www.isglobal.org

ISGlobal

ANNUAL REPORT ISGLOBAL 2013

A partnership of:

Obra Social "la Caixa"

CLÍNIC BARCELONA Hospital Universitari

Universitat de Barcelona

Generalitat de Catalunya

GOBIERNO DE ESPAÑA

Barcelona Institute for Global Health

	Malaria Elimination Initiative 2013	Chagas Initiative 2013
Research	• Epidemiology of malaria • *Plasmodium vivax* research • Studies on loss of immunity following cessation of exposure to the parasite • Strategic planning for malaria elimination • Entomology and vector control • Economic analysis	• Epidemiology of Chagas disease • Biomarkers for the early detection of cardiac damage and therapeutic efficacy • Development of new drugs for the treatment of chronic Chagas disease (E1224) • Immunological aspects of Chagas disease
Training & Education	• Course: The Science of Eradication: Malaria (Barcelona)	• 9th Workshop on Imported Chagas Disease (Barcelona)
Think Tank	• Secretariat of the Malaria Eradication Scientific Alliance (MESA) • Report on progress in the science of eradication (prepared by Policy Cures) • Participation in the preparation of the WHO's *World Malaria Report* 2013 • Conference: Advances in *Plasmodium Vivax* Malaria Research	• Global Chagas Disease Coalition: a roadmap for increasing access to treatment • Chagas Week in Cochabamba, Bolivia
Technical Cooperation	• Elaboration of a strategic plan for the elimination of malaria on the island of Lihir in Papua New Guinea	• Coordination of the Chagas platform in Bolivia

	Maternal, Infant and Reproductive Health Initiative 2013	Antibiotic Resistance Initiative 2013
Research	• Malaria in pregnancy (MiPPAD and PregVax projects) • Validation of the minimally invasive autopsy tool in the investigation of cause of death (CADMIA project) • Operational research related to the introduction of the human papillomavirus (HPV) vaccine	• Factors that increase antimicrobial resistance • Molecular basis for resistance (Saturn project) • European network for combatting antibiotic resistance (COMBACTE project) • Identification and validation of novel drug targets in Gram-negative bacteria (AntiPathoGN Project)
Training & Education	• Module in the ISGlobal-UB Master of Global Health • Training on HPV in Mozambique	• Workshop on the detection of antimicrobial resistance held in Morocco • Conference on *Escherichia coli* in collaboration with the European Society of Clinical Microbiology and Infectious Diseases
Think Tank	• Report: *Tracking Maternal Mortality Through an Equity Lens* • Advocacy and participation in decision-making forums on women's health and malaria in pregnancy	• Discussion Forum: The Global Threat of Antimicrobial Resistance
Technical Cooperation	• Support for the introduction of the HPV vaccine in Mozambique (PapVac project)	

With the Support of

Obra Social "la Caixa"

Bill & Melinda Gates foundation

Clínic Barcelona Hospital Universitari

aecid

Universitat de Barcelona

Generalitat de Catalunya

Agència Catalana de Cooperació al Desenvolupament

Agència d'Avaluació de Tecnologia Mèdica

Agència de Gestió d'Ajuts Universitaris i Recerca

Ajuntament de Barcelona

Associació Catalana d'Universitats Públiques

AstraZeneca

Biokit

Centers for Disease Control and Prevention

CEPHEID

CIBER - Epidemiología y Salud Pública

Drugs for Neglected Disease initiative

European Comission, Seventh Framework Programme

European & Developing Countries Clinical Trial Partnership

European Society of Clinical Microbiology and Infectious Diseases

Foundation Open Society Institute

Fundación para la Investigación Biomédica – Hospital Ramón y Cajal

Fundació IrsiCaixa – Hospital Germans Trias i Pujol

Fundación Mundo Sano

Fundación Privada Cellex

Fundación Ramón Areces

GlaxoSmithKline Biologicals

IMS Health

Innovative Medicines Initiative

Institució dels Centres de Recerca de Catalunya

Instituto de Salud Carlos III

International Society of Travel Medicine

Jacobs University Bremen GmbH

Johns Hopkins University

Laboratorios LETI

London School of Higiene & Tropical Medicine

Medicines for Malaria Venture

Merck Sharp & Dohme de España

Ministerio de Economía y Competitividad

Ministerio de Educación

National Institute of Health

Pfizer

Program for Appropriate Technology in Health

PATH Malaria Vaccine Initiative

Royal Society of Tropical Medicine and Hygiene

Servicio Andaluz de Salud

Siemens Healthcare Diagnostic

Swiss Federal Institute of Technology Zurich

The Institute of Tropical Medicine

Thrasher Research Fund

Tres Cantos Open Lab Foundation

World Health Organisation

Letter from the Director

When Barcelona's Hospital Clínic created Spain's first tropical medicine unit in 1984, it laid the groundwork for the country's long tradition in this specialty. Building on this base, in 2006 we founded the Barcelona Centre for International Health Research (CRESIB), which four years later became the cornerstone of the newly created Barcelona Institute for Global Health (ISGlobal). With the creation of ISGlobal, the task of treating tropical diseases was complemented and supported not only by the knowledge generated through research but also by the transfer of this knowledge to society.

ISGlobal was founded in a complex and restrictive financial climate, but the support of our trustees and the collaboration of our partners have allowed us to achieve and maintain a high level of excellence and remain competitive over the years. Moreover, our desire to maintain these standards has led us to implement a growth strategy aimed at increasing our capacities and expanding our scientific agenda to make ISGlobal one of the top three global health institutes in Europe by 2014. This year, with the support of the Catalan Government, ISGlobal has forged closer ties with the Centre for Research in Environmental Epidemiology (CREAL) as an initial step in the eventual merger of the two institutes, and CREAL has become the third member of the strategic alliance formed initially by ISGlobal and CRESIB.

Throughout these twelve months, we have continued to attract and retain the talent on which ISGlobal is built. The other elements that are key to our strategy as a global health institute—our international partners in Mozambique, Bolivia and Morocco—have also shown strong growth this year. Together, we will continue to work towards closing the health equity gap affecting the world's most vulnerable populations.

Pedro L. Alonso
Director de ISGlobal

Board of Trustees

The Barcelona Institute for Global Health is the fruit of a collaboration between institutions from the public and private sector. During 2013, the ISGlobal Board of Trustees membership was as follows:

H.R.H. The Infanta Cristina de Borbón,
President of the Board
Director of the International Area
of the "la Caixa" Foundation

Mr. Javier Solana Madariaga,
Vice-president of the Board
President of the ESADE Center
for Global Economy and Geopolitics

Ms. Mª Mercedes Vinuesa Sebastián,
Board Member
Director-general for Public Health,
Quality & Innovation. Ministry of Health,
Social Services and Equality, Government
of Spain

Mr. Jesús Manuel Gracia Aldaz,
Board Member
Secretary of State for International
Cooperation and for Ibero-America,
Ministry of Foreign Affairs and
Cooperation, Government of Spain

Dr. Boi Ruiz, Board Member
Minister of Health, Autonomous
Government of Catalonia

Dr. Dídac Ramírez Sarrió, Board Member
Rector of the University of Barcelona

Dr. Isidre Fainé Casas, Board Member
Chairman of "la Caixa" and the "la Caixa"
Foundation

Mr. Jaume Lanaspa Gatnau,
Board Member
President and Chief Executive Officer
of the "la Caixa" Foundation

Dr. Roberto Constantino Tapia Conyer,
Board Member
Director-general of the Instituto
de la Salud Carlos Slim

Dr. Josep Mª Piqué, Board Member
Director-general of the Hospital Clínic
de Barcelona

Dr. Enric Banda Tarradellas,
Secretary of the Board
Manager of the Area of Science, Research
and Environment of "la Caixa"
Foundation

Sr. Carles Constante i Beitia,
Board Member
Director-general of Regulation, Planning
and Health Resources, Department
of Health, Autonomous Government
of Catalonia

Dr. José Mª Leal Villalba, Board Member
Chairman of Caja Burgos

International Global Health Partnership Board

The International Global Health Partnership Board is made up of individuals and institutions of recognised international prestige in the field of health and international cooperation. One of the functions of the Committee is to advise the Board of Trustees and offer a global vision of the executive strategy of the organisation.

Aga Khan Foundation
Bill & Melinda Gates Foundation
Dr. Ciro de Quadros
Dr. Graça Machel
Dr. Jaime Sepúlveda Amor
Dr. Marcel Tanner
Instituto Carlos Slim de la Salud
Manhiça Foundation
Nelson Mandela Children's Fund

How We Work

At ISGlobal, we are committed to reducing inequity in health. Our goal is to transform the vicious circle of poverty and disease into a virtuous circle of health and development. We do this primarily by generating scientific knowledge oriented towards action.

The aim of our work model is to potentiate the positive impact of science as an instrument of change seeking a better understanding of the factors and mechanisms that determine diseases and their clinical course, implementing effective interventions and assessing their impact; and strengthening national health systems. We seek to transfer the scientific knowledge to society by educating and training professionals, analysing health strategies and policies, and carrying out real world projects.

Since knowledge transfer is particularly important in the field of global health, in ISGlobal we have launched four initiatives to increase the impact of research-generated knowledge beyond the realm of science. Focused on the four areas in which we are at the forefront of the research effort, the aim of the initiatives is to explore all the ways the knowledge generated by research can be transferred to society.

- Malaria Elimination Initiative
- Chagas Initiative
- Maternal, Infant and Reproductive Health Initiative
- Antibiotic Resistance Initiative

New Alliances

In 2012, we took the first steps towards expanding the long-standing strategic alliance between ISGlobal and the Barcelona Centre for International Health Research (CRESIB) to include the Centre for Research in Environmental Epidemiology (CREAL). The integration of these three centres is being supported by the Catalan Government through the SUMA programme for the amalgamation of research centres belonging to the CERCA network. The aim is to consolidate the excellence of the three institutions and increase their synergies and influence by creating a single entity with a greater capacity for global leadership in research, innovation and knowledge translation in global health.

Considerable progress has been made in 2013 on developing the common organisational model that is an essential precursor to the integration of the three centres as a single institution under the ISGlobal name. CRESIB and CREAL, the two research centres, are dedicated to generating new scientific knowledge about infectious, chronic, and non-communicable diseases, and their social and environmental determinants, while ISGlobal's Training Department, Think Tank and Technical Cooperation Department focus on the translation of this knowledge to society.

ISGlobal Barcelona Institute for Global Health

RESEARCH	THINK TANK	TRAINING	TECHNICAL COOPERATION
Knowledge Creation	Knowledge Management	Knowledge Transmission	Knowledge Application

CREAL · CRESIB Barcelona

↓

INITIATIVES

Research

Antoni Plasència

Technical Director, CRESIB, ISGlobal Research Centre

In 2013, we have seen a substantial consolidation of ISGlobal research capabilities and outputs, which constitute the core of its mission. The total annual output has stabilized in recent years at around 160 papers, with malaria and viral and bacterial infections as the leading topics. Overall, one out of every three new projects submitted was approved and financed. At present, we have 177 active projects, amounting to a total budget of 17 million euro.

Competitive funding has increased overall and we have been successful in obtaining competitive research funds from a broader range of new public and private sources (accounting for 40% and 60%, respectively). According to a recent report,[1] for every euro provided by the Generalitat de Catalunya—CRESIB's main contributing Trustee—more than eight euros were obtained from external research funding sources, making CRESIB the most effective health research centre in Catalonia.

In 2013, CRESIB's first strategic cycle (2010-2013) was successfully completed and positively evaluated by its external Scientific Advisory Committee. Our translational activities have been strengthened with the creation of Innovex Therapeutics, a spin-off company oriented towards the creation of an exosome-based vaccine platform. At the same time, ISGlobal's position as a leading research centre in Global Health has been reinforced by its designation as a WHO Collaborating Centre for Malaria Control, Elimination and Eradication.

[1] Observatori del Sistema de Salut de Catalunya. Central de Resultats. Recerca en Ciències de la Salut. Dades 2012. Barcelona: Agència de Qualitat i Avaluació Sanitàries de Catalunya. Departament de Salut. Generalitat de Catalunya, 2014.

ISGlobal's research programme is carried out by CRESIB, an international health research centre that was founded some years before ISGlobal and that in 2013 was an independent entity. The scientific knowledge generated by CRESIB's research activity is enhanced through the work of ISGlobal's departments, creating a virtuous circle involving knowledge, action, and impact on health.

CRESIB BARCELONA

Hospital Clínic - Universitat de Barcelona

Leading research at:

ISGlobal

Institució CERCA
Centres de Recerca de Catalunya

Facts and Figures

WHO Collaborating Centre for Malaria Control, Elimination and Eradication

Articles & Reviews

157

% in First Quartile

67%

% in First Decile

33%

Normalized Impact 2007-11*

2.09

* Scimago Institutions Ranking 2013

Researchers

Innovation

Heparin-lipidic nanoparticle conjugates.

- Inventors: Fernàndez-Busquets, X., Marques, J., Moles, E.
- Institutions: IBEC, CRESIB
- Ref. number: EP13152187.4
- Priority countries: Europe
- Filing date: January 22, 2013

Main Active Research Projects

"A phase III study to evaluate, in infants and children, the efficacy of the RTS,S/AS01E candidate vaccine against malaria disease caused by *P. falciparum* infection, across malaria transmission settings in Africa"

PI: Pedro L. Alonso
Funding Institution: PATH/MVI
Funding: 9.6 M$
Calendar: 2009-2013

SYSMALVAC - "Identifying correlates of protection to accelerate vaccine trials: systems evaluation of two models of experimentally-induced immunity to malaria"

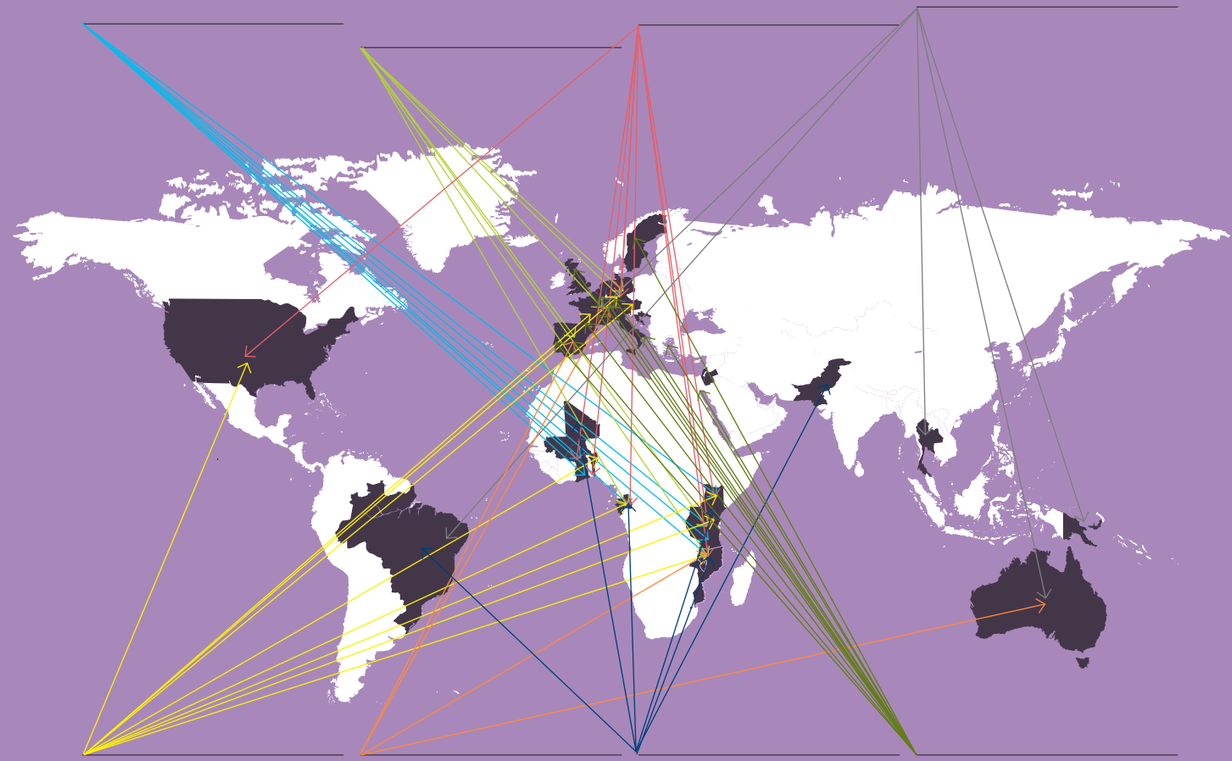
PI & Coordinator: Carlota Dobaño
Funding Institution: FP7 European Union
Funding: 2.8 M€
Calendar: 2013-2015

"Understanding RTS,S malaria vaccine-induced protection through integrated analysis of antibody, B Cell and T Cell immune responses"

PI & Coordinator: Carlota Dobaño
Funding Institution: NIH
Funding: 3 M$
Calendar: 2012–2017

TRANSEPI - "The Comparative Epidemiology of *P. falciparum* and *P. vivax* transmission in Brazil, Thailand and Papua New Guinea"

PI & coordinator: Ivo Mueller
Funding Institution: Bill & Melinda Gates Foundation
Funding: 3.5 M$
Calendar: 2012–2015



MiPPAD - "Evaluation of alternative antimalarial drugs to sulphadoxine-pyremethamine for intermittent preventive treatment in pregnancy (IPTp) in the context of insecticide treated nets"

PI & coordinator: Clara Menéndez
Funding Institutions: EDCTP, Malaria in Pregnancy Consortium (MiPc) and Fondo de Investigaciones Sanitarias (FIS)
Funding: 6.6 M€
Calendar: 2008-2013

GAMA - "Development of novel gastrointestinal biomarkers for use in HIV incidence determination in a sub-Saharan African setting "

PI and Coordinator: Denise Naniche
Funding Institution: Bill & Melinda Gates Foundation
Funding: 1 M$
Calendar: 2012–2016

CaDMIA – "Validation of the Minimally Invasive Autopsy (MIA) tool for cause of death investigation in developing countries"

PI and Coordinators: Quique Bassat, Clara Menéndez and Jaume Ordi
Funding Institution: Bill & Melinda Gates Foundation
Funding: 1.4 M$
Calendar: 2013-2015

COMBACTE - "Combatting Bacterial Resistance in Europe"

PI: Jordi Vila
Funding Institution: Innovative Medicines Initiative (IMI), European Union
Funding: 2.5 M€
Calendar: 2013–2020

Malaria

Despite being an entirely preventable and treatable disease, malaria is still a serious health burden in large areas of the world—particularly sub-Saharan Africa—and in two of the most vulnerable population groups: children and pregnant women. Thanks to new tools and an increase in the available resources, we have witnessed spectacular progress over the last decade. However, the evidence shows that as soon as efforts relax the situation once again deteriorates. This is why the only long-term, sustainable solution is the complete elimination of the parasite in a given territory. In ISGlobal, the Malaria Elimination Initiative is the lynchpin for efforts focused on the elimination of this parasitic disease.

Main Lines of Research

- Enabling technologies for malaria research
- Parasite biology
- Physiopathology
- Malaria immunology
- Diagnostics
- Evaluation of preventive and therapeutic tools
- Epidemiology and clinical presentation of *Plasmodium falciparum* and *Plasmodium vivax*
- Vector biology and control
- Novel approaches and strategies for malaria elimination

Main Results 2013

- We assessed the performance of six multiplex commercial kits in the quantification of cytokine and chemokine responses in culture supernatants from *P. falciparum* stimulations. Luminex-based kits with magnetic beads were found to have the best performance (Moncunill *et al*, PLoS One, 2013a).

- Heparin was found to bind with high specificity to *P. falciparum*-infected red blood cells versus non-infected red blood cells. This finding opens the way for the design of heparin-based nanotherapies for the targeted delivery of antimalarial drugs (Valle-Delgado *et al*, Nanoscale, 2013).

- We reported the first evidence of the presence of sugar nucleotides in the blood stages of *P. falciparum* and described the active metabolic routes involved in their biosynthesis. In addition, the de *novo* route of GDP-Fuc, a metabolite probably involved in the biosynthesis of novel fucosylated glycans not yet described in the malaria parasite, was characterised (Sanz *et al*, J Biol Chem, 2013).

- It was demonstrated that malaria parasites can become resistant to toxic compounds such as drugs as a result of epigenetic switches in the expression of genes necessary for the formation of solute channels (Mira-Martinez *et al*, Cell Microbiol, 2013).

- Antibody responses to *P. falciparum* in pregnant women were shown to be affected by variables that influence the risk of exposure to the parasite, such as parity, season and neighbourhood. HIV infection modifies these associations between exposure and antibody responses, probably through its impact on the maintenance of IgG responses (Mayor *et al*, JID, 2013).

- We found evidence of *P. falciparum* parasites expressing specific VAR2CSA variants that have the potential to reach a high parasitaemia in the placenta and eventually increase the risk of poor pregnancy outcomes. The motifs in VAR2CSA associated with high placental parasitaemia in the study may be of relevance to our understanding of the molecular mechanisms that mediate parasite sequestration to host tissues and to the development of new preventive tools against placental malaria (Rovira-Vallbona *et al*, PLoS One, 2013).

- Different antimalarial compounds were assessed in two studies. Artemether/lumefantrine (AL) was found to be an acceptable, interim option for young children in co-endemic areas where *P. vivax* is resistant to chloroquine. AL produces a rapid clinical response against both *P. falciparum* and *P. vivax* malaria. However, it is associated with a high rate of *P. vivax* recurrent clinical episodes, and should therefore ideally be complemented with a course of primaquine (Senn *et al*, CID, 2013). Furthermore, analyses of different dihydroartemisinin-piperaquine dosing schedules demonstrated the excellent efficacy of the formulation in a wide range of transmission settings. Treatment failure was associated with a lower dose of piperaquine, particularly in young children, suggesting that there is potential for further dose optimisation (WorldWide Antimalarial Resistance Network DP Study Group, PLoS Med, 2013).

Malaria Elimination Initiative

- Advances in the development of an *in vitro* culture system for *P. vivax* were reported (Fernandez-Becerra *et al*, Mem Inst Oswaldo Cruz, 2013; Martín-Jaular *et al*, Malar J, 2013).

- A novel computational approach was used to redefine the subtelomeric *vir* superfamily of *P. vivax*. This methodology, resource and new classification of *vir* genes will contribute to a new structural framing of this multigene family and other multigene families in malaria parasites (Lopez *et al*, BMC Genomics, 2013).

- In a study undertaken to describe clinically relevant cytoadhesive phenotypes of *P. vivax*, rosetting was shown to be a frequent cytoadhesive phenotype in *P. vivax* infections associated with an increased risk of anaemia. No specific cytoadhesion phenotypes associated with pregnancy were observed, although a *P. vivax* haplotype was more frequent among pregnant women than non-pregnant hosts, suggesting that other, as yet unknown, parasite phenotypes may increase the propagation of certain *P. vivax* clones observed in pregnant hosts (Marín-Menéndez *et al*, PLoS Negl Trop Dis, 2013).

- In areas where *P. vivax* and *P. falciparum* are co-endemic, immunity to *P. vivax* seems to be acquired more rapidly. The high number of *P. vivax* clones that infect children in early childhood was shown to be likely to contribute substantially to the rapid acquisition of immunity against clinical *P. vivax* malaria (Koepfli *et al*, PLoS Negl Trop Dis, 2013). In addition, in a cohort of Papua New Guinea children aged 1 to 3 years, the presence of antibodies to Merozoite Surface Protein 3α (PvMSP3α) Block II and Merozoite Surface Protein 9 (PvMSP9) N-terminus was shown to be associated with protection against clinical *P. vivax* malaria. This suggests that (PvMSP3α) Block II and

(PvMSP9) N-terminus should be further investigated for their potential as *P. vivax* vaccine antigens (Stanisic *et al*, PLoS Negl Trop Dis, 2013).

● Age- and exposure-dependent immune responses to *Plasmodium* infections may be the key to understanding the role that age and exposure play in the acquisition and maintenance of naturally acquired immunity to malaria. We evaluated immune responses (cytokines, chemokines and IgG levels against blood stage proteins) using flow cytometry and Luminex in plasma from Mozambican adults and children and European adults living in Spain who had visited Africa (travellers) or lived there for at least one year (migrants). Our findings indicate that age does not play an important role in the immune response to a first malaria episode. Migrants had a different cytokine/chemokine and antibody profile compared to immune adults, but also to naive adults. Upon cessation of malaria exposure, IgG responses to malaria-specific antigens were maintained to a large extent, although the conservation and magnitude of the recall response depended on the nature of the antigen. However, control of pro-inflammatory responses and tolerance to *P. falciparum* appeared to be reduced (Moncunill *et al*, PLoS One, 2013 b,c,d).

● The influence of temperature on the effectiveness and toxicity of chemical insecticides was established, providing information pertinent to the impact of vector control tools. In particular, data on the impact of temperature variations throughout the day led the authors to suggest that testing recommendations for new tools should include a broader range of temperatures so as to allow their deployment in different environments. (Glunt *et al*, PLoS Pathog, 2013). Daily fluctuations in habitat temperature were also studied in relation to vector fitness. It was shown that a cool mean temperature significantly increased larval development and survival, whereas warm temperatures reduced these processes. These findings are essential to understanding the distribution limits of vectors and their response to climate change (Paaijmans, Global Change Biology, 2013).

● Malaria epidemiology on Lihir Island, Papua New Guinea, was investigated. A substantial reduction in the prevalence and incidence of *P. falciparum* and *P. vivax* was found in villages adjacent to a mining area where an integrated malaria control intervention had been implemented. In other areas of the island, parasitaemia levels remained high. The observed reduction confirmed the positive impact of malaria interventions on transmission patterns (Mitjà *et al*, Malaria Journal, 2013).

● The economic burden of malaria in children under five years of age was estimated in three sub-Saharan African countries. Both direct and indirect costs were calculated. The findings may assist policy makers in the design and introduction of future malaria control interventions, help to guide the introduction of new prophylactic measures and improve the current strategies for malaria control (Sicuri *et al*, Malaria Journal, 2013).

● Strategic thinking on the key challenges and prospects for malaria control and elimination highlighted the risks posed by insecticide and drug resistance, weak health systems and declining funding, while stressing the importance of further R&D to improve malaria control and progress towards elimination. The authors also emphasized the need to address both *P. falciparum* and *P. vivax* in any elimination campaign (Alonso and Tanner, Nat Med, 2013).

Chagas Disease

Because of the potential for transmission and chronic health complications, Chagas disease clearly affects the health of Latin American immigrants living in Spain, where the disease is not endemic, and the Spanish health system. Since 2002, we have been involved in research on this imported disease in Spain. In 2008, we launched an intervention strategy in Bolivia, the endemic country most affected by this neglected disease.

Main Lines of Research

- Epidemiology of Chagas disease in non-endemic areas
-Biomarkers for therapeutic efficacy in treated patients and early diagnosis of cardiac damage in patients with Chagas disease
-Clinical trials for new drugs to treat Chagas disease parasitologically
-Studies on the pharmacokinetics of benznidazole

Main Results 2013

● Migratory flows have facilitated the spread of Chagas disease into areas where it was previously unknown. Economic, social and cultural factors play a significant role in the presence and perpetuation of the disease. We undertook a systematic review to provide a comprehensive overview of the qualitative research on Chagas disease in both endemic and non-endemic countries. Most interventions do not address clinical, environmental, social and cultural aspects together. Therefore, an explicitly multidimensional approach, incorporating the experiences of people affected by Chagas disease, is a potential tool for the development of successful long-term programmes (Ventura-García *et al*, PLoS Negl Trop Dis, 2013).

● Following our work on biomarkers, we evaluated an ELISA test based on a mucin glycoprotein antigen from *Trypanosoma cruzi*. This technique, which allows the serological detection of lytic antibodies against the parasite, proved to be highly sensitive and specific. This assay can therefore be used to detect active *T. cruzi* infection and to monitor trypanosomicidal treatment (Izquierdo *et al*, Mem Inst Oswaldo Cruz, 2013).

● Immunosuppression, which has become an increasingly common clinical condition in recent years, modifies the natural history of *T. cruzi* infection in most patients with Chagas disease. Parasitaemia is the most important defining feature of reactivation. We analysed the relationship between Chagas disease and immunosuppressive conditions and provided recommendations for the management of these patients based on our experience and on the data in the literature (Pinazo *et al*, PloS Negl Trop Dis, 2013).

● Cure biomarkers are crucial in assessing the efficacy of antiparasitic drugs in clinical trials. The lack of a reliable method to for assessing whether Chagas disease has been

cured is a major concern. Several potential biomarkers have been proposed for the detection of early cardiac or gastrointestinal disease. The validation of these clinical tools is essential to identify high-risk patients who require intensive monitoring and early therapy. We conducted a systematic review of biomarkers that are potentially useful in Chagas disease to provide an overview of the subject and help researchers choose future lines of research (Requena-Mendez *et al*, Expert Rev Anti Infect Ther, 2013).

● Information on the pharmacokinetics of benznidazole is limited. The data from our study show that benznidazole at a dosage of 5 mg/kg/day results in mean serum concentrations at the top of the trypanocidal range (3 to 6 µg/mL), indicating that this regimen is appropriate for obtaining therapeutic drug concentrations. Moreover, mean serum concentrations were below toxic levels. Adverse events were not related to serum concentrations in this cohort of patients (Pinazo *et al*, Antimicrob Agents Chemother, 2013).

● Together with the Platform for the Integral Care of Patients With Chagas Disease and the Drugs for Neglected Diseases Initiative (DNDi), we carried out a Phase II clinical trial of the experimental drug candidate E1224 as a treatment for Chagas disease. The new drug showed good safety and was effective in clearing the parasite that causes Chagas disease but its sustained efficacy over time was low (30%) compared to that of the current treatment, benznidazole (80%).

Maternal, Infant and Reproductive Health

Global health indicators show that maternal health is still the area in which the greatest inequities persist. Every year, around 287,000 women die as a result of complications related to pregnancy, childbirth or the postpartum period, and more than eight million children under five years of age die. Almost all of these deaths are from preventable causes and many could be avoided with the adequate use of evidence-based technology, preventive and therapeutic tools, and cost-effective measures. In the last decade, we have contributed to achievements in women's and children's health through field research undertaken to create tools that will lead to better and more effective application of knowledge generated in low and middle income countries.

Main Lines of Research

- Malaria in pregnancy
- Operational research on the acceptability and feasibility of the implementation of a human papillomavirus (HPV) vaccination programme for preadolescent girls in Africa.
- Pharmacovigilance studies of antiretroviral and antimalarial drugs in pregnant women
- Aetiology and risk factors for anaemia in children
- Causes of death in low-income countries

Main Results 2013

● In a study undertaken to describe clinically relevant cytoadhesive phenotypes of *P. vivax*, rosetting was shown to be a frequent cytoadhesive phenotype in *P. vivax* infections associated with an increased risk of anaemia. No specific cytoadhesion phenotypes associated with pregnancy were observed, although a *P. vivax* haplotype was more frequent among pregnant women than non-pregnant hosts, suggesting that other, as yet unknown, parasite phenotypes may increase the propagation of certain *P. vivax* clones observed in pregnant hosts (Marín-Menéndez *et al*, PLoS Negl Trop Dis, 2013).

● Antibody responses to *P. falciparum* in pregnant women were shown to be affected by variables that influence the risk of exposure to the parasite, such as parity, season and neighbourhood. HIV infection modifies these associations between exposure and antibody responses, probably through its impact on the maintenance of IgG responses (Mayor *et al*, JID, 2013).

● We found evidence of *P. falciparum* parasites expressing specific VAR2CSA variants that have the potential to reach a high parasitaemia in the placenta and eventually increase the risk of poor pregnancy outcomes. The motifs inVAR2CSA associated with high placentalparasitaemia in the study may be of relevance to our understanding of the molecular mechanisms that mediate parasite sequestration to host tissues and to the development of new preventive tools against placental malaria (Rovira-Vallbona *et al*, PLoS One, 2013).

● The concentrations of dichlorodiphenyltrichloroethane (DDT) compounds in the cord blood of 214 children born between 2003 and 2006 in Manhiça (Mozambique) were determined. The strongest factor affecting DDT concentration was parity. A well-defined decreasing concentration trend was observed for the cord blood concentrations in the period of study. Children from multiparous women showed much lower concentrations than primiparous women (Manaca *et al*, Envion Sci Pollut Res Int, 2013).

● Women with HIV RNA in breast milk showed a different pattern of microbiological composition, suggesting specific immunopathological phenomena in HIV-infected women. Both breast milk and faecal microbiota composition varied with lactation period. These findings provide insight into interactions between commensal bacteria and HIV infection in human milk and the role of these bacteria in mucosal protection against infections in breastfed infants (Gonzalez *et al*, PLoS One, 2013).

● Severe malnutrition among hospitalised children in Mozambique was found to be common but frequently undetected despite the association with a high risk of death. Measures to improve the recognition of severe malnutrition by clinicians responsible for the first evaluation of patients at the out-patient level are urgently needed in order to improve the likelihood of survival (Nhampossa *et al*, Public Health Nutr, 2013).

● In a prospective autopsy study that included all consecutive pregnancy-related deaths in a tertiary referral hospital in Maputo, Mozambique, between October 2002 and December 2006, extensive sampling of all major viscera was performed. Massive visceral sequestration of *P. falciparum*-infected erythrocytes with significant involvement of the central nervous system was found to be an infrequent but definite direct cause of maternal death in endemic areas of Africa (Castillo *et al*, Clin Microbiol Infect, 2013).

Viral and Bacterial Infections

Viral and bacterial infections account for a substantial proportion of the burden of disease, especially in under five years of age children in low-income countries. In particular, resistance to antimicrobial drugs is a serious global problem for many reasons: it threatens our ability to treat infectious diseases, it increases healthcare costs, and it poses a serious threat to the progress made in global health by individuals and communities over the past few decades. We have deployed our expertise in research in this area to contribute to the effort to fight the various causes of antimicrobial resistance.

Main Lines of Research

- Design of new tools for the rapid diagnosis of infectious diseases
- Molecular bases of antimicrobial resistance
- Relationship between virulence and antimicrobial resistance
- Discovery and assessment of new antibiotics
- Surveillance, phylogeny and clinical impact of the influenza virus and emergent viruses
- Search for biomarkers for the diagnosis and prognosis of bacterial and viral infections
- Pathogenesis and antimicrobial resistance of microorganisms that cause neonatal sepsis
- Treatment of yaws in Papua New Guinea

Main Results 2013

● In a multicentre study, 9,439 children with moderate-to-severe diarrhoea seeking care at health centres together with one to three randomly selected matched community control children without diarrhoea (13,129) were recruited in four sites in Africa and three in Asia. By analysing adjusted population attributable fractions, we found that most attributable cases of moderate-to-severe diarrhoea were due to four pathogens: rotavirus, *Cryptosporidium*, enterotoxigenic *Escherichia coli* producing heat-stable toxin (ST-ETEC, with or without co-expression of heat-labile enterotoxin), and *Shigella* (Kotloff *et al*, Lancet, 2013).

● In the predominantly rural Manhiça district in southern Mozambique, diarrhoea is one of the leading causes of death among children under five years of age. A survey on the use of healthcare services for gastroenteritis found that independent risk factors for seeking healthcare included the presence of diarrhoea with fever and ignorance of the signs of dehydration. Having a television at home was related with an independent decreased use of medical facilities. In another survey, the use of health services was significantly associated with diarrhoea accompanied by fever and vomiting. Establishment of continuous prospective monitoring would make it possible to account for changes in healthcare use that may be a result of seasonality or secular events (Nhampossa, Am J Trop Med Hy, 2013).

● Among enterotoxigenic *E. coli*, the most frequent toxin was STh, and the most frequent colonisation factors (CFs) were CS21, CS6, and CS3 (Rivera *et al*, J Clin Microbiol, 2013).

● We investigated whether hospitalisation for lower respiratory tract infections (LRTI) associated with rhinovirus during infancy was associated with an increased risk of wheezing. The findings suggest

that there is a short-term increased risk of wheezing after an initial episode of LRTI with rhinovirus (O'Callaghan-Gordo *et al*, PLoS one, 2013).

● We analysed the viral load (VL) of human metapneumovirus and human bocavirus in infants aged under 12 months admitted for bronchiolitis. VL correlated with length of hospital stay in both viruses: human metapneumovirus VL correlated with the duration of oxygen therapy and human bocavirus VL correlated inversely with days of respiratory effort before admission (Ricart *et al*, Pediatr Infect Dis, 2013).

● The *Haemophilus influenzae* type b (Hib) conjugate vaccine has dramatically reduced invasive Hib disease worldwide. However, data on the vaccine's efficacy in protecting against pneumonia in children with HIV are limited. The impact of the introduction of Hib conjugate vaccine in 2009 in a rural, high-HIV-prevalence area in Mozambique was evaluated. A considerable reduction in invasive disease and pneumonia following the introduction of the Hib conjugate vaccine in a high-HIV area was observed. Continued surveillance is needed to monitor the long-term effects of Hib conjugate vaccine, particularly among children with HIV (Sigauque *et al*, J Pediat, 2013).

● In 2012, one oral dose of azithromycin was shown to be as effective as intramuscular penicillin in the treatment of yaws, and the WHO launched a new initiative to eradicate the disease by 2020 (Mitjà *et al*, Lancet, 2013).

Antibiotic Resistance Initiative

● Multidrug resistance is a problem in the management of tuberculosis (TB), and new regimens that include currently available drugs are urgently needed. Of the various combinations of antimicrobials tested, the levofloxacin/amikacin/ethambutol combination was the most potent against *Mycobacterium tuberculosis* multiplying inside macrophages (Rey Jurado *et al*, Int J Antimicrob Agents, 2013).

● We found high levels of resistance to ampicillin and cotrimoxazol in diarrhoeagenic *E. coli* in children under five years of age in Lima, Peru. We also found that there is tendency to overuse antibiotics for diagnosed pharyngitis, bronchospasm and the common cold (Ecker *et al*, Pediatric, 2013; Rev Peru Med Exp Salud Public, 2013).

● Among 362 *Salmonella enterica* isolates of non-Typhimurium serotypes isolated in Terres de l'Ebre (Catalonia, Spain), 16.5% showed multidrug resistance (MDR). Overall, 35 isolates (9.2% of all isolates and 54% of MDR isolates) belonging to 15 different serotypes carried class 1 integrons. On investigating the antimicrobial resistance of *Shigella* sp. causing traveller's diarrhoea, an increase in nalidixic acid and tetracycline resistance was observed (Pérez-Moreno *et al*, Int J Med Microbiol, 2013; Pons *et al*, Travel Med Infect Dis, 2013).

● It has been suggested that efflux pumps are the main mechanism of resistance to rifaximin in *E. coli* isolates and that efflux pumps play a role in the basal levels and development of azithromycin resistance in *S boydii*. The combination of antibiotics and efflux pump inhibitors appears to be a good solution for reducing the frequency of mutation in *E. coli* and *Shigella* sp. clinical isolates (Gomes *et al*, Trans R Soc Trop Med Hyg, 2013; Microb Drug Resist, 2013; Int J Antimicrob Agents, 2103).

● Carbapenem-resistant *Acinetobacter baumannii* clinical isolate belonging to European clone II is on the rise worldwide, mainly in association with the production of OXA-23. The first description of this clone in Spain and an outbreak caused by an OXA-23 carbapenemase-producing *A. baumannii* were reported (Mosqueda *et al*, Antimicrob Agents Chemother, 2013; Espinal *et al*, Antimicrob Agents Chemother, 2013).

● The *in vitro* activity of ozenoxacin, a novel nonfluorinated topical quinolone, was compared with the activity of other quinolones against well-characterised quinolone-susceptible and quinolone-resistant gram-positive bacteria. Ozenoxacin was 3-fold to 321-fold more active than other quinolones. Ozenoxacin could be a first-in-class nonfluorinated quinolone for the topical treatment of a broad range of dermatological infections (Lopez *et al*, Antimicrob Agents Chemother, 2013).

HIV/AIDS

Remarkable inroads have been made against the global HIV epidemic over the past few years. New HIV infections and HIV-related deaths are decreasing more rapidly than ever before, and treatment programmes have expanded rapidly. However, more than two million people are newly infected with HIV every year, antiretroviral coverage still lags in some regions, and important disparities persist, notably for men, pregnant women, adolescents and key populations. Our research in HIV/AIDS focuses on sub-Saharan Africa and predominantly women and children, the groups hardest hit by the epidemic.

Main Lines of Research

- HIV and maternal and child health
- Pathogenesis of acute and early HIV infection
- Community epidemiology studies to inform future HIV-prevention interventions
- Immune reconstitution inflammatory syndrome (IRIS)
- Vaccination response in HIV-infected patients
- HIV testing modalities

Main Results 2013

● The incidence and mortality of immune reconstitution inflammatory syndrome associated with Kaposi sarcoma (KS-IRIS) was found to be higher in sub-Saharan Africa than in the United Kingdom. This was largely explained by the more advanced Kaposi sarcoma disease and lower availability of chemotherapy in Africa. Our findings support the need to continue the progressive scale-up and earlier initiation of antiretroviral drugs, better clinician and patient education to encourage earlier presentation, referral and diagnosis of KS, and high-level advocacy on improving access to optimal chemotherapy in order to decrease the unacceptably high mortality of KS and KS-IRIS in Africa (Letang *et al*, AIDS, 2013).

● HIV seropositivity is considered a risk factor for complications in hepatitis A virus infection. Factors associated with the immune response to hepatitis A vaccination in HIV-infected patients were described. The findings underscore the importance of identifying strategies that optimise the timing and effectiveness of hepatitis A vaccination in HIV-infected patients and the need for further studies on individual factors, such as sex and hepatitis C co-infection, that may affect the response to vaccination (Mena *et al*, Vaccine, 2013).

● A systematic review of the operational implementation of provider-initiated testing and counselling (PITC) programmes in sub-Saharan Africa found that the widespread adoption of PITC provides an unprecedented opportunity to identify HIV-positive individuals who are already in contact with health services. PITC programmes should be accompanied by measures aimed at strengthening health systems and fostering the normalisation of HIV at the community level, but the resources and effort needed to do this successfully should not be underestimated (Roura *et al*, AIDS, 2013).

Main Lines of Research

- Migrants' health and travel medicine
- *Leishmania*
- Evaluation of vaccination campaigns
- Pathology of premalignant lesions and neoplasias related to human papillomavirus infection

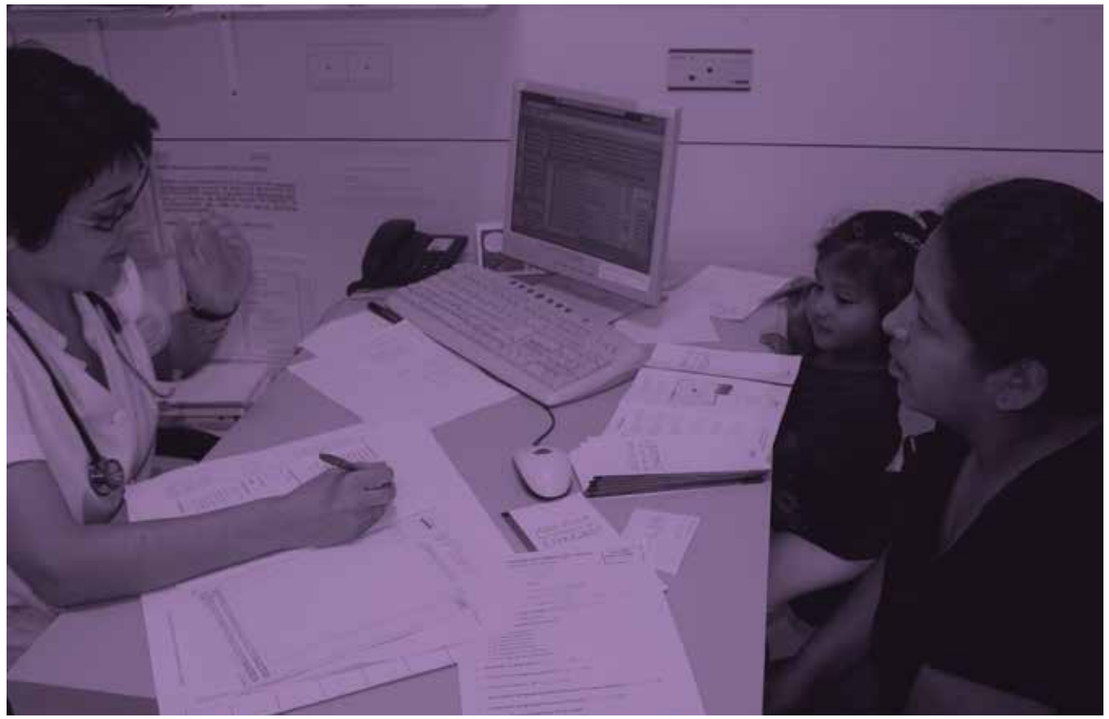
Main Results 2013

● A systematic review of the qualitative literature on TB in migrant populations indicated that immigrants' knowledge of and attitudes towards TB are largely a result of their previous experiences. The review concluded that in addition to escalating current interventions and increasing monitoring of the incidence and prevalence of TB in immigrant populations, it is crucial to understand immigrants' perceptions of TB and the specific obstacles they face in accessing the health system, seeking a diagnosis and adhering to a treatment programme (Abarca *et al*, PLoS One, 2013).

● Improved clinical management and diagnosis of infectious diseases that primarily affect travellers have been proposed for strongyloidiasis (Requena-Méndez *et al*, PLoS Negl Trop Dis, 2013), refractory giardiasis (Muñoz *et al*, Travel Med Infect Dis, 2013), schistosomiasis (Muñoz *et al*, PLoS Negl Trop Dis, 2013) and the neurological complications of dengue virus infection (Carod-Artal *et al*, Lancet Neurol, 2013).

● We described the case of Japanese encephalitis in Spain (Doti *et al*, Eurosurveillance, 2013).

● Epidemiological studies on canine *leishmaniasis* in the Balearic Islands (Alcover *et al*, Acta Tropica, 2013) and Lleida (Ballart *et al*, Prev Vet Med, 20113) found an apparent emergence of canine *leishmaniasis* in Menorca and the presence of an autochthonous focus of canine *leishmaniasis* in the Pallars Sobirà region of Lleida.



● An evaluation of an influenza vaccination campaign among health care workers at a university hospital in Barcelona found that increasing the information provided to health care workers and heightening their risk perception do not necessarily lead to greater acceptance of influenza vaccination (Llupià *et al*, Am J Infect Control, 2013). In addition, an evaluation of the effect of three vaccination promotion strategies on the intention of medical students to get vaccinated and an analysis of associated factors showed that having done clinical rotations and having received previous influenza vaccinations were independently associated with the intention to get vaccinated. Online promotional campaigns seemed to improve the intention to get vaccinated (Mena *et al*, BMC Med Educ, 2013).

● The pathways of vulvar intraepithelial neoplasia and squamous cell carcinoma were reviewed (del Pino *et al*, Histopathology, 2013).

● It was shown that a negative result or low Viral Load (VL) in the preconisation hr-HPV test is associated with the absence of cervical intraepithelial neoplasia in the loop electrosurgical excision procedure. In addition, patients with a negative preconisation hr-HPV test or a low VL have a low risk of postconisation recurrence (Rodriguez-Manfredi *et al*, Gynecologic Oncology, 2013).

● In a pilot study, intraoperative postconisation (IOP) human papillomavirus (HPV) testing was assessed for early detection of treatment failure in patients with cervical intraepithelial neoplasia. IOP-HPV testing was shown to be feasible and to accurately predict treatment failure in patients with CIN2–3. This new approach may allow the early identification of patients with treatment failure, thereby facilitating the scheduling of less intense follow-up for negative patients who are at very low risk of persistent disease (Torné *et al*, Gynecologic Oncology, 2013a).

● We evaluated transvaginal ultrasound-guided myometrial injection of radiotracer (TUMIR) as a new method for sentinel lymph node (SLN) detection in endometrial cancer. TUMIR was shown to be a safe, feasible method for SLN detection in patients with endometrial cancer. It has a good detection rate and provides representative information on the lymphatic drainage of endometrial cancer (Torné *et al*, Gynecologic Oncology, 2013b).

Think Tank

Rafael Vilasanjuan

Think Tank Director

The decline in funding for development cooperation and the need to identify the principal gaps in health equity have provided the dual focus for our work throughout 2013. In the firm belief that development aid is essential and that it is also a necessary component of the foreign policy of any country that aspires to occupy a position of global influence, we have focused our studies on the quantitative and qualitative improvement of international development strategies. Furthermore, we have begun a process of analysing the changes that are needed in decision-making and funding mechanisms and in the model that promotes access to medical innovation in global health.

Seminar: Building a Global Health Social Contract for the 21st Century

An international seminar on building a global health social contract for the 21st century was organised jointly by the ISGlobal Think Tank and the Open Society Foundations. The event was held on 7 and 8 November at the Centre de Cultura Contemporània de Barcelona (CCCB). Over the two-day seminar more than 40 specialists in global equity, financing, governance and scientific research discussed ways of closing the health equity gap that today affects developing countries, emerging economies and developed countries.

Practical Handbook for the Management of Severe Malaria

ISGlobal researchers participated in the preparation of *Management of Severe Malaria—A Practical Handbook* published by the World Health Organisation (WHO). This update of the existing guidelines for the diagnosis and management of severe malaria is an essential tool for transferring knowledge to clinicians and other health professionals working in malaria-endemic countries.

Portfolio of Publications

- *Contribuciones españolas en la lucha contra la malaria (2000-2010)*
- *Cooperación al desarrollo dirigida a la sanidad: el papel de los organismos internacionales*
- *El poder, el dinero y los recursos: la equidad en salud en un mundo globalizado*
- *A Non-State Centric Governance Framework for Global Health*
- *A Global Social Contract for a Healthy Global Society: Why, What and How*
- *The Challenge of Financing. The Fundamentals of an Equitable Health Financing System*
- *Transnational Transparency: Why Does it Matter for Global Health?*
- *Non-State Actors & Global Health. Eradicating Polio in Pakistan*
- *Tracking Maternal Mortality Through an Equity Lens*

Publications

09

EQUITY

Equal opportunity regardless of where one is born

Think Tank Tag Cloud

MATERNAL MDG EQUITY
GLOBAL GOVERNANCE
POLICIES MALARIA
ANTIBIOTICS
ECONOMY INTERNATIONAL
MORTALITY
HEALTH SYSTEM
ACCESS
INNOVATION DEVELOPMENT
CHAGAS COUNTRIES
YAWS MORTALITY

Malaria Elimination Initiative

Report on Progress in the Science of Eradication

The Policy Cures' report *Estimating Costs and Measuring Investments in Malaria R&D for Eradication*, commissioned by the Malaria Eradication Scientific Alliance (MESA), is the first attempt to quantify current investment and to estimate the proportion of malaria R&D expenditure that is pertinent to the elimination and eradication agenda. Data were collected for 2011 and are entirely new.

World Malaria Report 2013

For the third consecutive year, ISGlobal participated in the preparation of the *World Malaria Report*, published annually by the WHO. This collaboration is part of the work undertaken by ISGlobal as a WHO Collaborating Centre for Malaria Control, Elimination and Eradication.

Conference: Advances in *Plasmodium vivax* Malaria Research

In May, ISGlobal hosted an international conference on *Plasmodium vivax* research held in CosmoCaixa in Barcelona. Conference participants reviewed recent advances in *P. vivax* research. This event was the fourth in a series of scientific seminars dedicated to *P. vivax* launched in Bangkok in 2002. It brought together 175 experts from around the world to discuss the latest advances in the study of the world's most widely distributed malaria parasite.

Chagas Initiative

Chagas Week. Neglected Disease

The first edition of this week-long event dedicated to Chagas disease was held from 15 to 19 April in Cochabamba, Bolivia. During the week, over 400 leading specialists in Chagas disease discussed a joint strategy for dealing with this neglected disease. The meeting was also an opportunity to present the Global Chagas Disease Coalition in Latin America. The partners in this coalition, which was officially launched in December 2012 in New York, include ISGlobal, the Drugs for Neglected Diseases initiative (DNDi), CEADES Salud y Medio Ambiente, Sabin Vaccine Institute and Fundación Mundo Sano. The coalition was set up to improve patients' access to treatment for Chagas and to stimulate innovation in new tools to combat the disease.

Maternal, Infant and Reproductive Health Initiative

Publication: *Tracking Maternal Mortality Through an Equity Lens*

A paper on maternal mortality and equity presented at the annual ISGlobal seminar examines one of the fundamental issues facing global health today: why, despite improvement in maternal health indicators in recent decades, quality maternal care is still not available to all women. The paper highlights the high proportion of maternal deaths that occur in the most disadvantaged groups in developing regions and the fact that these deaths are due to entirely preventable and treatable causes. The statistics reflect the limited access to basic maternal care and the poor quality of the care available in these areas. The authors stress the need for strategies that will work towards remedying this situation.

Advocacy and Participation in Decision-Making Forums

We participated in all the major forums on maternal, child and reproductive health, including the Global Maternal Health Conference (Arusha, 15-17 January 2013) organised by the Maternal Health Task Force of the Harvard School of Public Health, the annual meeting of the Roll Back Malaria global partnership's Malaria in Pregnancy Working Group (Geneva, 13-14 May 2013), and the 7th Stop Cervical Cancer in Africa Conference (Maputo, 21-23 July 2013) organised by the Mozambican Ministry of Health and the Forum of African First Ladies Against Breast and Cervical Cancer.

Antibiotic Resistance Initiative

Discussion Forum: The Global Threat of Antimicrobial Resistance

To generate debate among the principal stakeholders involved in the prevention and treatment of infections caused by multidrug-resistant bacteria, ISGlobal and Biocat, in partnership with the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) and the Spanish Infectious Disease Research Network (REIP), organised a meeting in Barcelona held between 5 and 7 November at CosmoCaixa. The three major issues discussed were emerging drug resistance, factors affecting the emergence and spread of multidrug-resistant bacteria, and the lack of new agents to treat resistant infections.

Training & Education

Núria Casamitjana

Training & Education Director

Two important milestones marked our work in education in 2013. The year saw the graduation of the first class of students completing the ISGlobal-University of Barcelona (UB) Master of Global Health, one of the first programmes in Spain to deal with the health of the world's population from a multidisciplinary perspective. Secondly, we launched the Trans Global Health programme as part of the European Union Erasmus Mundus Joint Doctorate Programme promoting excellence in higher education. Our offering of high quality educational and training opportunities of international importance in the field of global health also includes a series of courses organised in collaboration with several institutions that have a long history in this area, including Harvard University, the Swiss Tropical and Public Health Institute, Doctors Without Borders, the National Institute of Public Health of Mexico and the U.S. Centers for Disease Control and Prevention.

Postgraduate Programmes

- Doctorate in Medicine: international health track, UB
- Trans Global Health: joint doctorate in the framework of the Erasmus Mundus programme in collaboration with academic institutions in Belgium, France and the Netherlands
- Master of Global Health, ISGlobal-UB
- Master of Clinical Research: international health track, ISGlobal-UB
- Master in Internationalization. Subject: international health, UB
- Master in Public Health. Subject: international health, UPF-UAB
- Master in Translational Medicine. Subject: Translational Research in Public Health: methods and applications, UB
- Diploma in Global Health, ISGlobal-UB

Erasmus Mundus Joint Doctorate Programme

Trans Global Health is a joint international doctorate programme. The participating institutions are the University of Barcelona and ISGlobal (Spain), the VU University of Amsterdam, Academic Medical Centre and University of Amsterdam (Netherlands), Bordeaux Segalen University (France), and the Institute of Tropical Medicine in Antwerp (Belgium). The programme is part of the European Union Erasmus Mundus Joint Doctorate Programme, which promotes excellence in higher learning. The first eight students taking the joint doctorate began their studies in September 2013.

Courses and Workshops

- 9th Workshop on Imported Chagas Disease (Barcelona, 4 March)
- Prevention, Detection and Management of Arboviral Diseases—organised jointly with the U.S. Centers for Disease Control and Prevention (CDC) and the Consell Comarcal del Baix Llobregat (Baix Llobregat local authority). (Barcelona, 22-26 April)
- The Science of Eradication: Malaria—organised jointly with Harvard University and the Swiss Tropical and Public Health Institute. (Barcelona, 5-13 May)
- Imported Diseases: an Intensive Course for Physicians in Clinical Practice—organised in collaboration with the Hospital Clínic. (Barcelona, 21-22 November)
- Health Systems, Policies and Economics (Barcelona, 28 November-20 December)

Six Doctoral Theses Completed

Virulence of drug-resistant Mycobacterium tuberculosis and activity of drug combinations against drug-resistant and drug-susceptible isolates in ex-vivo and in vitro models, **Emma Rey Juardo**, 11 February 2013, UB
Supervisor: Dr. Juliá González

Development of nanovectors for the targeted drug delivery of antimalarials, **Patricia Urban**
11 February 2013, UB
Director: Dr. Xavier Fernández-Busquets

Leishmaniasis in the province of Lleida and Andorra. Estudio de los factores que influyen en la densidad de los vectores y en la prevalencia de la leishmaniosis canina, **Cristina Ballart**
12 February 2013, UB
Director: Dr. Montserrat Gállego Culleré

Molecular bases of antimicrobial resistance and pathogenicity factors in Acinetobacter spp. clinical isolates, **Paula Espinal Marin**
25 February 2013, UB
Director: Dr. Jordi Vila

Functional analysis of variant proteins in Plasmodium vivax: implications in pathology, **Maria Bernabeu Aznar**
14 June 2013, UB
Directors: Dr. Carmen Fernández-Becerra, Dr. Hernando del Portillo

La epidemiología de las diarreas: Determinación del peso, etiología y secuelas de la enfermedad diarreica en niños de 0-59 meses de edad en el Distrito de Manhiça, Mozambique, **Tacilta Helena Francisco Nhampossa**
20 December 2013, UB
Directors: Dr. Pedro L. Alonso, Dr. Quique Bassat

Facts & Figures

Number of Students

Total Number of Students 196

Courses Students 94

Masters Students 65

Doctoral Students 42

Rotations 07

Diploma Students 01

Training Programmes

12

Doctoral Theses Defended

06

Scientific Seminars

43

Malaria Elimination Initiative

Course: The Science of Eradication: Malaria

The second edition of the course The Science of Eradication: Malaria was held in Barcelona from 5 to 10 May 2013. It was organised by ISGlobal in collaboration with the Harvard School of Public Health and the Swiss Tropical and Public Health Institute. All three institutions have extensive knowledge and experience in the field of malaria science. The training programme, which was accredited by the UB, brought together 60 leaders working in the field of malaria in over 30 different countries to study all the aspects of the elimination and eradication of this parasitical disease.

Chagas Initiative

Workshop on Imported Chagas Disease

In March we organised the 9th Workshop on Imported Chagas Disease in collaboration with the Mundo Sano Foundation. This event brought together over 140 scientists and experts from all over the world to review the most recent advances in the detection and treatment of Chagas disease. The members of the Ibero-American network NHEPACHA took advantage of the event to meet and analyse progress in research and the development of new tools and biomarkers for the diagnosis, assessment and treatment of Chagas disease. The network links 13 research groups from nine countries.

Maternal, Infant and Reproductive Health Initiative

Training Programme to Fight Cervical Cancer

In 2013, we were awarded the task of training Mozambican health professionals in order to build capacities and strengthen the national health system in preparation for the introduction of the human papillomavirus (HPV) vaccine. The project, which is funded by "la Caixa" Foundation, will take place in 2014 and 2015. It will be run by ISGlobal in collaboration with the Manhiça Health Research Centre (CISM) and the Mozambican Ministry of Health and will train health personnel who will be involved in the nationwide introduction of the HPV vaccine targeting preadolescent girls.

Antibiotic Resistance Initiative

Antibiotic Resistance Workshop in Morocco

In October, in the context of the 5th Scientific Conference of the Société Marocaine de Microbiologie Médicale, we organised a two-day seminar on antibiotic resistance in collaboration with the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) and the American Society for Microbiology (ASM). The event was held in the Mohammed V University in Rabat.

Conference on *Escherichia coli*

In November we hosted the ESCMID Conference on *Escherichia coli*. Over 100 participants had the opportunity to learn about the pathogenesis, clinical aspects and treatment of infection caused by this bacterium. An update was also presented on the current mechanisms of resistance to various antimicrobial agents and the transference of resistance determinants in *E. coli*.

Technical Cooperation

We work in the field of global health. This means that our research activity is strongly rooted in the realities of poor countries, especially those in three key geographical regions: sub-Saharan Africa, Latin America and the Maghreb. Throughout 2013, we have provided support for our cooperation platforms in Mozambique, Bolivia and Morocco, combining important research with efforts to promote and consolidate local human capacities as well as technical resources and infrastructure. Our ultimate goal is to build a bridge between scientific knowledge and effective interventions on the ground.

Mozambique

We have had a presence in Mozambique through the Manhiça Health Research Centre (CISM) since 1996. CISM was originally set up by the Clínic Foundation with support from the Spanish Agency for International Development Cooperation (AECID). The Centre has since evolved and is now run by the Manhiça Foundation, a Mozambican institution. Our research activity at CISM is focused on reproductive health, malaria, HIV, tuberculosis and other neglected diseases.

New Momentum in the Strategic Partnership with CISM

In March, more than 60 researchers and technical staff from CISM and ISGlobal met to take stock of their strategic partnership and to discuss new scientific challenges. The stable relationship between these two centres has existed for 20 years and is the result of a shared model based on the principles of scientific excellence, knowledge transfer, capacity building, and impact on health and equity. This model has made possible significant achievements in various areas of investigation and has consolidated CISM's position as a leading research centre in Africa. It has also enabled ISGlobal to develop lines of research based on studies carried out in Mozambique.

Technical Support for the Introduction of HPV Vaccination

In September, ISGlobal and CISM launched a collaborative study called PapVac: Barriers to and Determinants of Access to Reproductive Health Care in Mozambican Preadolescent Girls. The Example of the Human Papillomavirus (HPV) Vaccine. The aim of the PapVac project is to assess the acceptability and feasibility of implementing an HPV vaccination programme for preadolescent girls (10 years of age) in a rural area (Manhiça) and an urban setting (KaMavota, in the capital city of Maputo) in Mozambique. The study is being funded by Barcelona City Council's Department of International Cooperation.

04
Mozambican Researchers in the Training Fellowship Programme

5,746
New Patients Treated by the Chagas Platform in Bolivia

16
Joint Research Projects in Mozambique

357
Health Professionals Trained in Bolivia

172
Health Professionals Trained in Morocco

02
University Diploma Courses Created in Morocco

Bolivia

Chagas disease is one of Bolivia's biggest public health problems. Due to increases in migratory flows, it has also become a growing problem in non-endemic countries such as Spain. The Platform for the Integral Care of Patients With Chagas Disease was created in 2009 to limit the spread of the disease and provide patient care in Cochabamba, Bolivia, and in Catalonia, Spain. The Platform was created in collaboration with several Bolivian organisations: the Ministry of Health, CEADES Salud y Medio Ambiente, Universidad Mayor de San Simón in Cochabamba, and Universidad Autónoma Juan Misael Saracho in Tarija.

Chagas Platform Opens New Health Care Centre

In 2013, the Platform expanded its presence in Bolivia by opening a new health care centre in Sacaba. In addition to this new centre, the Platform also operates five centres in Cochabamba, Tarija and Chuquisaca. The new centre provides routine care (diagnosis, treatment and vector control) for adults with Chagas disease and organises educational activities and information sessions for the local community in their native language.

New Health Care Model

The Platform for the Integral Care of Patients with Chagas Disease in Bolivia has implemented a new health care model adapted to the country's national policies and strategies. Financed by the Spanish Agency for International Development Cooperation (AECID), this model combines direct interventions with patients aimed at improving the integral care of the disease (prevention, diagnosis and treatment), training for health professionals, and research activities. In 2013, the platform attended 26,136 patient visits, including initial consultations and follow up visits, including 5,746 new patients. The educational program provided training for 357 health professionals.

Morocco

For over 10 years, ISGlobal has been working to improve the health of women and children in Morocco. To achieve this goal, ISGlobal supports a research platform working on maternal and child health at the University Hospital of Rabat and collaborates with Morocco's Ministry of Health to improve the country's infrastructure and capacities.

Biomedical Research to Improve Maternal and Child Health

In February, ISGlobal presented preliminary data from studies on acute diarrhoeal and respiratory diseases in Morocco. Carried out in collaboration with researchers from the University Hospital of Rabat, these studies provide much-needed data on the morbidity and mortality associated with diarrhoeal and respiratory diseases. This data will inform decisions concerning the introduction of new vaccines and the improvement of clinical guidelines for the diagnosis and treatment of these diseases. In another project, the data collection phase has been completed in a study on the causes and risk factors during pregnancy for the vertical transmission of bacterial pathogens and their relevance as a cause of neonatal sepsis.

Creation of Two University Diploma Courses

In collaboration with the Faculty of Medicine in Rabat and Ibn Sina Hospital (CHIS), ISGlobal has created two university courses in specialties of national importance for Morocco: a certificate in emergency obstetric and neonatal care and a diploma in neonatal resuscitation. This initiative, which is funded by the "la Caixa" Foundation, is part of the Moroccan Ministry of Health's 2012-2016 action plan to speed up the reduction in maternal and neonatal mortality.

ISGlobal in Numbers

"The large number of international projects we manage and the size of the team of scientists involved means that quality management of human resources and talent is not just a priority, it is vital to the success of our institute. In 2013, we adopted the European Charter for Researchers and the European Commission Code of Conduct for Recruitment of Researchers to bring our policies into line with international standards. We took this important step to provide our researchers with a transparent and favourable environment and to make our centre more attractive to the best researchers."

Gonzalo Vicente
Manager

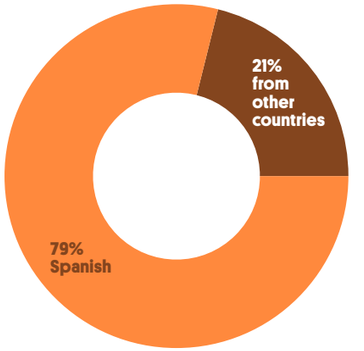
Total Number of Employees

176

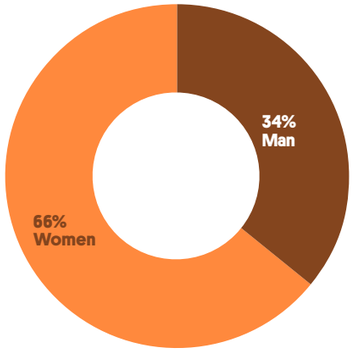
Average Age

38

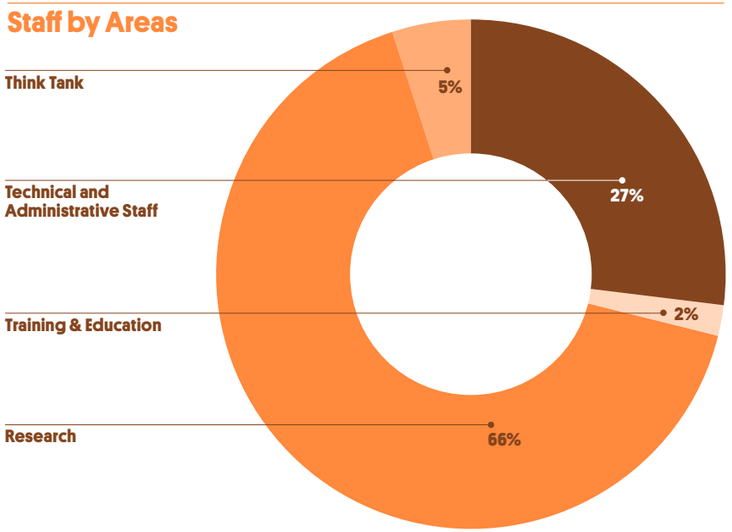
Nationality



Sex



Staff by Areas



Total Budget 2013

€15,249,003

*This information was taken from the audited annual accounts of the international health group comprising ISGlobal, its research centre CRESIB and the international health projects of the Fundació Clínic per a la Recerca Biomédica.

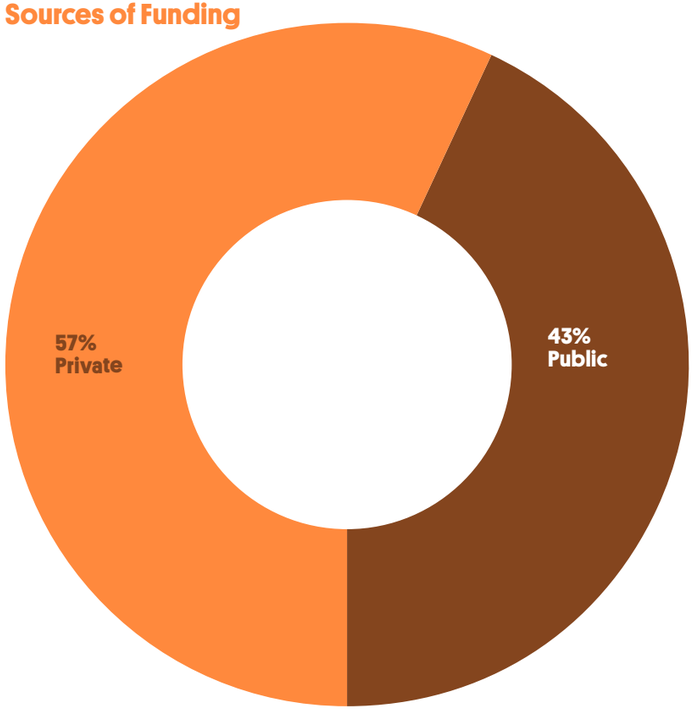
Projects Managed in 2013

177

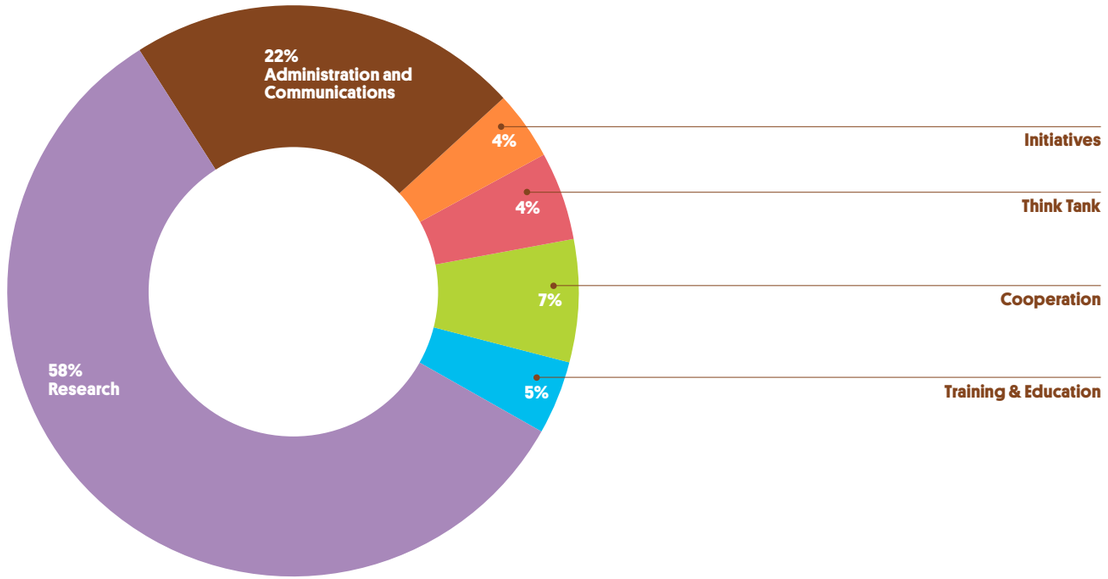
New Projects in 2013

53

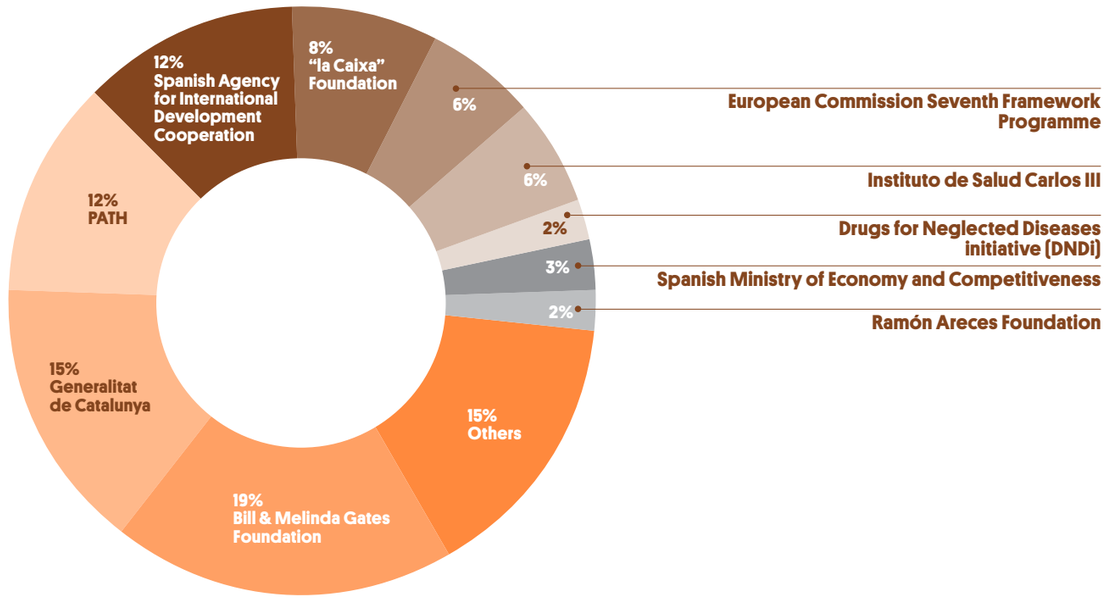
Sources of Funding



Budget Breakdown by Department



Main Funders



3 Ways to Stay Up to Date

1. Follow us on the social networks

@ISGLOBALorg

facebook.com/isglobal

You can also find us on:

LinkedIn

Vimeo

Youtube

Slideshare

2. Subscribe to our blog on global health issues

www.isglobal.org/healthisglobal

3. Subscribe to our monthly newsletter

You will receive the most important news by email.

Design

MUCHO

Photography

Andalu Vila San Juan
Gloria Solsona
Susana Oñoro
Pau Fabregat
Morrosko Vila-San-Juan
John McCarthy