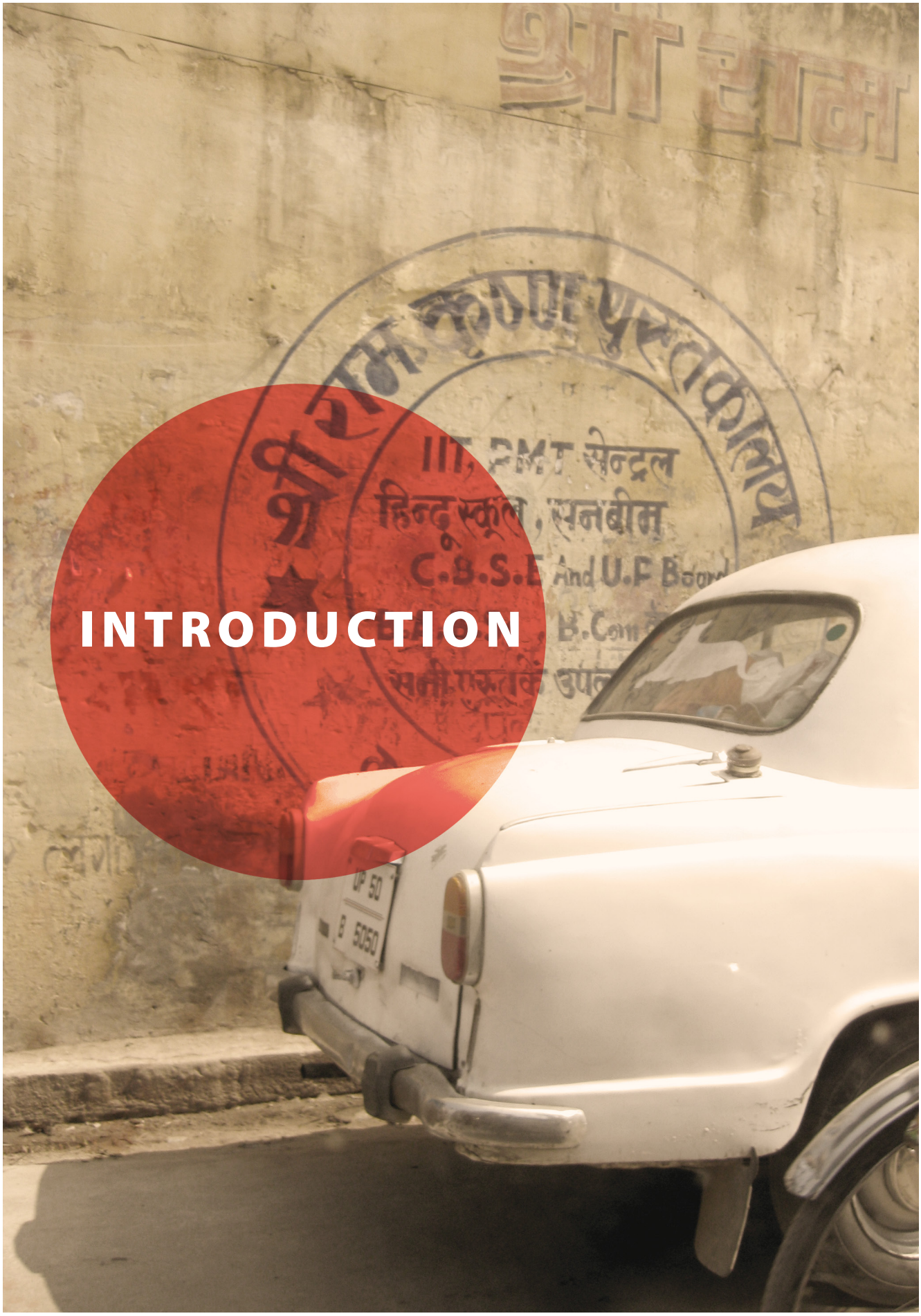
Institute of Tropical Medicine

ANNUAL REPORT 2010

Table of contents



INTRODUCTION

Foreword of the Chair

After its reconstitution by the end of 2009, the Board of Governors of the ITM met for the first time in its new and full composition on March 23th, 2010. Alain Verschoren, Rector of the University of Antwerp, and Minne Casteels, vice-rector of the University of Leuven, were appointed as Vice-Chairs. Also the Executive Bureau was recomposed. Ex officio members are the chair and vice-chairs, Bruno Gryseels as director and Marc Coosemans as representative of the tenure academic staff. Mr. Peter Moors, director-general and representative of the Belgian Directorate for Development Cooperation, and Mrs. Anja Stas, Chief Commercial Officer of the Antwerp Zoo, were elected as additional members. Mrs. Lieve Schueremans, General Manager of the ITM, and Mrs. Els Barbé, liaison officer of the Ministry of Education remain permanent observers in the Board as well as in the Bureau. The gender balance in the Board has reached parity (12-12), while women even have a majority in the Bureau (5-4). A few years ago, only 2 out of 24 members or observers on the Board were women. This evolution came along spontaneously, illustrating how the "glass ceiling" in society is at last being broken - be it not yet in all sectors. In the academic world, for instance, females make up a majority of junior and even postdoctoral researchers, but are still few among full professors. Also at the ITM, 54% of the junior scientists are women, while men still make up 77% of the tenured academic staff. Progress has been made over the past years, however, and a fair balance comes within reach.

The Board appointed two new professors and heads of unit in 2010. Bouke de Jong, an external recruit with a strong track record in the Netherlands, the U.S.A. and the Gambia, takes over from the illustrious Françoise Portaels in our world-renown Unit for Mycobacteriology. Jan Van Den Abbeele, senior postdoctoral fellow in the Unit of Entomology, was selected for the succession of Stanny Geerts as Head of the Unit of Veterinary Protozoology. We also filled in a good number of new post-doctoral and other research positions, ensuring the continuous renewal of the ITM›s scientific lifeline.

We implemented our new strategy of institutional investment in students housing, as the private market had become too narrow and expensive. In 2010, work was started in three construction sites in the vicinity of the Institute. From 2011 onwards, we should be able to house most of our students and visitors ourselves, in modern, comfortable rooms and flats at walking distance from the campus. Other strategic investments went to the extensive renovation and physical integration of the reference laboratories for Tropical Diseases and for HIV/STD. The Board introduced new depreciation rules for real estate and capital investments, leading to more transparent asset management.

The Board approved the second three-year term of the framework agreement convention with the Belgian Ministry and Directorate for Development Cooperation, which allows the ITM to carry out a substantial programme for scientific capacity strengthening in low and middle income countries. In spite of the financial crisis, the Belgian government has kept its pledge to further raise its budget for development cooperation to 0.7% of GNP. The successful ITM programme was a natural beneficiary and was allocated a budget of 39 million € for the period 2011-2013.

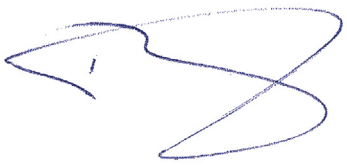
The Board and the Bureau invested most of their meeting time, however, in the follow-up of the strategic «ITM 2020+» reflection that was initiated in October 2009. The internal staff debates were animated and the outcome sometimes controversial. The Board took periodical stock of the consensus reached on strategic options, and consolidated these in formal decisions that could be further built upon. Also within the Board, stimulating discussions arose on the future role and strategies of the ITM, and on methods and timing of change management. Many of the questions figure also on the agenda of the academia, authorities and agencies represented in the Board but in few places they come together in such an explicit and cohesive debate as at the ITM. In May, we finally translated into policy the strategic consensus on education, research and international cooperation that had been adopted by the internal organs, after eight months of intensive soul-searching.

Not surprisingly, the organizational changes required to implement these strategic views were even more controversial and this debate was given another five months to reach internal consensus. The discussions eventually crystallised in the ITM›s Academic Council which, however, remained for a long time split about the proposed reorganisations and rather tended towards a «modified status quo». In October,

the Board nevertheless adopted the far-reaching reform plan, described in the next chapter and to be implemented in the course of 2011. In December, the Executive Bureau met with a delegation of the Academic Council to exchange concerns and arguments regarding this decision. It was agreed that the staff would remain closely involved in the concretization of the reforms, and that progress and impact would be systematically monitored.

The ITM2020+ process was initiated, at least partly, in preparation of the policy plan 2011-2015 that the ITM needed to submit to the Minister of Education by the end of 2011, as part of the management and funding agreements. In December, the Board approved the policy plan which was thus timely submitted. Obviously, however, the long-term vision and the sweeping reforms developed over 2010 are determinant for the strategies, activities and budgets for the next five years. Therefore, several chapters of the plan will be further developed over the course of 2011, as the new structures and strategies unfold.

We look thus forward to another challenging year and wish the management and staff renewed energy, after an extraordinary and exemplary strategic reorientation. As shown by this annual report, this strenuous exercise did not refrain the ITM from continuing its academic, medical and international programmes with amazing dedication and quality. It is a privilege to serve on the board of such a capable, open-minded and forward-looking organization.



Cathy Berx
Chair of the Board of Governors of the ITM
Governor of the Province of Antwerp

Director's note

2010 will be remembered at the ITM as one continuous debate on our future. As reported last year, this "ITM2020+" reflection process was initiated late 2009, in spite of praising assessments of our teaching, research and service programmes in previous years. Indeed, we need to prepare for a new era in which North-South relations, academic duties and health policies are being redefined in a rapidly changing global context. In order to remain societally relevant and scientifically competitive, strategic choices will have to be made which, in turn, require an adapted organisation and management. These new paradigms will, moreover, come together with a nearly complete generational turnover of the senior academic staff in the period 2015-2025, which is an enormous challenge as well as a unique opportunity to reshape the ITM.

Such a confronting thought exercise easily upsets entrenched notions of individual and institutional roles. Questioning the future need, even desirability, of the ITM's involvement abroad is theoretically implicit to the development agenda; integrating the consequences in the practices of today is quite another matter. Projecting the global health environment in 2030 may seem hazardous, but a look back to 1990 shows that it will in any case be very different. We had many internal meetings, retreats and working parties throughout the year, on and off the campus. Our debates sometimes led to polarisation instead of consensus, or to confusion rather than clarification. However, by May we could present a common vision on the future of our teaching, research and service programmes to the Board of Governors.

In summary, ITM beyond 2020 will draw its international added value primarily from scientific and academic excellence. Science *per se* will be our main contribution to society, in the belief that it is inherently a main driver of progress and development. As a knowledge centre, we will continue to exert direct societal impact through well-defined service delivery programmes, in patient care as well as international health. We assimilate, however, the consequences of the Paris-Accra principles and the motto of our own "switching the poles" capacity building programme. We believe in a (near) future in which all countries have their own individual and institutional capacities needed for the scientific underpinning of health policies, practices and innovation. Such a vision is not evident in these times of global health rhetoric, and may even seem existential to our own future. By aiming at scientific progress as such, however, the ITM2020+ mission statement assumes timeless academic and societal relevance. International collaboration among peers, especially in the South, will unavoidably remain a prerequisite to our trade but will and should be based purely on scientific added value rather than.

Moreover, new opportunities and technologies in biomedical as well as socio-economic sciences open up entirely new perspectives in the underexplored field of tropical diseases and global health. Their exploration may lead to ground-breaking insights and applications, not only for us but for science at large. Biomedically, human evolution has largely been determined by the fight against tropical infectious diseases. Only since the dawn of genomics, however, can this exciting concept be adequately addressed. In socio-economic terms, health care represents one of the largest and most influential sectors in society, with globalisation as a major determinant and challenge. However, the complex systems research needed to understand and optimize processes as well as outcomes is still in its infancy. The potential for scientific innovation is thus unprecedented, while its societal relevance is more important and more global than ever.

We envisage the ITM in 2020 and beyond therefore as a centre for ground-breaking multidisciplinary research, innovative knowledge applications and holistic approaches to scientific questions, in biomedical as well as social disciplines, and through a strategic set of national, European and global alliances. Its teaching programmes will target top students from all around the world, attracted by an international faculty involved in top research, student-centred curricula and learning environments, and a flexible blend of on-campus coaching with web-based learning. Our direct contributions to society will focus on reference services, best practices and quality systems in patient care as well as international health. While we remain committed to international solidarity among nations, people and scientists, and disposed to channel resources and expertise to the south if requested, the ITM will refrain from any donor-recipient relationship and the use of aid money as an institutional resource.

This vision is ambitious, but every sentence hides concrete objectives, strategies and action plans. These have been outlined in a new global policy plan for 2011-2015 and beyond, submitted to the government as the legal and operational basis for our core funding. We hope that the responsible ministers will acknowledge our vision and provide support that is level to our tasks. Apart from the academic, scientific and societal programmes, the policy plan also envisages radical organisational reforms and managerial innovations, including the introduction of full costing, integrated quality systems and paperless business processes.

Once the vision was formulated, indeed, an even more difficult debate arose on the organisational reforms needed for its strategic implementation. According to some staff, the existing collegial management of the departments could not be decisive enough for making the difficult choices ahead. Most others felt, however, that academic bottom-up processes would remain the best warrant for creativity, flexibility and commitment. Along the same lines, pledges for larger and more homogenous departments were countered by widespread resistance to the reshuffling of existing units and affinities.

After four more months of debate, and without reaching internal consensus, three main principles were finally proposed to and approved by the Board.

First, the current five "thematic" departments (i.e. Parasitology, Microbiology, Clinical Sciences, Animal Health, Public Health) will be reorganised in three "disciplinary" departments, i.e. Biomedical Sciences, Clinical Sciences and Public Health Sciences. This reform should ensure scientific quality, efficiency and critical mass by uniting researchers and technological platforms of related disciplines. Conceptually, the three departments will develop research hypotheses from the perspective of, respectively, the pathogen, the patient and the population, the "3P" model. Practically, the departments will have their main activities respectively in laboratories, clinics and health systems. In order to maintain and strengthen the thematic, interdisciplinary research, interdepartmental "Research Centres" will combine the various perspectives and expertise for main common subjects such as HIV/AIDS, tuberculosis, malaria, neglected tropical and zoonotic diseases.

Second, each of these departments will be led by a department head with full line management duties, appointed and mandated by the Board of Governors and reporting to the director. Participatory leadership will be their key to the coaching of academic staff and activities, and strong professional support will be provided for administrative matters. Individual professors will retain autonomy and responsibility for their academic field, but with a clear mandate and accountability to the department head. With the director and the general manager, the department heads will reconstitute a new and empowered direction committee that will be responsible for the strategic and operational management of the ITM.

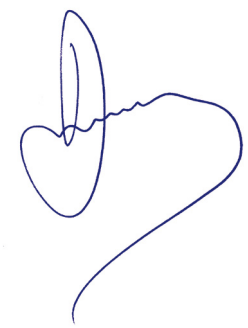
Third, the senior scientific staff will be considerably strengthened. The ITM has more than doubled in size over the past decade, but the professorial staff remained equal in numbers. On the other hand, many other senior scientists play a crucial role in the ITM without the security of a permanent academic appointment and contract. A stable and progressive career track will therefore be developed besides the traditional tenure, for senior scientists that have their main activity in educational support, medical services, reference laboratories and international programmes.

These main principles will be the guidelines for concrete reforms and actions, to be developed over the next months. By mid-2011, the new ITM should be ready for a test run and by 1 January 2012, all new structures, processes and budgets should be consolidated. The full impact of the changes will take years to take effect, however.

This report shows that all this soul searching did not affect the productivity and quality of our daily work. In 2010, the ITM delivered 63 Master graduates, 18 doctorates and 356 course certificates. Our 281 researchers published 390 papers and 48 books or chapters. Apart from the institutional programmes, we ran 202 externally funded projects and started up 42 new ones. Long-term support was provided to 20 partner organisations in the South, and a total of 14 million € was spent on individual, institutional and international capacity strengthening in the South. The medical services assured over 33472 patient contacts. The management oversaw a budget of 52 million €, a staff of 412, substantial building and renovation works, and complex administrative and technical support to a wide range of activities in 40-odd different countries. The year was full with special events and highlights, moreover, including a highly appreciated visit by the Ministry of Education, Mr. Pascal Smet; an exciting annual symposium that put young "Emerging Voices" from the field in the international spotlight; and an in-depth brainstorming meeting with our institutional partners on the future of global collaboration. There were also very sad moments, not least the dramatic loss of our colleague and friend Peter van den Bossche, who died in a car accident on his way to this very meeting.

I wish you all a good reading, and invite you to submit any questions, comments and suggestions. The year 2011 will be pivotal for the future of the ITM and its partnerships, and I look forward to report further on the implementation of ITM2020+ in our next annual rendezvous.

Bruno Gryseels
Director



Highlights

Scenes from ITM 2020+

Highlights

Minister of Education Pascal Smet visits ITM

Performance Indicators 2010

EDUCATION

International Master Courses (2009-2010)	
Applicants	412
Admitted students	69 (17%)
International students	63
Graduated students	63
Post Graduate Certificate and Short Courses	
Enrolled students	145
Graduated students	140
Short Course participants	215
Doctoral training	
Doctoral trainees on 31.12.10	117
of which international	86 (73,5%)
Doctoral trainees started in 2010	24
Doctoral graduates in 2010	18

RESEARCH

Total number of scientists on 31.12.10 (PhD fellows included)	281
Postdoctoral scientists	79
Number of scientific articles in 2010	390
In ISI journals	279
with JIF >=2 and <5	199
with JIF >=5 and <10	15
with JIF >=10	18
Number of books and chapters in 2010	48
Number of PhD dissertations in 2010	18
Average PhD duration	4 years
Number of externally funded research projects	202
Amount of external research funding (without transfers for partners & overhead)	10.1 million euro
Number of new collaborative projects	42
International conferences co-organised	5

MEDICAL SERVICES

Patient contacts total	33 472
Outpatients tropical and travel-related diseases	22 696
Outpatients HIV/STD	10 152
Hospitalised patients (UZA)	206
Laboratory patients	33 651
Calls Travel Health Phone	6 500
Page views travel health website	>270 000

INTERNATIONAL HEALTH DEVELOPMENT

Master students from developing countries	62
Doctoral trainees from developing countries	79
Doctoral graduates from developing countries in 2010	10
Institutional partnerships	16
Africa	8
Asia	3
Latin America	5
Expenses for capacity strengthening in the South	14 million euro
National and International Reference Laboratories	10
Diagnostic kits for neglected diseases shipped	2,1 million

FINANCES (million euro)

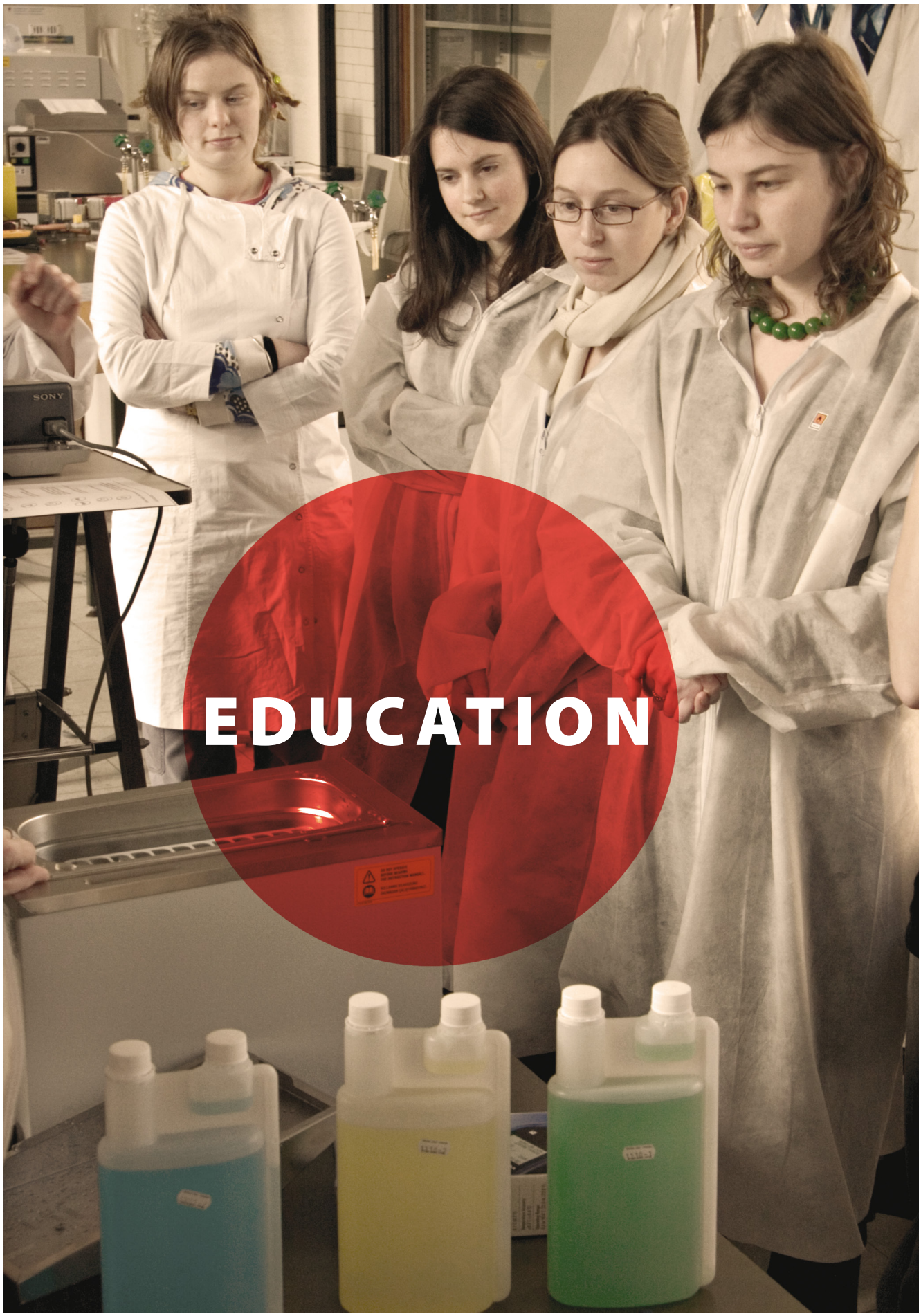
Total income	52,3
Government subsidies	26,3
Academic core funding	10,2
Research programme funding	1,8
Medical programme funding (excluding patient fees)	3,5
International development programme funding	10,2
Investment funds	0,6
Own income	26
External project funding	8,6
Tuition fees, overhead, fiscal rebates, other	12,4
Medical fees	5
Expenditure	47,8
Institutional education & departmental research	11
Externally funded research and services	10,4
Development cooperation (DGD Programme)	11,3
Medical Services	6,7
Management	8,4

HUMAN RESOURCES (in Full Time Equivalents)

Total Staff on 31.12.10	415,2
University and college graduates	368,0
Male : Female ratio	42:58
Total staff on institutional budget	207,0
Senior (tenure) academic staff	28,7
Academic assistants	37,9
Support staff	140,7
Staff medical services	54,5
Scientific staff on external funding	101,2
Support staff on external funding	51,1

QUALITY AND SAFETY MANAGEMENT

Accreditation Master Courses	Achieved in 2009
Audits	
By BELAC for reference and clinical biology laboratories (ISO17025 - ISO15189 - ISO43)	Very Good
Quality accreditation	
Staff working under formal quality assurance system	>130
Numbers of accredited tests	108
Wellbeing, safety and prevention at work	
Sick leave (% of work days)	3,7
Sick leave due to work-related accidents (% of work days)	0,2
Energy Performance Certificate	102%



EDUCATION

Education

In 2010 the master level courses did not undergo major changes and new developments mainly concerned our offer of expert short courses. We developed a French version of the electronic course on antiretroviral therapy (e-SCART) and a new expert course on qualitative and mixed methods research (QMM) in international health. We strengthened our international collaboration with South partners through specific bilateral initiatives as well as through the Linqed educational network initiative. The ITM 2020 process led us to reflect on future strategic orientations for teaching and learning at, with and through ITM.

Evolutions and achievements in 2010

ITM offers two master programmes: a Master in Public Health (MPH), with majors in Health Systems or Disease Control, and a Master of Science in Tropical Animal Health (MSTAH), with majors in Epidemiologic Surveys or Control of Animal Diseases. The two majors of Public Health train experts that can strengthen health systems for the delivery of either comprehensive health care or integrated disease control. For quality reasons, each course of MSTAH or major of MPH is limited to 25 participants.

In both Masters, more time is allocated to specialization in each major. Our offer of short courses and postgraduates has its own dynamics. Its level of specialization, adaptation to a changing international health context and relevance for PhD students was emphasized. We launched an expiremental short course on International Health and Aid Policy, which targeted country teams constituted of high level professionals, experienced in relating aid policy to national health development. Though highly appreciated by the participants, it did not fully attract the key stakeholders the course was aiming at. The face- to-face Short Course on Antiretroviral Therapy (ART) was held for the last time as the increased difference in prior knowledge of participants made it difficult to have one programme fit very different needs. Meanwhile the electronic version (e-SCART) will continue as an introductory cours to ART. The new short course on Qualitative and Mixed Methods in International Health Research, developed in 2010, is to be launched June 2011. The Belgian Association for Human and Veterinary Mycology (BVMDM) took over the coordination of the Medical Mycology course, as it now almost exclusively targets the professional context of specialized Belgian laboratory technicians outside the scientific scope of ITM. We continue to organize the Quantitative Risk Assessment (QRA) course on demand of the Belgian Technical cooperation (BTC) agency. In 2010 ITM hosted the 29th European Course in Tropical Epidemiology, with 42 participants from 24 countries. Ad-hoc training initiatives for PhD-students and young scientists, as the Emerging Voices initiative (see highlight), complemented our offer of short courses.

During the ITM2020+ process an interdepartmental working group on education analysed the challenges for the coming decades. This group considered that content specificity, a clearly defined niche, global relevance, a strong research focus, an approach stimulating the autonomy of students, flexibility of curricula and the use of ICT for blended learning are key concepts for the future. Institutional changes at ITM must take these challenges into account. Future developments in the master level courses of ITM, including new majors, will be built on the modular structure of current masters, ITM's short courses and these future challenges.

"2010 was a record year in terms of student numbers"

Educational innovations

Innovation is easier and swifter at short course level, especially when concerning IT applications, than on master and educational policy level.

During a second training for e-tutors from among selected former course participants of the Electronic Short Course on Antiretroviral Therapy (e-SCART)we tested technology to support a virtual Community of Practice (CoP).

Understanding human behavior and the socio-cultural context is key in international health research. This led us to developed a new course in Qualitative and Mixed Methods in International Health. It emphasizes qualitative research methods and skills, social theory and mixed methods as applied in international health research. The first session is planned in June 2011.

During a joint ITM-University of Pretoria (UP) workshop we explored a joint e-learning master degree, based on the UP web-based Master in Veterinary Tropical Health and our Master in Tropical Animal Health. The coherence of the profile of graduates as related to the respective institutional missions, and the differences in legal frameworks constitute the main hurdles.

With the support of the education innovation fund, we installed a 'district hospital level' laboratory within ITM's premises, where specific learning objectives raised by South partners and NGOs can be addressed. Generic (bio-safety, waste management, cooling systems …) and specific topics (rapid diagnostic testing, CD4 count, blood chemistry …) are offered as self-learning experiences to small groups of students in a problem-based setting, with limited mentor/ teacher involvement.

ICT for education

The Technology Enhanced Learning (TEL) team is gearing up for support of audio-visual services (recording seminars and lectures), administration of the learning management system (Moodle), website development (Telemedicine), graphic support, exploration and implementation of new software applications and hardware (i-Pad, mobile learning applications), and training of staff. The demand from scientific departments for support is increasing slowly, and requires a significant shift in education and knowledge management culture. In 2010 we institutionalized the first e-learning course.

In 2010, 7321 visits were recorded on our Telemedicine website, originating from 134 different countries. The users reported clear benefits for clinician's continuous training (67%) and reassurance (37%), and for diagnosis (61%). In June, the NST - WHO Collaborating Centre for Telemedicine in Tromsø (Norway) hosted a joint eHealth workshop. Contributions from experts from Ethiopia, Sudan, Trinidad, Egypt/USA, and Brazil fueled the discussion on "sustainability & scalability of telemedicine and e-health systems in resource-limited settings". In 2010 we

Interaction in small groups is very important in our educational approach.

Adapting to the weather.

surveyed the former participants of our yearly Telemedicine workshops (2007-2009). With a response rate of 77% (n= 20), 95% mentioned to be active in telemedicine projects in their country. 70% are involved in e-learning projects and overall 75% have become telemedicine trainers. The mobile learning project targeting rural health care workers in Peru, developed by the Institute of Tropical Medicine Alexander von Humboldt (Lima, Peru) in collaboration with ITM, received the 2010 Brandon Hall Excellence in Learning Award in the category of "Best Use of Mobile Learning".

Our Department of Animal Health contributed significantly to the development of the VETHUB portal for veterinary (e)-learning resources, managed by the Department of Veterinary Tropical Diseases at the University of Pretoria. We also studied mobile digital USB microscopes to be used for field-based tick identification in conjunction with an online tick identification guide (www.itg.be/photodatabase).

ITM's networking

Networking in education mainly takes place within the tropEd and Linqed networks as well as through the community of e-tutors for the e-SCART. In 2010 we acted as president of the tropEd network for education in international health (www.tropEd.org). Ten ITM students enrolled in the tropEd Master in International Health, through an agreement with the Swiss Tropical and Public Health Institute. Our Bolivian institutional partner (UMSS / Cochabamba) is acquiring tropEd membership.

We also coordinate Linqed (www.linqed.org), the "educational networking initiative with our institutional partners financed under the Third ITM-DGD Framework Agreement Programme The yearly workshop to be held at Gadgah Mada University in Yogyakarta in December was postponed to spring 2011 due to the eruption of the Merapi volcano. A workshop with HIV/AIDS experts on assessment and group-work strategies in e-learning gathered 7 persons from ITM and 7 from the field. This further strengthened our network of HIV/AIDS e-tutors.

Quality assurance

Quality assurance occurs at the level of individual courses and at institutional level through different representative bodies. In 2010, the Education Committee, gathering course directors and coordinators, met on a quarterly basis and reported to the academic council and director's committee. The six-monthly Student Participation Meetings between student representatives and ITM direction are perceived as highly informative and useful by all parties. These meetings also inspire operational and policy decisions. Examples are the decision to shift from the learning management system Blackboard to the more user-friendly Moodle, the decision to blend our epidemiology and statistics teaching with on-line self-study, to prioritize academic feedback and thesis coaching in quality assurance at course level and to make new agreements with landlords to improve student housing.

On an administrative level we reviewed and integrated our registration and management procedures for all categories of students. These procedures are to be implemented in 2011.

Fellowship programmes

The ITM-DGD Framework Agreement Programme supported 54 ITM master students in 2010. The Joint Japan/World Bank Graduate Scholarship Programme funded 2 MPH students, and another 4 master students obtained support from the Belgian Technical Cooperation (BTC) agency. Scholarships for ITM's short courses were awarded by the DGD, BTC, Debucquoy fund, Indonesian Pediatric Society, WHO, UNFPA, MSF, Médecins du Monde, City of Antwerp, Family Health International (FHI) and the Pharmaceutical Industry. Structural fellowship programmes for our master courses are largely restricted to participants from the South, so financial accessibility is mainly a problem for European students. As our master courses focus on mid-career professionals, usually with a family, interrupting income-generating activities for a year makes the choice even more difficult. ITM has attributed core funding and private sponsorships from the Ministry of Education to help lowering the financial barriers for a year of study at the ITM also for

Europeans. Such institutional scholarships, in 2010 granted to 7 master students and 11 short course participants, cover 80% of the tuition fee.

An additional DGD fellowship programme for 2009 and 2010 linked to the third DGD-ITM Framework Agreement (FA3) and representing yearly 1 million euro, strengthened the existing fellowship programme for Masters, PhD and some short courses, allowed to finance new initiatives (e-SCART, 29th European Course in Tropical Epidemiology (ECTE), the Emerging Voices programme (see highlight), predoctoral grants and postdoctoral re-entry grants, as well as local or regional fellowships through our institutional partners.

As one of the stakeholders we actively participated in the national consultation aiming at harmonizing fellowship conditions and reforming DGD fellowship policy. A major change is the alignment of PhD sandwich scholarships to both Belgian and local PhD scholarship regulations and explicitly sharing supervision responsibilities btetween local and ITM PhD promoters. The new fellowship conditions apply since September 1, 2010.

Tuition fees

ITMs tuition fees policy aims at covering 25 % (postgraduate level) to 50% (international master and expert level) of the full course costs. The rest is covered by the institutional budget, of which half is coming from the core funding of the Flemish Ministry of Education. While costs vary somewhat between courses, ITM aims at a uniform tariff per credit. Tuition and registration fees are pooled in the institutional budget; course budgets are allocated according to course needs rather than to course income. This policy contributes to the academic independence of the lecturers and the quality of the teaching.

For 2010 tuition fees were not adjusted to the cost of living as this index increased only minimally. The total fee for an 11-month master course (60 ECTS credits), taught in groups of 20-25 students, amounts to 14 800 euro. For an additional 700 euro, we provide the student with a portable PC, including extensive licensed software, preconfigured for course work and wireless access throughout the ITM premises. For shorter expert courses with similarly sized groups, we charge a pro rata fee of approximately 300 euro per credit. For the full postgraduate certificate course (5 months, 30 ECTS credits), which is taught in larger groups of 40-50 students, the fee is 1 300 euro for EU students and 2 600 euro for non-EU students.

Our international master and short courses aim at mid-career experts. The eligibility criteria include a university master degree, language proficiency (English or French) and relevant professional experience of minimally 2 to 4 years; most students actually have 5 to 10 years of experience. Competitive selection criteria include academic record, relevance of professional experience, future plans and peer review. In case of equality, we take gender and geographical balance into account. In exceptional cases, admission is also possible based on previously acquired competencies and other qualifications. For the academic year 2009-2010, 24 students out of 158 eligible applicants (15%) were selected for the MPH-DC, 25 out of 134 (19%) for the MPH-HSMP, and 22 out of 120 (18%) for the MSTAH. In 2010 we witnessed an increasing number of non-medical health professionals applying and being admitted to the MPH courses.

Student and alumni support

2010 was a record year in terms of student numbers. The Student Service assisted over 800 international master, short-course, doctoral and individual trainees and guests with travel, visa, housing, social support, cultural activities and practical advice. Making students feel at home and lighten all paperwork is the prime objective, so as to enable students to enjoy a fruitful and pleasant academic stay.

Affordable good quality short-term housing is hard to find. ITM is currently investing in student housing, aiming at 130 quality lodgings by 2014. In May 2011 the first 5 student lodgings (St. Rochus Street 13) will become available.

Our alumni support aims to enhance the professional capacity of alumni, and gathers feed-back on our courses. Activities are organized in two networks, respectively on human health and on animal health.

In 2010 the human health network supported a regional alumni meeting hosted by our institutional partner, the Institute of Public Health in Bangalore. 35 alumni in total attended the meeting and, based on prior selection of abstracts, 23 participants presented their experience related to the meeting's central theme: "The contribution of civil society organisations to health care delivery and disease control". We also received critical and valuable feed-back on our courses.

We sent more than 500 articles from the thematic network "International Health Policies" and the yearly alumni newsletter (52 pages) to 1500 alumni. We provided technical guidance to the Ecole de Santé Publique of Lubumbashi, which runs a master programme in public health, initiated by alumni.

The animal health network received through an alumni survey (MSTAH 2004-2009) valuable suggestions about content and organization of the MSTAH. 95% of alumni experience the course as a boost to their career. Most often, alumni request technical support for research projects, from protocol writing to publication. In 2010 the network also financially supported an innovative survey about antibiotics-use in poultry production by Togolese alumni.

International collaboration

In South America, ITM provides institutional and academic support to master and postgraduate courses in public health, disease control and tropical medicine at the Institute of Public Health at the Pontificia Universidad Católica (IPH-PUCE) in Quito, Ecuador, the Post Graduate Unit for Tropical Medicine of the Universidad Mayor San Simon in Cochabamba, Bolivia and the Instituto de Medicina Tropical Cayetano Heredia in Lima, Peru.

In Africa, ITM supports veterinary training programmes at the Centre for Ticks and Tick-Borne Diseases in Lilongwe, Malawi and to the web-based Veterinary Master of Science programme at the University of Pretoria. At the Institut National d'Administration Sanitaire in Rabat, Morocco, ITM supports curriculum development, e-learning capacity and PhD training. At the Makerere University School of Public Health, Uganda, ITM contributes to the development of a fellowship programme for district medical officers. In Maputo, Mozambique we repeated the two-week course on sexual and reproductive health within a Master of Public Health at the Eduardo Mondlane University. We supported the North Soudan Ministry of Health with a national blended short course on HIV/AIDS and antiretroviral therapy.

In Asia, ITM contributes to training programmes in clinical tropical medicine, internal medicine and HIV/AIDS at the Sihanouk Hospital Center of Hope in Phnom Penh, Cambodia; the tropical medicine diploma course at the B.P. Koirala Institute of Health Sciences in Dharan, Nepal; and public health training for health district teams at the Institute of Public Health in Bangalore, India.

Together with these and other institutional partners in the ITM-DGD framework programme, we constitute since 2008 the educational network called Linqed, with a focus on educational quality management (see above).

Doctoral fellowships

Doctoral and other research training makes up an ever greater part of ITM's educational mission. At the end of 2010, 117 PhD students were registered at ITM. Eighteen doctoral students successfully defended their PhD thesis, of whom 10 from developing countries.

The group of PhD students includes academic and research assistants employed by ITM, Belgian and European scientists with a fellowship from research funding agencies, and PhD bursaries from developing countries supported by the DGD or other development agencies. The latter category usually follows a "sandwich" track with alternating stays at ITM and in the home country. In 2010 all DGD funded grants were harmonized with the new guidelines and grant amounts valid from 01/01/2011 onwards. The PhD grant includes an allowance for living expenses, for research costs ('bench fee') and supervision costs. They are awarded as part of an institutional collaboration programme, or to competitively selected graduates from ITM's international Master and expert courses. In 2010 such 'individual' PhD scholarships were awarded to 3 graduates from Ethiopia, Uganda and RD Congo.

Postdoctoral re-entry grants

The continuity of postdoctoral careers is a challenge in academia all around the world. The number of PhDs has increased enormously, whereas postdoctoral positions remain scarce and haphazard. This problem is especially acute in developing countries, mostly due to the lack of structural resources. In most cases, postdoctoral positions are linked to teaching duties. This situation restricts the perspectives of young, talented scientists, resulting all too often in brain drain to industrialized countries.

ITM awards 'postdoctoral re-entry grants' to selected PhD graduates, allowing them to start up and consolidate their career in their own country. Such a grant requires a commitment from the home institution, including a career development plan referring to the institutional strategic plan. The home institution should financially contribute to the re-entry grant and gradually take over the entire funding by the end of the grant. The grant recipient is administratively and legally dependent on the home institute. ITM maintains a scientific relation as a collaborator and co-supervisor.

Currently there are 4 postdoctoral re-entry grantees of whom one new grantee in 2010 based in the National Institute of Biomedical Research (INRB), DR Congo.

ITM course offer

International Masters

Master of Public Health - Health Systems Management and Policy (MPH-HSMP)

Objectives	Target group	Language	Credits
Focus: Management and policy of comprehensive and accessible quality health services at local, national and international level ***Components***: • Health systems management • Analysis, research, decision-making • Communication skills • Optional modules • Integration and synthesis (master thesis) ***Options***: • Health Policy • Strategic Management	Experienced health professionals (mainly medical doctors)	Yearly alternating English and French	60

Master of Public Health - Disease Control (MPH - DC)

Focus: Epidemiological, technical and organisational aspects of disease control with emphasis on sustainable integration in regular health services ***Components***: • Quantitative and qualitative methods • Public health • Research & tools • Master thesis ***Options*:** • Reproductive Health Programmes • Tropical Diseases Control	Experienced health professionals (mainly medical doctors)	Yearly alternating English and French	60

Master of Science in Tropical Animal Health (MSTAH)

Focus: Epidemiological, technical and organisational aspects of animal disease control and surveillance ***Components***: • Research methodology • Project cycle management • Global livestock development • Epidemiological case studies • Master thesis ***Options*:** • Animal disease control • Epidemiological data collection & processing	Experienced health professionals (mainly veterinary doctors)	Yearly alternating English and French	60

Objectives	Target group	Language	Credits

Postgraduate certificate courses

Tropical Medicine and International Health (TM&IH / MT&SI)

Focus: Clinical, biomedical and epidemological aspects of tropical and poverty related diseases and their control; health care organisation in low and middle income countries ***Components***: • Vector-borne diseases • Tuberculosis, HIV, malaria • Maternal and child health • Emergency medical care • Management of health care systems • Tropical and neglected diseases • Clinical decision-making • Tropical laboratory sciences • Clinical specialties in the tropics	Health professionals, mainly from the North, preparing to work in tropical and developing countries	Yearly, separately French and English	30

Tropical medicine for nurses and midwives (TG / MT)

Focus: Clinical, biomedical aspects of tropical diseases and their control; health care organisation in low and middle income countries ***Components***: • Vector-borne diseases • Tuberculosis, HIV, malaria • Maternal and child health • Emergency medical care • Management of health care systems • Tropical and neglected diseases • Tropical laboratory sciences • Nursing in developing countries	Paramedical health professionals, mainly from the North, preparing to work in tropical and developing countries	Yearly, separately French and Dutch	20

Specialised short courses

Introduction to International Health (TM&IH / MT&SI: Module 1)

Focus: Diseases and health care in low and middle income countries ***Components***: • Vector borne and tropical diseases • TB, HIV and malaria • Maternal and child health • Emergency medical care • Management of health care systems	Health professionals, mainly from the North, preparing to work in tropical and developing countries	Yearly, separately French and English	20

Clinical and Biomedical Sciences of Tropical Diseases (TM&IH / MT&SI: Module 2)

Focus: Clinical & biomedical aspects of tropical diseases ***Components***: • Descriptive tropical medicine • Clinical decision-making • Laboratory sciences • Clinical specialties in the tropics	Health professionals, mainly from the North, preparing to work in tropical and developing countries	Yearly, separately French and English	10

Objectives	Target group	Language	Credits

Short course on Clinical Research and Evidence-based Medicine (SCREM)

Focus: Clinical research with focus on the design of guidelines and algorithms ***Components***: • Protocol / project development • Literature search and critical reading • Statistical data analysis and presentation • Algorithms and scoring systems • Research skills and communication	Experienced health professionals (mainly clinicians)	English	9

Short Course on Antiretroviral Therapy (SCART)

***Focus*:** Comprehensive HIV care and antiretroviral (ARV) treatment in resource-poor settings ***Components*:** • Virology, immunology and clinical aspects of HIV/AIDS/TB • ARVs and patient management • Prevention of mother-to-child transmission • Public health aspects • ARV scaling-up	Health professionals (mainly MDs)	English	4.5

Planning and Management of Reproductive Health Programmes (MPH – DC: Module RH)

***Focus*:** Management and integration of reproductive health programmes in general health services ***Components*:** • HIV/AIDS • Sexually transmitted infections • Family planning and maternal health • Project cycle management, logical framework	Experienced health professionals (mainly medical doctors)	Yearly alternating English and in French	15

Planning and Management of Tropical Diseases Programmes (MPH – DC: Module TD)

***Focus*:** Management and integration of tropical diseases control programmes in general health services ***Components*:** • HIV/AIDS, tuberculosis, malaria • Neglected and tropical diseases • Project cycle management, logical framework	Experienced health professionals (mainly medical doctors)	Alternating English and in French	15

Health Policy (MPH-HSMP: Module HP)

***Focus*:** Formulation, implementation and evaluation of public health policies in developing countries ***Components*:** • Framework for policy analysis • Actors and levers in policy making • Country case studies • Emerging challenges	Experienced health professionals	Alternating English and in French	9

Objectives	Target group	Language	Credits

Specialised short courses (continued)

Medical Mycology (Mycology)

***Focus*:** Medically important fungal infections ***Components*:** • General mycology • Medical and veterinary mycology	Health professionals (mainly laboratory)	Yearly in Dutch and French	3

Antwerp Short Course – Health and Aid Policy

Collaboration with Institute of Development Policy and Management (IOB) from the University of Antwerp (UA) ***Focus:*** Integration of budget support, PRSPs and national health sector objectives ***Components:*** • Development actors and institutional arrangements • Health systems performance & reform • Aid paradigms and health development	Key stakeholders from health and development aid sectors from Mali, Mozambique, Rwanda and Uganda	English	2

HIV & AIDS: the multidisciplinary approach ("HIV evening course")

***Focus*:** HIV/AIDS patient care in Belgium ***Components*:** • HIV: microbiology and epidemiology • Treatment of AIDS and opportunistic infections • HIV/AIDS in pregnancy and children • Multidisciplinary HIV/AIDS care	Medical and paramedical health professionals	Dutch (13 evening classes)	-

Electronic Short Course on Antiretroviral Therapy (e-SCART)

***Focus*:** Comprehensive HIV care and antiretroviral (ARV) treatment in resource-poor settings ***Components*:** • Virology, immunology and clinical aspects of HIV/AIDS/TB • ARVs and patient management • Prevention of mother to child transmission • HIV pediatrics • Post-exposure prophylaxis • ARV scaling-up	Health professionals (mainly medical doctors)	English	3

Objectives	Target group	Language	Credits

Quantitative Risk Assessment (QRA) Internship

***Focus*:** Quantitative risk assessment (QRA) in endemic disease control and disease import risk management ***Components*:** • Introduction to risk analysis • The R software environment • Probability theory • Uncertainty • Bayesian modelling • The WinBUGS software environment	Health professionals (mainly veterinary, medical and biomedical)	English	24 (equi-valent)

Educational output in 2010

Number and origin of participants in ITM-courses 2009-2010

	Belgium	EU	Europe other	Africa	Asia	Latin America	Other	Total
TM&IH-E	19	9	1	0	0	0	1	30
TM&IH-E Module	4	3	0	0	0	0	0	7
MT&SI-F	5	3	3	1	0	0	0	12
MT&SI-F Module	0	1	0	1	0	0	0	2
TG-D	28	1	0	0	0	0	0	29
MT-F	17	30	15	3	0	1	8	74
MPH-HSMP-E	3	1	0	13	5	3	0	25
MPH Mod HP-E	0	0	0	4	2	2	0	8
MPH Mod SM-E	0	0	0	3	1	0	0	4
MPH-MDC-E	2	1	0	12	6	3	0	24
MPH Mod RH-E	2	0	0	5	0	1	0	8
MPH Mod TD-E	0	0	0	3	1	0	0	4
MSTAH-E	1	0	0	14	5	1	0	21
MSTAH-Module	2	0	0	1	0	1	0	4
Mycology-D	6	0	0	0	0	0	0	6
Mycology-F	15	0	0	0	0	0	0	15
SCART-E	1	4	1	16	6	1	0	29
e-SCART-E	1	1	0	25	5	1	0	33
e-SCART-F	0	1	0	28	1	1	0	31
SCREM	0	1	1	8	6	4	0	20
ASC-HAP	0	0	0	13	0	0	0	13
QRA Internship	1	0	0	12	1	2	0	16
ECTE	1	4	1	12	7	4	1	30
Telemedicine workshop	0	0	1	8	1	0	0	10
HIV Evening course	65	7	0	1	0	0	0	73
PhD Ongoing 31/12	31	6	1	53	11	15	0	117
PhD Graduates	7	1	0	8	0	2	0	18
Total	**211**	**74**	**24**	**244**	**58**	**42**	**10**	**663**

E = English F = French D = Dutch

Age and gender of participants in ITM courses 2009-2010

	Gender		Age					Prior education	
	M	F	20-29	30-34	35-39	40-44	>45	Bachelor	Master
TM&IH-E	10	20	21	5	2	2	0	0	30
TM&IH-E Module	2	5	3	3	0	1	0	0	7
MT&SI-F	5	7	4	5	2	1	0	0	12
MT&SI-F Module	1	1	0	2	0	0	0	0	2
TG-D	3	26	20	7	0	0	2	74	0
MT-F	10	64	40	21	6	3	4	29	0
MPH-HSMP-E	16	9	0	4	10	6	5	2	23
MPH Mod HP-E	6	2	0	0	3	4	1	0	8
MPH Mod SM-E	3	1	0	0	0	2	2	0	4
MPH-MDC-E	15	9	0	4	11	7	2	0	24
MPH Mod RH-E	3	5	0	3	1	4	0	2	6
MPH Mod TD-E	3	1	0	0	3	0	1	0	4
MSTAH-E	17	4	2	12	2	4	1	0	21
MSTAH-Module	2	2	1	2	0	0	1	0	4
Mycology-D	5	10	6	1	2	1	5	15	0
Mycology-F	2	4	2	2	0	0	2	6	0
SCART-E	21	8	3	12	7	3	4	1	28
e-SCART-E	23	10	5	7	16	2	3	6	27
e-SCART-F	23	8	0	4	18	4	5	0	31
SCREM	15	5	1	4	10	3	2	0	20
ASC-HAP	10	3	0	4	0	5	4	0	13
QRA Internship	8	8	0	3	5	3	5	0	16
ECTE	18	12	2	12	9	4	3	4	26
HIV Evening course	17	56	36	11	6	6	14	73	0
Telemedicine workshop	7	3	0	1	6	2	1	0	10
PhD Ongoing 31/12	65	52	15	25	40	24	13	0	117
PhD Graduates	12	6	2	4	4	2	6	0	18
Total	**322**	**341**	**163**	**158**	**163**	**93**	**86**	**212**	**451**

PhD and master dissertations 2010

Doctoral Theses (PhD)

Department of Microbiology

Durnez L. The role of rodents and insectivores in the epidemiology of mycobacterial infections in Africa. Antwerp: University of Antwerp, Department of Biology, Unit of Pharmaceutical, Biomedical and Veterinary Sciences; Institute of Tropical Medicine, Department of Microbiology, 2010: 235 pp. UA promoter H. Leirs; ITM promoter F. Portaels (Unit of Mycobacteriology)

Dieltjens T. Characterization of the antibody landscape and viral evelope escape in HIV-1 infected patients with broad cross neutralizing antibodies using peptide phage display libraries. Antwerp: University of Antwerp, Faculty of Pharmaceutical, Biomedical and Veterinary Sciences, Department of Biomedical Sciences; Institute of Tropical Medicine, Departement of Microbiology, 2010: 147 pp. UA/ITM promoter G. Vanham; ITM co-promoter W. Janssens (Unit of Virology)

Kibadi Kapay A. Contribution à l'amélioration de la prise en charge des formes ulcerées entendues de l'Ulcère de Buruli. Antwerp: University of Antwerp, Faculty of Medicine; Institute of Tropical Medicine, Department of Microbiology, 2010: 247 pp. UA/ITM promoter F. Portaels (Unit of Mycobacteriology)

Von Groll A. Fitness of Mycobacterium tuberculosis associated to genotypes and drug resistance: new approaches for understanding the transmission dynamics of tuberculosis. Ghent: University of Ghent, Faculty of Science, Department of Microbiology; Antwerp: Institute of Tropical Medicine, Department of Microbiology, 2010: 137 pp. UGhent promoter P. Vandamme; ITM promoters Fr. Portaels; JC Palomino (Unit of Mycobacteriology)

Department of Animal Health

Levecke B. The importance of gastrointestinal protozoa in captive non-human primates. Ghent: University of Ghent, Faculty of Animal Health; Institute of Tropical Medicine, Department of Animal Health, 2010: 186 pp. UGhent promoter J. Vercruysse; ITM promoter P. Dorny (Unit of Veterinary Helminthology)

Assana E. TSOL18 vaccine antigen of Taenia Sollum: development of monoclonal antibodies and field testing of the vaccine in Cameroon. Ghent: University of Ghent, Faculty of Veterinary Medicine, Department of Virology, Parasitology and Immunology; Institute of Tropical Medicine, Department of Animal Health, 2010, 142 pp. UGhent/ITM promoter P. Dorny (Unit of Veterinary Helminthology)

Praet N. The epidemiology of Taenia solium: Towards the assessment of the burden of porcine and human cysticercosis. Liège: University of Liège, Faculty of Veterinary Medicine, Department of Infectious and Parasitic Diseases; Institute of Tropical Medicine, Department of Animal Health, 2010: 174 pp. UL promoter Cl. Saegerman; ITM promoter P. Dorny (Unit of Veterinary Helminthology)

Secka A. Epidemiology of Taenia solium cysticercosis in The Gambia and Senegal. Antwerp: University of Antwerp, Faculty of Medicine; Institute of Tropical Medicine, Department of Animal Health, 2010: 106 pp. UA promoter E. Van Marck; ITM promoter S. Geerts (Unit of Veterinary Protozoology)

Department of Parasitology

Mumba D. Shortening of the post-treatment follow-up in gambiense human African trypanosomiasis. Antwerp: University of Antwerp, Faculty of Medicine; Institute of Tropical Medicine, Department of Parasitology, 2010: 136 pp. UA promoter P. Cras; ITM promoter Ph. Büscher; ITM co-promoter M. Boelaert (Unit of Parasite Diagnostics)

Obsomer V. Multi-scale environmental analysis and prediction for instects vector of disease. Application to malaria vectors of Southeast Asia. Louvain: Université Catholique de Louvain, Department of Environmental Sciences – UCL Geomatics; Institute of Tropical Medicine, Department of Parasitology, 2010: 205 pp. UCLouvain promoter P. Defourny; ITM promoter M. Coosemans (Unit of Medical Entomology)

Nahum A. Malaria morbidity and drug efficacy in laguna area of Benin, West Africa, at the time of policy change to Artemisinin based combination therapy. Antwerp: University of Antwerp, Faculty of Medicine; Institute of Tropical Medicine, Department of Parasitology, 2010: 209 pp. UA promoter: M. Coosemans; ITM promoter U. D'Alessandro (Unit of Epidemiology and Disease Control)

Ashenafi Tafesse H. Equine Trypanosomosis in Ethiopia: Epidemiology, Characterization and Control. Leuven: Katholieke Universiteit Leuven, Faculty of Bioscience Engineering; Institute of Tropical Medicine, Department of Parasitology, 2010. KULeuven promoter B. Goddeeris; ITM promoter Ph. Büscher (Parasite Diagnostic Unit)

Van den Eede P. Molecular investigation on the dynamics of Plasmodium vivax infection in Peru and Vietnam. Leuven: Katholieke Universiteit Leuven, Faculty of Medicine, Unit of Biomedical Sciences; Antwerp: Institute of Tropical Medicine, Department of Parasitoloy, 2010: 145 pp. KUL promoter J. Anné; ITM promoter U.D'Alessandro (Unit of Epidemiology and Control of Parasitic Diseases)

Department of Public Health

Baly A. Costo y costo-efectividad de estrategias comunitarias para el control de Aedes Aegypti y la prevención del dengue. Havana, Cuba: Instituto de Medicina Tropical "Pedro Kourí", Subdirección de Epidemiología; Institute of Tropical Medicine, Departement of Public Health, 2010: 158 pp. IPK/ITM promoter P. Van der Stuyft; ITM co-promoter M. Boelaert (Unit of Epidemiology and Disease Control)

Hasker E. Control of chronic infectious diseases in low resource settings.. Amsterdam: University of Amsterdam, Faculty of Medicine; Institute of Tropical Medicine, Department of Public Health, 2010: 141 pp. UAmsterdam promoter M. W. Borgdorff; ITM promoter M. Boelaert (Unit of Epidemiology and Disease Control)

De Vos P. Strengthening public health systems: an analysis of global trends and counter-praxis in Cuba. University of Ghent, Faculty of Medicine and Health Sciences, Department of Public Health; Antwerp: Institute of Tropical Medicine, Department of Public Health, 2010: 212 pp. UGhent/ITM promoter P. Van der Stuyft (Unit of Epidemiology and Disease Control)

Department of Clinical Sciences

Wanyenze R. Provider initiated HIV testing and counseling in Uganda: assessment of feasibility, approaches and outcomes of implementation. Antwerp: University of Antwerp, Faculty of Medicine; Institute of Tropical Medicine, Department of Clinical Sciences, 2010, 119 pp. UA/ITM promoter R. Colebunders (Unit of HIV/AIDS & STD care)

Nakanjako D. Strategies to improve HIV care and treatment outcomes in resource-limited settings. Antwerp: University of Antwerp, Faculty of Medicine Epidemiology and Social Medicine; Antwerp: Institute of Tropical Medicine, Department of Clinical Sciences, 2010: 165 pp. UA/ITM promotor R. Colebunders (Unit of HIV/AIDS & STD care)

ITM Master Theses

Master in Public Health - Health Systems Management and Policy (HSMP)

Alonso Padrón E. Evaluation of the leptospirosis prevention and control program of Cienfuegos Province Cuba. 53 pp.

Bermejo RA. Accelerating progress towards 2015: a review of the maternal health program (2006-2009) in Capiz, Philippines. 64 pp.

Busiga MM. Public health benefits of strengthening family planning services in prevention of mother-to-child transmission of HIV program in Tanzania. 47 pp.

Carazo Perez S. Challenges and opportunities for malaria control in sub-Saharan Africa. 61 pp.

Degefu FS. Challenges, successes and failures of a telemedicine pilot project in Ethiopia. 64 pp.

Diby BCJ. Early evaluation of the effects of performance-based financing system on the uptake of ARV for prophylaxis in PMTCT and antiretroviral therapy at health facility level; experience of the Elizabeth Glaser Pediatric AIDS Foundation in Côte d'Ivoire. 52 pp.

Gobeh W. Impact of intermittent preventive treatment of malaria during pregnancy on anemia and low birth weight in Lofa County, Liberia. 42 pp.

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Kefie Arrey C. Outcomes of tuberculosis treatment in a high HIV-prevalent setting: the case of regional hospital Bamenda - Cameroon. 34 pp.

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Kiptanui ZS. Intensified TB case finding among HIV infected people in ICAP supported government health facilities in the central region of Kenya: what lessons can we learn? 65 pp.

Montalban Sandoval E. Evaluation of the MODS assay after being implemented at regional level in the public health laboratories in Peru. 47 pp.

Mudangha FE. Evaluation of the impact of health care workers training in using rapid diagnostic tests (RDTs) on the quality of malaria case management in Kanungu District, south-western Uganda. 47 pp.

Ngalamulume Kabuaya RG. Ivermectin mass treatment outcome for onchocerciasis control in co-endemic areas with loiasis in DR Congo. 42 pp.

Ngauv B. New approach for linking HIV/STD and reproductive, maternal, and child health services (linked response approach) in Cambodia; lessons learnt from the pilot project in Kirivong operational health district, Takeo province. 48 pp.

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Sanda Aksenenkova Petrovna T. Lessons learnt from global fund round 5 tuberculosis project implementation in Niger. 48 pp.

Ssenyondo Gonzaga G. The effects of HIV infection/AIDS on the patterns and prevalence of maternal and perinatal mortality and morbidity in sub-Saharan Africa: a literature review. 67 pp.

Stassijns J. Evaluation of the impact of a malaria control program in Bo & Pujehun, Sierra Leone. 54 pp.

Sunyoto T. Visceral leishmaniasis (VL) control in an unstable context: evaluation of an MSF program in Somalia, 2000-2008. 65 pp.

Master in Public Health - Orientation Disease Control (MDC)

Alonso Padrón E. Evaluation of the leptospirosis prevention and control program of Cienfuegos Province Cuba. 53 pp.

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Master of Science in Tropical Animal Health (MSTAH)

Abera BH. Use of random amplified polymorphic DNA (RAPD) analysis for the identification of potential molecular markers for T.b. brucei, T.b. rhodesiense and T.b. gambiense. 57 pp.

Dhikusooka Tefula M. Rinderpest eradication in Eastern Africa: the roadmap to success and the role of different organisations in its fulfilment. 42 pp.

Feussom Kameni JM. Using a geographic information system (GIS) to study possible relationships between the spatial distribution of human African trypanosomiasis and bioclimatic factors in East Africa. 44 pp.

Gilo WT. Molecular characterization of Echinococcus granulosus isolates from cattle slaughtered in Jimma Municipality abattoir, Southwest Ethiopia. 46 pp.

Hassan MM. Highly pathogenic avian influenza (H5N1) in Indonesia: the native chicken / domestic duck interface. 49 pp.

Hossain E. Models to stimulate spatial host-vector interactions: a review. 46 pp.

Hossain M. Mortality of dairy cattle in Central Cattle Breeding and Dairy Farm (CCBDF) in Bangladesh. 46 pp.

Khaluhi LM. In vitro culture of Trypanosoma congolense. 37 pp.

Mpouam SE. Anti-saliva antibody response in pigs challenged by tsetse flies. 41 pp.

Mudyanavana C. Comparison of the transmissibility of Trypanosoma congolense strains from sylvatic and domestic transmission cycles. 40 pp.

Nakure J. Molecular identification of the immature stages of Culicoides. 38 pp.

Omarch GN. In vitro cultivation of Trypanosoma vivax. 62 pp.

Otieno EA. The effect of tsetse fly (genus Glossina) saliva on the transmissibility of trypanosomes. 47 pp.

Pila R. Characterization of the in-house ELISA, implementation, optimization and characterization of WB protocol for Trichinella spp. 47 pp.

Poveda Cajina YI. The effect of temperature on the emergence activity of the Obsoletus complex in the laboratory and field condition. 44 pp.

Semu DT. Epidemiological and economic impact study of bovine trypanosomosis in Metekel zone, Northwest Ethiopia. 51 pp.

Souley Kouato B. Comparison of the development in the tsetse fly, Glossina morsitans morsitans, of diminazene aceturate resistant and sensitive strains of Trypanosoma congolense. 39 pp.

Teshale ST. Molecular identification of the immature stages of Culicoides species. 41 pp.

Vakuru CT. Situation-based survey of avian influenza viruses in possible 'bridge' species of wild and domestic birds in Nigeria. 46 pp.

Wilmaerts L. Prevalence of Toxoplasma gondii, Trichinella spiralis, and Taenia solium in pigs on two commercial farms in the Democratic Republic of Congo. 42 pp.

Yimer AH. Molecular characterization of Zambian field samples of Theileria parva using RFLP-PCR assay. 35 pp.

Zenal FC. Highly pathogenic avian influenza (H5N1) in Indonesia: the risk of spread between islands. 49 pp.

University Theses

Department of Parasitology

Alen C. *MagA* expressie in *Trypanosoma brucei* als genetische merker voor *in vivo* MRI. Biomedische Wetenschappen Universiteit Antwerpen. ITM promoter: P. Büscher.

Mijs E. Early geohelminth infections and allergic disorders in later childhood. MSc Health Sciences (Spec. Infectious Disease and Public Health). VU University Amsterdam. ITM Promoter: K. Polman.

Visser BJ. Detailed clinical and ultrasound assessment of children and adolescents with schistosomiasis-related morbidity in single and mixed Schistosoma infections in a follow up study in Pakh, Senegal. MSc Health Sciences (Spec. Infectious Disease and Public Health). VU University Amsterdam. ITM Promoter: K. Polman.

Department of Microbiology

Mertens J. Analyse van allogene NK cel activiteit gericht tegen HIV-geïnfecteerde CD4+ T-cellen door middel van flow cytometrie. Master in Biomedische Wetenschappen, Universiteit Antwerpen. ITG promotoren: L. Kestens en W. Jennes.

Njoroge T. Analysis of APOBEC3G single nucleotide polymorphisms in a cohort of HIV-1 concordant and discordant couples in Dakar, Senegal. Master in Molecular Biology, Vrije Universiteit Brussel. ITG promotoren: L. Kestens en W. Jennes.

Technical College theses

Department of Parasitology

Heykers A. Expressie van *Trypanosoma brucei gambiense* antigeen in *Pichia pastoris*. Master in de Industriële Wetenschappen: Chemie, Artesis Hogeschool Antwerpen. ITM promoter: P. Büscher.

Westerweele S. Optimalisatie en evaluatie van moleculaire testen voor de diagnose van humane Afrikaanse trypanosomiase. Bachelor of Applied Science, Chemistry, Life Sciences, Hogeschool Zeeland, Vlissingen. ITM promoter: P. Büscher.


RESEARCH

Secondary Research Funding ITM (SOFI)

Until 2008, ITM did not benefit from 'secondary' research funding, which at Flemish universities generously supplements the 'primary' academic core funding. In 2007 the Flemish Ministry of Research at last created a budget line for innovative research at ITM as well. This new research subsidy, which included a grant to consolidate the Clinical Trials Unit, is assured until the end of 2012 with a yearly budget of 1.75 M€ - which, unfortunately, was cut by 150000 € or 9% in 2010, as part of general austerity measures following the financial crisis.

The research subsidy was used to create an internally competitive research programme called SOFI (SOFI stands for 'Secundaire OnderzoeksFinanciering ITG – Secondary Research Funding ITM). Part of this programme, SOFI-A, allows scientists working on service-oriented programmes such as the Medical Services , the DGD programme or other, to finalize their PhD during an internal 'write up' fellowship for up to 18 months FTE. Up to 2010, 13 SOFI-A grants were awarded of which 8 already resulted in a PhD and a score of international publications. The other part, SOFI-B, is used to fund innovative, promising and strategically important spearhead projects. Currently 6 SOFI-B projects are running. Half a million eu is earmarked to co-fund the ITM's Clinical Trial Unit, which is instrumental to the conduct of collaborative GCP trials and to the participation of the ITM and its partners in the European and Developing Country Clinical Trials Partnership (EDCTP).

In 2010 we launched the third SOFI-A call, as in 2009 also open to external candidates.

Five eligible proposals were submitted and evaluated by the ITM Research Committee. The following project was selected on the basis of the SOFI-A criteria, i.e. scientific quality, relevance and feasibility:

PETERSON Kevin
Antiretroviral treatment success in the Gambia – Criteria, Predictors, Interventions, Outcomes.
Promoter: Bob Colebunders (ITM/University of Antwerp)
18 months full-time: March 2011 – August 2012

Because of the budget cut no new SOFI-B call could be launched in 2010.

Departmental Research

The SOFI funding makes up only 3% of the ITM's budget. Most research at ITM is funded by competitive, external grants or under the collaborative programme supported by the Belgian Cooperation Agency. Details follow on the next pages.

Department of Microbiology

Our main goal is to improve the knowledge and the control of the human immune deficiency virus (HIV), tuberculosis, and sexually transmitted infections (STI), especially in low and middle-income countries. Our department has four scientific units: Virology, Immunology, Mycobacteriology and Epidemiology and Control of HIV & STI. The AIDS Reference Laboratory (ARL) is service-oriented.

Unit of Virology

Our main focus remains the development of vaccines and microbicides against HIV, and immunotherapy targeting dendritic cells. In support to these themes, we also model heterosexual transmission *in vitro*, study biomarkers of HIV susceptibility *in vivo* and generate chimeric HIV constructs to study particular genes of interest.

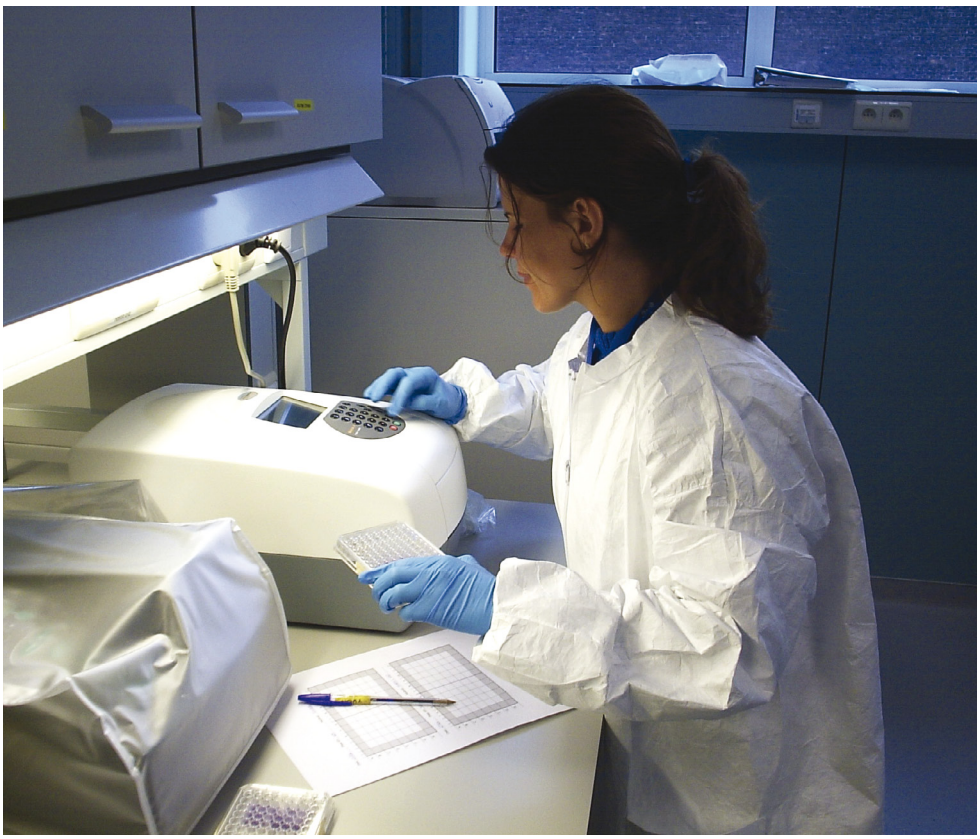
We identified antigens on the 'envelope' of the HIV virus, interacting with the 'broad neutralizing antibodies' from 2 African HIV-1 infected patients that inhibit a large number of HIV strains in cell based assays. In the European vaccine consortium NGIN this led to production of these viral envelopes either as trimeric proteins (called ITM-1) at the University of Oxford or as viral like particles at INT-NA (Naples). Both are tested for immunogenicity in rabbits applying prime-boost vaccination strategies at SSI (Copenhagen). In our lab we showed that HIV-neutralizing antibodies had effectively been induced. The ITM-1 envelopes will now be used for immunization of macaques at CEA (Paris).

In another international project, broad neutralizing antibodies from three other very interesting ITM patients were discovered. These new antibodies could block successive steps of HIV penetration into target cells and are currently further tested in macaques. Protective antibodies will be used as templates to design new immunogens for further vaccine development. We set out to further validate and standardize our neutralization assays, using the plasma and antibodies obtained from these patients.

In the microbicides field, we started a new European FP-7 project, CHAARM ("Combined Highly Active Anti-retroviral Microbicides"). We test candidate microbicides, which are developed in 10 European laboratories, in various cell culture systems. During 2010, we have screened over 150 new and existing compounds and identified at least 15 good candidates with high antiviral activity and low cellular toxicity. A strong collaboration has been established with the Medicinal Chemistry Unit at the University of Antwerp. We have developed an *in vitro* system to model HIV sexual transmission. This model is used to study the mechanism of sexual transmission and to assess levels of toxicity of candidate microbicides.

During 2010, we unraveled the mechanism by which some exceptional patients are able to keep HIV under control *in vivo* after stopping their treatment ("secondary controllers"). The main finding was that their CD8 T cells very efficiently suppress the replication of a whole range of HIV strains, upon infection of autologous CD4 T cells *in vitro*.

We also finalized a phase 1 clinical trial, using the patient's own dendritic cells, loaded with the messenger RNA for the Gag, Tat, Rev and Nef proteins. This candidate therapeutic vaccine was safe and it enhanced various T cell responses *in vivo*. Although it induced CD8 T cell suppression towards the vaccine strain, others strains were not suppressed. The challenge will be to broaden this anti-viral response, similar to what we observed in the "secondary controllers". Another challenge is the cumbersome process of modifying the dendritic cells of the patients. Therefore, we dedicate a major effort to develop a more generic and simple way of delivering the mRNA with 'cationic liposomes'. Mice were immunized with this new formulation of RNA and both T cell and B cell responses could be induced *in vivo*.



Developing the resazurin reduction method to measure the growth curve of *Mycobacterium tuberculosis.*

Unit of Immunology

The Unit of Immunology worked on HIV pathogenesis, on reconstitution of the immune system under AIDS-treatment and on features of the immune system that may be correlated with protection from HIV infection and disease.

Some individuals remain uninfected despite unprotected exposure to the virus (HIV-exposed seronegative or ESN persons). Understanding their natural mechanisms of protection may lead the way for the development of preventative vaccines or therapies. We study ESN subjects from a cohort of female sex workers in Abidjan, Côte d'Ivoire and a cohort of couples in Dakar, Senegal. By comparing the sequences in a part of the viruses, we found that, when both partners were infected, in 3 cases out of 4 transmission had occurred within the couple. Interestingly, the majority of these couples reported an occasional sexual relationship of the husband to be the source of the infection. These data emphasize the risk of married women in Africa. We also map the genetic variability of the intrinsic anti-HIV factors APOBEC3G, TRIM5-alpha, and tetherin in the CD4 cells of our Senegalese couples, and compare them to unexposed controls. We started analysing the functional properties of natural killer cells, another subset of immune cells known to exhibit powerful antiviral activities.

As part of a SOFI project on African trypanosomiasis (in collaboration with the Department of Parasitology) we started to study the kinetics of naive and memory T and B cells in sleeping sickness patients in RDCongo prior to and after treatment.

In another project we try to understand how and why the immune system of a large percentage (20-40%) of severely immune suppressed HIV-patients overreact during antiretroviral treatment (immune reconstitution inflammatory syndrome or IRIS), and what the effect of a tuberculosis infection on this process is (TBIRIS). We completed the 12 month follow up of our complete cohort (525 HIV patients). The immunological studies on the samples are in progress. A fourth plenary TBIRIS meeting with all partners was organized in Kampala from 7-8 June 2010.

We started a clinial trial with the Quantiferon TB-Gold assay. This immunological assay is used to exclude active tuberculosis in HIV-1 infected persons, but its performance in TB endemic areas in sub-Sahara Africa has not been tested. In the same context, we evaluate the reliability of the CD4 primary gating method (counting of CD4 cells with flow cytometry) in Senegalese patients, co-infected with HIV and TB.

In Tete, Mozambique, we participated in the PointCare NOW study, a point-of-care CD4 instrument evaluation. We continued the Institutional collaboration & capacity strengthening of the "Laboratoire de Virologie & Bactériologie" in "Le Dantec" in Dakar.

"Understanding the natural mechanisms of protection against HIV in these rare patients may lead to preventative vaccines or therapies"

Unit of Epidemiology and Control of HIV & STI

We played a prominent role in the UNAIDS "Prevention Evaluation Think Tank" on how to measure the effectiveness of complex HIV prevention programs. In 2010 these consultations led to new guidelines on Evaluation methods for program managers.

We continued to work with highly vulnerable groups, especially female sex workers and youngsters. In Ivory Coast and in Kenya, we provided technical support for the development of standardized tools for monitoring and quality assessment. We measured the retention rate of sex workers on anti-retroviral therapy in Ivory Coast, and assisted the government in designing the national AIDS strategy 2011-2015. In collaboration with the Kenya Medical Research Institute we provide technical assistance and training to organizations helping parents communicate with pre-teens about sex. In Kenya and Uganda we continued our work on the 'Brighter Future Intervention' to address the specific sexual and reproductive health needs of HIV infected adolescents. In Western Kenya, we continued our ethnographic study on young people's sexual behaviour and livelihood.

On request of the government we studied the prevalence of HIV among MSM and mapped prevention strategies in Flanders. We also perform a case-control study among seropositive MSM who are co-infected with hepatitis C. On the European level we stay involved in EMIS, the European internet survey among MSM in 38 countries. On World Aids Day, we organized a HIV seminar.

We also target MSM in developing countries, a vulnerable group that has all too long been neglected. We assisted in a survey of the HIV epidemic in MSM, female sex workers, youngsters and pregnant women in the city of Esmeraldas (Ecuador).

The year 2010 showed the microbicide research community proof of concept with the Caprisa004 trial. We now urgently need better products, with a good safety profile, and a better insight in the biology of HIV transmission. We identified the importance of *Lactobacillus crispatus and L iners* and described vaginal mucosal factors in a healthy European population. These baseline data will be compared with populations in Africa to elucidate vaginal factors that are of importance for HIV transmission.

We continued our assistance to the control programme of Cambodia for AIDS, sexually transmitted diseases and reproductive health in the district of Kirivong.

In 2010, the HIV prevention programme for sub-Saharan African migrants (SAM) commissioned by the Flemish Government, was integrated in our unit. We coordinate community-based HIV prevention activities for African migrants, and carry out operational research on community-based outreach HIV/STI testing. In addition, we coordinate a 10 country European public health project on positive prevention (Eurosupport 6). We developed a counseling intervention on sexual risk reduction for MSM and migrants living with HIV, combined with computer-assisted tools, which will be evaluated rigorously in a randomized trial in 2011.

Unit of Mycobacteriology

Under the new leadership of Bouke **De Jong,** we continued to focus on molecular epidemiology, drug resistance, diagnostics and operations research. We follow the transmission dynamics of *Mycobacterium tuberculosis* and *M. ulcerans*, and the effect of public health interventions; we map strain differences and mutations, also in animals, and look for markers of resistance and treatment outcome; we develop and test (low cost) diagnostics and microscopy techniques; we support clinical trials. We supervise 13 PhD students, 4 of whom successfully defended their thesis in 2010.

Furthermore, we are one of the WHO TB Supranational Reference Laboratories (SRL). We coordinate their annual rounds of proficiency testing. We discovered that some mutations for rifampicin resistance are overlooked in tests using liquid media, an issue we are exploring in more detail with the other SRL labs involved.

In Bangladesh, a 9 month treatment for multi-drug resistant TB (MDR-TB) improved treatment success to over 85%, compared to around 65% with the WHO recommended 24 month regimen. We provide the lab support for the multicentre randomized clinical trial TB STREAM, that will thoroughly compare both regimens.

We also optimize diagnostics for MDR-TB. For instance, staining of sputum with fluorescein diacetate for fluorescent microscopy allows to detect viable bacilli. We test whether this technique can be used to exclude the large majority of patients, excreting only dead bacilli, from further testing for

ITM scientists took actively part in the World AIDS Congress in Vienna.

drug susceptibility. In a small pilot study this technique proved highly predictive of MDR; it is now studied in a larger series. In the same perspective, we optimized LED based fluorescent microscopy.

We conduct collaborative studies on the development and optimization of low cost TB diagnostics and drug resistance (including the coordination of the European project FAST-XDR-DETECT), in addition to fundamental studies on mycobacterial fitness, drug efflux mechanisms and laboratory support to clinical trials on the new anti-tuberculous drug TMC207 from Tibotec pharmaceuticals, and other antibiotics.

Our work on diagnostics culminated in recommendation by the WHO of two of our methods, the Colorimetric redox indicator method (REMA) and the Nitrate reductase assay (NRA) (http://www.who.int/tb/laboratory/whopolicy_noncommercial-culture_and_dst_methods_mar2011.pdf). We are involved in a WHO/ TDR multicenter trial for the shortening of treatment of pulmonary tuberculosis, and the international laboratory capacity building program LabCap for Ivory Coast, and other projects.

We study the molecular epidemiology and drug resistance patterns of TB in humans and animals in numerous countries. In this process, we have identified strains with discrepant results on conventional and molecular resistance typing, and developed research proposals on alternative mechanisms of resistance against antibiotics of the fluoroquinolone group.

Our studies on Buruli ulcer focus on the role of amoebae as an environmental reservoir for *M. ulcerans*. We initiated a project on the differential diagnosis of Buruli ulcer in Benin, and lead a WHO Collaborating Center for Buruli ulcer.

We offer scientific support to Medecins Sans Frontières' studies in the field. This includes comparison of different decontamination techniques, differences in culture sensitivity between solid and liquid medium, prevalence of resistance to 1st and 2nd line drugs in Georgia and Abkhazia, validation of the TLA method for the rapid detection of rifampicin, isoniazid, ofloxacin and kanamycin resistance in *M. tuberculosis* sputum samples.

A new research subject is *M. africanum*. We conduct growth curves on isolates in the ITM collection. A new post-doctoral scientist will continue work on *M. africanum* at the MRC Laboratories in the Gambia. We complete a project on differences in mycobacterial gene expression in sputum from patients with and without HIV co-infection, and a project on co-infection with *M. tuberculosis* and *Helicobacter pylori* (a cause of stomach ulcers).

Reference laboratories

The department houses several national or international reference laboratories: the **Supranational Reference Laboratory for the Surveillance of Drug-resistant Tuberculosis**; the **International Collaborating Centre for Buruli ulcer;** the **National Reference Laboratory for STI; the National Aids Reference Laboratory (ARL); the WHO collaborating Centre for HIV/AIDS Diagnostic and Laboratory Follow Up.**

They all continued to fulfill their role, confirming tests from peripheral laboratories, building local capacity of partner laboratories in developing countries, organizing ring tests, and external quality controls.

Department of Microbiology: projects

For more details visit www.itg.be and enter the project reference number in the search field.
Projects of the ITM-DGDC Framework Agreement Programme are listed in the chapter Development Cooperation.

Unit of Virology

Reference number 100217
UCL-VDAC Consortium: vaccine-induced protective cross-neutralisation of HIV-1
ITM promoter: Sunita Balla-Jhagjhoorsingh
Support: Bill & Melinda Gates Foundation, USA

Reference number 314401
New HIV vaccines inducing broadly-reactive neutralising antibodies
ITM promoter: Guido Vanham
Support: European Commission, Belgium

Reference number 314402
Combined Highly Active Anti-Retroviral Microbicides
ITM promoter: Guido Vanham
Support: European Commission, Belgium

Reference number 414401
Inhibition of HIV replication
ITM promoter: Guido Vanham
Support: Federal Science Policy Office, Belgium

Reference number 424402
Sexual transmission of HIV: viral selection, fitness and adaption
ITM promoter: Guido Vanham
Support: FWO, Belgium

Reference number 424405
Protective immunity after stop of highly active antiviral therapy
ITM promoter: Guido Vanham
Support: FWO, Belgium

Reference number 424406
In vivo transduction of dendritic cells with mRNA to develop an immunotherapy.
ITM promoter: Guido Vanham
Support: FWO, Belgium

Reference number 524401
In vitro evaluation strategy for the benefit/risk analysis of microbicidal anti-HIV effects in the vaginal epithelium
ITM promoter: Guido Vanham
Support: Agence Nationale de Recherches sur le Sida et les Hépatites Virales, France

Reference number 524402
Evaluation of the antiviral activity of the CS panel
ITM promoter: Guido Vanham
Support: CONRAD, Eastern Virginia Medical School, USA.

Unit of Mycobacteriology

Reference number 100111
Elaborating public culture collections of diatoms, polar cyanobacteria and mycobacteria in Belgium
ITM promoter: Françoise Portaels
Support: Federal Science Policy Office, Belgium

Reference number 100179
Diagnosis of tuberculosis and drug resistance surveillance in Médecins Sans Frontières tuberculosis projects
ITM promoter: Françoise Portaels
Support: Médecins Sans Frontières France, France

Reference number 314201
Development and clinical evaluation of fast tests for tuberculosis diagnosis
ITM promoter: Françoise Portaels
Support: European Commission, Belgium

Reference number 314202
Development of a two-approach plate system for the fast and simultaneous detection of multidrug resistant and extensively drug resistant M. tuberculosis
ITM promoter: Françoise Portaels
Support: European Commission, Belgium

Reference number 314203
Pan-European network for the study and clinical management of drug resistant tuberculosis.
ITM promoter: Françoise Portaels
Support: European Commission, Belgium

Reference number 334203
Network for European / ICPC cooperation in the field of AIDS and TB
ITM promoter: Françoise Portaels
Support: European Commission, Belgium

Reference number 424201
Detection of the system and the level of the mycolactone expression of Mycobacterium ulcerans
ITM promoter: Françoise Portaels
Support: FWO, Belgium

Reference number 424203
SialoTarg: advanced vaccines and pharmaceuticals targeted to macrophages via sialoadhesin.
ITM promoter: Françoise Portaels
Support: IWT, Flanders, Belgium.

Reference number 514202
Development and maintenance of a bank of highly characterised M. tuberculosis isolates
ITM promoter: Françoise Portaels
Support: WHO, Switzerland

Reference number 514203
Multicenter RCT of gatifloxacin-containing short-course regimen for the treatment of pulmonary tuberculosis
ITM promoter: Françoise Portaels
Support: WHO, Switzerland

Reference number 514204
14th, 15th, 16th & 17th Round Proficiency Testing of the quality assurance programme for drug susceptibility of Mycobacterium tuberculosis in the network of Supranational Reference Laboratory of the WHO/IUATLD Global Project on Drug Resistance Surveillance
ITM promotor: Françoise Portaels
Support: WHO, Switzerland

Reference number 514205
Technical assistance for strengthening laboratory capacity and national surveillance of anti-tuberculosis drug resistance in the Supranational Reference Laboratory's partner countries of Central African Republic, Democratic Republic of Congo and United Republic of Tanzania
ITM promoter: Françoise Portaels
Support: WHO, Switzerland

Reference number 624208
STOP Buruli
ITM promoter: Françoise Portaels
Support: UBS Optimus Foundation, Switzerland

Reference number 624210
Collaboration agreement between ITM and Epicentre
Objectives: ITM technical support to Epicentre's mycobacteriology laboratory activities at EMRB.
ITM promoter: Françoise Portaels
Support: Epicentre, France

Reference number 624232
Tuberculosis: drug resistance surveillance 2010
ITM promotor: Françoise Portaels
Support: Damien Foundation, Belgium

Reference number 624215
Development of the nitrate reductase assay (NRA) for the rapid and simultaneous detection of MDR and XDR-TB in M. tuberculosis applied directly in sputum samples.
ITM promotor: Françoise Portaels
Support: Damien Foundation, Belgium

Reference number 514207
Quality assurance services for DRS survey
ITM promotor: Bouke de Jong
Support: World Health Organisation, Switzerland.

Reference number 624218
Operational research and development of new diagnostic methods for tuberculosis diagnosis in low resources settings
ITM promotor: Bouke de Jong
Support: Médecins Sans Frontières France, France

Reference number 314204
Novel strategies for the prevention and control of persistent infections
ITM promoter: Leen Rigouts
Support: European Commission, Belgium

Reference number 314205
Identification and development of vaccine candidates for Buruli Ulcer Disease
ITM promoter: Leen Rigouts
Support: European Commission, Belgium

Reference number 414201
Building of public collections of diatom, polar cyanobactery and mycobactery cultures and their further integration in the BCCM consortium.
ITM promoter: Leen Rigouts
Support: Federal Science Policy Office, Belgium, Belgium

Reference number 514206
Technical assistance to the EXPAND-TB project and drug resistance surveillance (DRS) in selected countries.
ITM promoter: Leen Rigouts
Support: World Health Organisation, Switzerland.

Reference number 624216
Investigation on the clinically relevant resistance level of fluoroquinolones and injectable second-line drugs in Mycobacterium tuberculosis.
ITM promotor: Leen Rigouts
Support: Damien Foundation, Belgium

Reference number 624217
The evaluation of a standardised treatment regimen of anti-tuberculosis drugs for patients with MDR-TB
ITM promotor: Leen Rigouts
Support: Union Internationale Contre la Tuberculose et les Maladies Respiratoires, France

Reference number 614201
Laboratory service agreement on TMC207-C208 clinical trial.
ITM promotor: Françoise Portaels
Support: Tibotec, Ireland

Reference number 614202
Consultancy agreement on TMC207-C209 testing of Mycobacterium TB.
ITM promotor: Françoise Portaels
Support: Tibotec, Ireland

Unit of HIV/STD Epidemiology and Control

Reference number 84991
Rapid expansion of HIV/AIDS activities by national non-governmental organisations and associations serving highly vulnerable populations in Côte d'Ivoire
ITM promoter: Marie Laga
Support: Family Health International, USA

Reference number 314301
European Vaccine and Microbicides Enterprise
ITM promoter: Anne Buvé
Support: European Commission, Belgium

Reference number 317508
Eurosupport VI : Developing a training and resource package for improving the sexual and reproductive health of people living with HIV/AIDS
ITM promoter: Nöstlinger Christiana
Support: European Commission, Health and Consumer Protection, Luxembourg

Reference number 324301
Preparing for phase III vaginal microbicide trials in Rwanda and Kenya: preparedness studies, capacity building and strengthening of medical referral systems
ITM promoter: Anne Buvé
Support: EDCTP, The Netherlands

Reference number 324302
Characterisation of novel microbicide safety biomarkers in East and South Africa.
ITM promoter: Anne Buvé
Support: EDCTP, The Netherlands

Reference number 414301
Guidance of a study on STI/HIV in Esmeraldas, Ecuador.
ITM promoter: Marie Laga
Support: Belgian Technical Cooperation

Reference number 424301
Outreach HIV testing for men having sex with other men (MSM)
ITM promoter: Marie Laga
Support: Flemish Agency of Care and Health, Belgium

Reference number 427510
HIV-SAM project: promotion of sexual health and prevention of HIV and other sexually transmitted infections (STI) for sub-Saharan African migrants (SAM) in Flanders
ITM promoter: Christiana Nöstlinger
Support: Flemish Agency of Care and Health, Belgium

Reference number 437520
AIDS prevention Sub Saharan African Migrants (SAM) in the Province of East-Flanders.
ITM promoter: Christiana Nöstlinger
Support: Province of East-Flanders, Belgium

Reference number 524301
Assessment of youth interventions in Asembo and Gem, Nyanza Province, Kenya
ITM promoter: Anne Buvé
Support: Centers for Disease Control and Prevention, USA

Reference number 524303
Learning by doing: enhancing treatment literacy and addressing sexual and reproductive health of young people living with HIV/AIDS (PLHA) in Uganda and Kenya
ITM promoter: Anne Buvé
Support: Amsterdam School for Social Science Research, The Netherlands

Reference number 524305
Improving the prevention response.
ITM promoter: Marie Laga
Support: UNAIDS, Switzerland

Reference number 524307
Support to the prevention strategy National Strategic plan on AIDS in Côte d'Ivoire
ITM promoter: Marie Laga
Support: The World Bank, USA.

Reference number 624502
Impact of vaginal ring (IPM013) on the vaginal flora
ITM promoter: Marie Laga
Support: International Partnership for Microbicides, USA.

Reference number 314302
Combined Highly Active Anti-Retroviral Microbicides
ITM promoter: Anne Buvé
Support: European Commission, Belgium

Unit of Immunology

Reference number 314101
Pathogenesis and identification of predictive factors of TB-IRIS in HIV patients under HAART
ITM promoter: Luc Kestens
Support: European Commission, Belgium

Reference number 424101
Correlates of protection against HIV infection among African HIV-exposed seronegative (ESN) subjects
ITM promoter: Luc Kestens
Support: FWO, Belgium

Reference number 744002
Study of HAART-induced immune restoration in HIV patients
ITM promoter: Luc Kestens
Support: various

HIV/STI Reference Laboratory

Reference number 334501
IPM-ITM partner agreement on Good Clinical Laboratory Practice
ITM promoter: Catharina Fransen
Support: European Commission, EuropeAid, Belgium

Reference number 624501
Phase III study to assess the role of Truvada in preventing HIV acquisition in women
ITM promoter: Catharina Fransen
Support: Family Health International, USA

Reference number 514502
Evaluation of the operational characteristics of HIV assays
ITM promoter: Catharina Fransen
Support: WHO, Switzerland

Reference number 514503
Assessment of HIV virological assays for prequalification (Phase I)
ITM promoter: Catharina Fransen
Support: WHO, Switzerland

Reference number 514504
Specimens collection for WHO HIV evaluation panel
ITM promoter: Catharina Fransen
Support: WHO, Switzerland

Department of Microbiology: ongoing PhD projects

ALAMO TALISUNA Stella Patricia.Efficiency, quality of care, and cost effectiveness of ART Delivery at REACH Out Mbuya HIV/AIDS Initiative, Uganda.
Promoters: M. Laga (ITM), F. Wabwire-Mangen(University of Makerere, Uganda)

BARLETTA Francesca. Molecular epidemiological approach to understand the emergence and spread of drug resistant Mycobacterium tuberculosis strains in Peru.
Promoters: B. De Jong, L. Rigouts (ITM), J. Arevalo (Instituto de Medicina Tropical 'Alexander von Humboldt', Peru)

CAMARA Makhtar. Study of the correlates of protection from HIV transmission in HIV-discordant couples in Dakar, Senegal.
Promoters: L. Kestens; W. Jennes (ITM), Souleymane Mboup (CHU Dakar, Senegal)

JUGHELI Levan. Improving control of multidrug-resistant (MDR) and extensively drug resistant (XDR) tuberculosis (TB): rapid detection of resistance to amynoglycosides and fluoroquinolones, and MDRTB treatment in a setting with a high prevalence of MDRTB.
Promoters: F. Portaels (ITM); L. Rigouts (ITM, University of Antwerp)

KYONGO KARANJA Jordan. Development of combined highly active anti-retroviral microbicides and or biomakers to assess safety of microbicides.
Promoters: G. Vanham (ITM)

MULENGA Chanda. Tuberculosis drug resistance and treatment outcome in the Copperbelt province of Zambia.
Promoters: F. Portaels (ITM); L. Rigouts (ITM, University of Antwerp), A. Mwinga (University of Zambia, Zambia)

PROANO Freddy. Bovine tuberculosis in Ecuador: prevalence in cattle and impact on human health.
Promoters: F. Portaels (ITM); L. Rigouts (ITM, University of Antwerp), A. Linden (University of Liège), W. Bénitez-Ortiz (CIZ Universidad Central del Ecuador, Quito, Ecuador)

SOPOH Ghislain. Etude des facteurs de risqué et de prognostic thérapeutique de l'Ulcère de Buruli.
Promoters: F. Portaels (ITM), S. Anagonou (Laboratoire de Référence des Mycobactéries, Cotonou, Bénin)

YEMOA Achille. Identification and chemical study of plants used in the traditional treatment of Buruli ulcer in Benin.
Promoters: F. Portaels (ITM), J. Quetin-Leclercq (Université Catholique de Louvain), S. Anagonou (Laboratoire de Référence des Mycobactéries, Cotonou, Bénin)

BLOMMAERT Ellen. A qualitative, ethnographic study on livelihood and sexual behaviour among out-of-school youth in Asembo, Nyanza Province, Kenya.
Promoters: A. Buvé (ITM), A. Hardon (University of Amsterdam, the Netherlands), M. De Bruijn (University of Leiden, the Netherlands)

DE HAES Winni. mRNA delivery to dendritic cells with liposomes and polymers as a new therapeutic vaccination strategy against HIV.
Promoters: G. Vanham (ITM/University of Antwerp)

GALI Youssef. Development of an in vitro model to study heterosexual HIV transmission.
Promoter: G. Vanham (ITM/University of Antwerp)

GOOVAERTS Odin. Immune pathogenesis of TB-IRIS in patients receiving ART: Quest for predictive and diagnostic markers.
Promoters: L. Kestens (ITM/University of Antwerp)

GRUPPING Katrijn. Characterisation of early transmitted viruses and the development of HIV-1 envelop mutants.
Promoter: G. Vanham (ITM/University of Antwerp)

JESPERS Vicky, Safety markers in microbicide trials: past experiences and future challenges.
Promoters: A. Buvé (ITM)

MOUS Kim. Study of intrinsic, cellular anti-HIV factors in frequently exposed seronegative (ESN) individuals.
Promoters: L. Kestens; W. Jennes (ITM), X. Van Ostade (University of Antwerp)

POLLARD Charlotte. The use of non-viral mRNA carriers in a novel immunization strategy for HIV.
Promoters: G. Vanham (ITM), J. Grooten (University of Ghent)

SELHORST Philippe. Analysis and induction of T cell mediated protective immunity in HIV patients under antiviral therapy.
Promoter: G. Vanham (ITM/University of Antwerp)

SUYKERBUYK Patrick. Micro and macro study of the ecological niche of Mycobacterium ulcernas in Buruli ulcer endemic regions in Benin and the Democratic Republic of Congo.
Promoters: F. Portaels (ITM), L. Kestens (University of Antwerp), P. De Maeyer (Ghent University)

VANDEN BERGHE Wim. The development of a structural explanatory model for sexual risk behaviour among men who have sex with men in Flanders, Belgium.
Promoters: M Van Houtte (UGENT), M Laga (ITM)

Department of Parasitology

The Department of Parasitology aims to generate, disseminate and apply knowledge of human parasitic diseases and to strengthen the scientific capacities of low and middle-income countries. Our main research subjects are malaria, leishmaniasis, sleeping sickness, Chagas disease, schistosomiasis and cysticercosis. While our work concentrates on the problems in (sub-)tropical regions, we also run programs that are relevant for Europe. The department counts five units: Medical Entomology, Epidemiology and Control of Parasitic Diseases, Molecular Parasitology, Parasite Diagnostics and Medical Helminthology. Our research covers a coherent continuum ranging from basic biology of parasites and their vectors, over applied sciences and tool development to clinical trials, vector control and intervention research.

Unit of Medical Entomology

We focus on the biology, biodiversity, identification, control and insecticide resistance of (malaria) vectors. Our research on the interactions between tsetse flies and trypanosome parasites was transferred to the Department of Animal health, due to the re-appointment of Jakke **Van Den Abbeele.**

We continued our collaborative studies on the efficacy and durability of long lasting insecticide treated nets in Vietnam and Cambodia. One test location became unusable, because river management sharply reduced the number of mosquitos. We also prepared studies on different insecticides for indoor spraying.

The MODIRISK study, an inventory of the biodiversity, dynamics and risk of mosquitos in Belgium resulted in two papers , and five more are in preparation. This work, together with a study on the emergence of viral diseases (with case studies on West Nile Virus, bluetongue and Chikungunya Virus) due to eco-climatic changes, was instrumental to convince the Belgian authorities to develop a risk surveillance policy.

In the VBORNET project we took part in the surveillance of vectors on a European scale, producing inventories and distribution maps. We organized a three-day meeting of the project partners in Antwerp.

We produced an elisa-test for tsetse saliva, studied the dialogue between trypanosomes and their tsetse host, and isolated and cultivated tsetse fly symbionts *(Sodalis glossinidius)*. We found a way to eliminate wild type symbionts from the fly, in order to reintroduce recombinants, producing anti-trypanosome nanobodies. The evaluation of the effect on the trypanosomes in the fly is ongoing.

Unit of Parasite Diagnostics

We work on African trypanosomiasis (sleeping sickness), leishmaniasis and Chagas' disease and we focus on parasitological, serological, bioclinical or genetic markers for diagnosis, stage determination and follow-up after treatment. Molecular diagnostics and recombinant and synthetic antigens remain important research lines.

We coordinate the evaluation of the PCR-oligochromatography method in seven Latin American countries. For a next generation of molecular tests, novel, amplification independent, nucleic acid detection systems are investigated by an FWO postdoctoral fellow currently based at the University of California.

"We challenge the dogma that cure equals complete elimination of the parasite"

Field laboratory in Bandundu province in the Democratic Republic of the Congo

For our study of experimental neuroinvasion in sleeping sickness, we extended the collection of bioluminescent and fluorescent trypanosomes. In addition, we construct (in collaboration with Antwerp University) biomagnetic parasites that can be tracked *in vivo* by magnetic resonance imaging.

The THARSAT clinical study showed that it is possible to reduce post- treatment follow-up in sleeping sickness by more than one year. Further analysis showed that PCR is not appropriate to discriminate cure from treatment failure ; a challenge of the dogma that cure equals complete elimination of the parasite. On the other hand, collaboration with the University of Geneva confirmed that recently discovered biomarkers for stage determination may also be appropriate to assess treatment outcome. THARSAT also resulted in a unique collection of *Trypanosoma brucei gambiense* parasites, ready for drug resistance studies and full genome sequencing.

In current detection tests for trypanosomiasis, fragments of actual parasite proteins (epitopes) are used. We successfully produced two new recombinant epitopes from random peptide phage libraries. These mimic the native epitopes of the parasite and have clear diagnostic potential.

Together with researchers in Burkina Faso, we confirmed the specificity of the immune trypanolysis tests for detection of antibodies against *Trypanosoma brucei gambiense*. We obtained a grant to replace the highly infective *Trypanosoma brucei gambiense* by a non-infective *Trypanosoma brucei brucei*.

In DR Congo, we started a project to investigate whether sleeping sickness deletes the immune memory, as observed in mouse models. We also assess the diagnostic sensitivity and the repeatability and reproducibility of several parasitological and molecular tests

In Ethiopia, we started a collaborative study on the epidemiology and the genotypic characterisation of *Trypanosoma vivax* within tsetse-infested and tsetse-free regions.

Unit of Molecular Parasitology

We continued our three main lines of research on *Leishmania*.

In the first line, we aim to understand the mechanisms of drug resistance and its relationship with treatment outcome. In *L. donovani*, we found evidence for a higher fitness of antimony-resistant strains, making it a unique model in the world of pathogens. Through the Kaladrug-R project, we monitor the susceptibility of the parasites to miltefosine in the Indian sub-continent: we are currently validating the required in vitro assays, but did not find so far natural drug-resistant strains. The Kaladrug-R project was successfully evaluated during its mid-term review. We found multiple emergences of antimony resistance in *L. braziliensis*, accompanied by pleomorphic molecular adaptations of the parasite.

Tine Huyse received the Merial Award for her research on the population genetics of parasitic worm infections

Our second focus is on molecular epidemiology. Through our DGD collaborations with sister institutes in Lima and La Havana, we validated a series of new (or improved) tools for *Leishmania*-species identification. We are also involved in the LeishMAN network, promoting integrated dynamic parasite typing at European level. During our evolutionary and genetic analyses of Old World *Leishmania,* we discovered a new hybrid between *L. donovani* and *L. aethiopica*. The FP7-project Chagasepinet underwent a positive mid-term review. Our unit was involved in the evaluation of PCR-RFLP tools for the identification of the major lineages of *Trypanosoma cruzi* as well as in the organization of training workshops in Latin America.

In our third research line we integrate genomics, metabolomics and clinical infectiology. The genomic component reached cruising speed, with the generation of a first version of the reference genome of *L.donovani* and the completion of a genome diversity study of 17 parasite lines from Nepal and India. This revealed unique features, like a generalized aneuploidy among the parasites. Exploitation of the results is in progress and 40 new strains were prepared for further sequencing at Sanger Institute. With respect to the metabolomics, 2010 was a transition year, as we opened a new collaboration with the university of Antwerp for mass-spectrometry analysis of *Leishmania* metabolites.

Unit of Epidemiology and Control of Parasitic Diseases

We further developed our main research lines on anti-malaria drug resistance and new treatment combinations, malaria in pregnancy, as well as on *Plasmodium vivax* biology and epidemiology & treatment.

Our research on malaria is carried out in different countries, including Vietnam, Uganda, DR Congo, Zambia, Peru. The 4ABC-trial (evaluation of 4 artemisin-based combinations in uncomplicated malaria in African children) was successfully completed, all recurrences were genotyped in our laboratory, and first results are being submitted for publication. It is the largest trial ever done on artemisin-based combinations.

The EDCTP- and Gates Foundation funded multicenter trial on antimalarial treatment in pregnant women is ongoing in 4 countries (Burkina Faso, Ghana, Malawi and Zambia) and all of them are recruiting patients. It will test artemisin-based combination therapy in more than 3 000 pregnant women.

Together with the Clinical Research Unit on Malaria in Nanoro, Burkina Faso, we successfully completed the recruitment of the children's cohort for the phase III trial on the malaria vaccine RTS,S produced by GSK. Still in Burkina, we are involved in a new collaborative project, PALUFER, to assess the safety and efficacy of weekly iron and folic acid supplementation in young women of childbearing age living in a highly malarious area in Africa. This strategy is recommended by WHO but has never been validated in Sub-Saharan Africa.

Our work on *P.vivax* in vitro culture has drastically expanded in 2010 with the set-up of a new L2 laboratory and the successful establishment of *P.vivax* invasion tests with both fresh and frozen reticulocytes, obtained either directly from cord blood or after differentiation from hematopoietic stem cells .

In Peru and Vietnam, we follow up a cohort *of P.vivax* infected patients to assess the efficacy of the respective national guidelines for the radical cure of *P.vivax*. First results obtained indicate that, despite low transmission levels, malaria recurrences were very common but remained underdiagnosed by microscopy. Molecular, serological and epidemiological data will be combined to build a model that estimates the probability of new infections.

We developed anthropological research in several of our studies in order to get more insight into socio-cultural determinants of disease transmission, of treatment efficacy, of effectiveness of new interventions, etc... especially in low endemic settings where the disease occurs in remote areas inhabited by poor ethnic minorities. Moreover, anthropological research will also be of invaluable help in assessing the zoonotic risk of malaria in Central Vietnam, as we identified *P. knowlesi*, a simian malaria species, in 3 different individuals in one of our previous study sites.

Unit of Medical Helminthology

Our overall objective is to understand the relationship between humans and their helminth parasite, and to identify strategies for integrated and sustainable control strategies.

In 2010, we used microsatellite markers to study the effect of repeated drug treatment on the genetic structure of the schistosome populations in Senegal, in collaboration with the K.U.Leuven and the Natural History Museum in London. Contrary to the expectations, we found no real difference in the population genetic structure or diversity, suggesting treatment failure rather than rapid re-infection.

In Senegal, we also compared immunological profiles in population groups who did or did not get sick after infection with schistosomes. Preliminary analysis showed an association between bladder morbidity and innate anti-inflammatory cytokine patterns.

With the Institut National de Recherche Biomédicale in Kinshasa, we surveyed schools and health services in Bas-Congo on the re-emergence and control of schistosomiasis, and found infections in up to 85% of people. In DR Congo we also study porcine and human cysticercosis. In a village in Bas-Congo, we found a prevalence of active human cysticercosis of more than 20%, the highest ever reported. We now will investigate if in co-endemic areas with other worm diseases, repeated mass drug administration of praziquantel lowers the frequency of cases in humans and pigs.

In Cuba, we collaborate with the Instituto Nacional de Higiene, Epidemiología y Microbiología, with the Instituto de Nutrición e Higiene de los Alimentos in Havana, and with the VU University of Amsterdam on helminth-nutrition interactions in relation to atopy. In 2010, we carried out a large follow up study in schoolchildren and analysed the large amount of data collected over the past years. We also initiated two hospital based studies: one on (neuro)cysticercosis in patients with epilepsy, and one on ocular larva migrans and toxocariasis. A systematic review of available data on toxocariasis in Cuba illustrated the lack of recent data and diagnostic expertise. A serological study pointed to *Toxocara* exposure in almost 40% of school aged children.

In collaboration with the Department of Public Health at ITM, we study the interface between local health systems and global health initiatives, especially campaigns tackling a range of neglected (helminth) diseases by combined mass drug administration.

Study team P. vivax project in Tra leng, Central Vietnam

Highlights

Unit of Parasite Diagnostics

After treatment follow-up in sleeping sickness reduced by more than a year

Clinical management of human African trypanosomiasis, also called sleeping sickness, requires a two-year patient follow-up. At each follow-up visit, a lumbar puncture is performed and the cerebrospinal fluid (CSF) is examined for trypanosomes and white blood cells (WBC).

Aiming at making this follow-up shorter, we performed a prospective study on 360 patients in DR Congo. During two years, several biomarkers in the CSF were studied on their potential to predict cure or relapse. The proportion of treatment failure was 37%. Based on the studied biomarkers, criteria for failure and cure were defined and combined in several algorithms. This study showed that, by using simple trypanosome detection and CSF WBC count as follow-up criterion at 6 months and by introducing "no trypanosomes and a white blood cell count of less than 20 per microliter CSF" as criterion for cure at 12 months, the post-treatment follow up can be considerably reduced. For patients with second stage *gambiense* sleeping sickness the follow up may go down from the current two years, to 6 or maximum 12 months.

This also implies a 74% reduction in lumbar punctures, which improves the overall patient comfort considerably.

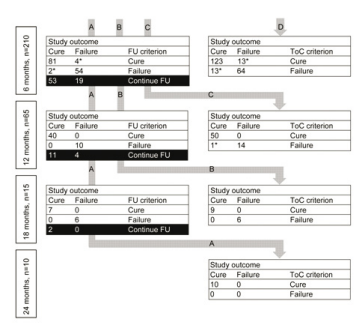


FIG: Impact on follow-up duration in second stage sleeping sickness patients of four algorithms (A, B, C, D) based on a combination of two different criteria for treatment failure and cure. Algorithm C was shown to be the best one.

Mumba Ngoyi *et al.* 2010. How to shorten patient follow-up after treatment for *Trypanosoma brucei gambiense* sleeping sickness? J Infect Dis 201, 453.

Unit of Medical Entomology

Malaria elimination in Southeast Asia: Insecticide treated nets, indoor residual spraying… Do we miss something?

Scaling up of Insecticide Treated Nets (ITNs) and the expansion of Indoor Residual Spraying (IRS) programmes contributed significantly to a worldwide decrease of malaria in recent years. Beside the personal protection, ITNs confer a community protection when wide coverage is assured, so unprotected persons benefit, as they are surrounded by protected persons.

Within the Greater Mekong Subregion (i.e. Cambodia, Lao PDR, Myanmar, Thailand, Vietnam and South-China), progress in malaria control has been substantial over the last 10 years. Active transmission is still occurring in remote forest foci, mainly concentrated along the international borders and characterized by a high population mobility. Partial artemisinin resistance has emerged at the Thai-Cambodia border, compromising the global malaria control efforts.

A containment programme has been launched to interrupt the spread and prevent further emergence of artemisinin resistance. Most efforts are concentrated on increasing coverage with effective antimalaria treatment, active surveillance and case detection and possibly mass drug administration. The coverage by Long lasting Insecticidal Nets (LLINs) has been considerably increased.

But all this will probably not be enough to stop malaria transmission. Indeed, outdoor and/or early biting species are not affected by the nets, and indoor spraying will have little impact on outdoor resting vectors. Our collaboration with the National Institute for Malariology, Parasitology & Entomology (Vietnam) and the National Centre for Malaria Control (Cambodia), has shown that about 40-50% of the vector bites occur before sleeping time (with high variation). Consequently, people are at high risk of being infected during their outdoor evening activities. Similar challenges occur in Africa. There is thus an urgent need to assess the impact of additional personal protection tools against outdoor and early biting vectors, such as topical and spatial repellents, and insecticide treated clothing. This may be a prerequisite for not compromising elimination programmes in the long term.

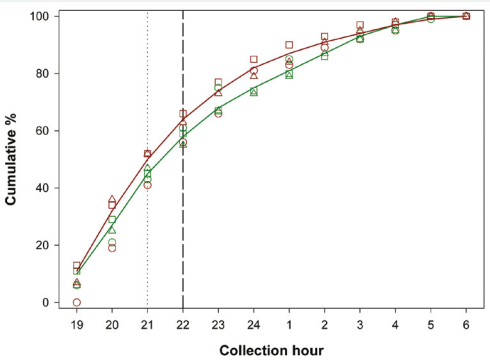


FIG: High early biting rate (up to 60% before 10 pm) in Ninh Thuan province Vietnam. No variation was observed between species or collecting places. In forest: green; in villages: red; *Anopheles* species: straight line, *Anopheles dirus:* circles, *Anopheles maculatus s.l.*: triangles, *Anopheles minimus s.l:* squares. The vertical dotted line indicates the human sleeping time in the forest. The vertical dashed line indicates the human sleeping time in the villages .

Van Bortel *et al. Malaria Journal* 2010 **9**:373 doi:10.1186/1475-2875-9-373

Unit of Molecular Parasitology

A challenging journey to the diversity of Leishmania donovani

In collaboration with the Sanger Institute in the UK, state-of-the-art technologies could be used to sequence the whole genome of 17 different strains of *Leishmania donovani* originating from the Indian subcontinent. The generation of high-quality genetic code information of entire parasite populations is a première in neglected diseases research. We then performed an in-depth comparative analysis of these genetic codes, which required leaping through a whole series of bio-informatic hurdles.

First of all, a number of point mutations, specific of drug sensitive and drug-resistant parasites, could be identified. By further identifying the affected genes, we can gain further insight into the cellular processes that enable a parasite to become drug-resistant. Changes in the genetic code, allowing survival in a drugged environment, have been documented in many pathogens; it is part of evolution in an ever-changing environment.

Another finding was totally unexpected, and never before reported to that extent, in any other organism. The genomic data overwhelmingly show that the architecture of the *Leishmania* genome varies substantially amongst drug-sensitive and drug resistant parasites. The most striking finding concerned the number of chromosomes present in the studied parasites. It has always been assumed that the genome of *Leishmania*, like that of man, constitutes of a series of chromosomes, each present as a pair. We now discovered that this is not at all the case; numerous chromosomes were present in 3 (trisomy) or 4 copies (tetrasomy) in all parasite isolates (FIG 2).

In humans, trisomy leads to serious, often lethal, physical and mental abnormalities. However, we assume that in *Leishmania*, this is part of their strategy to adapt to the treatment they encounter in the patient. Having excess copies of particular chromosomes could allow the parasite 'emergency access' to a whole battery of genes when needed for survival in particular circumstances, e.g. to resist to a drug.

This research was made possible by the support of the European Commission, the SOFI-B programme and the Inbev-Baillet-Latour foundation.

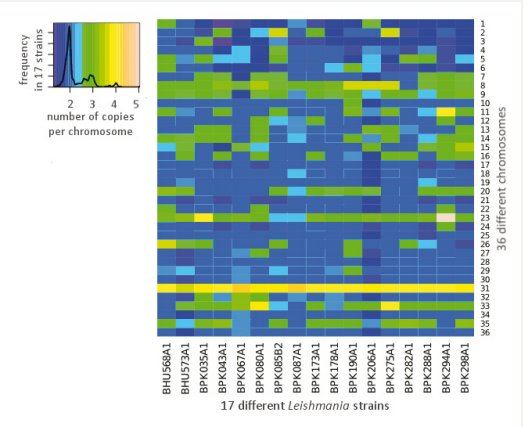


FIG: Overview of chromosome number variation in *Leishmania donovani* of Nepal and India.

The figure shows an overview of the number of chromosomes in 17 different *Leishmania* strains. Leishmania has 36 distinct chromosomes, and we found that one particular chromosome can be present in 2 copies (blue), 3 copies (green), 4 copies (yellow) or even 5 copies (orange). Overall, each parasite strain has a unique total number of chromosomes. This type of architectural genome variation is a first .

Department of Parasitology: projects

For more details visit www.itg.be and enter the project reference number in the search field.
Projects of the ITM-DGDC Framework Agreement Programme are listed in the chapter Development Cooperation.

Parasite Epidemiology and Control]

Ref. 325201
Safe and efficacious artemisinin-based combination treatments for African pregnant women with malaria
ITM promoter: Umberto D'Alessandro
Support: European and Developing Countries Clinical Trials Partnership, The Netherlands

Ref. 335201
Multi-drug resistance in malaria under combination therapy: assessment of specific markers and development of innovative, rapid and simple diagnostics
ITM promoter: Umberto D'Alessandro
Support: European Commission, Belgium

Ref. 525201
Phase IV trial to compare the safety and efficacy of 4 ACT's for single and repeat treatments of uncomplicated malaria in children
ITM promoter: Umberto D'Alessandro
Support 525201: Medicines for Malaria Ventures, Switzerland

Ref. 80304
Evaluation of 4 artemisinin-based combinations for treating uncomplicated malaria in African children
ITM promoter: Umberto D'Alessandro
Support 80304: European and Developing Countries Clinical Trials Partnership, The Netherlands

Ref. 525202
Long-term weekly iron and folic acid supplementation (WIFS) and malaria risk in early pregnancy: a randomised controlled trial
ITM promoter: Umberto D'Alessandro
Support: National Institute of Health, USA.

Ref. 625201
Antimalarial combination treatments in African pregnant women with Plasmodium falciparum infection
ITM promoter: Umberto D'Alessandro
Support: Bill & Melinda Gates Foundation, USA

Ref. 625202
P. vivax control in Central Vietnam
ITM promoter: Umberto D'Alessandro
Support: UBS Optimus Foundation, Switzerland

Ref. 755023
The complete in vitro Plasmodium vivax cycle as a first step for understanding its biology and identifying new therapeutic targets
ITM promoter: Umberto D'Alessandro
Support: various

Parasite Diagnostics

Ref. 315504
Comparative epidemiology of genetic lineages of Trypanosoma cruzi (ChagasEpiNet)
ITM promoter: Philippe Büscher
Support: European Commission, Belgium

Ref. 315505
NIDIAG: Syndromic approach to Neglected Infectious Diseases (NID) at primary health care level: an international collaboration on integrated diagnostic-treatment platforms
ITM promoter: Philippe Büscher (Marleen Boelaert)
Support: European Commission, Belgium

Ref. 425501
A new light on anti-trypanosoma drug discovery: bioluminescence meets marine biology
ITM promoter: Philippe Büscher
Support: Research Foundation Flanders, Belgium

Ref. 425502
Development of innovative diagnostics for sleeping sickness or human African trypanosomiasis with synthetic peptides as antigens
ITM promoter: Philippe Büscher
Support: Research Foundation Flanders, Belgium

Ref. 425503
Trypanosomes pictured: a novel model for in vivo follow-up of Trypanosoma brucei infections through bioluminescence and magnetic resonance
ITM promoter: Philippe Büscher
Support: Research Foundation Flanders, Belgium

Ref. 625501
Stable expression of T.b. gambiense variable surface antigens by non-human infective trypanosomes.
ITM promoter: Philippe Büscher
Support: UBS Optimus Foundation, Switzerland

Ref. 715504
Separation of parasites from venous blood of patients with suspicious infection with T.b.gambiense, T.b. rhodesiense and other trypanosome species
ITM promoter: Philippe Büscher
Support: Foundation for Innovative New Diagnostics, Switzerland

Ref. 745002
Control of equine trypanosomiasis (T. equiperdum and T. evansi) in the Arsi and Bale highlands of Ethiopia
ITM promoter: Philippe Büscher
Support: various

Ref. 755053
Polyclonal B-cell activation in human African tryponosomiasis (HAT): impact on acquired immunity and on rapid diagnostic tests.
ITM promoter: Philippe Büscher
Support: various

Molecular Parasitology

Ref. 315402
KALADRUG: new tools for monitoring drug resistance and treatment response in visceral leishmaniasis in the Indian subcontinent
ITM promoter: Jean-Claude Dujardin
Support: European Commission, Belgium

Ref. 755043
GEMINI: From genome to the field: a global study of pathogen genetic and metabolic diversity and its relationship to clinical phenotypes
ITM promoter: Jean-Claude Dujardin
Support: European Commission, Inbev-Baillet-Latour foundation, SOFI-B

Entomology

Ref. 100243
Tsetse flies and the control of African sleeping sickness
ITM promoter: Marc Coosemans
Support: European Commission

Ref. 415101
Molecular dialogue between parasite and hosts: the trypanosome model
ITM promoter: Marc Coosemans
Support: Federal Science Policy Office, Belgium

Ref. 415104
Mosquitoes vectors of disease: spatial biodiversity, drivers of change and risk (MODIRISK - second fase)
ITM promoter: Marc Coosemans
Support: Federal Science Policy Office, Belgium

Ref. 415105
Risk of emergence of viral diseases driven by eco-climatic changes and socio-economical situations (VIRORISK).
ITM promoter: Marc Coosemans
Support: Federal Science Policy Office, Belgium

Ref. 515102
Comparison of the efficacy of existing long lasting insecticidal nets in experimental huts
ITM promoter: Marc Coosemans
Support: World Health Organization, Switzerland

Ref. 515103
Large scale field trial (Phase III) to study the efficacy, longevity and fabric integrity and community acceptance of Netprotect.
ITM promoter: Marc Coosemans
Support: World Health Organization, Switzerland

Ref. 515104
European network for athropod vector surveillance for human public health.
ITM promoter: Marc Coosemans
Support: Avia-Gis, Belgium

Medical helminthology

Ref. 315301
Innate immune responses and immunoregulation in schistosomiasis: novel mechanisms in the control of infection and disease
ITM promoter: Katja Polman
Support: European Commission, Belgium

Ref. 425301
The impact of genetic diversity in Schistosoma parasites on patterns of infection and disease in humans.
ITM promoter: Katja Polman
Support: Research Foundation Flanders, Belgium

Department of Parasitology: ongoing PhD projects

ACHAN Jane. The current and future role of quinine in the management of malaria in Africa.
Promoters: U. D'Alessandro (ITM), G. W. Pariyo and A. Talisuna (Makerere University School of Public Health, Kampala, Uganda)

ADAUI Vanessa. Molecular epidemiological approach to the understanding of emergence and spreading of drug resistance in Neotropical Leishmania.
Promoters: J-C Dujardin (ITM), L. Maes (University of Antwerp), J. Arevalo (Universidad Peruana Cayetano Heredia, Lima, Peru)

ADOKE Yeka. Evaluation of the best approach to retreating recurrent malaria in Ugandan children.
Promoters: U. D'Alessandro (ITM), A. Talisuna (Ministry of Health, Kampala, Uganda)

CHALWE Victor. Interaction between HIV and malaria: implications for public health and medical decision making.
Promoters: U. D'Alessandro (ITM), M. Mulenga (Tropical Diseases Research Centre, Ndola, Zambia)

FIKRU REGASSA Gari. Epidemiological study and molecular characterization of no-tsetse transmitted trypanosomes in Ethiopia: understanding the importance of mechanical versus cyclical transmission in control strategies.
Promoters: Ph. Büscher; F. Claes (ITM), M. Bekana (Faculty of Veterinary Medicine, Debre Zeit, Addis Ababa University, Ethiopia)

MEURS Lynn. Innate Immune Responses and Immunoregulation in schistosomiasis in Northern Senegal.
Promoters: K. Polman (ITM), M. Yazdanbakhsh (Leiden University Medical Center, Leiden, the Netherlands)

NAMBOZI Michael. Antimalarial treatment efficacy and safety in pregnant women.
Promoters: U. D'Alessandro (ITM), J. P. Van geertruyden (University of Antwerp), M. Mulenga (Tropical Diseases Research Centre, Ndola, Zambia)

ODIWUOR Samwel Ogado. Identification and application of molecular markers in the development of simple and robust tests for distinguishing leishmania species.
Promoters: J-C Dujardin (ITM), M. Mbuchi, M.K. Wasunna (Kenya Research Institute, Nairobi, Kenya)

PYANA Pati. Investigation on drug sensitivity profiles of Trypanosoma brucei gambiense from treatment refractory patients.
Promoters: P. Büscher (ITM), L. Maes (University of Antwerp), J. J. Muyembe-Tamfum (Institut National de Recherche Biomédicale, Kinshasa, DR Congo)

RAI Keshav. Development and appliation of cellular and molecular tools for monitoring miltefosine resistance in Leishmania donovani isolates from Nepal.
Promoters: JC Dujardin; S. Decuypere (ITM), S. Rijal (B.P. Koirala Institute of Health Sciences, Nepal)

SOTO Veronica. P. vivax morbidity after radical cure treatment in the Peruvian Amazon region.
Promoters: U. D'Alessandro (ITM), A. Llanos-Cuentas (Universidad Peruana Cayetano Heredia, Lima, Peru)

TAHITA Marc Christian. Safe and efficacious artemisinin-based combination treatments for pregnant women with malaria in Burkina Faso.
Promoters: U. D'Alessandro (ITM), H. Tinto (Centre Muraz, Ministère de la Santé, Burkina Faso)

VALEA Innocent. The new antimalarial drug policy in Africa: How can we improve the existing strategies? The experience of Burkina Faso.
Promoters: U. D'Alessandro (ITM), H. Tinto (Centre Muraz, Ouagadougou, Burkina Faso)

VAN DER WERFF Suzanne. Helminths, nutrition and allergy: untangling the triangle. Epidemiological studies in Cuban children.
Promoters: K. Polman (ITM), J. Seidell (University of Amsterdam, Amsterdam, the Netherlands)

VINH THANH Pham. Plasmodium vivax genotyping and modelling: a new tool for malaria control in Central Vietnam.
Promoters: U. D'Alessandro (ITM), L. Xuang Hung (National Institute for Malariology, Parasitology and Entomology, Hanoi, Vietnam)

WÖRDEMANN Meike. Helminth infections and atopic diseases: clinical epidemiological studies in Cuban children.
Promoters: B. Gryseels, K. Polman (ITM)

INOCÊNCIO DA LUZ Raquel Andreia. Evaluation of the in vitro and in vivo pathogenicity, susceptibility to anti-leishmania drugs and genetic resistancy markers of laboratorium- and field strains of the zoonotic Leishmania infantum parasites.
Promoters: J-C Dujardin (ITM), L. Maes (University of Antwerp)

ROGE Stijn. Diagnosis of human African trypanosomiasis based on invariable surface glycoproteins.
Promoters: P. Büscher, M. Coosemans (ITM), Y. Guisez (University of Antwerp)

VANAERSCHOT Manu. Antimonial resistant Leishmania donovani: relation with fitness of the parasite and influence on other drugs.
Promoter: J-C Dujardin (ITM/University of Antwerp)

VAN NIEUWENHOVE Lies. Development of innovative diagnostics for sleeping sickness or human African trypanosomiasis, based on synthetic peptides as antigens.
Promoters: P. Büscher; M. Coosemans (ITM), Y. Guisez (University of Antwerp)

VAN REET Nick. Biology and clinical staging of trypanosome neuroinvasion in sleeping sickness.
Promoters: P. Büscher (ITM), E. Van Marck (University of Antwerp)

VERSTEIRT Veerle. The taxonomic and functional biodiversity of endemic and invasive mosquito species (Culicidae) in Belgium.
Promoter: M. Coosemans (ITM/University of Antwerp)

Department of
Animal Health

The research of the Department of Animal Health is focused on the biology, epidemiology and prevention of vector-borne diseases and worm infections of livestock, and on related diseases of humans. More than 20 PhD students are integrated in our fundamental and applied research programs. We organise the Master course on Tropical Animal Health at the ITM in Antwerp, and collaborate with the University of Pretoria, South Africa, in a web-based Master course on tropical veterinary medicine.

Unit of Veterinary Protozoology

Our unit, since July 2010 led by Jakke **Van Den Abbeele,** concentrated on bovine tick-borne diseases (in casu theileriosis), African animal trypanosomiasis and on the interactions between tsetse flies and the *Trypanosome* parasite. We also monitor the weekly density of the vector of bluetongue disease in several Flemish farm environments.

Concerning bluetongue, we developed and validated new probes to identify different species and strains of the *Culicoides* vector with microarray technology (to replace the cumbersome morphological identification). This work helps in studying the breeding places and biology of the vectors, without the need for time-consuming breeding experiments.

In South Africa we started a collaborative project for the molecular characterization and comparative genomics of *Theileria parva,* to evaluate the risk of transition from wild buffaloes to cattle. Our SOFI-B project on the transfection of *Theileria parva* has undergone a staffing setback; we try to get it back on track. In 2010 we also started a project to develop a vaccine strategy against *Theileria annulata*.

In Mozambique we continued to coach 2 PhD students working on sustainable control of African trypanosomiasis in cattle, and on the drug resistance involved. Together with CIRDES in Burkina Faso, we coordinate a network (RESCAO) for the follow up of the drug resistance of trypanosomes (*T. congolense and T. vivax*) in six West-African countries. Out of 730 field samples collected, 123 were PCR-positive for trypanosomes and are currently analysed for their drug-resistance phenotype. Expansion of the RESCAO-network to other countries such as Niger and Nigeria is planned.

Also in West-Africa, we collected data on the impact of stress on the vector capacity of tsetse flies during the rainy season; they will be compared to data from the dry season. Together with CIRDES, we successfully concluded the EC-funded determination of the vector competence of different tsetse fly populations from Lake Victoria.

Our group continues the work on the interactions between trypanosomes (the cause of sleeping sickness in humans and livestock) and tsetse flies (their vectors) that was previously done in the Department of Parasitology. The Inter-University Attraction Pole project on the molecular dialogue between parasite and host received an excellent evaluation by an external scientific committee. We could demonstrate that the *Trypanosoma brucei* parasite steers the behavior of the fly, and forces it to bite more often. The parasite changes the composition of the tsetse fly saliva, making it less efficient to keep the blood fluid at the biting site in the mammalian host. This results in a more difficult blood feeding process and favors the fly biting activity on multiple hosts, thereby promoting the survival and circulation of the parasite within the natural host population. These findings give us a better understanding of how trypanosome infections in the human population can be maintained given the fact that only very few tsetse flies are actually carrying the parasite.

We are currently developing a tsetse anti-saliva antibody detection ELISA for measuring tsetse challenge in livestock. This tool will be very valuable in trypanosomiasis epidemiological studies and for the monitoring of the efficacy of tsetse fly control measurements.

Our experimental work on the genetical modification of a bacterial endosymbiont (*Sodalis glossinidius*) of the tsetse fly progressed well with the expression of trypanosome-targeting Nanobodies by in vitro cultured bacterial symbionts.

We also published a technique to treat resistant *Trypanosoma congolense* parasites. This parasite of livestock has become resistant against the current medicines. We showed that a combination of one of two affordable antibiotics and the old drug isometamidium chloride, separately ineffective, can cure the infection.

Unit of Veterinary Helminthology

We mainly study worm infections that infect both animals and humans, particularly cysticercosis, trichinellosis and fasciolosis. Cysticercosis, a neglected disease caused by the tapeworm *Taenia solium*, is the most common cause of acquired epilepsy of humans in many developing countries.

Together with the American National Institutes of Health and local partners, we inventoried the burden of the disease in Burkina Faso (between 3 and 14% of humans, depending on the region). We started a five year project to improve pig management in Burkina Faso, to prevent epilepsy. We also inventoried the cysticercosis disease burden in several regions in India and Nepal. In rural areas about three times as many people had antibodies against the infection than in cities. 13% of epilepsy cases were due to brain cysts of *Taenia*.

We also study human tapeworm infections in Zambia; sample and data analysis are ongoing. We develop a quick test to confirm visual carcass inspection for bovine cysticercosis, and aim at patenting it.

In the Eastern Cape Province we collected samples for a study of the effect of cysticercosis and toxocariosis on the neurological problems in HIV patients, and prepared for training of the local technicians. We also started a project to analyse the proteome of the excretion and secretion products of *Taenia* species, to identify proteins interacting with the host, or that can be used for diagnostic tests.

Our field tests with a vaccine against the tapeworm *Taenia solium* in pigs in Cameroon were a great success and seem to break the cycle. We also put new numbers on the scope of this infection in RD Congo. It appears that pork trade plays a role in the epidemiology of the infection. Visibly infected pigs are refused by the urban merchants, and so are mainly eaten in the village.

Unit of Control of Animal Diseases

2010 was overshadowed by the tragic death of Peter Van den Bossche, the head of our unit, on November 11 (see highlight).

We focus on appropriate strategies for the control of major livestock diseases in developing countries, mostly neglected zoonoses and tsetse-transmitted trypanosomiasis. We study the local epidemiological situation and the reasons why control attempts fail. The development of veterinary control interventions is supported by research on people's knowledge and their perception of diseases and disease control.

A new project TickRisk, funded by BELSPO, was accepted in 2010. The spread of the cattle tick Rhipicephalus microplus will be studied in Benin and predictions made for the West-African region.

Rabid dog brought to the clinic in Mnisi, South-Africa

We collaborate intensely with the Department of Veterinary Tropical Diseases at the University of Pretoria. Together we studied brucellosis in the Mnisi community at the interface with the Kruger National Park. Preliminary results indicate that the proximity of wildlife is unlikely to be a source of *Brucella* for livestock, because the villages with the highest prevalence are farther from the park. We also evaluated the survival of *Mycobacterium bovis* in milk. We estimated that storing spiked milk at 20°C for a day resulted in a loss of mycobacteria viability of 80%, corresponding to a half-life time of about 10 hours. Survival at 33°C was even shorter.

In Zambia, we worked on people's knowledge and perception of human cysticercosis, a disease caused by the pig tapeworm *Taenia solium*. The communities do not seem to know much about it; they do not fear to be infected and consider using latrines very difficult, given all the taboos related to defecation practices. People do not relate epilepsy with porcine cysticercosis nor human taeniosis. Local scientists and technicians were trained to carry out focus group meetings on cysticercosis.

In Mozambique we studied the epidemiology of animal trypanosomosis and trypanocidal drug resistance in areas where livestock was restocked after the civil war in the early nineties. Blood samples and data such as haematocrit and body weight of 3600 animals were collected and are ready for analysis.

We were also committed in Epi-STIS, aimed at developing a set of innovative integrated generic spatial tools and to improve the capability to analyse and understand the space-time dynamics of diseases. We collaborated on studies on foot and mouth disease at the wildlife - livestock interface in Kruger (South Africa).

The Zoonosis Network was mostly involved in the training of local scientists in qualitative survey techniques (focus group meetings in Zambia and qualitative data analysis in Morocco) and in the preparation of the symposium "Where medics and vets join forces" at ITM. The focus-group data collected in Morocco in 2009 were further analysed and accepted for presentation at the One Health conference in Melbourne in February 2011.

Lastly, we coordinated the creation of the FP7 consortium OH-NEXTGEN, to create a primarily web-based course on One Health in Africa, with four partners from Africa and four from Europe.

Unit of Epidemiology and Biostatistics

We continued to study the epidemiology of brucellosis in various domestic species in the tropics. We have demonstrated that current diagnostic tests are not reliable, leading to underestimation of the disease prevalence and of risks posed to humans. We continued to collaborate with the Belgian Central Veterinary and Agrochemical Research Institute to improve the diagnostic tests. A transmission model, including both vertical and horizontal transmission is being developed.

We have finished a study to optimise veterinary epidemiosurveillance networks in Central Africa. Active and passive surveillance were compared in a randomised field study, using foot-and-mouth disease incidence and reporting as indicators. The principal result is that active surveillance is too expensive to maintain in the tropics for rare diseases: a participatory, passive surveillance relying heavily on animal owners' involvement is more efficient and cheaper.

We performed a spatio-temporal analysis of incidence of canine leishmaniasis in Algeria, in order to reveal risk factors; in collaboration with the epidemiologists of the Public Health Department we try to find a possible correlation between the spatial distribution of prevalence in the dog reservoir and the incidence of visceral leishmaniasis in people.

ITM Strategic networks on Zoonoses and on Neglected Diseases

Symposium 'Where medics and vets join forces'

The Belgian Platform on Tropical Animal Health and Production (Be-troplive), the Belgian Platform for International Health (Be-cause Health), and ITM's Strategic Networks on Zoonoses and on Neglected Diseases organized a joint 'One Health' symposium at ITM on November 5, 2010. The symposium focused on the intersectoral collaboration between the medical and veterinary professions in low-resource societies, From the 1 415 known human pathogens, 62% are of animal origin.

224 scientists from 41 countries all over the world attended the symposium, with among them representatives of international organisations, aid agencies and NGOs. Professor Bruno **Gryseels,** ITM's director, officially opened the event.

The first session focused on neglected zoonoses for which intersectoral collaboration is indicated to reduce disease incidence in humans. The second session addressed the need and the means to reconcile assessments of zoonoses burden in humans and animals. The need to revise burden estimates of neglected diseases and to prove the added value of intersectorial were highlighted. In the next session, "Voices from the field", mixed teams presented results of joint initiatives in developing countries. Finally came a discussion on the road ahead, introduced by a presentation entitled "The role of animals in public health crisis: source of diseases or shield?". Provocative questions challenged the participants on the contribution of veterinary sciences to human public health, including in emergency situations in low-resource societies.

A novel concept used was the "buzzing with coffee", for which participants were asked to discuss intersectoral collaboration issues with people they had never met before and preferably from another discipline. From the moment they agreed on certain aspects, they had to move to another interlocutor. This technique led to a very animated and fruitful general plenary discussion afterwards.

All in all, the original concept of bringing two different worlds together while looking for interfaces and possible synergies has led to an exciting event for all participants.

Aula Janssens, our largest meeting room, was completely filled.

Unit of Veterinary Protozoology

African trypanosomes favor their transmission by modifying the tsetse fly saliva

Many devastating parasitic diseases that affect humans and animals are transmitted by a blood feeding insect. Here, the insect is more than just a flying syringe. A complex interaction between insect, parasite and human is continuously taking place.

In the case of sleeping sickness (African trypanosomiasis), the protozoan parasite *Trypanosoma brucei* spp. is exclusively transmitted by obligatory blood feeding tsetse flies (*Glossina* sp.). After a complex developmental journey inside the fly, the parasite ends up in its salivary glands.

We demonstrated that the parasite alters the composition of the saliva, making it less efficient to keep the blood fluid at the biting site in the mammalian host. We showed that the trypanosome induces a reduction in salivary gland gene transcription, resulting in a strong decrease in protein content and related biological activities. The saliva becomes 3 times less good in hampering platelet aggregation, and 16 to 32 times in inhibiting thrombin-induced coagulation. As a result, the uptake of a blood meal by the tsetse fly becomes more difficult, which favors the fly biting activity on multiple hosts. Each biting contact implies the transmission of the parasite together with the tsetse fly saliva into a new host. We could not monitor the effect of the disturbed feeding process on parasite transmission in a natural setting, but it seems highly probable that the infected fly will bite more people, enhancing the likelihood of infecting them.

In humans, the parasite multiplies in blood and lymph and eventually installs itself in the heart, kidneys and brain. Without adequate treatment this invariably ends in coma and death. According to the WHO, between 10 000 and 20 000 people each year die of sleeping sickness.

The finding got quite some press attention, for instance from Nature Reviews Microbiology.

ITM has its own breeding colony of tsetse flies.

Unit of Veterinary Helminthology

Pig vaccine against human epilepsy

A field study with a vaccine against the pork tapeworm, which also affects humans, was able to break the infection cycle in Burkina Faso. It is the first time a vaccine against a parasite succeeds in eliminating transmission. The study carried off the cover of the *International Journal for Parasitology*.

Humans are (mainly) infected by two species of tapeworm, the pork tapeworm *(Taenia solium)* and the beef tapeworm *(Taenia saginata)*. These tapeworms need a human and an animal to close their life cycle. They attach themselves to the wall of our intestine, where they can reach a length of many meters. Their eggs leave our body with the faeces. If these are eaten by pigs then the eggs hatch into larvae, which establish in the pig muscles. When we eat undercooked pork, the larva develops into a tapeworm and the story repeats itself. In Western Europe and other rich countries the pork tapeworm has almost disappeared.

In many cases neither pig nor human are much bothered by the parasite. But humans may accidentally ingest eggs, and then larvae do not only establish in muscle tissue, but also in the brain. This may lead to epilepsy and other neurological problems.

There are good drugs against the worm and the larva, but treatment cannot prevent reinfection.

Scientists at The University of Melbourne have developed a vaccine, which is reasonably cheap, and effective under laboratory conditions. Emmanuel **Assana** and colleagues from Antwerp and Cameroon now proved that it works in field conditions too.

They vaccinated 120 piglets at two, three and six months, and gave them a deworming drug at three months, to make sure they did not carry an infection from before the vaccination. Each piglet, together with an untreated control animal, was handed out to a family, which let it roam free around the village..

After a year not one vaccinated pig was infected, against 20% of control animals, of which one had 37 000 larvae in its body.

Much work remains to be done, such as more trials, large-scale GMP production of the vaccine, booster schemes, develop an oral vaccine. But for the first time there is a perspective on the elimination of pork tapeworms in pigs and humans.

Unit of Control of Animal Diseases

In memoriam Peter Van den Bossche

Professor Peter Van den Bossche, 48, died on 11 November 2010 in a tragic car accident.

Peter was an excellent researcher with an international reputation for his research on tsetse flies and trypanosomiasis. His interest for this subject dated back to 1985 when, after obtaining his degree in veterinary medicine, he applied to ITM for volunteer work. During this training a very rudimentary but successful breeding colony of tsetse flies was set up in the basement of the institute. In 1987 he obtained the diploma of tropical veterinary medicine and animal production. For his thesis work he developed a permanent breeding colony of tsetse flies. It still exists, and has ever since been an invaluable instrument in various ITM research programs.

After a few additional years of research at ITM, Peter left Belgium for Africa. He was first appointed in Eastern Zambia to study the epidemiology of trypanosomiasis and the ecology of tsetse flies. With his Belgian and Zambian colleagues, he developed successful tsetse and trypanosome control programmes. Insecticide impregnated targets made of cheap black cloth and bamboo sticks were planted and maintained in tsetse infested areas with a strong support and involvement of the communities. For the control of trypanosomes, Peter proposed a basic drug delivery scheme mostly relying on qualified field workers. In 1994, he was invited to work for a regional tsetse and trypanosomiasis control project. In 2000, at the University of Pretoria, Peter defended his PhD thesis based on his field experience, entitled "The development of a new strategy for the sustainable control of bovine trypanosomosis in Southern Africa".

Peter then returned to ITM, where he was appointed professor in 2005. He continued his work on the interaction between tsetse flies, mammalian hosts and trypanosomes, combining it with research on diseases at the wildlife/livestock interface.

Due to his field and research experience, Peter acquired an international reputation as an expert in the control and epidemiology of vector transmitted pathogens. Southern Africa was his second home country. Beside his appointment at ITM, Peter was also guest professor at the University of Pretoria.

Peter has always been an early bird who started work days whistling with eternal optimism. He enjoyed social contacts and the good things of life. At work, he distinguished himself through his enormous zeal and his enthusiasm, which he transmitted to his numerous students and research assistants. Using his investigatory spirit, his helpfulness and his friendly attitude, Peter always managed to motivate and inspire his students and collaborators.

His tragic death left all his friends at ITM, the University of Pretoria and elsewhere in shock and great sadness. He leaves a void forever.

Department of Animal Health: projects

For more details visit www.itg.be and enter the project reference number in the search field.
Projects of the ITM-DGDC Framework Agreement Programme are listed in the chapter Development Cooperation.

Unit of Veterinary Protozoology

Reference number 85581
Optimising and field testing of a practical vaccine against *Taenia solium* cysticercosis in pigs
ITM promoter: Stanny Geerts
Support: The Wellcome Trust, UK

Reference number 100222
Integrated Consortium on Ticks and Tick-borne Diseases
ITM promoter: Pierre Dorny
Support: European Commission, Belgium

Reference number 419007
Identification of possible vectors of bluetongue virus (BTV) through microarray tests, extraction of viral RNA and isolation of virus
ITM promoter: Pierre Dorny
Support: Federal Agency for Health, Food Chain Safety and Environment, Belgium

Reference number 529001
Epidemiology and control of zoonotic infections in Gambia and Senegal
ITM promoter: Stanny Geerts
Support: University of Antwerp, Belgium

Reference number 748001
Improved diagnosis of drug resistance and pathogenicity of trypanosomes
ITM promoter: Stanny Geerts
Support: various

Reference number 758023
Transfection of *Theileria parva* and the role of genes encoding QP-rich proteins in host-parasite interactions
ITM promoter: Jan Van den Abbeele
Support: various

Reference number 100186
Développement d'une souche candidat vaccine contre la théileriose bovine au Maroc
ITM promoter: Dirk Geysen
Support: BTC

Unit of Veterinary Helminthology

Reference number 319001
Integrated control of neglected zoonoses: improving human health and animal production through scientific innovation and public engagement
ITM promoter: Pierre Dorny
Support: European Commission, Belgium

Reference number 419006
National Reference Laboratory for Trichinella
ITM promoter: Pierre Dorny
Support: Federal Agency for Health, Food Chain Safety and Environment, Belgium

Reference number 419005
Monitoring the bluetongue vector
ITM promoter: Pierre Dorny
Support: Federal Agency for the Food Chain Safety

Reference number 429003
Development of a detection test to confirm visual postmortem diagnosis of bovine cysticercosis
ITM promoter: Pierre Dorny
Support: Agency for Innovation by Science and Technology, Tetrafund, Flanders, Belgium

Reference number 429004
High througput analysis of Taenia excretion/secretion products of an enhanced insight in host-parasite interactions and optimising of immunodiagnostic tests in in Taenia solium cysticercosis
ITM promoter: Pierre Dorny
Support: Research Foundation Flanders, Belgium

Reference number 529003
EFECAB : Improving pig management to prevent epilepsy in Burkina Faso: a randomized controlled trial
ITM promoter: Pierre Dorny
Support: National Institute of Health, USA

Reference number 748002
The diagnosis, epidemiology and control of parasitic infections of livestock in Cambodia
ITM promoter: Pierre Dorny
Support: Flemish Interuniversity Council, University Development Cooperation, Belgium.

Reference number 748003
Epidemiology and control of cysticercosis in the Indian subcontinent
ITM promotor : Pierre Dorny
Support : Flemish Interuniversity Council, University Development Cooperation, Belgium

Unit of Animal Disease Control

Reference number 748005
Institutional collaboration with Jimma University, Ethiopia, sub-project Zoonotic and Helminth Diseases
ITM promoter: Pierre Dorny
Support: various

Reference number 419003
Remote sensing tools to study the epidemiology and space/time dynamics of diseases
ITM promoter: Peter Van den Bossche
Support: Federal Science Policy Office, Belgium

Department of Animal Health: ongoing PhD projects

ADEL Amel. Etude épidémiologique de la leishmaniose canine à 'Leishmania infantum' et son impact sur la leishmanioseviscérale humaine sur le littoral algérien.
Promoters: D. Berkvens; M. Boelaert (ITM), C. Saegerman (University of Liège), A. Soukehal (CHU Béni-Messous, Alger, Algiers)

BANKOLE Anani Adéniran. Epidemiology and control of bovine brucellosis in the Gambia and Senegal.
Promoters: D. Berkvens (ITM), C. Saegerman (University of Liège)

BOUKARY Abdou Razac. Impact of livestock husbandry on the transmission of brucellosis and tuberculosis in urban and periurban Niamey.
Promoters: P. Van der Stuyft; F. Portaels, E. Thys (ITM), C. Saegerman (University of Liège), A. Yenikoye (Université Abdou Moumouni, Niamey, Niger)

CHITANGA Simbarashe. Domestication of the trypanosome transmission cycle and its effect on the level of drug resistance, the pathogenicity and transmissibility of T. congolense.
Promoters: P. Dorny (UGent), J. Van Den Abbeele; V. Delespaux (ITM), B. Namangala (University of Zambia, Zambia)

DIONE Michel. Epidemiology and control of Salmonella spp. in the Gambia (Upper River Division) and Senegal (Casamance).
Promoters: S. Geerts (ITM), G. Ieven (University of Antwerp), A. Schönefeld (International Trypantolerance Centre, Banjul, Gambia)

DUGUMA Reta. The development of a tsetse anti-saliva antibody detection ELISA for measuring tsetse challenge in livestock.
Promoters: J. Van den Abbeele (ITM), L. Duchateau (Ghent University), M. Bekana (Faculty of Veterinary Medicine, Debre Zeit, Addis Ababa University, Ethiopia)

GONDWE Nkwachi. Study of the epidemiology of human and animal trypanosomiases at the game/cattle/domestic interface of the Nkhotakota Game Reserve, Malawi.
Promoter: J. Van Den Abbeele (ITM)

HESHBORNE Tindih. Analysis of virulence factors in Theileria perva.
Promoters: S. Geerts, D. Geysen (ITM), B. Goddeeris (Katholieke Universiteit Leuven), J. Naessens (International Livestock Research Institute, Nairobi, Kenya)

HOUNDJE Evelyn. Epidémiologie et impacts économiques de la fièvre aphteuse au Bénin.
Promoters: D. Berkvens (IMT), M. T. Kpodekon (Université d'Abomey – Calavi, Cotonou, Bénin)

MWAPE Kabemba. Epidemiological study of human tapeworm infections in communal areas of Zambia.
Promoters: P. Dorny (ITM), V. Schwan (University of Pretoria, South Africa)

MWEEMPWA Cornelius. Environmental changes in Africa and tsetse habitat fragmentation: epidemiological consequences and perspectives for control.
Promoter: P. Dorny (ITM)

NGUYEN Thi Giang Thanh. Zoonotic fasciolasis in Vietnam: molecular identification and geographical distribution.
Promoters: P. Dorny (ITM), Le Thanh Hoa (Institute of Biotechnology, Hanoi, Vietnam)

OUAGAL Mahamat. Evaluation de l'efficacité d'un réseau d'épidemio-surveillance.
Promoters: D. Berkvens (ITM), C. Saegerman (University of Liège), Kiram Djibrine (Laboratoire de Recherches Vétérinaires et Zootechniques de Farcha, N'Djamena, Chad)

RAHMAN Anisur. Brucellosis in Bangladesh.
Promoters: D. Berkvens (ITM), C. Saegerman (University of Liège), M. U. Ahmed (Bangladesh Agricultural University, Myemnsingh, Bangladesh)

RON GARRIDO Lenin Javier. Modelling of transmission dynamics of major zoonoses in Ecuador.
Promoters: D. Berkvens (ITM), L. Duchateau (Ghent University)

RON ROMAN Washington. Brucellosis epidemiology in Ecuador.
Promoters: D. Berkvens (ITM), C. Saegerman (University of Liège), W. Bénitez-Ortiz (CIZ Universidad Central del Ecuador, Quito, Ecuador)

SIBEKO Kgomotso. Characterisation of Theileria infections in African buffaloes and cattle and validation of diagnostic tests.
Promoters: S. Geerts (ITM), N. Collins (University of Pretoria, South Africa)

SUMAYE Robert. Epidemiology of Rift Valley Fever (RVF) in the Kilombero river valley, Tanzania.
Promoters: D. Berkvens (ITM), E. Geubbels (Ifakara Health Institute, Tanzania)

VU THI Nga. The epidemiology of trichinellosis in northern Vietnam.
Promoters: P. Dorny (ITM), N. Van De (Dept. Of Parasitology, Hanoi Medical University, Vietnam)

YEWHALAW Delenasaw. Dynamics and trends of malaria in relation to anopheline mosquitoes ecology, distribution and kdr resistance in a hydropower dam area of Southwestern Ethiopia.
Promoters: N. Speybroeck (ITM), L. Duchateau (Ghent University)

DE GOEYSE Ine. Prime boost strategy for CTL response against Theileria parva.
Promoters: S. Geerts; D. Geysen (ITM), Y. Guisez (University of Antwerp)

DE VOOGHT Linda. The construction of tsetse flies refractory to Trypanosoma brucei by expression of trypanolytic agents through their symbionts.
Promoters: J. Van den Abbeele (ITM), M. Coosemans (University of Antwerp)

Department of Clinical Sciences

The Department of Clinical Sciences provides training, conducts research and offers services in clinical tropical medicine and HIV/AIDS. Within Belgium, we assure reference clinical, diagnostic and preventive tasks through ITM's Medical Services.
The Department is responsible for teaching tropical medicine, laboratory diagnostics and HIV/AIDS in the post-graduate courses of the ITM. We also organize the distance learning international short course on antiretroviral treatment (e-SCART) and the short course in clinical research and evidence based medicine (SCREM).

Unit of Tropical and Travel Medicine

We focus on imported diseases, travel risks, tuberculosis, malaria and medical decision making. Within the TropNetEurop, we collaborate on ambulatory treatment of malaria, imported schistosomiasis and dengue fever. Together with the Unit of Tropical Laboratory Medicine, we finalised studies on molecular diagnostics for intestinal parasites and malaria, and of point-of-care malaria tests, including the prozone effect. We also participated in a multi-centre Belgian study on the treatment of chronic hepatitis C in patients with HIV. A study on altitude sickness was published and the validation of the KABISA decision aid for imported diseases in several clinics in Europe was analysed. We published case reports on Mediterranean spotted fever and hantavirus nephropathy. We wrote the major part of the second edition of the standard Dutch textbook on travel medicine "Reizen en ziekte".

We finished a metanalysis on guidelines for field treatment of leprosy reactions and on the decision making and treatment in tuberculosis in children and adults. In Burkina Faso we published two articles and prepared a third from a clinical trial of rapid diagnostic tests for malaria. In Mozambique we focused on occupational health, blood-borne infections among blood donors and validation of a point-of-care apparatus for CD4 testing.

Unit of Tropical Laboratory Medicine

As part of our teaching activities, we further completed the 'Problem Based Learning' track for biomedical students in the course of Tropical Medicine and International Health. We also offered new topics in practical teaching (such as rapid diagnostic testing) inspired by on-going discussions with leading NGOs.

We set up microbiological analyses and typing of bacterial resistance in DR Congo, Cambodia and Peru, including the implementation of standard antibiotic treatment guidelines. In Cambodia, we were closely involved in the organisation of the National Melioidosis Symposium. In addition, we expanded our activities in laboratory quality management with projects on malaria diagnosis in DR Congo and courses on research quality management in Peru.

“We wrote the major part of the second edition of the standard textbook on travel medicine”

Unit of HIV/AIDS & STD Care

Our outpatient clinic in Antwerp participated in several multi-centre clinical trials on HIV/AIDS, including treatment strategy studies, therapeutic vaccination and investigational drug trials. We also participate in the EuroSIDA network.

In the South, our main focus is on AIDS, tuberculosis, visceral leishmaniasis and antimicrobial resistance. We concentrate our efforts on institutional collaborations with clinical or diagnostic centres in Phnom Penh, Cambodia (Sihanouk Hospital Centre of HOPE); Kampala, Uganda (Makerere University); Kinshasa, DR Congo (School of Public Health, the NGO Amocongo and the Institut National de Recherche Biomédicale); South Africa (Pretoria, University of Limpopo), Ethiopia (Gondar and Jimma University); Mozambique (Tete Regional Hospital).

We investigate the interaction of HIV with other infections as tuberculosis, visceral leishmaniasis and schistosomiasis. Particular interest goes to the immune reconstitution inflammatory syndrome (IRIS), on which we coordinate the International network (INSHI). We also contribute to the International epidemiological database to evaluate AIDS (IeDEA) network of the Central African region.

Our portfolio includes several clinical trials on antiretroviral second line treatment and presumptive tuberculosis treatment in very sick patients with HIV infection but without clinical evidence of tuberculosis. We are co-investigators with Family Health International in a CDC sponsored study to evaluate different models of care and treatment for persons with HIV in Tanzania, Uganda and Zambia. In Cambodia we study mechanisms to improve the diagnosis of smear-negative tuberculosis and to predict and diagnose multidrug resistant tuberculosis.

We collaborate with WHO to develop guidelines and training modules that accompany the approach of “Integrated Management of Adult and Adolescent illnesses” (IMAI).

Laboratory quality management is one of our focal points.

Medical Laboratory

Melioidosis Laboratory Workshop

In September the first Cambodian National Conference on Melioidosis was organized in Phnom Penh, to raise awareness for this severe community-acquired disease. It is caused by *Burkholderia pseudomallei*, an environmental Gramnegative bacteria that is endemic in South East Asia and tropical Australia. In Cambodia, only few laboratories have the diagnostic facilities needed, and the disease is unfamiliar to most clinicians.

With our partner Sihanouk Hospital Centre of HOPE (SHCH), we contributed actively to the scientific committee. SHCH presented the largest adult case series, a result of the surveillance data collected in the hospital. The bacterium accounts for 12% of bloodstream infections diagnosed by the SHCH laboratory.

With SHCH we also organized the 2-day laboratory workshop that followed the conference. There were 41 participants from 11 different laboratories in Cambodia, including delegates from the ministry of Health and 3 provincial laboratories starting up their microbiology services. Small group sessions allowed hands-on training for participants on general microbiology: Gram stain, different sample types and their processing, key pathogens, antibiotic susceptibility testing and its quality control, biosafety and laboratory waste management. For *Burkholderia pseudomallei* colonial morphology was shown on different growth media, and the workflow from presumptive to definitive identification could be practiced. We specially emphasized the importance of the interaction between the laboratory and the clinicians: intermediate results can lead to faster treatment adaptation and save lives.

The event was highly appreciated by the attendants as occasions like this are scarce within the country. Contacts were established to install a Cambodian network on microbiology and antibiotic surveillance.

Mr. Kosal from SHCH laboratory explaining the use of logbooks for the work-up of samples and the traceability of results.

Department of Clinical Sciences: projects

For more details visit www.itg.be and enter the project reference number in the search field.
Projects of the ITM-DGDC Framework Agreement Programme are listed in the chapter Development Cooperation.

Unit for HIV/AIDS and STD

Reference number 100251
Antiretroviral therapy adherence study
ITM promoter: Robert Colebunders
Support: Family Health International, USA

Reference number 327004
Prevention of early mortality by presumptive tuberculosis treatment in HIV infected patients initiating antiretroviral therapy
ITM promoter: Robert Colebunders
Support: EDCTP, The Netherlands

Reference number 427301
HIV infectie, seksuele dysfunctie en HAART, wat zijn de interacties?
ITM promoter: Robert Colebunders
Support: FWO, Belgium

Reference number 427302
An alternative way for a better diagnosis of multiresistent tuberculosis: a fast diagnostic test and a predictive score
ITM promoter: Robert Colebunders
Support: FWO, Belgium

Ref. 627301
Protease inhibitors (PIs) for VL control in VL/HIV coinfections
ITM promoter: Lut Lynen
Support: UBS Optimus Foundation, Switzerland

Reference number 747003
Epidemiologic database to evaluate AIDS, Regional Center in Region 9 - Central Africa
ITM promoter: Robert Colebunders
Support: various

Reference number 741901
A Multicentre Phase III Trial of second-line antiretroviral treatment in African adults
ITM promoter: Robert Colebunders
Support: EDCTP

Reference number 741902
The Eastern and southern Africa Research Network for Evaluation of Second Line Therapy in HIV infection: The EARNEST Trial
ITM promoter: Robert Colebunders
Support: EDCTP, The Netherlands

Reference number 741903
A phase II trial of a new TB vaccine in African infants
ITM promoter: Robert Colebunders
Support: EDCTP, The Netherlands

Unit of Tropical and Travel Medicine

Ref. 317301
NIDIAG: Syndromic approach to neglected infectious diseases (NID) at primary health care level : an international collaboration on integrated diagnosis-treatment platforms
ITM co-promoter: Emmanuel Bottieau (Part Clinical Sciences)
Support: European Commission, Belgium

Reference number 427307
Rede Integrada II: AIDS care project in Tete, Mozambique
ITM promoter: Emmanuel Bottieau
Support: Vlaams Agentschap voor Internationale Samenwerking, Belgium

Reference number 627108
Side effects and paradoxal reactions on the TB treatment with HIV-negative and positive patienst in Rwanda
ITM promoter: Jan Clerinx
Support: Tibotec BVBA, Belgium

Department of Clinical Sciences: ongoing PhD projects

AYANA ABEBE Gemeda. Predictors of Immune Reconstitution Inflammatory Syndrome in Mycobacterium tuberculosis and HIV co-infected patients: Mycobacteriological Aspects.
Promoter: R. Colebunders (ITM/University of Antwerp)

BISOFFI Zeno. Accuracy of rapid diagnostic malaria tests and clinical and cost-effectiveness of the introduction of these tests in a rural setting in sub-Saharan Africa.
Promoters: J. Van den Ende (ITM), M. Coosemans (University of Antwerp)

GARCIA Coralith. Antimicrobial resistance of bacterial pathogens in Peru.
Promoters: J. Jacobs (ITM), F. Salmavides (Universidad Peruana Cayetano Heredia, IMTAvH, Lima, Peru), E. E. Stobberingh (Maastricht University, the Netherlands)

HUIS IN 'T VELD Diana. Management of HIV-infection: second line treatment in Africa.
Promoter: R. Colebunders (ITM/University of Antwerp)

LUNGUYA Octavie. Aspects microbiologiques et diagnostiques de la fièvre typhoide en République Démocratique du Congo.
Promoters: J. Jacobs (ITM), J. J. Muymbe-Tamfum (Institut National de Recherche Biomédicale, Kinshasa, DR Congo)

MUWANGA Alice. Identification of optimal models of care for persons with HIV infection in limited resource setting.
Promoter: R. Colebunders (ITM/University of Antwerp)

NEYRA Edgar. Contribución a la Epidemiología Molecular de Micosis importantes en el Perú.
Promoter: D. Swinne (ITM), E. Gotuzzo (Universidad Peruanan Cayetano Heredia, Lima, Peru)

OCAMA Ponciano. Hepatitis B, HIV and liver diseases in Uganda.
Promoter: R. Colebunders (ITM/University of Antwerp)

OTITI Juliet. Ocular complications in HIV positive individuals in sub-Saharan Africa.
Promoter: R. Colebunders (ITM, University of Antwerp)

PHOBA Marie-France. Microbiologic aspects of childhood bacterial meningitis in the Democratic Republic of the Congo.
Promoters: J. Jacobs (ITM), J.J. Muyembe-Tamfum (Institut National de Recherche Biomédicale, Kinshasa, DR Congo)

TADDEGE DERIBEW Amare. Evaluation of the operational and diagnostic performance of the revised recommendations and algorithms for improving the diagnosis of TB in HIV prevalent settings, South-West Ethiopia.
Promoters: R. Colebunders (ITM/University of Antwerp)

WORODRIA William. Immune Reconstitution Inflammatory Syndrome (IRIS) in TB HIV co-infected patients first commencing HAART.
Promoter: R. Colebunders (ITM/University of Antwerp)

CONESA BOTELLA Anali. IRIS: pathogenesis, clinical and public health aspects.
Promoter: R. Colebunders (ITM/University of Antwerp)

GILLET Philippe. Malaria Rapid Diagnostic Tests: technical aspects in the diagnostic setting.
Promoters: J. Jacobs (ITM), C. Bruggeman (Maastricht University, Maastricht, the Netherlands)

VLIEGHE Erica. Containment of antimicrobial resistance of invasive Gram-negative bacteria in low resource settings in the tropics.
Promoters: J. Jacobs (ITM), W. Peetermans (Katholieke Universiteit Leuven)

Department of Public Health

The Department of Public Health contributes to the sciences underpinning the development of equitable and sustainable health systems, particularly in developing countries. Our research focuses on access to care, quality of care, development of human resources, integrated disease control and international health policies. Most projects involve several units, other ITM departments and external partners. Teaching is a major activity, in close interaction with research and policy development.

Unit of Public Health Management

Our unit went ahead with the publication of the book *International Health and Aid Policies* (Cambridge University Press, October 2010), which compiles papers on the impact of international health policies over the last two decades. It attracted positive reviews from major health policy. By the end of 2010 the book was on the Cambridge University Press' bestsellers list of public health books.

We gave invited lecturers in Argentina, Colombia, Ecuador, Gran Canaria, Spain and the United States and coached a Bolivian PhD.

We took the scientific lead for the first work package of the EU FP7 research project HESVIC, (Health Systems Strengthening in Vietnam, India and China). Late 2010, research teams started their field studies on the regulatory governance capacity in their countries, with a research methodology developed under guidance from our unit.

We also contributed to the EU research project Equity-LA, to study the impact on equity of access and efficiency of integrated health care networks in Colombia and Brazil. For the field studies, combining qualitative and quantitative methods, we paired up with the University of Rosario, Bogotá, Colombia.

We organised the second plenary meeting of the Docencia, Investigación y Extensión de salud para América latina network (IDESAL) on research, teaching and service delivery for health in Latin America, in Medellín, Colombia, with participants from13 countries. They pledged more efforts on influencing health policy and service delivery in the continent. Our unit also supports a consultant for the network, a webmaster and gatekeeper, and its website. We continued our support to the Public Health Institute of the Pontificia Universidad Católica del Ecuador, Ecuador. The project was positively evaluated and obtained the extension for the coming three years.

Finally, we continued coaching the Local Health System project in Belgium, meant to develop bottom-up integrated health care systems in the districts of Antwerp, Brussels and Malmédy.

Unit of Nutrition and Child Health

We concentrate on the dual nutritional burden in many developing countries: persisting under-nutrition on the one hand, and an explosive increase of diet-related chronic diseases and overweight on the other.

In under-nutrition, we focus on the highest risk group, infants and children under the age of two.

In a rural district in Burkina Faso, we started the Lucoma project, comparing 3 alternative approaches for managing cases of moderate acute malnutrition: a local soy-based ready-to-use supplementary food, an enhanced corn soy blend from the World Food Program, and a child-centred counselling. To maximise sustainability, Lucoma involves the local community

"We are pioneering a new strategy in terms of networking: the Community of Practice"

to the maximum. Part of the food supplements are produced by a local women's association. Health centre nurses are trained in communication skills and assessment of familial food habits. Mothers are invited to cooking demonstrations by trained local women, showing how traditional food can be adapted to the nutritional needs of young children. We take care the project is integrated into the existing district health services.

In Tanzania we demonstrated that stunting and underweight in toddlers does not come from the low nutritional value of the complementary maize porridge they receive when breast milk is no longer sufficient, but that mycotoxins are to be blamed. Martin **Kimanya,** whose PhD was focused on that topic, was laureate for the price of the Belgian Development Cooperation. We are now developing strategies for reducing mycotoxin intake, and to increase the consumption of animal products, fruits and vegetables.

Children under two years old run the highest risk of malnutrition.

We also prepared a review paper on the use of middle arm circumference for the detection of malnutrition in children, which will be part of the new evidence-based guidelines of the World Health Organisation.

Diet-related chronic diseases are quickly increasing in low and middle income countries, where adolescents make up the majority of the population. We completed a number of descriptive studies on food habits, physical activity patterns and their determinants in different countries. We are now conducting two intervention studies to improve diet and physical activity through school based health promotion in Ecuador and Benin. Data collection is on-going. We are also conducting a policy review for the World Health Organisation on nutrition policies in low and middle income countries concerning those diseases.

Together with Jimma University in Ethiopia, we worked on food security strategies. We also worked on capacity strengthening of partners in Uganda and India. Finally, we prepared an important EC-funded multinational project: the Sustainable Nutrition Research for Africa in the Years to come (SUNRAY). It redefines the needs in nutrition research from the viewpoint of stakeholders in sub-Saharan Africa.

Unit of Epidemiology and Disease Control

We focus on the integration, acceptability, cost-effectiveness and sustainability of disease control measures, in collaboration with local research and health institutes.

We studied the perceptions of communities on neglected infectious diseases, and highlighted the main social determinants and planned interventions, in Mérida, Mexico. In Cuba we test 2 strategies for community-based dengue prevention with insecticide treated curtains, and analyse 2 strategies of case finding of tuberculosis. In Peru we completed two studies on the diagnosis of tuberculosis, leading to a clinical algorithm.

The number of sleeping sickness cases in Congo has declined to the extent that exhaustive population screening has become inefficient, and we have designed a study on the feasibility of alternative surveillance systems using resident health workers and blood samples on filter paper. We developed a computer database on clinical treatment outcomes, and presented the first retrospective analysis of data. In Asia we finalized the KALANET study on long lasting insecticidal nets against Kala Azar (conclusion: they do not offer extra protection). We completed the data collection for our study on risk factors

for Kala Azar in Bihar, India, and we evaluated novel ways of monitoring clinical outcomes of treatment within the KALADRUG program. We offered methodological support to a multicentre evaluation by WHO of diagnostic kits for Kala Azar.

We took the lead in a 13-partner European FP7 project on integrated diagnosis-treatment platforms for a syndromic approach to neglected infectious diseases at primary health care level ('NIDIAG').

We keep working on the capacity strengthening of several institutional partners. In the Institut National de Recherche Biomédicale (INRB) in Kinshasa (DR Congo) we decided to invest in an inter-departmental molecular biology unit. In Cuba, we have a close cooperation with the Instituto Nacional de Higiene, Epidemiologia y Microbiologia and with the Instituto Pedro Kourí. There we finished assessing the roles of family doctors and nurses and prepared for the intervention phase to improve continuity of care. Our descriptive study on 'determinants of differences in health' was concluded and intervention proposals are being developed to integrate participatory planning in the national health system.

Our unit and its Strategic Network on Neglected Infectious Diseases was instrumental in the organisation of the joint symposium "Where medics and vets join forces", together with the Department of Animal Health, and in the colloquium "Emerging Voices".

Unit of Health Care Management

We primarily work on reproductive health and on the management of health care systems. The randomized controlled trial on clinical audits in obstetrics, AUDOBEM, was continued in Burkina Faso, Benin and Niger. We started work for Défi Jeunes, a new youth sexual and reproductive health project in West Africa. Responding to a demand from the Federal ministry of Public Health, we estimated the numbers of women living in Belgium with female genital mutilation and the needs for preventive and curative care. They were substantially higher than previously thought.

We began to round up the survey of the REACT project, on the impact of fair priority setting on health district management in Tanzania, Kenya and Zambia. In Ghana and Tanzania we finalised 2 case studies in the frame of the study on the role of leadership HR management on hospital performance. We also evaluated Passage, a youth reproductive health project in West Africa.

Because we are interested in the mechanisms of diffusion of an innovation, we carried out a qualitative study in Ouagadougou, Burkina Faso, to evaluate the determinants of scaling-up of the AQUASOU project (2003-2006) in the Centre Region. This work is part of our research into innovative evaluation designs, for which we organised an international expert meeting on 22 and 23 November 2010 at the ITM. About 15 researchers presented their work and discussed the methodological challenges of theory-driven inquiry in health systems research. One result is the setting up of an international network of TDI researchers.

We also started the development of a realist monitoring and evaluation system for Défi Jeunes.

In our scientific guidance of Belgian Technical Cooperation-supported health projects in Senegal and Niger, we focused this year on taking stock of action research. Themes were financial accessibility (e.g. innovative medical insurance scheme for school children in Senegal) and availability of essential surgical care at district level (Senegal and Niger). Highlights of this guidance in 2010 were a participatory analysis workshop conducted as part of an Unmet Obstetrics Needs exercise in Senegal and a national workshop to disseminate the lessons learnt. In Yemen, we contributed to the elaboration of the new national reproductive health strategy 2011-15, aiming at improving access to family planning services and to maternal health care.

In the institutional collaboration with the *Institut National d'Administration Sanitaire* (INAS) in Rabat, we helped launch research projects, reinforce the library capacity, and assist teaching staff in developing new curricula and modules.

Unit of Health Policy and Financing

In 2010 we increasingly worked as 'knowledge manager', creating bridges between knowledge holders, and getting them to work together. We further strengthened our networks and our institutional partnerships. We collaborate with institutes in Bangalore (India), Kampala (Uganda) and Lubumbashi (DR Congo) and stimulate them into South-South collaborations. Our unit is pioneering a new strategy in terms of networking, the "Community of Practice", in close coordination with experts in North and South. In 2010 we started a multi-country UNICEF-commissioned study on health service delivery in Ghana, Burkina Faso, Guinea-Conakry and Guinea-Bissau that will eventually evolve into such a Community of Practice. We continued to emphasize extensive field experience in the recruitment of new team members (4 in 2010) and PhD students.

In 2010, we carried off three new FP7 research projects, and obtained commissions for four projects from Unicef and the World Bank.

Our research focuses on four areas: health care delivery models; social health protection; the changing role of government, private actors and civil society; and international health financing and policy.

In the first research line we started preparatory work for the above-mentioned study on service delivery in West Africa. Concerning social protection we started the European project FEMHealth that will capitalise on our sustained efforts to bring together decision-makers, technicians, donors, scientists and civil society actors. We also prepared for another European multicentre project, Health Inc, on socially inclusive health care financing in West Africa and India. We took the lead in writing the background paper on the role of community health insurance in the wider endeavour of universal coverage for the 2010 World Health Report.

In several international events we presented our strategy on creating platforms gathering different actors in health, and its potential in terms of health sector reform. Examples are the Incentive for Health Provider Performance Network, and the Community of Practice on Performance Based Financing in Africa. For our work on international health financing and policy, we started a partnership with the Law Faculty at the University of Antwerp and Yale University in the USA.

Clinical Trials Unit

The Clinical Trials Unit is an interdepartmental group hosted by the Department of Public Health. It provides technical support to ITM researchers and partner institutions that carry out clinical research addressing health problems of developing countries.

In 2010, the database of the 4-ABC malaria trial, the first ever multi-country study sponsored by the ITM, was closed and analysed. The collaboration with the Unit of Epidemiology and Control of Parasitic Diseases now continues with 3 studies on malaria in pregnancy: the Cotrimal in Zambia; the PREGACT in Burkina Faso, Ghana, Malawi and Zambia; and the Palufer in Burkina Faso.

With the Unit of HIV/AIDS & STD Care and colleagues in Ethiopia, we are now ready to start the ITM-sponsored trial in HIV-leishmaniasis co-infection. With the Department of Microbiology we collaborate to the study 'Preparing for Phase III vaginal microbicide trials in Rwanda and Kenya'. With the Department of Public Health, we support the National Sleeping Sickness program in DR Congo with data management and capacity building.

In our work, we are daily confronted with technical and ethical challenges: how to respect universal standards in resource constrained settings or with limited budgets? How to avoid North-South double standards? How to translate universal ethical principles in contextualized procedures? We address these concerns within the Clinical Research Strategic Network, which now brings together 12 Southern partner institutions. In 2010, a 10-day course in Good Clinical Practices was organized in Burkina Faso by IRSS/Centre Muraz and ITM, consisting of a theoretical part which addressed the challenges of research in resource-poor contexts, and of a practical training in the field. Bringing together 15 participants from 3 continents, it was a great opportunity to confront the experience from different geographical and cultural areas.

To address other concerns raised by the Network's members, two more initiatives were launched: a multidisciplinary research project in Burkina to assess the performance and quality of informed consent tools and processes in vulnerable populations; and a small network of data managers, which aims to look for appropriate and affordable solutions concerning data management in non-commercial clinical research.

We organized a data managers workshop at ITM, exchanging knowledge, addressing challenges and strengthening international collaboration among data managers – people who are often neglected but who play a key role in clinical research teams.

The village of Karaba in Burkina Faso hosts the Lucoma project on maternal supplementation.

Department of Public Health

The Emerging Voices experience

In view of allowing experts from the South expressing their views in global health forums, we launched an original concept called "Emerging Voices". Through an essay competition we selected promising early and mid-career experts to benefit from a four pronged package. First they were trained at ITM in writing, publishing and communicating skills and met editors of several journals. Second they received individualized coaching to sharpen and publish their viewpoints. Third they attended and animated the November 2010 ITM Colloquium, on Universal Coverage, were they presented their results. Finally, they participated in the First Global Symposium on Health Systems research, organised in Montreux by WHO and others.

Twenty one of them were given the chance to present their viewpoint during the symposium; three were eventually even offered a slot in the closing plenary session. This grand finale was an enormous success and a jump start on the international scene.

The candidates had to submit a 1500 words document presenting their perspective on "how health systems research could contribute to universal health care coverage". More than 230 experts, from 47 countries, submitted a paper. A peer review process contributed to select the best ones. Fifty four, among them 16 women, were offered the 'Emerging Voice' treatment. Ultimately, we expect 15 papers to be published in peer reviewed journals. On top of those papers, one of our Emerging Voices could place an article in *The Lancet,* another one had a guest blog in the *British Medical journal,* four had a blog on *Healthaffairs.org,* several were interviewed…

The 'Emerging Voices' were not the only innovation during the 2010 ITM Colloquium. The organisers experimented with novel ways of presenting, and of stimulating discussion. All Emerging Voices held their talks in the Pecha Kucha format they had trained for: 20 slides of exactly 20 seconds each. Those 6 minutes and 40 seconds are much more imposing, informative and clear than the classic 'twenty minutes dull lecture'. Through 'speed dating', participants were stimulated to discuss shortly with many consecutive partners displaying the same choice of topic. They could 'book' senior experts for conversation over coffee. 'Fish bowl' discussions gathered discussants in a circular arrangement with a regular turn-over. Participants could blog on the live colloquium website, where they also could see themselves and others be interviewed, and where pictures appeared live. All those formats worked out very well, and gave the colloquium a dynamic and high-spirited atmosphere. Afterwards the Antwerp Colloquium participants kept on a lively discussion on its website (colloq2010.ning.com), another sign that the initiative bears long-lasting fruit.

Unit of Epidemiology and Disease Control

Insecticide treated materials, beyond malaria control?

Over the past two decades insecticide treated bed nets have emerged as one of the most effective methods in the control of malaria. Not only do they physically protect the sleeping individual, they also reduce the number of vector insects. The modern, so-called long-lasting insecticidal nets, do not have to be re-impregnated yearly, but remain insecticidal for at least three years. If they are so successful against malaria, why not use them against other vector borne diseases? We put it to the test, in Venezuela against dengue and in India and Nepal against Kala Azar.

Forty percent of the world population is at risk of dengue, fifty million people are infected annually, of which up to half a million develop severe hemorrhagic forms and 25 000 die. No specific treatment exists. The only possible prevention consists of suppressing the vector, the *Aedes* mosquito. We distributed long lasting insecticide treated curtains and jar covers in the city of Valera, Venezuela, where many cases are found, and explained how to use them. No further promotion activities were organized afterwards. 77% of households accepted the nets, but only 22% accepted the jar covers. After 18 months, the number of *Aedes* larvae and pupae had gone down with 55% in the intervention area, but not outside. The effect was due to the nets, the jar covers had no effect.

Unfortunately, even though the insecticide treated curtains themselves may be long lasting, their use under 'real life conditions' was not. People gradually stopped using them. For a meaningful effect on the *Aedes* mosquito, intensive accompanying promotion strategies will have to be developed, which will further increase the already high cost.

Kala Azar, or visceral leishmaniasis, affects half a million people annually and is fatal if left untreated. The parasite is transmitted through the bite of a female sand fly, a tiny insect of about 1mm that can pass through the maze of a normal, not insecticide treated, bed net. On the Indian subcontinent the parasite only lives in humans (and sand flies). The disease can thus be controlled by treating patients as early as possible and by preventing contact with sand flies.

We distributed long lasting insecticide treated nets in 26 hamlets, divided into pairs. In each pair tossing a coin decided which hamlet would receive the nets, and which would not (all communities had agreed to this procedure). Routine spraying of insecticides in the houses by the government went on as before, and people already using a (mostly non-treated) bed net were encouraged to continue doing so.

The long lasting nets reduced the number of sand flies indoor by one quarter, but not the cases of Kala Azar. In contrast, the numbers of malaria did go down in the hamlets with the long lasting insecticide treated nets. We suppose that, contrary to what was previously assumed, sand flies often bite humans outdoors.

In conclusion: extrapolating positive results observed in the control of one vector to the control of another should be done with caution.

Unit of Health Policy and Financing

Bringing evidence into public health policy

In 2005, the Indian government launched its National Rural Health Mission (NRHM), a flagship programme to improve access to accountable and effective healthcare for the 300 million plus rural poor. Five years later, a simple googling of 'NRHM' reveals over 350 000 publications. Most of them are opinions and suggestions, a lot of them conflicting and contradictory, and few of them reaching the people that can bring about a change.

In the words of Dr. **Devadasan,** director of the Institute of Public Health Bangalore (IPH): "On the one hand, researchers transform crucial evidence from the field in highly academic studies, circulated within a very close milieu. On the other hand, policymakers are forced to make decisions in a vacuum".

Bridging this gap is no small task. So when IPH Bangalore announced it would organise a national conference to just do that, ITM was all too happy to support this initiative of its long standing partner Evidence-informed policy advocacy is a core part of IPH's mission, and the National Rural Health Mission is an explicit focus. We joined forces to make the 'Evidence in Public Health Policy' conference a notable event.

The conference took place in Bangalore on December 10 and 11, 2010. It attracted over 200 policymakers and researchers from all over India, and abroad. For the first time researchers were able to communicate their findings and questions directly to the politicians. Prominence was given to experiences from the very field where healthcare delivery takes place, thereby lifting local experiences to a broader level. Policymakers eagerly absorbed a wealth of relevant information, and recognised the need to take this process further. A member of the NRHM steering group declared that "constant monitoring of NRHM's impact for course corrections should be built into the system".

This conference was only the start of a process, but a very promising one. The eventual aim in Dr. Devadasan's words is "to make India a better place for those who live in tremendous poverty". And it definitely confirmed IPH Bangalore's position as a key actor in Indian health research and advocacy. ITM is proud to have contributed to this achievement.

Full coverage of the congress is available on http://www.ephp.in/

Dr. Devadasan officially opens the Bangalore EPHP conference.

Highlights

Unit of Epidemiology and Disease Control

Targeted disease campaigns can be detrimental to general health

Global initiatives to control specific diseases in low income countries, such as polio or worm diseases, not only do good. If they pull people and resources away from basic health care, the remedy may be worse than the disease. In an article in the open-access journal *PLoS Neglected Tropical Diseases*, we cautioned the international aid community for complacency.

Basically it is a matter of balance between preventive and curative medicine – or as the Greeks would have put it, between Hygeia and Panacea, the two daughters of the god of Medicine. Prevention can be achieved by periodical campaigns, but care for the sick and injured must be available on a daily basis. That balance is unfortunately not yet guaranteed everywhere in developing countries. If in such a context (in itself valuable) mass campaigns have to be implemented with absolute priority, the daily provision of basic health care may well suffer.

Over the last decades an increasing number of health problems have been identified as 'priority diseases'. For a typical West-African country, these may include: river blindness, Guinea worm, tuberculosis, vitamin A deficiency, bilharzia, intestinal worm diseases, trachoma, polio and other vaccine-preventable child illnesses, malaria, HIV. In most cases, each problem is addressed by a separate control programme – even if there are now integrated programmes tackling five neglected diseases together, with four drugs and 28 different extra forms to be filled in by the health workers.

Few research has been done on the consequences for the fragile local health systems. In sixteen health centres in Mali, we determined the time spent by nurses on 'campaign-related work against neglected diseases'. Over a year, the campaigns claimed about one third of the time of the health workers; a quarter of the year they were absent from the health centre (and thus unavailable for their patients). In return for this campaign work they received a bonus of about one tenth of their annual pay, which is quite motivational for underpaid health centre staff.

During these campaigns the rural health centres were thus often closed, out of sheer necessity, as the nurses involved were the only ones in the centre qualified to offer curative consultations. Scheduled vaccinations had to be postponed. Children only received the campaign drug; other obvious illnesses they presented with were often disregarded.

Only the strongest health centres (2 out of 16) with more, experienced, and highly motivated staff, could more or less integrate the campaigns into their main duties, without interfering with regular activities. In all other cases, targeted disease campaigns, sometimes against diseases with no overriding local priority, were at the expense of basic health care. Hygeia and Panacea should sit together and talk.

Unit of Nutrition and Child Health

Infant foods should be protected from mycotoxins

Worldwide, 1 child in 3 suffers from growth retardation and 1 in 4 is underweight. The problems of stunting and underweight are associated with over 5 million deaths annually of children less than 5 years old. 70% of these deaths are concentrated in sub-Saharan Africa and South Asia. Malnutrition is implicated in the majority of cases. Already in 2004, we reported that improving the nutritional quality of the complementary maize porridge they are given when breast milk is no longer sufficient, does not reduce stunting and underweight in Tanzanian toddlers. This raises questions about the actual management of malnutrition by international aid organisations.

We looked for other possible causes of poor growth as soon as breastfeeding falls off and maize porridge is introduced. Until now, not much attention was paid to mycotoxins in food (mycotoxins are toxins produced by fungi) – with the exception of aflatoxin, of mouldy nuts. We knew aflatoxin had been observed to impair child growth in Benin and Togo. We explored for fungi growing on maize, the staple food in Tanzania – and in many other parts of the world – that could produce toxins such as fumonisin. The responsible fungus can be present without being visible to the untrained eye. Indeed, children of twelve months, who through their corn flour based complementary food were exposed to fumonisin above the WHO maximum tolerable daily intake (2µg/kg body weight), were significantly shorter and lighter than their counterparts.

Complementary food for infants in developing countries, especially those where corn is a staple food, should be protected against fumonisin, a toxin produced by fungi. The problem can be prevented by correct storage of the maize.

Maize on a local Tanzanian market.

Department of Public Health: projects

For more details visit www.itg.be and enter the project reference number in the search field.
Projects of the ITM-DGDC Framework Agreement Programme are listed in the chapter Development Cooperation.

Epidemiology and Disease Control

Reference number 426202
Sputum smear negative TB: validation of laboratory research and effectiveness of alternative diagnostic strategies
ITM promoter Patrick Van der Stuyft
Support: Research Foundation Flanders, Belgium

Reference number 426203
Effectiveness and uptake of specifically designed sandfly bednets in the prevention of Visceral Leishmaniasis
ITM promoter: Marleen Boelaert
Support: Research Foundation Flanders, Belgium

Reference number 526602
Visceral leishmaniasis in Bihar State, India
ITM promoter: Marleen Boelaert
Support: Banaras Hindu University, India

Reference number 626201
Development and validation of a clinical algorithm for extra-pulmonary tuberculosis in resource constrained high incidence areas
ITM promoter: Patrick Van der Stuyft
Support: Damien Foundation, Belgium

Reference number 316801
NIDIAG: Syndromic approach to neglected infectious diseases (NID) at primary health care level : an international collaboration on integrated diagnosis-treatment platforms
ITM promoter: Marleen Boelaert
Support: European Commission, Belgium

Reference number: 516201
Study of the Social Determinants of Neglected and other Poverty-Related Diseases in Latin America and the Caribbean
ITM promoter: Patrick Van der Stuyft
Support: Universidad Autonoma de Yucatan, Mexico

Health Policy and Financing

Reference number 100221
Human resources for health in Tete, Mozambique
ITM promoter: Wim Van Damme
Support: Vlaams Agentschap voor Internationale Samenwerking, Belgium

Reference number 100143
Protecting the rural poor against the economic consequences of major illness:a challenge for Asian transitional economies
ITM promoter: Wim Van Damme
Support: European Commission, Belgium

Reference number 100253
Global Health initiatives in Africa
ITM promoter: Wim Van Damme
Support: European Commission, Belgium

Reference number 100262
Effects of antiretrovirals for HIV on African health systems, maternal and child health
ITM promoter: Wim Van Damme
Support: European Commission, Belgium

Reference number 316101
Health equity and financial protection in Asia
ITM promoter: Wim Van Damme
Support: European Commission, Belgium

Reference number 416601
Follow-up of Belgian Technical Cooperation primary health care projects in DRC
ITM promoter: Bart Criel
Support: Belgian Technical Cooperation, Belgium

Reference number 416602
Technical continuous follow-up of health care programmes in Benin; outputs of this mix of interventions at the various levels of the local health system.
ITM promoter: Bart Criel
Support: Belgian Technical Cooperation, Belgium

Reference number 716104
Development of discussion paper on HIV Measure & Evaluation and Health Information systems
ITM promoter: Wim Van Damme
Support: UNAIDS, Switzerland

Reference number 716104
Commissioned background paper for The First Global Symposium on Health Systems Research "The Political Economy of Transnational dynamics on universal Coverage".
ITM promoter: Wim Van Damme
Support: World Health Organisation, Switzerland

Reference number 716105
Community health insurance in sub-Saharan Africa
ITM promoter: Bart Criel
Support: various

Reference number: 436601
Prise en charge du diabète en RD Congo
ITM promoter: Bart Criel
Support: CISO (Antwerp City), Belgium

Reference number: 526603
Performance-Based Financing in Central Africa
Reference number: 526702
Performance-Based Financing in Rwanda
ITM promoters: Bart Criel, Wim Van Damme
Support: World Bank

Reference number: 526604
Community of Practice on service delivery: a systematic analysis of service delivery of high impact interventions to reduce child and maternal mortality
ITM promoter: Bart Criel
Support: UNICEF Dakar, Senegal

Reference number: 526703
Which systems for Disease Control ?
ITM promoter: Wim Van Damme
Support: World Bank

Quality and Human Resources

Reference number 100157
Strengthening fairness and accountability in priority setting for improving equity and access to quality health care at district level in Tanzania, Kenya and Zambia
ITM promoter: Vincent De Brouwere
Support: European Commission, Belgium

Reference number 100230
Scientific follow-up Belgian Technical Cooperation projects in Senegal and Niger
ITM promoter: Guy Kegels
Support: Belgian Technical Cooperation, Belgium

Reference number 100261
Effectiveness of facility-based audits to improve the responsiveness of West African district hospitals to obstetric emergencies: a three-country cluster randomised controlled trial
ITM promoter: Vincent De Brouwere
Support: European Commission, Belgium

Reference number 716102
Prevalence of circumcised women and of girls at risk of circumcision in Belgium
ITM promoter: Vincent De Brouwere
Support: Ministry of Social Affairs and Public Health, Belgium

Reference number: 626501
Promotion de la demande des adolescents en services de santé sexuelle et reproductive
ITM promoter: Vincent De Brouwere
Support: Equilibres & Population, France.

Public Policy and Management

Ref. 316401
Impact on equity of access and efficiency of Integrated Health care Networks (IHN) in Colombia and Brazil.
ITM promoter: Jean-Pierre Unger
Support: European Commission, Belgium

Ref. 316402
Health System stewardship and regulation in Vietnam, India and China.
ITM promoter: Jean-Pierre Unger
Support: European Commission, Belgium

Nutrition and Child Health

Reference number 746007
Inter University collaboration Jimma, Ethiopia: nutrition and child health project
ITM promoter: Patrick Kolsteren
Support: various

Reference number 526300
The LUCOMA project. Acceptability, efficacy and cost-effectiveness of a local soy-based RUSF
ITM promoter: Patrick Kolsteren
Support: various

Department of Public Health: ongoing PhD projects

ASSEFA Yibeltal. Scaling-up antiretroviral treatment (ART) in a resource limited setting with severe human resources for health (HRH) constraint: What is an appropriate ART delivery model to increase coverage and improve retention in case of patients in the Ethiopian context?
Promoters: W. Van Damme; M. Laga (ITM), Damen Haile Mariam (School of Public Health, Addis Ababa University, Addis Ababa, Ethiopia)

ASSARAG Bouchra. La morbidité maternelle severe aigue au Maroc – Facteurs explicatifs et consequences: une base d'évidence nécessaire pour une réponse appropriée.
Promoters: V. De Brouwere (ITM), A. Maaroufi (Institut National d'Administration Sanitaire, Rabat, Maroc)

BASAZA Robert. Community-based health Insurance in Uganda: prospects and policy issues.
Promoters: B. Criel (ITM); P. Van der Stuyft (Ghent University), G. W. Pariyo (Makerere University, Kampala, Uganda)

BAYA BOTTI Ana Maria. The metabolic syndrome in Bolivian adolescents study (MESA).
Promoter: P. Kolsteren (ITM, Ghent University)

BHOJANI Upendra. Strengthening the role of local health systems in India to improve chronic disease care.
Promoters: P. Kolsteren (ITM), N. Devadasan (Institute of Public Health, Bangalore, India)

DEVADASAN Narayanan. Enhancing the Insurance functions of the Indian health system: the role of local health Insurance.
Promoters: B. Criel; W. Van Damme (ITM); P. Van der Stuyft (Ghent University), K. R. Thankappan (Sree Chitra Tirunal Institute of Medical Sciences and Technology, Kerala, India)

DIRO EJARA Ermias. Better clinical management of Visceral Leishmaniasis in HIV patients in Ethiopia: secondary prophylaxis and HAART optimization.
Promoters: M. Boelaert; L. Lynen (ITM), A. Hailu (Faculty of Medicine, University of Addis Abbaba, Ethiopia)

GONZALEZ LAGOS Elsa. Promoting HTLV-1 blood transfusion safety in an endemic country. Towards expanded evidence-based HTLV-1 control strategies at Peruvian Blood Banks.
Promoters: M. Boelaert (ITM), E. Gotuzzo (Instituto de Medicina Tropical, Peru)

HACHRI Hafid. Leviers de la performance des soins de santé primaries au Maroc.
Promoters: G. Kegels; V. De Brouwere (ITM), A. Maaroufi (Institut National d'Administration Sanitaire, Rabat, Maroc)

IDRISSI Ahmed. Performance de médecins generalists en matière de prise en charge du diabète de type 2 au Maroc.
Promoters: G. Kegels (ITM), A. Maaroufi (Institut National d'Administration Sanitaire, Rabat, Maroc)

IR Por. Health Equity Funds to improve access to quality health care for the poor and protect poor households in Cambodia from catastrophic health expenditure.
Promoters: W. Van Damme (ITM), E. Huot (University of Health Sciences, Phnom Penh, Cambodia)

KASWA Michel. Validity and feasibility of use of a rapid and innovative test for detection of Multi-Drug Resistant (MDR) TB cases in Kinshasa, DRC.
Promoters: M. Boelaert (ITM), J.J. Muymbe-Tamfum (Institut National de Recherche Biomédicale, Kinshasa, RD Congo)

KEUGOUNG Basile. Etude de l'interface entre programmes verticaux et services de santé de premier échelon. Comment optimiser cette relation dans les systèmes de santé d'Afrique sub-saharienne ?
Promoters: B. Criel, A. Buvé (ITM), J. Meli (Université de Yaoundé I)

KU-BLANCO Grace. First line approach to chronic diseases in the Philippines through the chronic disease care model – Improving quality of chronic disease care.
Promoters: G. Kegels (ITM), E. A. Barrenechea (Veterans Memorial Medical Center, Quezon City, the Philippines)

KULWA Kissa. Diatery strategies to increase content and bioavailability of iron and zinc in complementary foods of breastfeeding infants in rural Tanzania.
Promoters: P. Kolsteren (ITM), J. Van Camp (Ghent University)

MARTINEZ MEDINA Dalila Yolinda. Assessment of co-infections as determinants of treatment failure in cutaneous leishmaniasis.
Promoters: M. Boelaert; JC Dujardin, K. Polman (ITM), A. Llanos-Cuentas (Instituto de Medicina Tropical, Peru)

MITASHI MULOPO Patrick. Nouveaux tests diagnostiques pour la Trypanosomiase Humaine Africaine (THA): quel rôle dans les structures fixes des soins de santé primaires..
Promoters: M. Boelaert (ITM), P. Lutumba

NABYONGA Juliet. Diffusion of evidence and knowledge into health policies and practice at country level: moving from knowledge to practice.
Promoters: B. Criel (ITM), J. Macq (Université Catholique de Louvain), G. W. Pariyo, Makerere University School of Public Health, Kampala, Uganda

NAGO Eunice. The nutritional quality of street foods and their role in the diet of school-going adolescents in urban Benin.
Promoters: P. Kolsteren (ITM), J. Van Camp (Ghent University)

OTERO VEGAS Larissa. Tuberculosis case finding in high incidence settings with low HIV prevalence.
Promoters : P. Van der Stuyft (ITM), C. Seas (Instituto de Medicina Tropical, Peru)

OUEDRAOGO NIKIEMA Laeticia. Evaluation d'une approche communautaire pour la prise en charge de la malnutrition du jeune enfant dans un district rural au Burkina Faso.
Promoters: P. Kolsteren (ITM/Ghent University), B. Sondo (Institut de Recherche en Sciences de la Santé, Ouagadougou, Burkina Faso)

PEREZ CHACON Dennis. Follow-up and evaluation of institutionalization processes of participatory strategies in Aedes aegypti control.
Promoters: P. Van der Stuyft (ITM/Ghent University), P. Lefèvre (ITM)

PHANZU MAVINGA Delphin. Controle de l'Ulcère de Buruli dans le Territoire de Songololo en République Démocratique du Congo : Impact de la décentralisation et de l'intégration des activités de lutte dans les services de santé de base.
Promoters: M. Boelaert (ITM), P. Lutumba (Institut National de Recherche Biomédicale, Kinshasa, RD Congo)

PRASHANTH Nuggehalli Srinivas. Management matters : the impact of district level management capacity on health outputs.
Promoters: B. Criel (ITM), N. Devadasan (Institute of Public Health, Bangalore, India)

RICHARD Fabienne. La césarienne de qualité.
Promoters: V. De Brouwere (ITM), B. Dujardin (Université Libre de Bruxelles)

TASHOBYA Christine. Developing an appropriate Health Systems Performance Assessment framework in Low Income Countries: the example of sub national assessment in Uganda.
Promoters: B. Criel (ITM), F. Ssengooba (Makerere University School of Public Health)

TEJERINA SILVA Herland. International aid to Bolivia health sector: a win-win game? Analysis and orientations for a new cooperation.
Promoters: J. P. Unger (ITM), M. C. Closon (Université Catholique de Louvain), O. Lanza (Universidad Mayor de San Andrés, La Paz, Bolivia), C. Darras (PAHO, Bolivia)

URANW Surendra Kumar. Kala-azar in Nepal: from Public Health Evidence to control.
Promoters: M. Boelaert (ITM), S. Rijal (B.P. Koirala Institute of Health Sciences, Dharan, Nepal)

ZERPA SOLARI Lely. Development and validation of Clinical Prediction Rules that address bottlenecks in tuberculosis diagnosis.
Promoters: P. Van der Stuyft (ITM), C. Cabezas Sánchez (Ministerio de Salud, Instituto Nacional de Salud, Lima, Peru)

BOUCKAERT Kimberley. Omega 3 and 6 fatty acids for child growth, development and gut integrity.
Promoters: P. Kolsteren (ITM), J. Van Camp (Ghent University)

JACOBS Bart. Access to health care for the poor in Cambodia.
Promoters: W. Van Damme (ITM), T. Mets (Free University of Brussels)

LACHAT Carl. Out of home eating as determinant of unbalanced nutrition?
Promoter: P. Kolsteren (ITM/Ghent University)

MARCHAL Bruno. Well-performing healthcare organizations: What's the role of (HR) management?
Promoters: G. Kegels (ITM), T. Mets (Free University of Brussels)

MENTEN Joris. Latent variable models in diagnostic medicine.
Promoters: M. Boelaert (ITM), E. Lesaffre (Catholic University of Leuven)

ROBERFROID Dominique. Intergenerational nutrition: the effects of maternal micronutrients on foetal growth and infant health.
Promoters: P. Kolsteren (ITM), B. Brabin (University of Amsterdam, the Netherlands)

VAN BELLE Sara. Global Non-State Actor Involvement in District Decision-Making Processes in the Domain of Sexual and Reproductive Health: A Comparative Case Study Series in the Sub Sahara Africa Region.
Promoters: V. De Brouwere, G. Kegels (ITM), S. Mayhew (London School of Hygiene & Tropical Medicine)

VANLERBERGHE Veerle. Effectiveness and acceptance of integrated dengue vector control strategies.
Promoter: P. Van der Stuyft (ITM, Ghent University)

VERSTRAETEN Roosmarijn. A school-based health promotion intervention in adolescents in Ecuador: a cluster-randomized controlled trial.
Promoters: P. Kolsteren (ITM), L. Maes (Ghent University)

Library and bibliometrics

Library and bibliometrics

In 2010, login options into the library network from outside ITM were enhanced substantially. Apart from a few additional titles, online journal subscriptions remained stable at over 8 000 (including open access journals). But while e-journals have been outshining the traditional printed editions for more than a decade now, e-books remained relatively scarce in the library. In 2010 we acquired a substantial number of e-books, either on a title by title selection base (*MyiLibrary, Elsevier Expert Consult, Books@ovid)* or as part of large e-book package deals such as SpringerLink.

TropMed Central Antwerp (TMCA), the open access repository of ITM's scientific publications, was extended back to the year 1990 and now counts over 5,000 items, about 30% with full text. Overall *TMCA* received 14 221 visits from 171 countries. The full text items were downloaded 153 671 times, 169 of which at least 200 times, 14 items over 500 times. Over 90% of all 2000-2010 ITM staff publications are now directly available from the database in PDF format.

The DGD Framework document delivery service handled some 25% more requests than in 2009, for partners in Latin America, Africa, and Southeast Asia. Two Moroccan and a Cuban librarian received a two weeks training at our library. In October Lenny Rhine (Medical Library Association and Librarians Without Borders) was our guest. He presented an ITM seminar on *Hinari: improving access to biomedical and health information for researchers and practitioners in developing countries* for an auditorium filled with interested staff and foreign students, the latter being the obvious beneficiaries of WHO's Hinari program.

After 23 years of dedicated service, Veerle **Demedts** retired at the end of December. Archives manager Kris **Didden** succeeded Veerle as deputy-head librarian. Nele **Verstraeten,** joined us in February to reinforce the library's much appreciated document delivery (DocDel) services.

Table: Summary of research output of the ITM, 2001-2010

Indicator	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total number of publications	245	223	206	252	235	227	272	308	319	392
All journal contributions	164	180	166	205	191	203	240	262	275	325
Research papers only *	147	158	142	175	165	183	220	240	253	288
Papers in JIF - journals **	121	135	138	161	151	166	201	217	221	279
Research papers in JIF - journals *	107	114	117	135	130	149	183	198	198	242
Sum JIF values all contributions	425	490	510	596	561	790	897	833	1060	1217
Average JIF all contributions	3.5	3.6	3.7	3.7	3.7	4.8	4.5	3.8	4,8	4,4
Sum JIF research papers *	327	317	348	364	338	626	642	730	743	808
Average JIF research papers *	3.1	2.8	3.0	2.7	2.6	4.2	3.5	3.6	3,8	3,3

* excluding editorials, letters and published abstracts.
** JIF = Journal Impact Factor according to ISI Journal Citation Report

Hafida Fakir and Rachida Cherqi, two colleagues from the Rabat Centre de Documentation en Santé de l'Institut National d'Administration Sanitaire (CDS-INAS), received a two weeks training at our library.

2010 saw the creation of a new storage room as well as the transfer of several parts of the historical archives to the central archives room. As a precursor to the institutional policy, a set of procedures to describe the appraisal, storage and ownership of records in case of reorganisation was created. A draft appraisal list was compiled from legislation and guidelines applicable to the Institute's activities.

Bibliometrics 2010

In 2010 the publications output once more reached new heights (Table). The number of items and the overall sum of journal impact factor (JIF) values is again substantially higher than the years before, yet average JIF per paper was slightly lower. The number of full-text research papers - i.e. excluding letters, editorials and comments - increased with more than 20%, their total JIF value with some 8%. As always, these preliminary JIF totals and averages were calculated on the *ISI Journal Citation Reports (JCR)* values for the previous year. As expected *PLoS ONE* now gained its first JIF, with a respectable 4.351 value. As such the eleven 2010 items could this time duly be included in the 'elite' group, which was not yet possible for the year 2009. This example and other evolutionary phenomena of the JIF ecosystem tend to somewhat exaggerate this year's genuine progress on the JIF front.

Tropical Medicine and International Health is again and by far ITM's most popular publication outlet with 32 items. Even if one discounts letters, editorials and a leishmaniasis supplement edited by ITM researchers and featuring 7 ITM papers, *TM&IH* remains at the top. *PLoS Neglected Tropical Diseases* (17) climbs to second place, before *The American Journal of Tropical Medicine and Hygiene* (13). *The Malaria Journal* (12) drops from first to fourth place, narrowly preceding *PLoS ONE* (11). Then follow other usual suspects like *The International Journal of Tuberculosis and Lung Disease* (9), *The Lancet* (9), *The Transactions of the Royal Society of Tropical Medicine and Hygiene* (7), *Acta Tropica, Journal of AIDS, Parasitology* and *Veterinary Parasitology* (6 all). The electronic-only publications now feature 91 items or about 23% of the total ITM output. While most of these are either *Public Library of Science (PLoS)* or *BioMed Central (BMC)* journal contributions, 15 are digital non-journal publications, including one CD-ROM.

Apart from JIF journal contributions the ITM output consists of articles in journals without impact factors, books, book chapters, dissertations and miscellaneous grey literature. As usual, these represent about 30% of all publications and are necessarily not included in the JIF values.

Library Publications

Schoonbaert D, Rosenberg V. Personal bibliographic systems (PBS). In: *Encyclopedia of Library and Information Science; 3rd ed.* London: Taylor & Francis, 2010: 2127-2136.

Library statistics 2010

Books

Acquisitions	367
> Purchased	290
> Donated	77
Total number of books	21650
Total number of individual e-books*	75
Total number of e-books in packages**	ca. 4000
Total number of CD-ROMs	279
Total number of videos	382
Total number of ITM dissertations (non-PhD)	2810
> Total number of digital ITM master theses	1989
Total number of PhD theses in collection	817
> Total number of digital PhD theses	12

Journals

Print subscriptions	331
> Volumes bound in 2010	270
> Total number of volumes	ca. 2700
Online subscriptions	ca. 2200
> Online package subscriptions	5
> Free open access journals	ca. 6000

Databases

Electronic Reference Library (ERL)	
> Number of databases	12
> ITG Staff Publications: nr of records	13257
> TropMed Antwerp: nr of records	5250
> ERL logins	3008
> ERL Database logins	13674
Other database subscriptions***	4
Major free online databases	5

Document Delivery

Incoming requests	1464
Outgoing requests	1385
> Success rate	97,3%
DGDC Framework requests	809
> Success rate	94%
Photocopies & prints****	68960
Scans**	43959

User training

Teaching hours	31

* Individual e-book purchases, excl. open access e-books from e.g. WHO or NCBI

** SpringerLink medical and biomedical collections 2005-2010

*** ISI Web of Knowledge (Thomson Reuters) + The Cochrane Library (Wiley) + Global health (CABI) + Veterinary Science (CABI)

**** 1 photocopy = 1 scan + 1 print; multiple photocopies = 1 scan + multiple prints

ITM publications in 2010

Department of Microbiology

Publications in international peer-reviewed journals with impact factor

Affolabi D, Torrea G, Odoun M, Senou N, Ligali MA, Anagonou S, Van Deun A. Comparison of two LED fluorescence microscopy build-on modules for acid-fast smear microscopy. Int J Tuberc Lung Dis 2010;14(2):160-4.

Ariën KK, Vanham G. First real success for anti-HIV gel: a new start for HIV microbicides? [editorial]. Future Microbiol 2010;5(11):1621-3.

Beelaert G, Fransen K. Evaluation of a rapid and simple fourth-generation HIV screening assay for qualitative detection of HIV p24 antigen and/or antibodies to HIV-1 and HIV-2. J Virol Methods 2010;168(1-2):218-22.

Behets F, Edmonds A, Kitenge F, Crabbé F, Laga M. Heterogeneous and decreasing HIV prevalence among women seeking antenatal care in Kinshasa, Democratic Republic of Congo. Int J Epidemiol 2010;39(4):1066-73.

Boily MC, Buvé A, Baggaley RF. HIV transmission in serodiscordant heterosexual couples [editorial]. BMJ 2010;340(7757):1149-50.

Bryja J, Granjon L, Dobigny G, Patzenhauerova H, Konecny A, Duplantier JM, Gauthier P, Colyn M, Durnez L, Lalis A, Nicolas V. Plio-Pleistocene history of West African Sudanian savanna and the phylogeography of the *Praomys daltoni* complex (Rodentia): the environment/geography/genetic interplay. Mol Ecol 2010;19(21):4783-99.

Buvé A, Kapiga S, Hayes R. HIV prevention: where now? AIDS 2010;24(Suppl.4):92 pp.

Buvé A, Lynen L. Treating HIV infection with drugs for HSV-2 infection? [comment]. Lancet 2010;375(9717):782-4.

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Camara M, Dieye TN, Seydi M, Diallo AA, Fall M, Diaw PA, Sow PS, Mboup S, Kestens L, Jennes W. Low-level CD4+ T cell activation in HIV-exposed seronegative subjects: influence of gender and condom use. J Infect Dis 2010;201(6):835-42.

Chaillet P, Tayler-Smith K, Zachariah R, Duclos N, Moctar D, Beelaert G, Fransen K. Evaluation of four rapid tests for diagnosis and differentiation of HIV-1 and HIV-2 infections in Guinea-Conakry, West Africa. Trans R Soc Trop Med Hyg 2010;104(9):571-6.

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Chonde TM, Basra D, Mfinanga SG, Range N, Lwilla F, Shirima RP, Van Deun A, Zignol M, Cobelens FG, Egwaga SM, van Leth F. National anti-tuberculosis drug resistance study in Tanzania. Int J Tuberc Lung Dis 2010;14(8):967-72.

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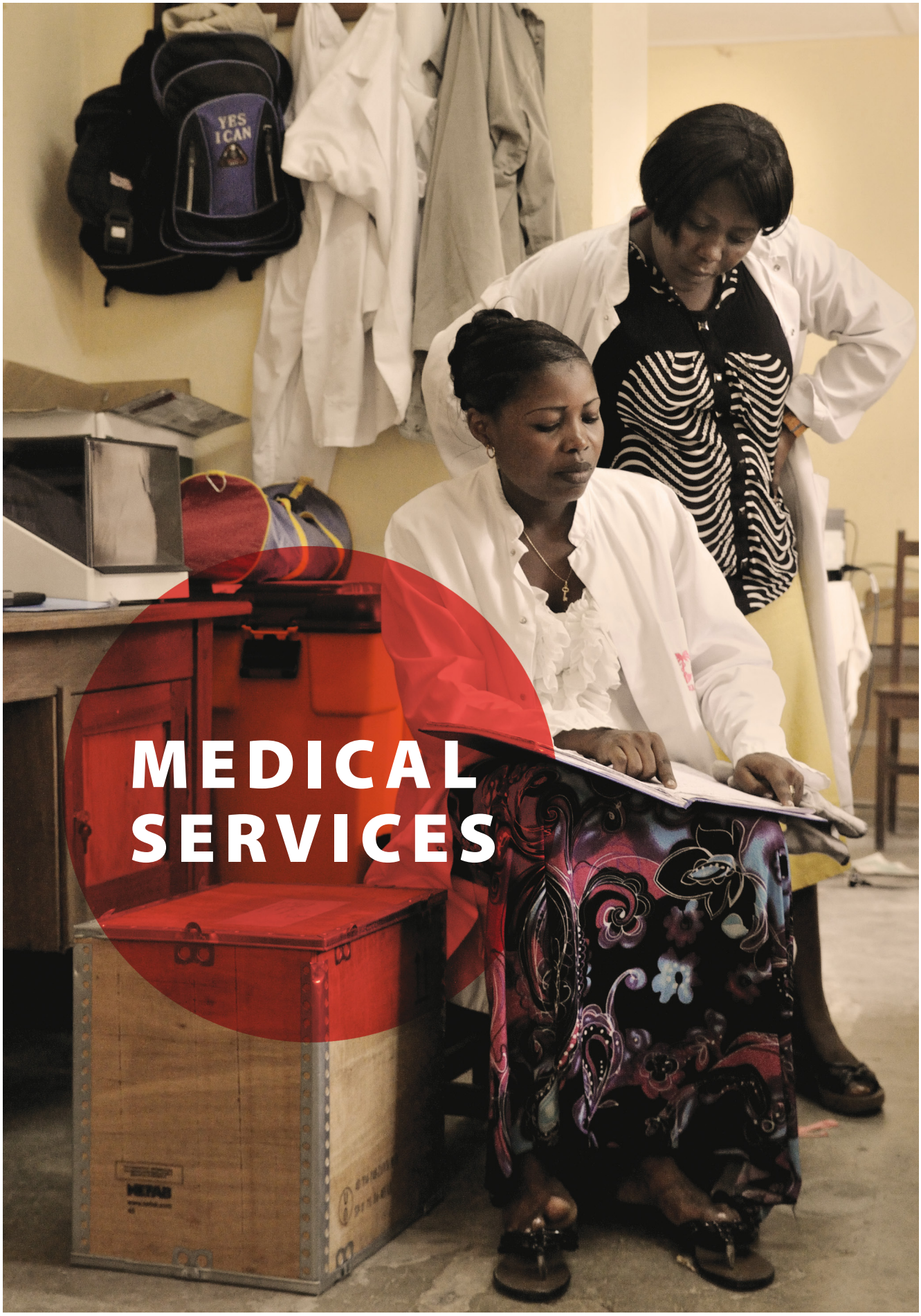


MEDICAL SERVICES

Medical Services

The Medical Services constitute a separate administrative and operational entity within the Institute. Research, education and scientific service functions are carried out under the umbrella of the Department of Clinical Sciences. The Medical Services also comprise national reference centres for tropical and infectious diseases and for HIV/AIDS.

Medical Services

In 2010 we performed 33 472 consultations, of which half were pre-travel advice. HIV and tropical & import pathologies each stood for about 20%.

The **Service for Tropical and Import Pathology** provides specialized outpatient, diagnostic, clinical and preventive care to returning travelers, expatriates and migrants. As part of the ITM's national reference role, we are 24/7 on call to advise other healthcare workers, and the authorities. As in previous years, we participated in the main national and international scientific meetings on import pathology and travel medicine, and contributed to international travel health publications, including WHO manuals.

The pre-travel advice and care is provided by the **Travel Clinic**, which offers general, country-specific and disease-specific information, vaccinations, chemoprophylaxis, advice about treatment, and promotes healthy travelling. We delivered 16 567 consultations and 36 565 vaccines.

Our **travel websites,** www.reisgeneeskunde.be (Dutch), www.medecinedesvoyages.be (French) or www.travelhealth.be (English) received over 270 000 pageviews. They have been completely renewed and made more user-friendly in 2010, while the information was continuously updated.. Our **Travel Phone** system for tourists (0900 10 110), also permanently updated, received around 6 500 calls.

The **Service for HIV/AIDS & STD Care** performed 8 096 consultations, of which 6 722 from HIV patients and 1 374 for other Sexually Transmitted Diseases. Our **AIDS-care Reference Centre** followed up 1 982 HIV-infected patients, of which 77% were on anti-viral treatment. 56% of our patients are from Belgium (mainly MSM, 'Men having Sex with Men') and 29% from sub-Saharan Africa. In 2010 we registered 210 new HIV positive patients; among them, the proportion of MSM is increasing. The extra-muros **Helpcenter** aims at improving secondary HIV prevention, in particular for groups with high risk behaviour; people can remain anonymous. It performed 2 020 consultations on 1 382 patients, MSM and migrants both making out a third of our visitors. Sub-Saharan African Migrants (SAM) accounted for 13%; a percentage that is growing. 1278 HIV-tests were performed in 2010; 0.9% of them were positive. The rate was much higher in our main two target groups: 2.9% among MSM and 3% among SAM. We performed 120 sexological consultations, with 55 different persons.

The **Tropical Disease and HIV/AIDS Ward** at the University Hospital of Antwerp took care of 206 inpatients. 110 had HIV-related problems, the others suffered from severe tropical or travel related diseases, most frequently malaria.

“Among our new patients, the proportion of ‘Men having Sex with Men’ is increasing”

The integrated analyzer replaces four different machines.

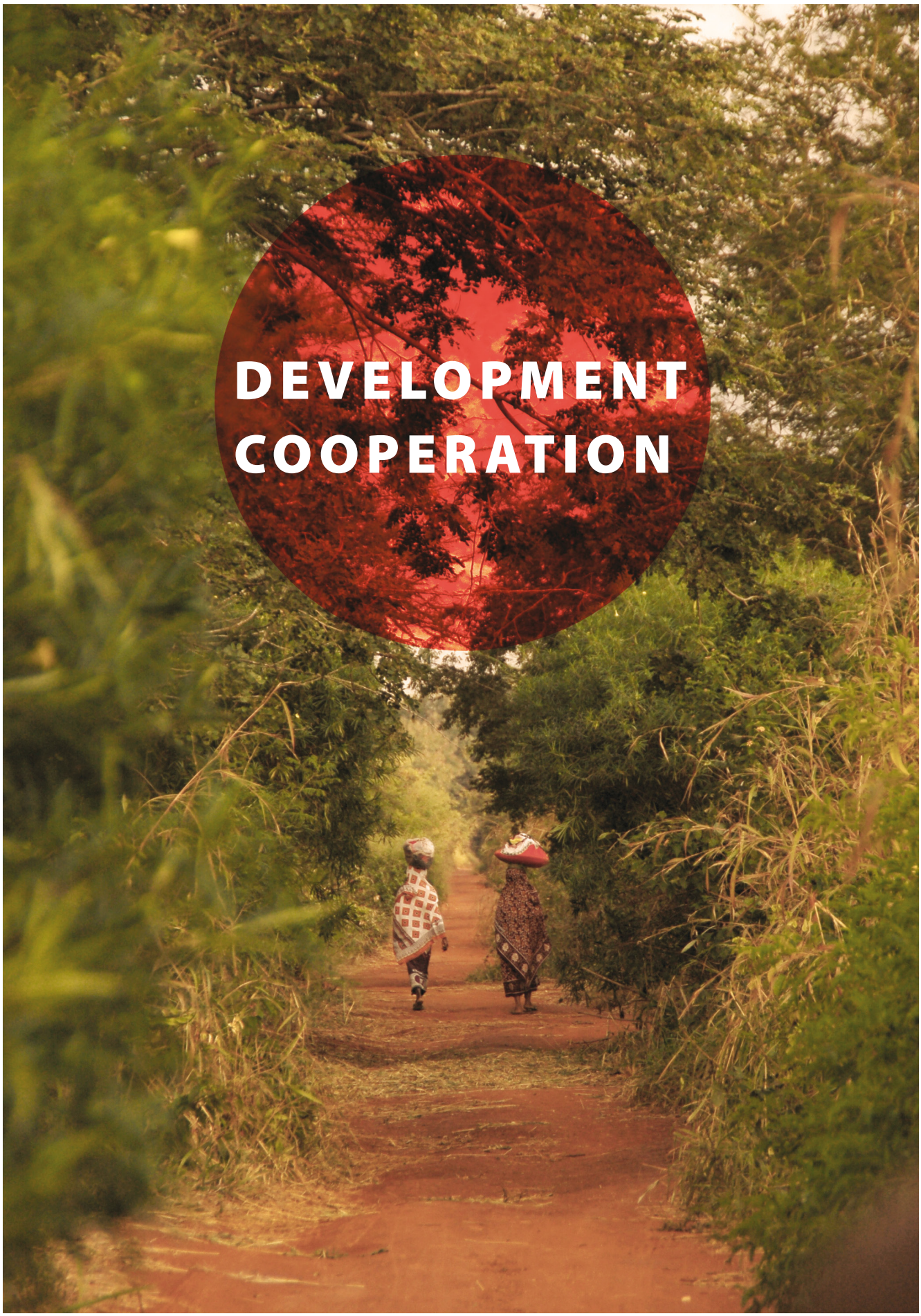
Medical Laboratory

We ensure routine and expert diagnosis for our own outpatients, and referral services for laboratories, clinics and hospitals throughout Belgium. In 2010, we processed samples of 13 450 internal and 20 201 external patients (total 33 651). Besides routine biochemistry, hematology and microbiology, we performed 130 736 specific serological and parasitological tests for tropical and imported diseases. We installed an integrated analyzer, replacing four different apparatus. At the end of 2010 we moved to new laboratory and office space, on the second floor of the clinic. This move allowed the regrouping of laboratories and a closer interaction with the clinicians.

A remarkable evolution was the rise in the number of serological tests requested for dengue, which rose with 60% compared to previous years. The number of positive cases even rose with 143%, from 53 in 2009 to 129 in 2010. The rise was concentrated in August and September, with a third of the cases linked to the French Antilles.

Belgian National Reference Laboratory for Tropical and Infectious Diseases.

In 2010, the Belgian National Reference Laboratory for Tropical and Infectious Diseases was active in development and evaluation of diagnostic tests and in the surveillance and containment of infectious diseases. Real-time PCRs for the diagnosis of dengue virus and microsporidian infections were designed and clinically validated, and the diagnostic PCR assays for *Strongyloides* spp. and *Leishmania* spp. received ISO 15189 accreditation. We converted the four-primer real-time Plasmodium PCR for the diagnosis of malaria (ISO 15189 accredited for blood samples) to archived blood slides and rapid diagnostic tests cassettes. This method opens new perspectives in the field. In addition, newly released malaria rapid diagnostic tests were assessed for diagnostic performance, cross-reactions and end-user’s errors.


DEVELOPMENT
COOPERATION

Development Cooperation

Since 1998, the ITM works together with the Belgian Direction-General for Development Cooperation (DGD) in a coherent and comprehensive Framework Agreement programme. This set of activities aims at sustainable scientific, medical and veterinary capacity building in the South. We are now working under the third Framework Agreement (FA3), of which 2010 was the third year.

The third Framework Agreement

The first two FA programmes ran from 1998 through 2002, and from 2003 through 2007. Both were successfully concluded and positively evaluated. In 2008, ITM started with the third Framework Agreement programme (2008-2013). It covers two periods of three years. The budget for the first period, 2008-2010, amounted to 36 million €. The motto is 'Switching the Poles', the theme of our 2006 centennial colloquium. It implies that we intend not just to transfer expertise and resources to our South partners, but also ownership and leadership – and accountability – in line with the Declaration of Paris (2005) and the Accra Agenda (2008). Ownership, leadership and accountability of the country (in casu the partner institute) need to be explicitly pursued from both sides, a vision we share with DGD and our institutional partners in the South.

The overall objective of the FA3 programme is "to strengthen the rational basis and the country ownership of health care systems and policies in developing countries, in order to improve the health status of the populations and thereby contribute to the reduction of poverty and inequity". More specifically: we aim to build, reinforce and support appropriate and sustainable capacity to conduct the research, training and reference services that are needed to fulfil the health needs of the country.

Our target groups are, in order of impact and level:

(1) the leaders, scientists and experts in our partner institutions, who act as multiplicators; (2) the health professionals and policy makers that can implement the improved practices and policies resulting from our work; (3) the population that should benefit from the outcome of (1) and (2).

FA3 is divided into five subprogrammes, in a logical connection:

Training: strengthening the capacity of individuals from developing countries

Institutional collaboration: strengthening the capacity of institutes, organizations and networks in those countries

Strategic cooperation: addressing and completing strategic priorities by targeted additional projects and partnerships, and through networking within and outside of FA3

Policy support and advocacy: supporting the Belgian development cooperation in the formulation, implementation and dissemination of its policies

Management: ensuring adequate administrative and financial management of the programme and its projects, including planning, monitoring and evaluation

The **Training** sub-programme focuses on mid-career professionals from developing countries in the master and short expert courses at ITM, and on doctoral training for health scientists from developing countries, mostly in a "sandwich" setting in cooperation with a partner institute in their homeland. While at ITM, we provide them with administrative, financial, social and cultural support. For students and scientists abroad we develop and provide novel educational tools and updated scientific information, e-learning programmes and expert telemedicine support, networking with and between alumni.

The training sub-programme has proceeded according to plan and has been complemented by an additional fellowship programme of 2 million €, allowing amongst others the extension of our post-doctoral re-entry scheme.

In the **Institutional Collaboration** sub-programme we work with partners institutions that were competitively selected on the basis of scientific and institutional quality. The participants represent a geographical mix, although sub-Saharan Africa would ideally have been somewhat more strongly represented. We lend support to training, research and/or services delivery, but also to institutional development and to the translation of research into policy and practices. Most of the shared thematic priorities of DGD and the ITM are broadly covered.

Our 17 strategic partners are: the Institut Nationale de Recherche Biomédicale (INRB) Democratic Republic of Congo; the Institut National d'Administration Sanitaire, Morocco; the Makerere University School of Public Health, Uganda; the Institute of Public Health at the Pontificia Universidad Católica del Ecuador, Quito, Ecuador; the Institute of Tropical Medicine Pedro Kourí, and the National Institute of Hygiene, Epidemiology and Microbiology, Cuba; the Universidad Mayor de San Simón of Cochabamba, Bolivia; the Institute of Public Health, Bangalore, India; the Sihanouk Hospital Centre of HOPE in Phnom Penh, Cambodia; the Tropical Diseases Research Centre in Ndola, Zambia; the Instituto de Medicina Tropical Alexander von Humboldt in Lima, Peru; the National Institutes for Malaria, Parasitology and Entomology of Vietnam and Cambodia; the Centre Hospitalier Universitaire, Dakar, Senegal; the Department of Veterinary Tropical Diseases, Faculty of Veterinary Science, University of Pretoria, South Africa; the International Centre for Research and Development of Livestock in the sub-humid zone of West Africa, Bobo-Dioulasso, Burkina Faso; the Centro Internacional de Zoonosis, Universidad Central del Ecuador.

All 15 institutional collaboration projects will continue in FA3-II. While a few were initially slow on delivery, expenditure and/or reporting, these shortcomings do not justify a drastic discontinuation. The original 6-year plans were usually on track, so the exercise of elaborating FA3-II was mainly a matter of revisions, refinements and updates.

The **Strategic Progjects** sub-programme works complementarily to the Institutional Collaboration. For instance, in that sub-programme HIV/AIDS is underrepresented, because it was - coincidentally or not - mainly addressed by applicants that did not fulfil institutional criteria. The Strategic Programmes compensate for that, while also addressing main global health topics, geographic priorities and cross-cutting issues.

The FA3 also substantially increased the emphasis on synergetic **networks** and other interactions between the south-partners, with the aim to capitalise on each other's expertise, to join forces on the international scene and to reduce the role of ITM as a (perceived) donor and technical leader. Some networks are thematic (health systems, HIV, malaria, neglected diseases, zoonoses, …), others are normative (good laboratory practices, good clinical practices, gender, …).

Strategic networks were a new project format in FA3-I, to be tested under different concepts and modalities. Therefore, in 2010 we commissioned an external Mid Term Review of the nine networking projects. Recommendations were: consolidate networks that have been performing well; provide enough "seed money" for activities and products "owned" by the South; shift governance to the South; extend the network to non-IC partners, where appropriate.

The **Policy Support and Advocacy** sub-programme aims to support the DGD in the development, implementation and follow-up of its international health policies, including the coordination of Belgian actors by means of platforms (Be-Cause Health, Be-TropLive), expert assistance in international fora, public information and sensitization, organisation of the annual colloquia, other seminars and events.

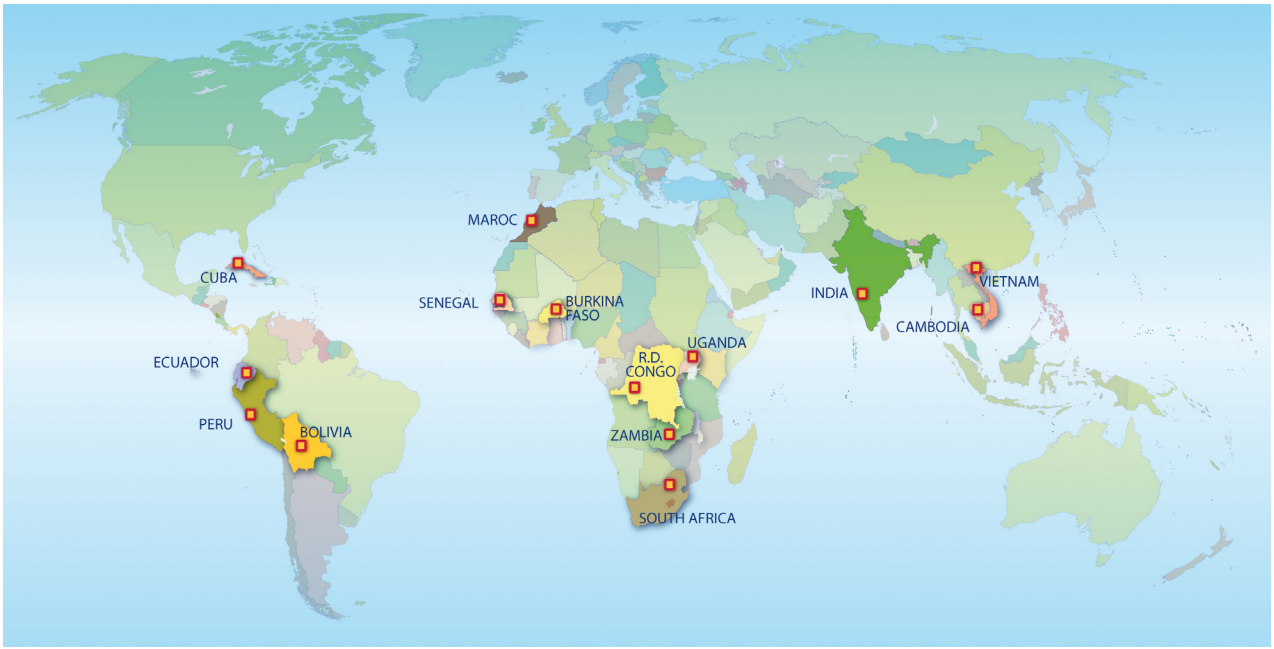
Many paragraphs of the documents produced by ITM found their way in DGD technical papers, speaking notes and statements of Belgian policy makers in national and international fora. Preparatory policy support research set the scene for the QUAMED network (QUAlity MEDicines for All) which will be developed in 2011-2013. Early 2010, an external evaluation of the Be-Cause Health platform produced a set of useful recommendations whose implementation is being put in practice.

The adequate management of the ITM-DGD Programme has been assured by project cycle management, monitoring and evaluation, quality assurance, financial accounting, administrative and substantive reporting. Selected focussed missions were done to guarantee the proper administrative and financial follow-up.

In 2010, ITM and its partners have made substantial efforts for the preparation of FA3-II on the basis of the initial FA3-programme and along the line of the same 5 subprogrammes. The process involved promoters from the ITM and the partner institutes, as well as a dialogue with ITM-DGD steering committee. At the end of 2010 the federal government was still in resignation, so the second part of the agreement (2011-2013) could not yet be formally approved. We continue as planned, however, as DGD provides us with bridging funding.

The progress of individual projects can be followed on www.itg.be, by filling in the project reference number in the search box.

Institutional Collaboration projects in the third ITM-DGDC Framework Agreement Programme.



Instituto Nacional de Higiene, Epidemiologia y Microbiologia (INHEM), Havana, Cuba and Instituto Pedro Kourí (IPK), Havana, Cuba
Centro Internacional de Zoonosis (CIZ), Universitad Central, Quito, Ecuador
Institute of Public Health, Pontificia Universidad Católica del Ecuador (IPH-PUCE), Quito, Ecuador
Instituto de Medicina Tropical "Alexander von Humboldt" (IMTAvH), Universidad Cayetano Herredia, Lima, Peru
Post-Graduate Medical School, Universidad Mayor de San Simon (UMSS), Cochabamba, Bolivia
Centre Hospitalière Universitaire (CHU), Université Cheik Hassan Diop, Dakar, Senegal
Institut National d'Administration Sanitaire (INAS), Ministère de la Santé, Rabat, Morocco
Centre International de Recherche-Développement sur l'Elevage en Zone Subhumide (CIRDES), Bobo-Dioulasso, Burkina Faso
Institut National de Recherche Biomédicale (INRB), Ministère de la Santé Publique, Kinshasa, RD Congo
Tropical Diseases Research Centre (TDRC), Ndola, Zambia
Department of Veterinary Tropical Diseases (DVRD), University of Pretoria (DVTD), South Africa

Institute of Public Health (IPH - MU), Makerere University, Kampala, Uganda
Institute of Public Health (IPH), Bangalore, India
Sihanouk Hospital Center of HOPE, Phnom Penh (SHCH), Cambodia
National Institute of Malariology, Entomology and Parasitology (NIMPE), Ministry of Health, Hanoi, Vietnam

FA3 Projects and Partners

The projects listed below are funded by the Belgian Directorate-General for Development Cooperation (FA3). For more details on the projects of Institutional Colloboration or the Strategic Programmes visit www.itg.be and enter the project reference number in the search field.

Strategic Projects

Africa

Reference number 930100
Preventive interventions targeting HIV uninfected and HIV infected young people in Kenya and Uganda
ITM promoter: Anne Buvé (Department Microbiology – Unit of Epidemiology and Control of HIV & STI)

Reference number 930200
HIV prevention among female sex workers in Côte d'Ivoire
ITM promoter: Marie Laga (Department Microbiology – Unit of Epidemiology and Control of HIV & STI)

Reference number 930500
Diagnosis and control of Buruli ulcer in Benin and West Africa
ITM promoter: Leen Rigouts (Department Microbiology – Unit of Mycobacteriology)

Reference number 930600
Clinical trial capacity strengthening for malaria in Burkina Faso
ITM promoter: Umberto D'Alessandro (Department Parasitology – Unit of Epidemiology and Control of Parasitic Diseases)

Reference number 930700
Support to clinical research on human African trypanosomiasis in the Democratic Republic of Congo
ITM promoter: Raffaella Ravinetto (Clinical Trials Unit)

Asia

Reference number 930300
Improving access to comprehensive reproductive health in Cambodia through increased linkages between HIV/STI and reproductive health services
ITM promoter: Marie Laga (Department Microbiology – Unit of Epidemiology and Control of HIV & STI)

Reference number 930400
Visceral leishmaniasis control
ITM promoter: Marleen Boelaert (Department Public Health – Unit of Epidemiology and Disease Control)

Strategic Networks

Reference number 931100
Network on Health Systems: 'Health for All beyond 2000'
ITM promoter: Guy Kegels (Department Public Health – Unit of Health Care Management)

Reference number 931200
Network HIV/AIDS programmes and policies network
ITM promoter: Marie Laga (Department Microbiology – Unit of Epidemiology and Control of HIV & STI)

Reference number 931500
Network Neglected Diseases
ITM promoter: Marleen Boelaert (Department Public Health – Unit of Epidemiology and Disease Control)

Reference number 931600
Network zoonotic diseases
ITM promoter: Peter Van den Bossche (Department Animal Health – Unit of Veterinary Protozoology)

Reference number 931700
Network International Health Policies
ITM promoter: Wim Van Damme (Department Public Health – Unit of Health Policy and Financing)

Reference number 932100
Network Integrated laboratory quality management
ITM promoter: Jan Jabobs (Department Clinical Sciences – Unit of Tropical Laboratory Medicine)

Reference number 932200
Network Clinical Research
ITM promoter: Raffaella Ravinetto (Clinical Trials Unit)

Reference number 932300
Network Equity, ethics and gender
ITM promoter: Ann Verlinden (Direction – Research Coordination)

Institutional collaboration

Africa

Reference number 920100
Institutional strengthening of the reference and research functions of the Institut National de Recherche Biomédicale (INRB), Kinshasa, Democratic Republic Congo
ITM promoter: Marleen Boelaert (Department Public Health – Unit of Epidemiology and Disease Control)

Reference number 920200
Support to the development of training and research capacity of the Institut National d'Administration Sanitaire (INAS), Rabat, Morocco
ITM promoter: Vincent De Brouwere (Department Public Health – Unit of Health Care Management)

Reference number 920300
Capacity strengthening for health systems research and health policy development in the Institute of Public Health (IPH), Makerere University, Kampala, Uganda
ITM promoter: Bart Criel (Department Public Health –Unit of Health Policy and Financing)

Reference number 920900
Institutional capacity strengthening of the Tropical Diseases Research Centre (TDRC) for the conduct of quality clinical research, Ndola, Zambia
ITM promoter: Umberto D'Alessandro (Department of Parasitology – Unit of Epidemiology and Control of Parasitic Diseases)

Reference number 921200
Strengthening of Centre Hospitalier Universitaire de Dakar as centre of excellence for research and control of HIV, tuberculosis and other infectious diseases in Senegal and Africa
ITM promoter: Luc Kestens (Department Microbiology – Unit of Immunology)

Reference number 921300
Institutional collaboration to develop and transfer methods for the control of parasitic livestock diseases and zoonoses in the Southern African Development Community Region with the Department of Tropical Veterinary Diseases (DVTD), University of Pretoria, South Africa
ITM promoter: Peter Van den Bossche (Department Animal Health – Unit of Control of Animal Diseases)

Reference number 921400
Strengthening as a reference centre for the diagnosis and control of trypanosomosis and trypanocide resistance in West Africa of the Centre International de Recherche Développement de l'Elevage en zone Subhumide (CIRDES), Bobo Diolassou, Burkina Faso
ITM promoter: Jan Van Den Abbeele (Department Animal Health – Unit of Veterinary Protozoology)

South America

Reference number 920400
Strengthening the capacity for public health training and research of the Institute of Public Health Institute at Pontificia Universidad Católica del Ecuador (IPH-PUCE), Quito, Ecuador
ITM promoter: Jean-Pierre Unger (Department Public Health – Unit of Public Health Management)

Reference number 920500
Strengthening public health and tropical disease research in Cuba at the Instituto Nacional de Higiene, Epidemiologia y Microbiologia (INHEM), Havana, Cuba and Instituto Pedro Kourí (IPK), Havana, Cuba
ITM promoter: Patrick Van der Stuyft (Department Public Health – Epidemiology and Disease Control)

Reference number 920600
Strengthening postgraduate training at the Faculty of Medicine, Universidad Mayor de San Simon (UMSS) of Cochabamba, Bolivia
ITM promoter: Patrick Van der Stuyft (Department Public Health – Unit of Epidemiology and Disease Control)

Reference number 921000
Institutional collaboration with the Instituto de Medicina Tropical "Alexander von Humboldt" in Lima, Peru
ITM promoter: Jean-Claude Dujardin (Department Parasitology – Unit of Molecular Parasitology)

Reference number 921500
Capacity strengthening of Centro Internacional de Zoonosis (CIZ), Universidad Central, Quito, Ecuador
ITM promoter: Dirk Berkvens (Department Animal Health – Unit of Veterinary Epidemiology and Biostatistics)

Asia

Reference number 920700
Strengthening the capacity to provide training and conduct public health research of the Institute of Public Health, Bangalore, India
ITM promoter: Bart Criel (Department Public Health – Unit of Health Policy and Financing)

Reference number 920800
Building capacity to conduct high-quality clinical research and training in infectious diseases at the Sihanouk Hospital Centre of Hope (SHCH), Phnom Penh, Cambodia
ITM promoter: Lut Lynen (Department Clinical Sciences – Unit of HIV/AIDS and STD Care)

Reference number 921100
Institutional collaboration to strengthen rational prevention and control of malaria and other parasitic diseases in Southeast Asia with the National Institute of Malariology, Entomology and Parasitology (NIMPE), Ministry of Health, Hanoi, Vietnam
ITM promoter: Marc Coosemans (Department

Training

Reference number 910100
Master and short courses
ITM promoter: Govert van Heusden (Direction - Education Coordination)

Reference number 910200
PhD programme
ITM promoter: Ann Verlinden (Direction - Research Coordination)

Reference number 910300
Educational tools
ITM promoter: Govert van Heusden (Direction - Education Coordination)

Reference number 910400
Distance education & eLearning
ITM promoter: Govert van Heusden (Direction - Education Coordination)
Reference number 910500
Alumni support
ITM promoter: Jean Van der Vennet

Reference number 910600
Educational networking
ITM promoter: Hilde Buttiëns (Direction - Education Coordination)

Reference number 910700
Student support
ITM promoter: Helga Bödges (Student Services)

Policy Support and Advocacy

Reference number 940100
International Health Policies and Representation
ITM promoter: Dirk Van Der Roost (Direction – Networking)

Reference number 940200
Policy Supportive Research
ITM promoter: Dirk Van Der Roost (Direction – Networking)

Reference number 941100
Be-cause health: Belgian platform for international health
ITM promoter: Dirk Van Der Roost (Direction – Networking)

Reference number 941200
Be-troplive: Belgian platform for animal health and animal production in the tropics
ITM promoter: Eric Thys (Department Animal Health)

Reference number 941300
Quality Medicines For All (QUAMED)
ITM promoter: Dirk Van Der Roost (Direction – Networking)

Reference number 942100
Public information and sensitisation
ITM promoter: Pieter Van Dooren (Direction – Communication)

Reference number 943100
ITM Annual Colloquium
ITM promoter: Dirk Van Der Roost (Direction – Networking)

Reference number 943200
Seminars and events
ITM promoter: Ann Verlinden (Direction – Research Coordination)

MANAGEMENT

Support Services

The Support Services worked hard to make the life of physicians, scientists and students easier, among other things by extending the access hours to the buildings, by renovating the facilities of the clinical laboratories, by delivering the first student housing, or by streamlining the printing operations.

The **Purchasing Service** handled 4 811 purchase orders for some 10 000 items, mainly laboratory and office supplies, and we registered over 3000 stock item transactions. Over 650 items were for export to partners overseas. We installed, tested and validated a batch follow up of critical items used in the accredited labs. We screened our suppliers and were ourselves audited in 2010, with a positive result. We handled about 750 travel tickets for staff and students, and 284 visa applications. A new travel procedure for all staff of ITM was drafted and approved. We handled 93 air cargo shipments and 62 shipments of dangerous goods, according to IATA regulations. Together with the Prevention and Safety Unit we also aligned ITM with road transport regulations for dangerous goods. In collaboration with the IT and Graphics units, we initiated the first phase of the ITM print policy, aiming at a more sustainable use of printing and copying, through a central print infrastructure.

The **General Accounts Service** ironed out the last bugs in the Ivan software, and organized its direct reporting from the application software.

The **Medical Accounts Service** gave special attention to the prevention and systematic remediation of input errors, to the streamlining of the invoicing in the policlinic, and in general prepared the introduction of the ISO 9001 quality system.

Our **Human Resources Service** formulated a telework policy, implemented a training course database, wrote procedures for the in- and outflow of employees and revised the procedure for the reception of new employees. They started up 118 employment contracts and handled the termination of 106 contracts. More details are provided in the next chapter.

The **Project Management Service** started 47 new projects, followed 388 budgets and handled 250 contracts. We prepared the new DGD 3-years programme. The time registration system became fully operational, in preparation of our full cost book keeping. We organized the formation of 38 administrators of overseas partner institutes.

The activities of the **Student Service** are described in the chapter on Education.

The **Graphics Service** assured the lay-out of the annual report, publications, posters, brochures, photo expositions etc. Together with the Communication Service, we prepared for the introduction of a 'house style'. We produced the ITM booth for the World Aids Congress. Together with Purchasing Service and IT, we installed and managed the first phase of the new, more environment-friendly, printing system. We continued the intake in our digital imaging archive, among other things with unique personal archives.

The **Information Technology Service (IT)** installed 163 laptop computers, 73 PCs, 56 printers, 28 mobile phones, 2 cameras, etc. In 2010 we kept running 345 laptops and 477 PCs. We did the preliminary study for a grand overhaul and reorganization of the information technology for the institute. We installed and took into service the wireless and wired teledata network in the new laboratory and office space on the second floor of the clinic building. We prepared for the installation of a callcenter module, and for the upgrade to Office 2010 and Windows 7. We organized training sessions with the digital RX software, supported the Education Services with the increase in mobile and internet-based learning and we coordinate the preparation and selection of a new Electronic Patient File for our medical services.

The main activity of the **Applied Technology and production Unit** remains the production and distribution of non-commercially available diagnostic kits for neglected diseases, such as sleeping sickness, and visceral leishmaniasis. We supplied 40 mg of Variable Surface Glycoprotein to the Foundation

The Technical and IT Services completely renovated the Medical Laboratory.

for Innovative New Diagnostics. We shipped 227 040 visceral leishmaniasis tests, 1 793 500 Card Agglutination Tests (CATT) for *Trypanosoma gambiense* sleeping sickness, and 31 000 for *T. evansi*. Requests for testing on *T. evansi* increased with 220 % (to 515 tests), for parasitological examination with 800% (to 292 tests).

By the end of 2010, 64 500 vials were stored in **Cryobiology**, a slight increase as to 2009. The **Laboratory Animals Service** on average cared for 529 mice, 141 rats and 42 Rabbits. The activities of the **Laboratory Kitchen** keep on declining.

The **Technical Services,** carried out an endless list of projects, tasks and odd jobs to keep ITM's infrastructure running. We led the complete renovation of the laboratory and office space for the Medical Laboratories, the building of student houses at Bogaardenstraat and Sint-Rochusstraat, installed sensor-operated light switches and refined the sustainable operation and energy-efficiency of all processes and operations.

Coordination and policy support cells

The **Unit for Safety, Prevention and Wellbeing** implemented alcohol and drugs prevention, an ergonomy policy, explosion safety regulations, optimised the asbestos inventory and the storage of dangerous goods, took stress reduction action. We formulated the procedures for infectious goods, and were successfully audited by the ministry of Transport. We optimized the alarm and safety camera procedures. A main achievement was the surveillance by an external firm outside working hours, extending access to ITM for scientists and students.

The **Communication Service** produced the annual report and distributed 33 press releases, which were picked up well by the media. We launched the new ITM website, as well as specific websites for units or research groups and the annual ITM Colloquium. We had a booth at the Flemish biotechnology trade fair Knowledge for Growth and at the World AIDS Congress, and took part in two job fairs for university students. On June 7, 2010, we welcomed minister of Education Pascal **Smet** at ITM. At the occasion of World AIDS Day we offered hospitality to two art expositions and we supported the ITM volunteers who earned 10 000 euros for the 'Music for Life' event, this year focusing on AIDS orphans.

The **Quality Assurance Unit** continued working toward a fully accredited quality system for all ITM activities. An integrated quality and safety strategic plan was drafted and presented to the management committee, and will be revised and further developed as the organizational change process at ITM takes shape. We further aligned, improved and expanded general quality procedures and systems, such as the change management and the complaints systems, to the support services and/or research departments. The accredited laboratory quality system was further elaborated and optimized. Several documents were translated into English to guarantee maximal access for the ever growing international workforce at ITM. The Quality Assurance Unit also took part in several overseas projects in which quality and standardization aspects are promoted, such as Laboratory Quality Network, Clinical Trial Network, the Quamed project, etc.

Corporate Social Responsibility

Corporate social responsibility or "sustainable entrepreneurship" means that organisations and companies adjust their activities and processes to better balance their financial-economic results, social interests and environmental impact. It also means they reduce the negative effects of climate change and international trade on developing countries. Among ITM employees there exists a clear sensitivity for this theme. In the course of 2007, ITM brought together relevant information, invested in condensation boilers for heating, and started

to sensitize staff and students, with the intention to act as a pioneer in the academic and development sector.

On 'Heavy Pullover Day' in 2010, we lowered the heating with a degree or two. The hours of central heating in the morning and the evening were permanently reduced, almost without anyone reporting discomfort. The total gas consumption lowered with more than a third in the period 2008 – 2010 in comparison with the period 2006 – 2007. 80 ITM employees were present at the yearly Bike Day for employees, organized by the City of Antwerp. On the Fairtrade@Work day, Mariam Yaya Touré gave a personal testimony about the cacao producer group Uirevi from Ivory Coast. Articles in the internal newsletter *ITGazet* supported these actions.

ITM also invested in light sensors in most of the corridors, water-saving buttons, presence sensors in the students' accommodation, etc. A lot of environmental friendly investments were put on the rails, for instance in printers and copiers, and in the new students' accommodation.More and more fairtrade products are being offered to the staff, such as coffee, tea, sugar.

The International Year of Biodiversity 2010 lead to the installation of nesting boxes and bee hotels in our beautiful classified gardens. In June 2010, students of the postgraduate in nursing took the initiative to purchase reusable coffee cups. It provoked us to make a thermos cup with ITM logo part of the standard equipment of each student.

Our showpiece is the commuter traffic. 42% of the employees come by bike. Together, we've been travelling the globe more than 6 times in 2010! The bike allowance has risen to 20 cents per kilometer. 14% of employees come to work by car; three years earlier it was 20%.

This building at Sint-Rochusstraat 17-21 will house 24 students.

Human Resources

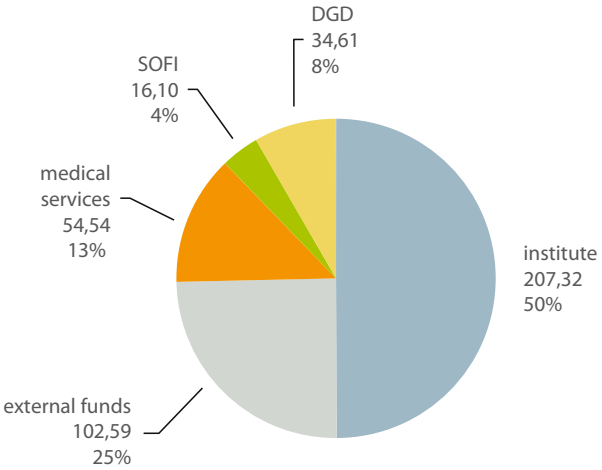
On December 31 2010, ITM employed 456 people, equal to 415,16 FTEs, which is almost a status quo (+4,4 FTE, or +1%) as compared to 2009. Half of the employees are paid by institutional funds; 37% by project and programme funds and 13% by the medical services budget. We have more women than men at work (58/42), and the average age is 41 years.

Our staff categories and policies are similar to those of the Flemish universities and consist of senior scientific staff (academic, scientific and medical staff with a permanent employment contract); junior academic staff (academic,scientific and medical staff with an temporary employment contract); and administrative and technical staff. Next to the employees on the payroll, also many non-employees are active in research, education and service delivery, for instance PhD students, emeriti and academic guests. The numbers in this chapter incorporate the doctoral students on a Belgian grant, the guests on a long stay and the emeriti.

Support services on a teambuilding ride.

Figure 1 shows the number of FTEs on 31/12/2010 per funding source.

Half the ITM staff are paid by institutional funds, a quarter by external research projects and 4% on internal competitive research projects, the secondary research funds. Medical services employ 13% of our staff and 8% is paid by funds from the federal ministry of Development Cooperation (DGD). Over the last ten years, the staff grew by half (+148,5 FTE).



Permanent scientific staff at 31/12 per funding source

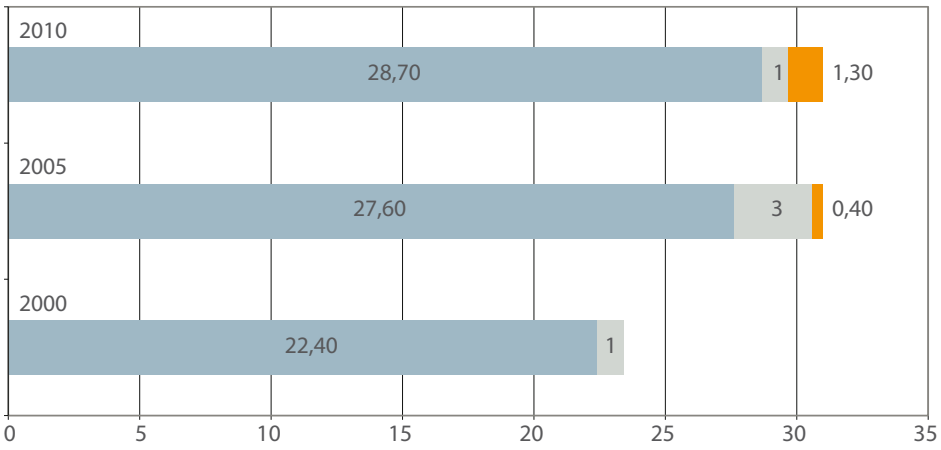


Figure 2 shows the evolution of permanent academic staff over the last ten years.

The permanent scientific staff consists of 32,1 FTE or 8% of total staff. They are mainly paid by institutional funds.

Temporary scientific staff at 31/12 per funding source

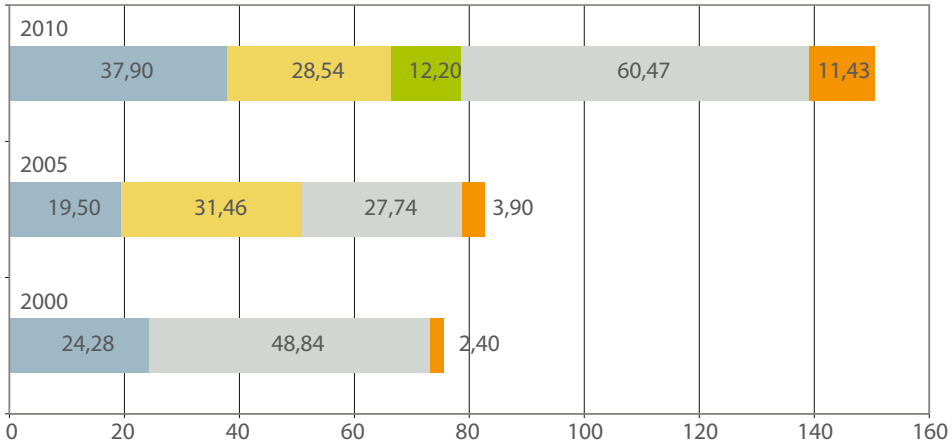


Figure 3 shows the evolution of temporary scientific staff over the past ten years.

We counted 150,6 FTE temporary researchers at the end of 2010, a third of total staff, and almost the double of ten years before. They are the fastest growing group at ITM, due to the investments in the DGD programme, the SOFI grants and more external project financing. This number does not include 89 PhD-fellows.

Support staff at 31/12 per funding source

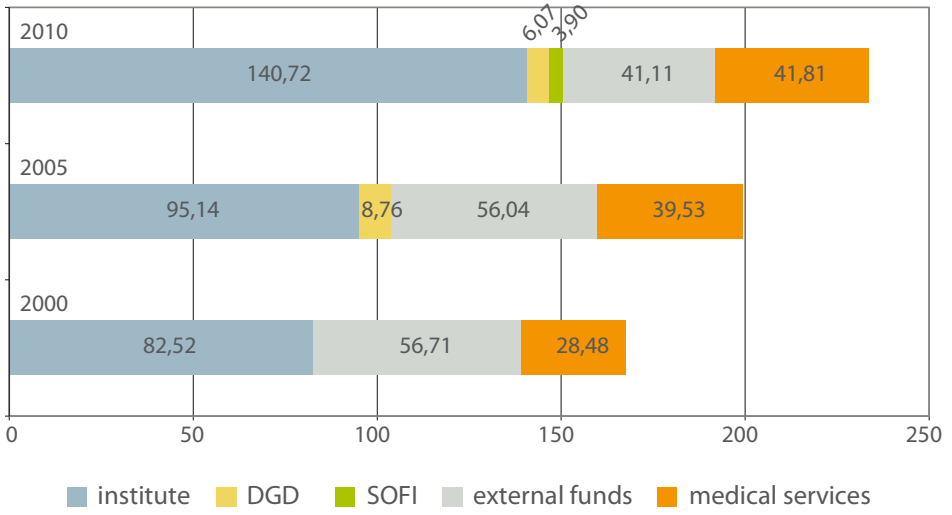
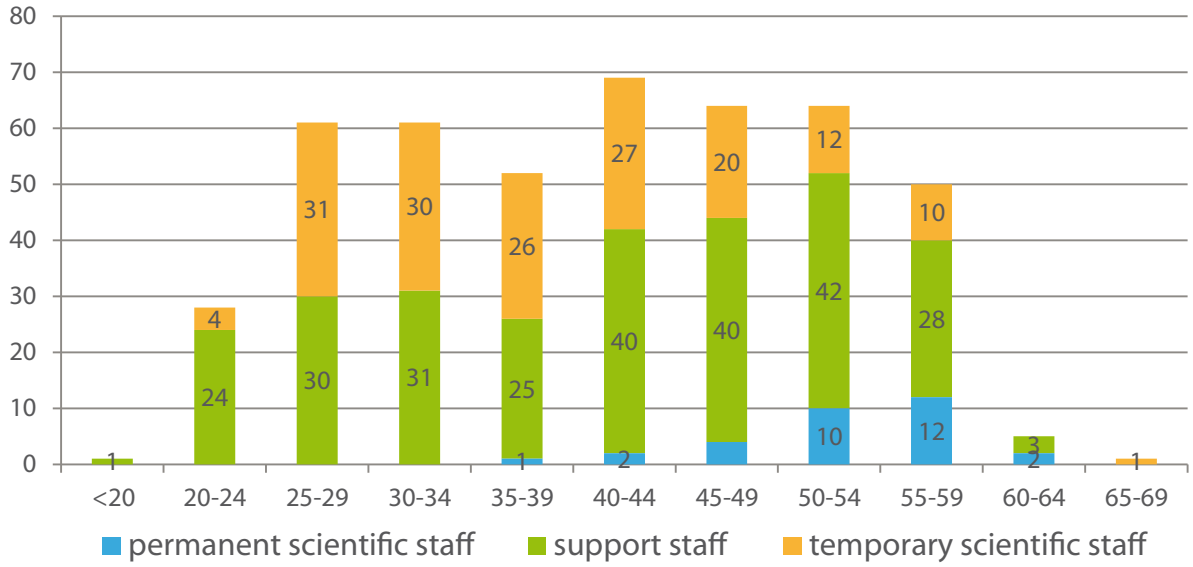


Figure 4 shows the evolution of administrative and technical staff over the past 10 years.

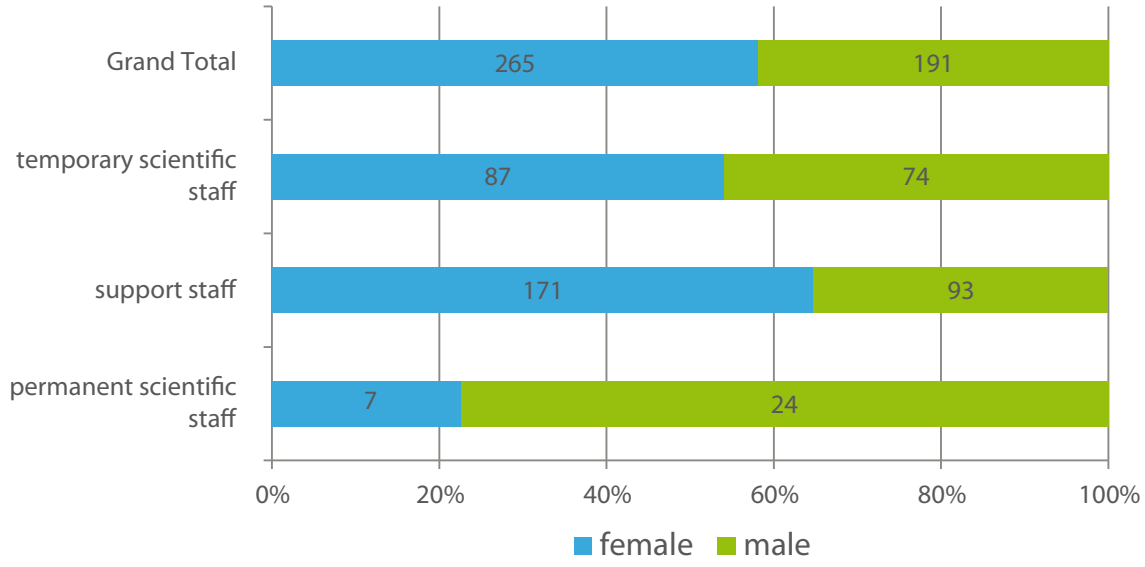
On December 31, 2010, there were 233.6 FTE administrative and technical staff at the ITM, or 56% of the total staff. This percentage is higher than at most universities, due to the integration of medical service, reference tasks, laboratory and production activities.

Figure 5 shows the number of staff according to age and staff category.



Noticeable is the equal division over the different age groups. Average age is 41 years. 155 of the 456 staff members are 55 and older. Between now and ten years, at least 12% of the staff will thus retire. For senior scientific staff that retirement coefficient even is 45%.

Figure 6 shows the male/female ratio per staff category.



There are more women (58%) than men (42%) at the ITM. This ratio is quite different according to staff category. Of administrative and technical staff 65% are women, of junior scientific staff 54%, of senior scientific staff only 23%. Breaking the glass ceiling remains a challenge.

97% of staff has an EU nationality, among which 88% Belgians. 3% comes from Africa, Asia or the Americas.

Finances

Income

In 2010 the **net income** of ITM totaled 52,7 million Euros, an increase of 11% compared to 2009 and a doubling since 2000. The peaks in 2002 and 2003 were due to one-shot AIDS impulse programs by DGD. The graphs do not take into account the income and costs of the departments Funds & legacies and Investments.

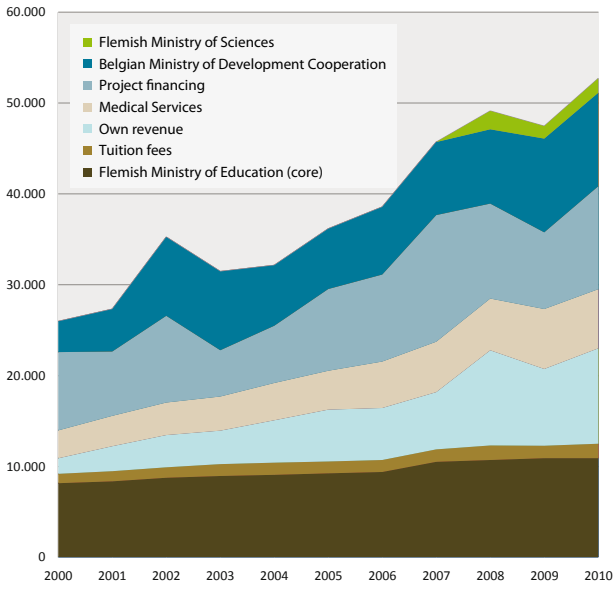
The **Core Funding of the Flemish Government, department of Education (1st funding source)** makes up 20% of the total revenue and increased nominally with 31% over the past 10 years, the catch-up of 2007 included. In fact, the real value decreased over that period, due to the fork between indexation of the subsidy and inflation.

Own revenue (non earmarked), including overhead, internal billing, fiscal and social rebates, and since 2002 also the revenue from production of diagnostics, account for 20% in 2010. The peaks in 2008 and 2009 are one-shot events due to the arrear payments of social security rebates. Nevertheless these revenues keep on increasing. The own revenue has risen from 7% to 20% over the last decade, and has become a substantial pillar for the institutional budget, especially the fiscal and parafiscal rebates. Without these, we would not have been able to keep our reference scientific staff and would have been obliged to cut down on it.

The income of the **Medical Services** has doubled since 2000, due to the increase in patients and activities, and the contributions of the Belgian National Service for Medical and Disablement Insurance (RIZIV) for the AIDS Revalidation Centre and for the Reference Laboratory of Tropical medicine. It now accounts for 12% of the total turnover.

The income through **Project Funding** keeps on increasing, with 31% since 2000; they now ammount to 21% of total income. The European Framework Programmes for Research, where ITM researchers score very well, play an important role in this evolution. The typical three-year funding cycle of this framework programme explains the fluctuation of those revenues.

Figure 7: Overview of the income since 2000 - 2010 (X 1000 euro)



Since 1998, the **DGD Framework Agreement** bundles the activities financed by the Belgian Direction-General for Development Cooperation (DGD) in one coherent programme. In 2010 it amounts to 20% of the income (tuition fees and overhead excluded).

The new funding though the **Flemish Ministry of Science and Innovation (EWI)** counts for 3% of total turnover. It has been specifically reserved for innovative research and for the Clinical Trial Unit.

Figure 8 illustrates the evolution of the project funding since 2005 (including SOFI, the secundary research funding by the Ministry of Science and Innovation), sorted according to

Figure 8: Research and project funding 2005-2010 (excluding DGD programme)

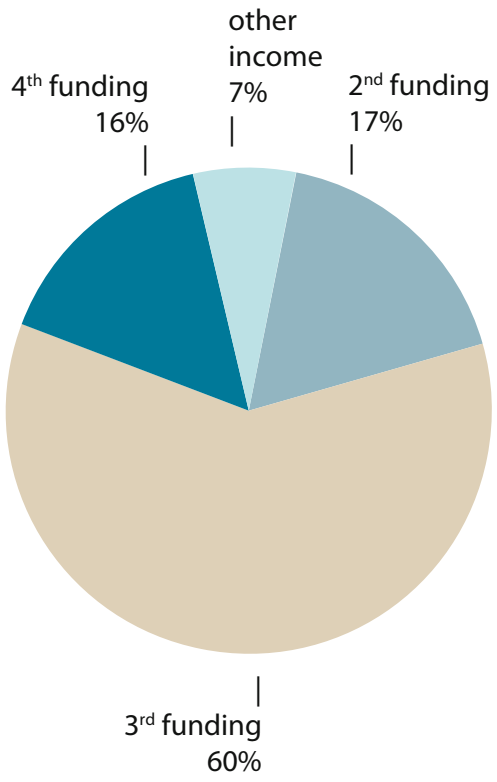
Projects and SOFI according to official categories for Flemish Universities	2005	2006	2007	2008	2009	2010	%
Government funding for basic research (2nd funding source)							17%
BOF / SOFI (Secondary Research Funding ITM)				2.000.004	1.355.877	1.563.855	13%
IUAP (Inter University Attraction Poles, Federal)	0	0	47.893	182.122	140.017	133.826	1%
FWO (Fund for Scientific Research Flanders)	281.852	255.108	409.938	293.913	323.084	303.918	3%
Government funding for applied research (3rd funding source)							60%
Other Federal Government	767.903	983.418	1.810.181	1.206.896	992.532	2.160.844	19%
Flemish government	666.468	561.739	643.812	1.163.166	855.346	557.131	5%
IWT						20.399	0%
Cities & provinces	35.024	34.676	10.636	24.000	55.965	51.924	0%
European Union	1.837.020	613.958	2.888.862	2.537.203	1.645.429	2.709.232	23%
International organisations	124.183	204.287	224.590	134.167	406.121	804.745	7%
Other foreign governments	260.392	542.498	453.772	857.694	881.223	737.112	6%
Contract research with the private sector and scientif services (4th funding source)							16%
Contract research - non profit organisations	819.685	1.059.915	1.803.977	3.045.786	1.289.191	1.718.102	15%
Contract research companies	109.704	140.800	136.666	142.028	189.126	95.396	1%
Other project income from education, research and services							7%
Project funding: various income and transfers	711.844	598.748	854.115	697.821	592.882	796.681	7%
Other income							
Other income Institute (Bank intrests)	0	26.836	0	47.755		0	
Totaal	**5.614.074**	**5.021.983**	**9.284.442**	**12.332.555**	**8.726.792**	**11.653.164**	**100%**

the accounting system of the Flemish universities and the applicable VAT code. Since July 2007 ITM has to pay VAT over a number of its research activities, like the universities.

Thanks to the SOFI funding, the governmental funding for basic research (**2nd funding source**) accounts for an important part. But proportionally it goes down, from 22% in 2009 to 17% in 2010.

The **3rd funding source** accounts for 60%. The ITM scientists score well in the European Framework programmes (23% of all project revenues). The federal authorities paid an arrears for the AIDS Reference Laboratory and so scores exceptionally high, with 19%.

The **4th funding source** remains stable at 16%, as in previous years, with the exception of 2008, due to a new project of the Bill & Melinda Gates Foundation. These projects are mostly funded through international Public Private Partnerships, "Global Health Initiatives" and NGOs like the Bill & Melinda Gates Foundation, Family Health International (FHI), US President's Emergency Plan for AIDS Relief (Pepfar), Medicines for Malaria Venture, the Damian Foundation, Doctors without Borders, Memisa and others.



Expenses

Figure 9 shows ITM's expenditure in 2010 (49.1 million Euros). We expended 64% of that money on education and research, 14% on our medical services and 18% on management and support services.

Figure 10 shows in more detail the expenditure of the programme funded by the Direction-General for Development Cooperation (DGD). 2010 was the third year in the running (third) multiannual programme (FA3, 2008-2013), that was established for two times 3 years. Due to the initial uncertainty about the budget and the ensuing slow start, the costs in the last year are higher.

The table gives a comparative overview of the expenditures in the second and third FA programmes. Of the DGD funds, 67% directly goes directly to the South, through training, strategic programmes and institutional cooperation. As far as they can be separated, these funds go for 48% to Africa, 21% to Asia and 31% to South-America.

Management costs and scientific staff account for 32%, compared to 36% in the previous programme. This is a conscious choice, ITM finances part of the scientific input, amounting to 4.5 millions over 3 years.

Figure 9: Overview of the expenditures since 2000 - 2010 (X 1000 euro)

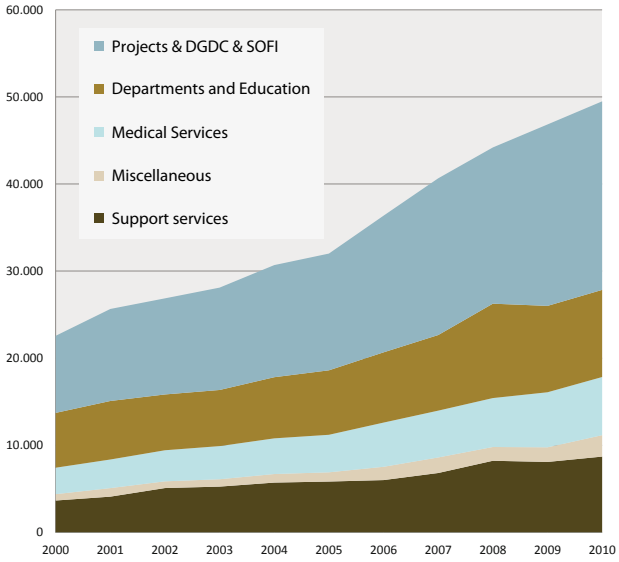


Figure 10: DGD Framework Agreement (FA) expenditures (x 1000 euro)

FA2	2003	2004	2005	2006	2007	2008	2009	2010	FA3 2008-2013
Training in Belgium	1.022	1.145	1.172	1.212	1.455	2.499	2.814	4.205	Training and fellowships
Fellowships	936	900	980	983	1.094				
Conferences	25	108	134	91	102				
Institutional Collaboration	1.519	1.805	1.854	1.697	2.031	3.213	4.381	4.004	Institutional Collaboration
Other projects	866	1.034	1.115	1.220	1.752	679	897	911	Strategic Programmes
Policy support	98	180	212	177	263	97	155	364	Policy Support & Advocacy
General expenses & scientific support	2.437	2.913	2.975	3.593	3.446	2.825	3.693	4.774	Management & Scientific support
Total	**6.903**	**8.085**	**8.442**	**8.973**	**10.143**	**9.313**	**11.940**	**14.257**	
AIDS Impulse Programme	1.470								

Financial results 2010

Figure 11 summarises ITM's results account, according to the model of the Flemish Universities, for all sections.

In this presentation, the result, including transfers from previous years, amounts to € +1 672 618, of which € 1 910 708 in the section institute and an expected negative result of € -238 089 through the Medical Services. This exceptional result is due to increased overhead income (€ 370 000), the starting up of 46 new research projects, the payments of social security rebates (€ +780 000) and the settling of the management costs of the past 3 years of the FA3 program with DGD (€ +670 000).

The results of the Medical Services are negative, as was expected, due to a new booking period, applied since last year. In 2009 there was an exceptional positive result of € +207 697, by booking on 2009 all patient income from consultations in 2009, even if they were effectively paid in 2010. Together with a diminished income from radiology, this leads to the negative result of 2010.

The institutional balance is partly reserved for the 'Reserve Pension Fund' and partly for new postdoctoral mandates. The balance is reserved as a buffer for lesser years and for the five-year budget in October. The result of the Medical Service is decreased with the transferred losses of last year to € -65 537.

In 2010, the personnel costs totaled 55% of the total expenditure in all sections combined, 74% of the expenditure (68% of income) in the section Institute and 57% in the section Medical Services. The section Institute paid 53% of total personnel costs: SOFI 5%, DGD 10%, Project Funding 18% and Medical Services 14%.

The capital investments are only accounted when the renovated building is finished and in use. Thereafter the capital investment is activated and depreciation enters the result account. As this depreciation amounts to only 3%, costs enter very slowly and are spread over 33 years.

Annual result following the model for Foundations

Results account (Figure 12)

For the sake of completeness, we also publish the results account as it will be legally filed. This results account was audited and certified by the financial auditors (see further).

The difference between both presentations are due to varying use of the different income and expenses accounts. The result, however, is the same if the results of the sections Funds and Legacies, Investments and Production are added. In the filed accounts, these allocated results must be added to the operating results.

Balance (Figure 13)

The assets have increased with € 2.8 million compared to 2009, of which € 3 million through the fixed assets due to the diverse investments in the main building, and the acquisition of the house Sint-Rochusstraat 13 and the grounds of the boarding house Sint-Rochusstraat 17-21. The Zuidkasteel project is not yet included, because the contract has only just been signed.

The current floating assets diminish with € 0.2 million due to several shifts. The decline in Stocks and orders in execution (€ -0.8 million) in fact are expenses through project financing that are not yet paid by the financier. There also is a shift between deposits and liquid assets, with a rise of € 2 million.

On the Liabilities side these changes are translated in a rise of capital and reserves with € 2.4 million, the allocation of the result to Reserves (account 13) and the transfer of the rest to Profit/loss brought forward (account 14).

On request of the revisers the saldi of the available research funds (which do not need to be settled) are added to Provisions (account 16), instead of Advanced payments on orders (account 46). They comprise the received advances on project financing.

The financial indicator for "Floating assets", calculated as the ratio between "Floating assets" (€ 21.8 million) and "Short term debts" (€ 12.4 million) is 1.76. This means that sufficient funds are available to pay of short term debts.

Figure 11: Results account (according to Flemish University template)	2010	2009
Company income (+)	52.333.547,33	46.082.675,21
Income from training, research and service provision	47.249.236,09	42.616.025,58
Government allocations and subsidies - basic funding (primary funding source)	10.787.000,00	10.787.000,00
Government contribution to fundamental basic research (second funding source)	1.853.648,93	1.818.977,70
Government contribution to applied scientific research (third funding source)	18.734.598,06	16.110.824,97
Contract research with the private sector and scientific services (fourth funding source)	1.869.955,04	1.478.316,52
Other income from training, research and services	14.004.034,06	12.420.906,39
Funds & legacies	13.584,02	13.315,02
Other company income	5.070.727,22	3.453.334,61
Other company income Institute	4.928.338,86	3.323.234,98
Other company income Medical Services	142.388,36	130.099,63
Company costs (-)	48.760.636,83	45.395.557,63
Purchase of goods	119.181,30	13.993,10
Services and various goods	17.735.073,55	15.278.066,44
Salaries, social dues and retirement contributions	27.602.403,08	26.208.108,56
ZAP / VWK (Senior Academic Staff)	**3.372.672,89**	**3.334.871,26**
Projects	14.079,52	5.019,42
Institute	3.358.593,37	3.329.851,84
AAP / BAP / TWP (Temporary Scientific Staff**)**	**10.128.286,84**	**9.816.860,60**
DGD	2.418.924,94	2.206.870,25
Projects	2.954.652,19	2.759.552,90
Institute	3.696.586,97	3.682.786,69
SOFI	1.058.122,74	1.166.750,76
ATP (Administrative and Technical Staff**)**	**10.098.923,47**	**9.624.540,38**
DGD	277.335,87	273.809,82
Projects	1.920.253,44	1.855.413,50
Institute & Production	7.675.202,69	7.339.101,92
SOFI	226.131,47	156.215,14
Visiting lecturers	-	-
Staff Medical Services	**3.470.965,52**	**3.284.112,40**
Other staff costs (provision holiday pay and early retirement)	**531.554,36**	**148.623,92**
Depreciation and value devaluations on start-up costs, intangible and tangible fixed assets	844.893,78	777.088,46
Value depreciation on stocks and commercial dues (additions +, withdrawals -)	-	-82.600,30
Provisions for risks and costs (additions +, expenses and withdrawals -)	-236.109,90	54.991,40
Other company costs	2.695.195,02	3.145.909,97
Payments to DGD partners	2.695.195,02	3.145.909,97
Company surplus (deficit)	3.572.910,50	687.117,58
Financal profits (+)	178.398,38	218.266,26
Financial costs (-)	125.375,53	137.202,04
Surplus (deficit) from regular activities	3.625.933,35	768.181,80
Exceptional profits (+)	2.399,51	2.356,32
Other exceptional income	2.399,51	2.356,32
Exceptional costs (-)	39.744,39	37.651,04
Devaluation on the realisation of the fixed assets	26.547,12	27.755,36
Other exceptional costs	13.197,27	9.895,68
Surplus (deficit) of the financial year	3.588.588,47	732.887,08
Transfers (PROJECT FUNDING/DGDC/SOFI/INVESTMENTS)	1.915.970,32	-273.904,85
RESULT	**1.672.618,15**	**1.006.791,93**

Figure 12: Results account (template Foundations)

	2010	2009
Company income (+)	**51.735.865,27**	**47.210.855,86**
Turnover	6.557.453,00	6.460.739,78
Stock goods in execution and ready product and orders in execution (additions +, withdrawals -)	-1.651.852,05	1.603.287,52
Member fees, funds, legacies and subsidies	32.597.323,80	27.792.371,23
Other company income	14.232.940,52	11.354.457,33
Company costs (-)	49.509.144,99	45.720.358,25
Commodities, raw and helping materials	1.792.288,65	1.640.811,23
Purchases	1.775.042,29	1.650.356,65
Stock (withdrawal +, addition -)	17.246,36	-9.545,42
Services and variable goods	18.781.085,33	15.843.087,59
Salaries, social contributions and pensions	27.600.407,69	26.812.918,15
Depreciation and value devaluation on start-up costs, on intangible and tangible fixed assets	844.893,78	1.718.818,53
Value depreciation on stock, orders in execution and commercial receivables (additions +, withdrawals -)	-	10.924,94
Provisions (additions +, expenditures and withdrawals -)	463.151,41	-325.418,49
Other company costs	27.318,13	28.761,72
Company costs activated as reorganisation cost (-)	-	-
Company profit (loss)	2.226.720,28	1.490.497,61
Financial income (+)	199.656,90	271.361,45
Income from fluid assets	16.805,19	27.406,17
Other financial income	182.851,71	243.955,28
Financial costs (-)	119.295,50	110.930,60
Costs of debts	73.894,27	89.552,02
Value depreciations on fluid assets other than stocks, orders in execution and commercial receivables (additions +, withdrawals -)	1.881,83	4.876,89
Other financial costs	43.519,40	16.501,69
Profit (loss) from regular company activities	2.307.081,68	1.650.928,46
Exceptional income (+)	2.399,51	46.389,52
Other exceptional income	2.399,51	46.389,52
Exceptional costs (-)	13.197,27	9.895,68
Other exceptional costs (explanation XIV, B)	13.197,27	9.895,68
Profit (loss) of the financial year	2.296.283,92	1.687.422,30

Figure 13: Balance sheet (template Foundations)

ASSETS	2010	2009
Fixed assets	**22.384.059,38**	**19.371.701,04**
Intangible fixed assets	49.542,98	52.107,16
Tangible fixed assets (investments)	22.321.425,40	19.319.593,88
Land and buildings	19.577.390,13	16.092.675,85
Installations, machines and equipment	553.948,25	466.136,73
Furniture and rolling stock	557.448,35	568.282,60
Leasing	-	-
Assets in course of construction and advance payments	1.632.638,67	2.192.498,70
Financial fixed assets	13.091,00	-
Floating assets	**21.796.839,93**	**22.002.645,36**
Stocks and orders in execution	3.350.821,88	4.175.402,25
Stocks	122.931,66	140.178,02
Orders in execution (project funding)	3.227.890,22	4.035.224,23
Receivables on maximum one year	1.603.884,81	2.185.524,71
Commercial receivables	1.601.746,67	2.089.013,95
Other receivables	2.138,11	96.510,76
Deposits	2.506.165,20	4.869.267,82
Liquid assets	13.591.346,34	9.405.907,95
Prepayments and accrued income	744.621,70	1.366.542,63
TOTAL ASSETS	**44.180.899,31**	**41.374.346,40**

LIABILITIES		
Capital and reserves	**19.963.583,82**	**17.552.169,24**
Funds of the Foundation	345.711,60	345.711,60
Revaluation surpluses	11.891.000,00	11.891.000,00
Reserves	2.675.069,18	2.135.550,70
Profit (Loss) brought forward	3.182.857,74	1.426.092,30
Capital allowances	1.868.945,30	1.753.814,64
Provisions	**7.501.525,74**	**1.566.942,78**
Provisions	7.501.525,74	1.566.942,78
Provision for pensions and similar obligations	865.577,69	1.526.388,32
Other provisions	6.635.948,05	40.554,46
Debts	**16.715.789,75**	**22.255.234,38**
Debts on more than one year	2.650.307,05	2.942.939,99
Financial debts	2.650.307,05	2.797.152,94
Other debts	-	145.787,05
Debts on maximum one year	12.414.488,30	17.900.666,68
Debts on more than one year due within a year	306.989,72	356.231,60
Commercial debts	1.824.762,68	2.268.962,23
Received advanced payments on orders (Project funding)	6.550.204,75	12.258.645,71
Debts in reference to taxes, salaries and social contributions	3.295.986,11	2.958.082,21
Various debts	436.545,04	58.744,93
Accruals and deferred income	1.650.994,40	1.411.627,71
TOTAL LIABILITIES	**44.180.899,31**	**41.374.346,40**

Statutory auditor's report to the Board of Governors of the Prince Leopold Institute of Tropical Medecine on the financial statements for the year ended on 31 december 2010

Business advisers

In accordance with the legal and statutory requirements, we report to you on the performance of the mandate of statutory auditor, which has been entrusted to us. This report contains our opinion on the true and fair view of the financial statements as well as the required additional statements.

Unqualified audit opinion on the financial statements

We have audited the financial statements for the year ended 31 December 2010, prepared in accordance with the financial reporting framework applicable in Belgium, which show a balance sheet total of 44.180.899,31 and a profit for the year of EUR 2.296.283,92.

Management is responsible for the preparation and the fair presentation of these financial statements. This responsibility includes: designing, implementing and maintaining internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error; selecting and applying appropriate accounting policies; and making accounting estimates that are reasonable in the circumstances.

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the legal requirements and the Auditing Standards applicable in Belgium, as issued by the Institute of Registered Auditors (Institut des Réviseurs d'Entreprises / Instituut van de Bedrijfsrevisoren). Those standards require that we plan and perform the audit to obtain reasonable assurance whether the financial statements are free from material misstatement, whether due to fraud or error.

In accordance with the above-mentioned auditing standards, we considered the foundation's accounting system, as well as its internal control procedures. We have obtained from management and from the foundation's officials the explanations and information necessary for executing our audit procedures. We have examined, on a test basis, the evidence supporting the amounts included in the financial statements. We have assessed the appropriateness of accounting policies and the reasonableness of the significant accounting estimates made by the foundation as well as the overall financial statement presentation. We believe that these procedures provide a reasonable basis for our opinion.

In our opinion, the financial statements for the year ended 31 December 2010 give a true and fair view of the foundation's assets and liabilities, its financial position and the results of its operations in accordance with the financial reporting framework applicable in Belgium.

Additional statements

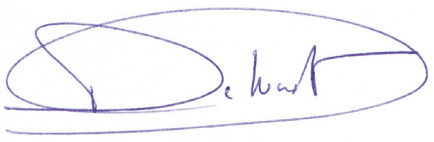
The compliance by the foundation with the Law related to not-for-profit associations, international not-for-profit associations and foundations is the responsibility of management.

Our responsibility is to supplement our report with the following additional statements, which do not modify our audit opinion on the financial statements:

- Taking into account that the audit of the report of the board of directors is not part of our legal mission, we do not give an opinion upon its contents.
- Without prejudice to formal aspects of minor importance, the accounting records were maintained in accordance with the legal and regulatory requirements applicable in Belgium.
- There are no transactions undertaken or decisions taken in violation of the association's statutes or the Law related to not-for-profit associations, international not-for-profit associations and foundations that we have to report to you.

Antwerp, 20 May 2011

PKF bedrijfsrevisoren CVBA
Statutory Auditors
Represented by



Paul De Weerdt
Registered Auditor

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(**) Observer in the Bureau and the Board of Trustees

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Jubilees

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Maeckelbergh Ciska

Maes Yolanda

Vereecken Kathleen

25 years of service

Anthonissen Frank

Cornelis Molly

Jansegers Ivo

Nys Patrick

Schreurs Anne

Van Hees Jos

Willems Betty

30 years of service

Van Maerken Claire

Vermeulen Anita

Van Overmeir Chantal

35 years of service

Lepage Bernadette

Beelaert Greet

Word of thanks

We are grateful to many organisations and individuals that support our activities and objectives. The Flemish Ministries of Education and of Economy, Sciences and Innovation provide our primary and secondary funding for teaching and research. The Belgian Ministry of Development Cooperation supports our international capacity strengthening programme. The Federal Ministry of Public Health and Social Affairs funds our medical reference tasks.

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and many other organisations, companies and individuals.