotic diseases transmitted from animals to humans have been built off a “one health” concept, but the Global Report calls for another dimension to be added to this – a “one world” concept – to incorporate ideas of development and delivery and the synergies between control programmes and health systems. A ‘larger table’ is needed for policy-makers, funders and researchers to fully address these new complexities.

Governments in disease endemic countries should work towards increasing interactions between
finance, environment, health, science and technology, and agriculture. They should also work to enlarge the spectrum of science and scientists that contribute the necessary knowledge. When health system issues are being considered, they must include community and local dimensions. Information contributed by social and economic sciences, control programmes, animal health, agriculture, environment (including climate change), natural resources and wildlife should all be included when developing plans for research on infectious diseases of poverty.

Uptake of the “One Health, One World” strategy should lead to increased collaborative research and interactions between government departments and other stakeholders, more sustainable ways to tackle the problems and better interventions at a faster pace.

**IMAGINE THIS IN THE NEWS…**

**Cysticercosis on the path toward elimination**

More than one million people are reducing their risk to a disease that causes epilepsy. Cysticercosis is a disease caused by a tapeworm that affects both humans and pigs. Consequently, the disease creates two major problems – not only the health aspect but also an economic one because farmers can’t sell their pigs to earn money. Eliminating this problem requires multiple approaches, which the “One Health, One World” campaign launched in 2012 has helped develop. Veterinarians, clinical researchers, and ministry officials from science, health, agriculture, environment and finance all came together to fight this disease. One outcome was a new vaccine that can prevent cysticercosis. Another was an environmental approach to eliminate human defecation from open lands where the pigs graze and pick up the parasite, so community volunteers set up locally accepted sanitation facilities. The two strategies support each other, one by preventing the disease in humans, and the other by removing the infective source for pigs.
Option 3

Promote research ownership by disease endemic countries

Ownership, active engagement and investment in the research enterprise for control of infectious diseases of poverty must be strengthened with effective policies in order for countries where infectious diseases are endemic to reap the full benefits of advances in research for health.

Imagine this in the news...

International funding coming for nationally set health research priorities

New funding of US $2.5 million will be coming to address infectious disease research priorities identified within the country. The nationally agreed list of health research priorities developed for the first time and published in the scientific press has helped international funders see how they can best support the needs. Expert consultations were held within the country and with scientists from several universities and global health funders. Several of those funders have agreed to align their research calls to the priorities adopted by the government, resulting in this new flow of financial support to meet the critical health needs.
It is typical for national research agendas and implementation strategies in low and middle income countries to be driven by international funders. This is because these countries often have little or no capacity to mount their own research programmes or develop their research strategies. But this approach must change to better understand, control and prevent the spread of infectious diseases. Because so many of the critical milestones in the life-cycle of a disease outbreak occur within the affected countries themselves – from first observations and impact assessment to the development and implementation of intervention strategies and subsequent monitoring and control – it is critical that these countries be the ones which guide the research, ensuring that their own needs are met and their implementation strategies are effective and sustainable.

Consequently, disease endemic countries are encouraged in this third option to develop research priorities congruent with the burden of infectious diseases of poverty in their own populations; increase their own research activity and improve research leadership; develop regional partnerships to build research infrastructure, human resources and research capacity; create policies and develop plans to guide national and international investments towards the identified research priorities; and aim to increase their national support for research and translation of research to strategies for health.

To promote greater in-country ownership of research programmes, global funders, philanthropies, universities and commercial entities should vigorously seek to engage in long term partnerships with institutions in low and middle-income countries, including universities, public health and research institutes, and healthcare systems. A key goal of these partnerships should be the achievement of research independence in the partner countries, primarily by boosting support and training, access to a steady stream of diverse research grants, and by generating demand for scientific and analytical work that influences public health policy and contributes to improved health.
Option 4

Foster a culture of innovation to benefit public health

A culture of innovation must be developed within countries burdened by infectious diseases of poverty; this culture should support and promote the social, legal, political and regulatory environment that promotes innovation in public health systems.

In most low and middle income countries, the public and private sectors are not geared towards developing new technology and innovative approaches to the infectious diseases of poverty. The systems for support and local participation are not set up, so most new treatments and strategies come from outside, but they lack local knowledge and sustainability.

A new paradigm of an “open innovation culture”, with a broader definition of innovation that is supported by the social, legal, political and regulatory environment, should be encouraged. This environment can be created through collaborations of research and development agencies, industry and academia – both “North” and “South” – with disease endemic countries.
Home grown capacity for scientific research and technological knowhow should be built up with the support of a strong health research and development policy, in parallel with an improved research infrastructure and enhanced budget.

An “open access innovation platform” should be created and adopted, comprising a repository of tools and enabling mechanisms that both respond to the needs of disease endemic countries and expedite the global community’s efforts to meet the challenges of diseases of poverty.

Open access to research information and to raw data (with new concepts and information on intellectual property) must be promoted as part of this platform.

Implementation of this action will lead to more innovation-focused research with disease endemic countries playing a more central role. An open innovation platform should improve the access to and sharing of data and consequently speed up scientific discovery and production of interventions.

**IMAGINE THIS IN THE NEWS…**

**Bednet distribution improved as a result of research sharing among African countries**

A new approach to distributing insecticide-treated bednets to prevent malaria-carrying mosquitoes from biting has been developed in Country X. Health officials in a northern village in this country worked with a team of research students who found a model developed in Country Y that they felt could be adapted to their conditions. The information was freely available on the open Innovation Platform which stores data and evidence from social, economic, and health research on infectious diseases of poverty from across the world. The platform has the goal of increasing the pace of new tools and strategies. In this case, the exchange among African countries provided details on best practices in specific geographic zones, the optimal timing for distribution and what resources should be located at the distribution centres.
Option 5

Create an online global platform of research resources to inform on strategies, policies and funding commitments

Periodic systematic analysis of the research resource landscape for infectious diseases of poverty should be performed to identify resource gaps and provide information to guide strategic planning.

Currently there is no single, transparent, and user-friendly tool widely available to health policy-makers, funders and researchers that helps them develop strategies, policies, and mechanisms. The dearth of information on health research resources (financial and non-financial) makes it hard to identify gaps in funding and other resources, including manpower and infrastructure.

An easily accessible, online global platform is recommended to include information on who funds what, together with where, when and how much funding is available. Used together with the research needs identified in Option One’s infectious diseases of poverty index, and Option Four’s innovation platform, the resources platform would help improve ownership by low and middle-income countries.
described in Option Three and allow better, more cohesive and effective support for research on infectious diseases of poverty.

This platform should result in a more balanced portfolio of funding across countries and sectors, and better alignment of research with national priorities. A transparent and accurate picture of the funding landscape would be a positive contribution to the “One Health, One World” concept.

**IMAGINE THIS IN THE NEWS…**

**New funding to increase access to malaria medicines in remote, African villages**

Thanks to a new online database of infectious disease research funding, new support is going to several African countries from both national and international sources. The IDP (infectious diseases of poverty) database set up 4 years ago has been helping countries to see and analyse funding patterns. Country X found out that the majority of funding was going to develop new drugs for diseases that were not a major issue there, yet millions of children were not getting valuable bednets and antimalarial treatments. So both the country and 3 international funders are working together to support more research that will identify the bottlenecks and increase access. This type of research is called implementation, or operational research, and has now risen to the top of funding priorities where there are good treatments and strategies that are not being used.
Going forward

These five options for action arise from the *Global Report for Research on Infectious Diseases of Poverty*, in which the authors argue that a systems-based approach to addressing these diseases is the only way forward if the global disease burden is to decrease. Research in all sectors needs to be structured on the basis of accurate and meaningful data. The current wastage of resources brought on by a scatter-gun approach to funding must end. What will always be limited resources must be channelled in the right direction, and the proposed index that links infectious diseases to development will act as a solid foundation for building this effort.

It might seem obvious to advocate for a holistic interdisciplinary approach to research, but the fact is we are faced with a disease-by-disease and “silo” thinking approach. This must come to an end. “One Health, One World” sets the scene for a new strategic direction for research. This should be accompanied by a new equilibrium in favour of the emerging economies most affected by the infectious diseases of poverty, which allows them to set their research agendas and yet continue to benefit from the expertise and resources available in those countries and the funding institutions that have “called the shots” so far.

These changes cannot be brought about by some waving of a magic wand; they will require years of continued dedication from all the actors in the complex web of research and funding initiatives. This is why a new culture of innovation must be encouraged to emerge within the “One Health, One World” strategy.

And finally, there is the issue of allocating financial resources according to needs on the ground and not on the basis of donor preferences or political patronage and expediency. This will always be a challenge, but if the current over-allocation in some areas and the dearth of resources in others is to be replaced by a more balanced and coherent investment strategy, it must be possible to have information at hand that produces a needs-based investment flow.

The authors of this report remain optimistic in the face of the challenges that lie ahead. The emergence of new institutions, partnerships, networks and funding streams is proof of political will and offers great hope for the eventual eradication of these diseases.

These five calls to action, which set the architectural framework upon which progress can be built, can revolutionize the global research landscape and result in a better life for those who suffer most from the infectious diseases of poverty.
“THIS REPORT OUTLINES IMPORTANT ISSUES FOR CREATING MORE EQUITY AND REACHING THE POOREST AND HARD TO REACH CHILDREN. ITS CALL FOR MORE IMPLEMENTATION RESEARCH TO REDUCE BOTTLENECKS IS A CRITICAL TO-DO.”

Dr Mark Young, Senior Health Specialist, Policy and Evidence, Health Section, Programme Division
United Nations Children’s Fund (UNICEF)

“This report is a valuable resource for low and middle income countries who want to expand innovation, research and development capabilities.”

Dr Armin Fidler, Lead Health Policy Adviser, Human Development
The World Bank
The full report and more details, resources and visual aids are available online at:
www.who.int/tdr/stewardship/global_report