

Table of contents



Introduction

3

Foreword from the Chair
Director's note

5
6



Education

11

PhD and master dissertations

24



Research

29

Microbiology
Parasitology
Animal Health
Clinical Sciences
Public Health
Library and bibliometrics
Conferences

32
48
64
74
78
88
108



Medical Services

117



Development Cooperation 121



Management

129

Support Services
Human Resources
Finances

130
134
138



Introduction

Foreword from the Chair

The Board of Governors of the ITM has a statutory mandate of four years, and was up for renewal in October 2009. Together with many other members, I was very happy to accept another term of office and to continue my duties as chairwoman. We also welcomed a good number of new stakeholder representatives and co-opted Board members. Vice-rector Prof. Dr. Minne Casteels will represent the Catholic University of Leuven; Dr. Sofie Maes, the Ministry of Public Health and Social Affairs; Dr. Werner Soors, the assisting scientific staff of the ITM; Mrs. Els Coopman, the administrative and technical staff. The new Board co-opted Prof. Dr. Philippe Vandekerckhove, director of the Red Cross Flanders, Mrs. Anja Stas, marketing director of the Royal Zoological Society (Antwerp Zoo) and Mrs. Ann van Gysel, director of Flanders Bio (umbrella organisation of biotech companies). We took leave, with huge gratitude, of Baron Theo Bracht and Prof. Filip Reyntjes, who both served no less than 16 years as co-opted members and contributed immensely to the Boards' activities. Prof. Marc Waer became rector of the Catholic University of Leuven and remains a close friend of the ITM in this academic top position. Dr. Dirk Cuypers has been for seven years an excellent representative of the Ministry of Public Health. Mrs. Diane Jacquet and Dr. Eric Thys, the first full staff representatives on the Board, have served their constituencies very well.

As five members, including myself, had joined the Board only in 2008, half of the Board has been renewed in one year. The mix with the "old hands" seems to work just fine, however, particularly in view of the reflection and reform process on the long-term future of the ITM. This exercise responds to a formal request of the Minister of Education as well as to an internal drive after the successful academic and managerial audits of 2008 and 2009. A challenging kick-off position paper of the Director was intensely debated in the house but also provided a hot start for the new Board. We are confident that the internal process will lead to an exciting "ITM 2020+" vision. This should become the basis of the strategic plan for 2011-2015/2020 that is expected by end 2010, as part of the new convention with the Ministry of Education.

Indeed, this vital charter was renewed on the basis of the highly positive outcome of the external management audit, of which we received the report early May, not long after the final and evenly praising report of the Scientific Advisory Council's academic evaluation at last years' end. Both also identified the managerial challenges inevitably linked to the strong growth of the ITM in an increasingly complexity and competitive environment. The Board is very pleased that the ITM will address such questions not only from the viewpoint of today's problems, but also and even mainly as an element of its future vision.

Several other decisions of major strategic importance passed the Boards' table in 2009: revised guidelines for scientific capacity strengthening programmes funded by the Belgian Ministry of Development Cooperation; the first-ever investments in boarding houses for the ITM's international students; the introduction of a new accounting system and depreciation rules; further steps towards a full-cost system; the principle commitment to the creation of a single, high-standard biobank; the funding of new "spearhead" research programmes; and others.

Read more about all this in the following chapters. In spite of its excellent performance the ITM clearly takes no time for complacency. In the Board we witnessed another exciting year of great activity paired with reflection on and investment in the future. It is a pleasure and privilege to chair such a committed and professional organisation that integrates the most powerful principles of our society: equity as a global human right, and science as a motor of progress.



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

Director's note

Early in the year, the Scientific Advisory Council delivered its final report on the evaluation of the departmental research programmes, performed in November 2008. In March, another external panel reviewed the strategic, scientific and administrative management of the ITM. This audit was commissioned by the Flemish Ministry of Education, as a regular element of the five-yearly management cycle of the ITM. Both reports were highly positive, but identified also important challenges for the future. Most are related to the rapid growth of the ITM over the past ten years: insufficient core funding and tenured academic staff; the absence of hierarchic line management at department level; a need for structured communication, top-down and bottom-up; the extension and integration of quality assurance systems. The reports and related documents can be consulted on our website.

We were happy to read so much praise, but are aware that the problems cited must be tackled. Rather than a piecemeal approach, we opted for the development of a long-term vision on the ITM in which new management options would serve the future instead of the past. We kicked off this "ITM 2020+" exercise in September with a "Challenge paper", a first "Foresight Conference" and dedicated sessions of the management committee, the academic council and the Board of Governors. At the core of the debate are the long-term consequences of the Paris-Accra Agenda and our own "Switching the Poles" capacity strengthening programme. The role of the ITM and other "global health institutes" in the North will and should be fundamentally altered as our partners in the South take full ownership of the health research agendas in their countries. The added value of the ITM will have to stem from its scientific and academic excellence in truly equal and global partnerships. In spite of much rhetoric, this concept is not yet prevailing in the current global health arena and rather uneasy for scientists and experts in the North.



At the helm of the Beagle (see p. 59)

The outcome of the exercise is expected for mid-2010, and may alter the ITM more drastically than ever before in its century-long existence. Meanwhile, the Minister of Education already renewed the management agreement with the ITM for another five years, based on the excellent results of the audit. By the end of 2010, we shall present a new five-year policy plan that will obviously be a first chapter of the ITM2020+ vision.

There were many other highlights over the past year. As described by the Chair in her foreword, the Board of Governors was renewed; we are very pleased and proud to have such a diverse and committed group of experts guiding us through challenging times.

A new policy agreement with the Belgian Ministry of Development Cooperation explicitly incorporated the Paris-Accra principles, especially regarding country ownership. Additional funding for training in our third Framework Agreement Programme (FA3) for capacity strengthening was put to good use, not only for a quantitative increase but also for innovative schemes such as the re-entry postdoctoral fellowships, South-South exchanges and topical seminars on international health for senior decision makers. Meanwhile, the FA3 programme reached cruising speed in almost all collaborations and projects. The annual colloquium in November, organised in collaboration with the Instituto de Medicina Tropical (University Cayetano Heredia) in Lima, Peru, was one of its crowning pieces and highlighted the neglected diseases of South America.

The "SOFI" programme for innovative research, created with (still all too limited) funding from the Flemish Ministry of Sciences and Innovation, allowed the initiation of several exciting new projects and fellowships. We developed an elaborate plan for the



The management audit team (right) in dialogue with the members of the Works' Council (left).

creation of a high-end institutional biobank, which was submitted for funding to the Flemish government ("Hercules Foundation"). Our Clinical Trial Unit, also supported by SOFI funds, has consolidated a true network of clinical research centres committed to strict ethics and best clinical practices despite limited resources. The establishment of the ITM as a legal sponsor of non-commercial trials, and its active participation in the European & Developing Countries Clinical Trial Partnership (EDCTP) are two other key elements in our contribution to clinical research and related capacity strengthening.

In our educational programmes, the evolution to more student-centred and IT-supported didactics translated in new short expert courses and e-learning initiatives. In view of growing concerns about the quality and affordability of student accommodation, we decided to take matters in our own hands. In a few months time, we acquired several nearby plots of land on which we will build modern student flats. Meanwhile, the expansions and renovations in the main building are in progress and should result in an entirely new environment for the reference laboratories and the clinical department.



Participants in the Foresight Conference pondering their future.

In the field of administrative management, we undertook a major overhaul of our accountancy system in which we had to match new rules for universities as well as for foundations. At the same time, we prepared the introduction of a full cost system including the maledicted time-writing.

Without doubt, 2009 was another good and busy year. We are grateful to all collaborators and supporters throughout the world for their contributions. On a personal level, I wish to express my admiration and appreciation to all the staff of the ITM for their endless drive, friendship and professionalism.

Bruno Gryseels
Director

Performance Indicators 2009

EDUCATION

International Master Courses (2008-2009)	
Applicants	379
Admitted students	63 (17%)
International students	62
Graduated students	61
Post Graduate Certificate and Short Courses	
Enrolled students	133
Graduated students	131
Short Course participants	166
Doctoral training	
Doctoral trainees on 31.12.09	111
of which international	78 (70%)
Doctoral trainees started in 2009	23
Doctoral graduates in 2009	27

RESEARCH

Total number of scientists on 31.12.09 (PhD fellows included)	276
Postdoctoral scientists	74
Number of scientific articles in 2009	319
In ISI journals	221
with JIF ≥ 2 and < 5	133
with JIF ≥ 5 and < 10	19
with JIF ≥ 10	23
Number of books and chapters in 2009	18
Number of PhD dissertations in 2009	27
Average PhD duration	5.3 years
Number of externally funded research projects	178
Amount of external research funding (without transfers for partners & overhead)	7.4 million euro
Number of new collaborative projects	40
International conferences co-organised	6

MEDICAL SERVICES

Patient contacts total	32 356
Outpatients tropical and travel-related diseases	22 555
Outpatients HIV/STD	9 792
Hospitalised patients (UZA)	206
Laboratory patients	32 319
Calls Travel Health Phone	>10 000
Page views travel health website	>270 000

INTERNATIONAL HEALTH DEVELOPMENT

Master students from developing countries	58
Doctoral trainees from developing countries	72
Doctoral graduates from developing countries in 2009	14
Institutional partnerships	16
Africa	8
Asia	3
Latin America	5
Expenses for capacity strengthening in the South	11.9 million euro
National and International Reference Laboratories	11
Diagnostic kits for neglected diseases shipped	1,9 million

FINANCES (million euro)

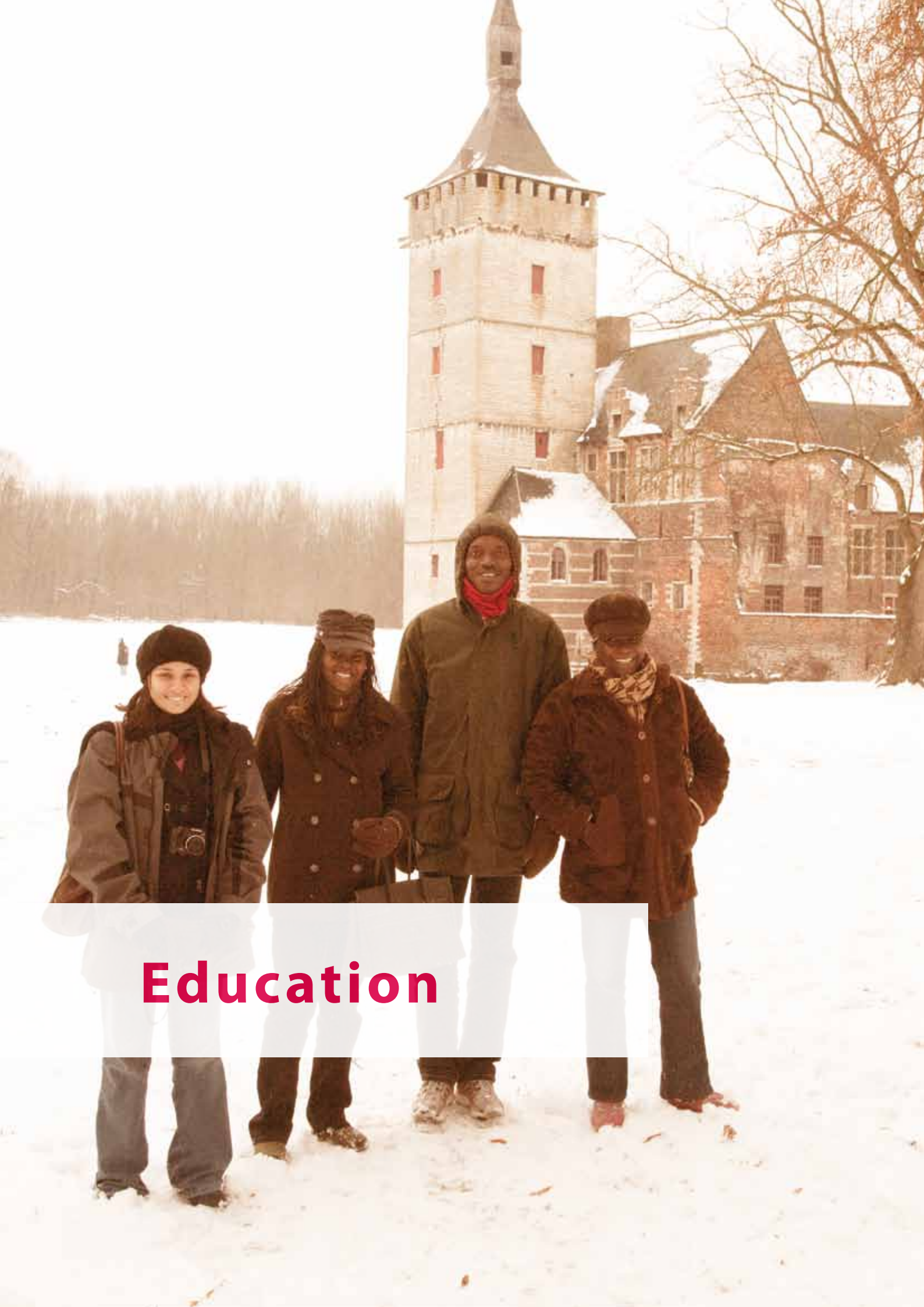
Total income	46,3
Government subsidies	24,8
Academic core funding	10,2
Research programme funding	1,8
Medical programme funding (excluding patient fees)	2,1
International development programme funding	10,2
Investment funds	0,6
Own income	21,5
External project funding	5,9
Tuition fees, overhead, fiscal rebates, other	10,3
Medical fees	5,2
Expenditure	45,6
Institutional education & departmental research	9,9
Externally funded research and services	9,2
Development cooperation (DGDC Programme)	11,9
Medical Services	6,3
Management	8,2

HUMAN RESOURCES (in Full Time Equivalents)

Total Staff on 31.12.09	410,7
University and college graduates	360,3
Male : Female ratio	42:58
Total staff on institutional budget	209,4
Senior (tenure) academic staff	29,5
Academic assistants	39,5
Support staff	140,4
Staff medical services	50,0
Scientific staff on external funding	104,7
Support staff on external funding	46,6

QUALITY AND SAFETY MANAGEMENT

Accreditation Master Courses	Achieved in 2009
Audits	
By BELAC for reference and clinical biology laboratories (ISO17025 - ISO15189 - ISO43)	Very Good
By Harrison for Clinical Trial Unit 4ABC study Parasitology (EU GCP)	Satisfactory
By Family Health International for HIV/STD Reference Laboratory	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)	2,89
Sick leave due to work-related accidents (% of work days)	0,09
Energy Performance Certificate	102%



Education

Education



In 2009 our international course offer, quality assurance and networking systems and educational policies evolved steadily. We launched an e-learning course on antiretroviral therapy (e-SCART), reformed the master programmes, institutionalized the international short courses and committed institutional resources to innovation in education. We strengthened the international collaboration in education, and the Linqed network for quality assurance in higher education started concrete projects.

Evolutions and achievements in 2009

The 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. Each course of MSTAH or major of MPH can admit up to 25 participants. Since 2009, students also can follow an increasing number of modules as stand-alone short courses. Whereas the total number of master students remained fairly stable over the past years, the number of international short course participants kept increasing.

In the Master of Public Health, we stimulate collaboration between the two majors. Both aim at training experts that can strengthen health systems for the delivery of either comprehensive health care or integrated disease control. Other course developments emphasize research skills and student-centeredness of teaching and learning methods.

The offer of short courses and postgraduate certificates has its own dynamics. ITM doctoral students attended the module on advanced research methods in the Disease Control major and the Short course on Clinical Research and Evidence-based Medicine (SCREM) as part of their doctoral training. We developed a new short course on International Health and Aid Policy, in

collaboration with the Institute of Development Studies (IOB) of Antwerp University, to be launched in 2010. This course targets integrated country teams of high level professionals from different sectors, involved in aid policy and national health sector development.

Networking

Our networking in education includes participation in the tropEd network for training in international health (www.tropEd.org). In 2009 the academic coordinator of ITM became a member of the tropEd Executive Committee. The General Assembly of TropEd gathered in Antwerp on January 22-25. In 2009 four ITM postgraduate certificate students enrolled in the tropEd Master in International Health, through an agreement with the degree delivering Swiss Tropical and Public Health Institute (TPH) of Basel University. 'Linqed' is an educational networking initiative within the Third ITM-DGDC Framework Agreement Programme (www.linqed.org). A second Linqed workshop was held at the Institut National d'Administration Sanitaire (INAS) in Rabat (see also below).

We offered two sessions of the new electronic version of the Short Course on Antiretroviral Therapy (e-SCART). We also organized a workshop for its international tutors.



Opening of academic year 2009 in Aula Janssens.

We developed another innovation: short continuous education messages delivered via multiple media, such as the internet and mobile devices. Such new technologies and learning opportunities via smart phones boost the concept of “blended learning”. In December, an interdepartmental working group created scenarios for the future of teaching and training. In view of this ‘ITM 2020+’ process, we put on hold the new Master in International Health (MIH). The aim of this MIH will be to deliver versatile experts in international health. A flexible curriculum will incorporate a broad introduction to global health, and optional modules at ITM and/or at foreign institutions.

Quality assurance

In October, the Academic Council performed its annual reviews of all training programmes, and proposed adaptations for the subsequent academic year to the direction and the Board of Governors. The Education Committee met on a quarterly basis. We also organised six-monthly Student Participation Meetings with student representatives of the different courses and the ITM direction. Students have their say at course level and participate in institutional policy making. Language barriers and the short stay of students exclude structural representation in ITM’s management bodies, but this format is coherent with the spirit of the Flemish Participation Decree on this issue. These direct meetings between students and directors became a very useful instrument for the identification of major

educational issues. The most important topics were the balance between contact hours and self-study time, and between teaching and coaching. Stronger student-centeredness becomes a priority for the future. As a first initiative, we organized three workshops on coaching skills for ITM staff. The student representatives also re-iterated the shortage and cost of housing. As a consequence the ITM started investing in its own accommodation for students.

At course level, we matched the student investment time in the postgraduate certificate courses with the awarded credits. We prevented evaluation fatigue in the master courses by revising the evaluation methods. Pilot integration of modern audio-visual tools and e-learning in selected master and short courses confirmed their positive effect.

In terms of external quality assurance, the new e-learning version of the Short Course on Antiretroviral Therapy (e-SCART) was accredited for the Master in International Health (MIH) of the tropEd network.

Educational innovations

We further developed our offer of specialised short courses, following the growing demand for flexible, modular postgraduate training. The major in Disease Control of the MPH restructured its advanced statistics teaching in a three weeks module, now open for external (mainly PhD) students.

The Department of Clinical Sciences offered two sessions of the Electronic Short Course on Antiretroviral Therapy (e-SCART), which was piloted in 2008. The first course ran for 15 weeks (March-June) with a retention rate of 95%. 40 participants from 19 different countries, self-funded or supported by a variety of sponsors, successfully completed the course. The course was offered through an open source learning management system, Moodle. Based on the pilot experience, we limited the group size to 30. The e-tutors, selected among former course participants, participated in a training workshop. The second e-SCART started in December.

In 2009 the Telemedicine / e-Health workshop, with a “training of trainers” perspective, was internationally advertised and offered to 9 participants from 7 different countries. This course was organized in collaboration with the Norwegian Centre for Integrated Care and Telemedicine in Tromsø. Other partners included the WHO, the World Bank and the Scottish Centre for Telehealth. We developed nine Continuing Medical Education (CME) modules, partly in collaboration with Telemedicine partners. These CMEs were taken by 180 SCART alumni, of whom 63 took the annual test and 36 obtained a CME certificate.

We conducted an in-depth evaluation of the web-based Master in Veterinary Tropical Health, a collaboration with the University of Pretoria. This online degree course focuses on infectious and parasitic diseases of cattle and wild animals in sub-Saharan Africa. In a curriculum workshop we refined the target

group and programme, and studied the possibilities for a genuine international joint e-learning degree. This collaboration led to the joint accreditation as Reference Centre for Veterinary Health Training by the World Organization for Animal Health (OIE). Within this framework the VetHub was launched, a web-resource featuring online courses as well as lifelong learning material.

The institutionalization of most international short courses made them less independent from fluctuating income. Structural funds (50 000 euro per year) were earmarked for small initiatives in educational innovation.

Master fellowship programmes

The ITM-DGDC Framework Agreement Programme supported 56 ITM master students in 2009. The Joint Japan/World Bank Graduate Scholarship Programme funded 4 MPH students, and another 3 master students obtained support from the Belgian Technical Cooperation agency (BTC). Scholarships for ITM's short courses were awarded by the DGDC, BTC, WHO (EMRO), Médecins sans Frontières, Tibotec/Janssens-Cilag, Abott, US CDC China, NCAIDS CDC China, Vidha Association/Kenya, Suriname National AIDS Programme, Dubucquoy fund and the City of Antwerp.

Structural fellowship programmes for our master courses are largely restricted to participants from the South, and financial accessibility is mainly a problem for western students. As our master courses focus on mid-



The fellowship of the wooden shoe.

“Our focus on mobile learning allowed us to actively participate in the development of new technologies”

career professionals, usually with a family, interrupting income-generating activities for a year makes the choice even more difficult. ITM has therefore attributed some of its core funding from the Ministry of Education, along with private sponsoring, to lower the financial barriers for a year of study at the ITM for Europeans. Such institutional scholarships cover 80% of the registration fee, and were granted in 2009 to 5 master students and 9 short course participants.

Despite the financial crisis the Belgian government maintained its commitment to allocate 0,7 % of GDP to international aid by 2010. This allowed the creation of additional fellowships in the third DGDC-ITM Framework Agreement (FA3) for a total of 2 million euro (2009-2010). This additional budget was used to strengthen the existing fellowship programme (Masters and PhD), to finance new initiatives (e-SCART, predoctoral and postdoctoral re-entry grants) and South-South fellowships through international and institutional partners.



Louis Vermeulen, a pillar of educational IT-support and development, retired after a career of 43 years at ITM.

Tuition fees and admission criteria

ITM maintains a tuition fees policy that aims at covering 25 % (postgraduate level) to 50% (international master and expert level) of the full course costs. The other part is covered by the institutional budget, of which half is core funding from the Flemish Ministry of Education. While costs vary somewhat between courses, ITM applies 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, which is applied to all master courses and since 2009 also to short courses, contributes to the academic independence of the lecturers and the quality of the teaching.

Tuition fees were adjusted to the cost of living (health-index) for 2009. 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 high-end portable PC including extensive licensed software, preconfigured for course work and wireless internet. 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 relevant university master degree, course language proficiency (English or French) and relevant professional experience of minimally 2 to 4 years; most students actually have 5 tot 10 years experience or more. Competitive selection criteria include academic record, professional experience, future plans and peer review. In case of equality, we take gender and geographical balance into account. In line with the Flemish educational decrees, we developed a procedure to allow exceptional admissions based on previously acquired competencies and other qualifications. Such cases are proposed by the selection committees and approved by the ITM direction.

For the courses of 2008-2009, 25 students out of 145 (17%) eligible applicants were selected for the MPH-DC, 21 out of 152 (14%) for the MPH-HSMP, and 17 out of 82 (21%) for the MSTA. For 2008-2009, the MPH-HSMP reduced from two classes of about 20 students to one group of maximum 25 students. This decision illustrates our focus on quality and efficiency, rather than quantity and income.

Support of students and alumni

In 2009, the Student Service assisted over 600 students and trainees with travel, visa, housing, social support and practical advice. The prime objective is enabling them to fully concentrate on academic matters. A wide range of social and cultural activities completes the "Belgian experience". Since 2009 international students can obtain a prepaid credit card, eliminating the need to carry cash even for short stays at ITM.

In 2009, country-level meetings between ITM staff and alumni took place in Rabat (Morocco), Phnom Penh (Cambodia), Cochabamba (Bolivia) and Lubumbashi (DR Congo). Objectives ranged from networking over local curriculum support to feedback for our master courses.

The RIPROSAT network (animal health) held its fourth international symposium for MSTA alumni in Quito, Ecuador, on 1st to 3rd September. Forty participants, primarily South American alumni as well as some Haitians and Africans, attended. The scientific topic was "Transboundary diseases and food security". Former students presented work on arbovirus infections, foot and mouth disease, Teschen disease, avian influenza,

prion diseases and virulent Gumboro virus strains in Latin America. Different methods to ensure traceability of animals and animal products, and the role of globalization and trade in the spread of diseases were discussed. The participants discussed ways to improve the MSTA.

In March 2009 the MPH alumni network introduced a weekly diffusion service of bibliographical references to alumni interested in health policy. A similar service is built up in the field of health systems research. The "book service" of the network sent a total of 191 books to 59 alumni.

ITM alumni receive a six-monthly newsletter from their respective networks (RIPROSAT; 400 recipients; MPH: 1 450 alumni). Former participants sharing their experiences made up 65 % of the newsletter content.

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.

At IPH-PUCE the 10th promotion of the Master of Public Health started with 18 participants (admission rate 50%). A thorough self-assessment of the MPH was



Graduation ceremony of the 2009 Master of Science in Tropical Animal Health.

conducted in view of national re-accreditation. A better adaptation of the Problem-Based Learning approach to the part-time format remains a major challenge. Additionally, a new e-learning course on Health Systems and Services Research was developed. In Cochabamba, 15 participants graduated from the specialization course in Tropical Medicine and 10 from the Master in Disease Control. In Lima, we co-support the well-known international Gorgas course on tropical medicine.

In Africa, ITM provides structural support to veterinary training programmes at the Centre for Ticks and Tick-Borne Diseases in Lilongwe, Malawi and to the web-based Veterinary Master of Science programmes at the University of Pretoria. At the Institut National d'Administration Sanitaire, Morocco, ITM supported curriculum development, e-learning capacity, study visits to the Belgian health system, PhD training and thesis research programmes. At the Makerere University School of Public Health, Uganda, ITM contributes to the development of a fellowship programme for district medical officers.

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 (first cohort May-June 2009 with 17 participants); public health training for health district teams at the Institute of Public Health in Bangalore, India (first session August 2009 with 20 participants).

Together with these and other institutional partners in the ITM-DGDC framework programme, we founded in 2008 the educational network 'Linqed', with a focus on quality management. The second Linqed workshop was held in Rabat (Morocco) from 2nd to 4th of December 2009, with 31 participants from 13 institutions and 12 countries. It was prepared by the Linqed executive committee during a special task force meeting in Pretoria in June, based on a survey among all network partners. The 3-day programme included a discussion on determinants of curriculum design, a review of student assessment tools, the "Socratic dialogue" as a method to explore fundamental questions and a brainstorming on concrete networking objects. These include an exchange programme for faculty and students, mutual support for e-learning and joint development of quality assurance guidelines.

Many ITM staff members contribute as guest lecturers to a wide range of courses in Belgium, Europe and worldwide.

Doctoral fellowships

Doctoral and other research training makes up an ever greater part of ITM's educational mission. At the end of 2009, 111 PhD students were registered at the ITM. This group includes academic and research assistants employed by the ITM, Belgian and European scientists with a fellowship from research agencies or universities, and PhD bursaries from developing countries supported by the DGDC or other development agencies. The latter category usually follows a "sandwich" track with alternating stays at the ITM and in the home country. These sandwich fellowships include sustenance, travel costs and a bench fee for a four-year period. They are awarded as part of an institutional collaboration programme, or to competitively selected graduates from ITM's master programmes. In 2009 such 'individual' PhD scholarships were awarded to 5 graduates from Ethiopia (3), Tanzania and Vietnam. In 2009, 23 new PhD students started their PhD training and 27 doctoral students successfully defended their PhD thesis, 14 of which from developing countries.

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 industrialised countries.

The 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. Wherever possible, the home institution should gradually take over the funding. The grant recipient is administratively and legally dependent of the home institute. The ITM maintains only a scientific relation with its post-doctoral trainees.

The contribution of ITM departments

The **Department of Public Health** is responsible for the Master in Public Health – Health Systems Management and Policy (MPH-HSMP) and its optional modules, as well as public health courses in the MPH-Disease Control (MPH-DC), the postgraduate certificate courses for doctors and nurses, and specialised short courses as the SCART and the SCREM.

The **Department of Animal Health** organises the Master of Science in Tropical Animal Health (MSTAH) and its modules for Continuous Professional Development as well as the international short course on Quantitative Risk Assessment. The veterinary staff also takes part in the biomedical sciences track of the postgraduate certificate courses, and coaches the students in the joint e-learning MSc in Veterinary Tropical Diseases with the University of Pretoria in South Africa.

The **Department of Clinical Sciences** takes care of the courses on tropical medicine, tropical biomedical sciences and HIV/AIDS care in the postgraduate certificate courses. It is also responsible for the face-to-face and online versions of the Short Courses on Antiretroviral Therapy (SCART & e-SCART) and on Clinical Research and Evidence-based Medicine (SCREM). The teaching on clinical HIV/AIDS management is amplified through a Telemedicine network.

The **Department of Microbiology** is responsible for courses on microbiology, immunology, infectious diseases, HIV/STD control and reproductive health in the MPH-DC, and contributes to the postgraduate certificate courses, the SCART, e-SCART and the SCREM. Together with the departments of Public Health and Parasitology, it assures the coordination of the MPH-DC. The **Department of Parasitology** assures the teaching in parasitology, parasitic disease control and medical entomology, in the postgraduate certificate courses and in the MPH-DC, in which it also teaches the optional modules on tropical disease control.

All departments host PhD students, coach thesis work of master students from the ITM and Belgian universities and train other scientists and technicians from Belgium and abroad.

Overview of ITM courses

The table below summarises the educational programme of the ITM in 2009. More details and the 2010-2011 programme can be found on www.itg.be.

Further down we provide an overview of the student body and of dissertations and theses in 2009.



A mixed team of students and staff competed in the 'ten miles of Antwerp'.

ITM course offer

Objectives

Target group

Language

Credits

International Masters

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

<p>Focus: Management and policy of comprehensive and accessible quality health services at local, national and international level</p> <p>Components:</p> <ul style="list-style-type: none"> • Health systems management • Analysis, research, decision-making • Communication skills • Optional modules • Integration and synthesis (master thesis) <p>Options:</p> <ul style="list-style-type: none"> • Health Policy • Strategic Management 	Experienced health professionals (mainly medical doctors)	Yearly alternating English and French	60
--	---	---------------------------------------	----

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

<p>Focus: Epidemiological, technical and organisational aspects of disease control with emphasis on sustainable integration in regular health services</p> <p>Components:</p> <ul style="list-style-type: none"> • Quantitative and qualitative methods • Public health • Research & tools • Master thesis <p>Options:</p> <ul style="list-style-type: none"> • 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)

<p>Focus: Epidemiological, technical and organisational aspects of animal disease control and surveillance</p> <p>Components:</p> <ul style="list-style-type: none"> • Research methodology • Project cycle management • Global livestock development • Epidemiological case studies • Master thesis <p>Options:</p> <ul style="list-style-type: none"> • Animal disease control • Epidemiological data collection & processing 	Experienced health professionals (mainly veterinary doctors)	Yearly alternating English and French	60
---	--	---------------------------------------	----

Postgraduate certificate courses

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

<p>Focus: Clinical, biomedical and epidemiological aspects of tropical and poverty related diseases and their control; health care organisation in low and middle income countries</p> <p>Components:</p> <ul style="list-style-type: none"> • 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)

<p>Focus: Clinical, biomedical aspects of tropical diseases and their control; health care organisation in low and middle income countries</p> <p>Components:</p> <ul style="list-style-type: none"> • 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)

<p>Focus: Diseases and health care in low and middle income countries</p> <p>Components:</p> <ul style="list-style-type: none"> • 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)

<p>Focus: Clinical & biomedical aspects of tropical diseases</p> <p>Components:</p> <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Framework for policy analysis • Actors and levers in policy making • Country case studies • Emerging challenges 	Experienced health professionals	Alternating English and in French	9
--	----------------------------------	-----------------------------------	---

Specialised short courses (continued)

Medical Mycology (Mycology)

Focus: Medically important fungal infections Components: <ul style="list-style-type: none"> • General mycology • Medical and veterinary mycology 	Health professionals (mainly laboratory)	Yearly in Dutch and French	3
--	--	----------------------------	---

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

Focus: HIV/AIDS patient care in Belgium Components: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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
---	---	---------	---

Quantitative Risk Assessment (QRA) Internship

Focus: Quantitative risk assessment (QRA) in endemic disease control and disease import risk management Components: <ul style="list-style-type: none"> • 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 (equivalent)
--	--	---------	-----------------

Educational output in 2009

Number and origin of participants in ITM-courses 2008-2009

	Belgium	EU	Europe other	Africa	Asia	Latin America	Other	Total
TM&IH-E	21	6	2	0	0	0	1	30
TM&IH-E Module	4	2	0	0	0	0	0	6
MT&SI-F	7	1	2	0	0	0	0	10
MT&SI-F Module	1	0	1	2	0	0	0	4
TG-D	35	1	0	0	0	0	0	36
MT-F	14	13	13	1	0	2	4	47
MPH-HSMP-E	0	0	0	20	0	0	1	21
MPH Mod HP-E	2	0	0	5	0	0	1	8
MPH-MDC-E	0	0	0	10	0	0	0	10
MPH Mod RH-E	1	3	0	19	0	0	1	24
MPH Mod TD-E	2	0	0	5	0	0	1	8
MSTAH-E	0	0	0	3	1	0	1	5
MSTAH-E Module	0	0	0	16	1	0	0	17
Mycology-D	10	1	0	0	0	0	0	11
Mycology-F	3	1	0	2	0	0	0	6
SCART-E	1	2	1	22	5	5	0	36
e-SCART-E	1	0	0	26	10	1	2	40
SCREM workshop E	4	3	0	6	6	1	0	20
QRA	0	0	0	11	0	3	0	14
Telemedicine workshop	0	1	0	5	1	1	0	8
PhD Ongoing (31/12/08)	33	6	0	51	7	13	1	111
PhD Graduates (2008)	11	2	0	6	5	3	0	27
Total	150	42	19	210	36	29	13	499

E = English

F = French

D = Dutch

Age and gender of participants in ITM courses 2008-2009

	Gender		Age					Prior education	
	M	F	20-29	30-34	35-39	40-44	>45	Bachelor	Master
TM&IH-E	11	19	15	11	4	0	0		30
TM&IH-E Module	3	3	2	1	2	0	1		6
MT&SI-F	1	9	1	8	0	0	1		10
MT&SI-F Module	2	2	1	1	2	0	0		4
TG-D	6	30	26	7	2	1	0	36	
MT-F	7	40	34	10	1	0	2	47	
MPH-HSMP-E	18	3	0	0	9	9	3		21
MPH Mod HP-E	6	2	0	0	0	3	5		8
MPH-MDC-E	8	2	0	0	1	5	4		10
MPH Mod RH-E	16	8	0	2	11	8	3	1	23
MPH Mod TD-E	3	5	1	3	1	3	0	2	6
MSTAH-E	2	3	0	0	3	0	2		5
MSTAH-E Module	15	2	1	9	4	3	0		17
Mycology-D	3	8	3	3	0	1	4	4	7
Mycology-F	1	5	1	2	2	0	1	1	5
SCART-E	24	12	0	8	13	7	8	3	33
e-SCART-E	30	10	3	2	18	8	9		40
SCREM workshop E	10	10	1	4	8	5	2		20
QRA Internship	9	5	1	3	2	3	5		14
Telemedicine workshop	6	2	0	1	1	4	2	2	6
PhD Ongoing (31/12/08)	66	45	18	22	33	23	15	0	111
PhD Graduates (2008)	17	10	5	4	7	3	8	0	27
Total	264	235	113	101	124	86	75	96	403

PhD and master dissertations 2009

Doctoral Theses (PhD)

Department of Microbiology

Affolabi D. Development of simple and inexpensive tools for the control of mycobacterial diseases in a low-resource country. Antwerp: University of Antwerp 2009. 210 pp. UA promotor L. Kestens; ITM promotor F. Portaels (Unit of Mycobacteriology)

Delvaux T. Linking sexual and reproductive health and HIV services: From needs to feasibility and evidence of benefits. Ghent: University of Ghent, 2009. 176 pp. UGhent promotor P. Van der Stuyft; ITM promotor A. Buvé (Unit of Epidemiology Epidemiology and Control of HIV & STI)

Eddyani M. Development of better methods for the laboratory diagnosis of Mycobacterium ulcerans disease (Buruli ulcer) and search for environmental reservoirs of Mycobacterium ulcerans. Antwerp: University of Antwerp 2009. 200 pp. UA promotor H. Leirs; ITM promotor F. Portaels (Unit of Mycobacteriology)

Stragier P. Heterogeneity and molecular characteristics of Mycobacterium ulcerans and related species. Antwerp: University of Antwerp, 2009. 189 pp. UA promotor L. Kestens; ITM promotor F. Portaels (Unit of Mycobacteriology)

Terrazas Aranda K. Development of microbicides in a model system of dendritic cells and CD4+ T cells, with emphasis on avoidance of resistance. Antwerp: University of Antwerp 2009. 257 pp. UA/ITM promotor G. Vanham (Unit of Virology)

Van den Bergh R. Transcriptome analysis of monocyte-HIV interaction. Brussels: Vrije Universiteit Brussel 2009. 199 pp. VUB/ITM promotor G. Vanham (Unit of Virology)

Department of Animal Health

Deckers N. Serological markers for improved diagnosis of porcine cysticercosis. Ghent: University of Ghent 2009. 154 pp. UGhent promotor J. Vercruysse; ITM promotor P. Dorny (Unit of Veterinary Helminthology)

Janssens M. Molecular biological tools for the immunisation and diagnosis of T. parva. Antwerp: University of Antwerp 2009. 144 pp. UA promotor Y. Guisez; ITM co-promotor D. Geysen (Unit of Protozoology)

Simukoko H. The epidemiology of livestock trypanosomosis in a trypanosomosis endemic area of Eastern Zambia. Ghent: University of Ghent 2009. 126 pp. UGhent promotor J. Vercruysse; ITM promotor P. Van den Bossche (Unit of Control of Animal Diseases)

Department of Parasitology

Akoda G. K. Effect of nutritional stress on the tsetse fly's vector competence and its implications on trypanosome transmission in the field. Ghent: UGhent 2009. 122 pp. UGhent promotor P. Dorny; ITM promotor P. Van den Bossche; ITM co-promotor: J. Van Den Abbeele (Unit of Entomology)

Bhattarai N. R. Visceral leishmaniasis in Nepal: development and application of PCR-based tools to re-assess the paradigm of Leishmania infection. Antwerp: University of Antwerp 2009. 167 pp. UA promotor M. Coosemans; UA/ITM promotor J.C. Dujardin; ITM co-promotor G. Van der Auwera (Unit of Molecular Parasitology)

Deborggraeve S. Towards simplified and standardised molecular diagnosis of human African trypanosomiasis, leishmaniasis and Chagas disease. Leuven: Katholieke Universiteit Leuven 2009. 202 pp. KULeuven promotor P. Herdewijn; ITM promotor Ph. Büscher (Unit of Parasite Diagnostics)

Gies S. Preventing malaria in pregnancy by health promotion and intermittent treatment: a community-based intervention in rural Burkina Faso. Antwerp: University of Antwerp 2009. 180 pp. UA promotor M. Coosemans; ITM promotor U. D'Alessandro (Unit of Epidemiology and Control of Parasitic Diseases)

Ngo Duc T. Long-lasting insecticidal hammocks for controlling forest malaria in Vietnam. Antwerp: University of Antwerp 2009. 138 pp. UA promotor M. Coosemans; ITM promotor U. D'Alessandro (Unit of Epidemiology and Control of Parasitic Diseases)

Sow S. The behavioral determinants of intestinal schistosomiasis transmission: water contact, hygienic practices and risk prevention. A study in Northern Senegal. Rotterdam: University of Rotterdam 2009. 127 pp. URotterdam promotor J.D.F. Habbema; ITM promotor K. Polman (Unit of Helminthology)

Tran T. The invariant surface Glycoprotein ISG75: a target for vaccination and diagnosis of trypanosomiasis. Brussels: Vrije Universiteit Brussel 2009. 149 pp. VUB promotor S. Magez; ITM co-promotor P. Büscher (Unit of Parasite Diagnostics)

Verhaeghen K. Presence and role of knockdown resistance in Anopheles species of Africa and the Mekong region. Antwerp: University of Antwerp 2009. 198 pp. UA promotor T. Backeljau; ITM promotor M. Coosemans (Unit of Entomology)

Department of Public Health

Borchert M. Epidemiology and Control of Marburg Haemorrhagic Fever Epidemics in Central Africa. Ghent: University of Ghent 2009. 176 pp. UGhent/ITM promotor P. Van der Stuyft (Unit of Epidemiology and Disease Control)

Kabali Hamuli E. Facteurs associés à la mortalité maternelle et circonstances de décès à Kinshasa (République Démocratique de Congo). Louvain: Université Catholique de Louvain 2009. 323 pp. UCLouvain promotor C. Gourbin; ITM promotor V. De Brouwere (Unit of Health Care Management)

Mahendradhata Y. Integration of intervention strategies to control the dual tuberculosis and HIV/AIDS epidemics in Indonesia. Ghent: Ghent University 2009. 199 pp. UGhent/ITM promotor P. Van der Stuyft; ITM co-promotor M. Boelaert (Unit of Epidemiology and Disease Control)

Meessen B. An institutional economic analysis of public health care organisations in low-income countries. Louvain: Université Catholique de Louvain-la-Neuve 2009. 225 pp. UCLouvain promoter M. Nyssen; ITM promoter W. Van Damme (Unit of Health Policy and Financing)

Toledo Romani M-E. From passive to active community participation in dengue control. Havana: University of Havana 2009. 123 pp. ITM promoter P. Van der Stuyft (Unit of Epidemiology and Disease Control)

Department of Clinical Sciences

Callens S. Pediatric antiretroviral treatment in resource poor settings. Antwerp: University of Antwerp 2009. 186 pp. UA/ITM promoter R. Colebunders (Unit of HIV/AIDS & STD Care)

Hung C. Clinical spectrum and treatment of HIV-related opportunistic infections in Taiwan. Antwerp: University of Antwerp 2009. 186 pp. UA/ITM promoter R. Colebunders (Unit of HIV/AIDS & STD Care)

Lynen L. Challenges of HIV care in low-income countries. Antwerp: University of Antwerp 2009. 170 pp. UA promoter R. Colebunders; ITM promoters R. Colebunders; L. Kestens (Unit of HIV/AIDS & STD Care)

Moreira J. Threshold thinking in medicine: time for a paradigm change?. Antwerp: University of Antwerp 2009. 114 pp. UA/ITM promoter J. Van den Ende (Unit of Tropical and Travel Medicine)

Torpey K. E. Delivering HIV prevention, care and treatment program in resource limited settings: Lessons from Ghana and Zambia. Antwerp: University of Antwerp 2009. 170 pp. UA/ITM promoter R. Colebunders (Unit of HIV/AIDS & STD Care)

ITM Master Theses

Master en Santé Publique – Politiques et Management de Systèmes de Santé (MSP-PMSS)

Affoukou CD. La prime à la performance dans le district sanitaire de Comè au Bénin: conditions nécessaires pour son efficacité (Bénin). 47 pp.

Ba H. Performance du district sanitaire de Niafunké (Mali); analyse critique et propositions d'amélioration. 45 pp.

Benitez JJ. Une approche à la performance des ressources humaines; l'expérience de Cienfuegos, Cuba. 36 pp.

Coulibaly S. Médecins de campagne au Mali: relations opérationnelles et managériales dans un contexte de décentralisation. 39 pp.

Drabo S. La subvention des accouchements: alternative pour une meilleure utilisation des services maternels du premier échelon? Cas du district sanitaire de Réo (Burkina Faso). 58 pp.

Fotsing R. Les insuffisances de la participation communautaire à la santé au Cameroun: le cas du district de santé de Maga. 41 pp.

Gbane M. Pérennité des activités initiées par les ONG internationales: exemple de MSF à l'hôpital de Man en Côte d'Ivoire 2003-2007. 51 pp.

Hakizimana E. La problématique du VIH/sida et tentatives des solutions dans le milieu carcéral au Rwanda, cas de la prison centrale de Kigali. 44 pp.

Idi Assoumane AAM. Gratuité ciblée et qualité des soins; cas du service de pédiatrie du Centre hospitalier régional Poudrière de Niamey. 49 pp.

Kacil MC. Les facteurs de sous utilisation des services de soins de santé de base après la fin d'un appui extérieur: cas de la zone de santé de Kitenge de 2005-2008, R. D. Congo. 59 pp.

Kande M. Analyse de la qualité de la prise en charge des infections sexuellement transmises dans la région sanitaire de Kankan/Guinée-Conakry. 54 pp.

Konate S. Rôle de l'association des Médecins de Campagne au Mali dans le renforcement des services de santé de première ligne. 54 pp.

Lo B. Prise en charge médicale des personnes âgées, enjeux et perspectives du Plan Sésame au Sénégal. 43 pp.

Mukumpuri G. Zone de santé peu performante: décentralisation et nouvelles options de développement: le cas de la Zone de Santé Rurale de Sia en RDC. 43 pp.

Mwikume Banza F. Améliorer la qualité de la prévention de la transmission mère-enfant du VIH à l'hôpital général de référence: quelles stratégies pour Hakika, Lubumbashi, RDC? 47 pp.

Ndibu MKKN. Analyse critique de la gestion participative des centres de santé: le cas de la zone de santé de Kongolo en RDC. 44 pp.

Nguemeleu M. Couvertures préventives optimales et pérennes sans accès aux soins curatifs: est-ce possible? Cas du district de santé de Mogodé au Cameroun. 43 pp.

Nimpagaritse M. La gratuité des soins au Burundi. L'Etat, un tiers payeur: expérience de l'hôpital de Muramvya. 50 pp.

Nombre Y. Vers de meilleurs soins de santé dans le district sanitaire de Titao au Burkina Faso: est-il possible d'introduire l'approche centrée sur le patient à travers un protocole de recherche action? 63 pp.

Nyombo Mutamba D. Impact du retrait d'une ONG subventionnant les soins, sur l'utilisation et l'organisation des services dans un district sanitaire; cas du district sanitaire de Kasenga en République Démocratique du Congo. 51 pp.

Ouatara A. Optimiser l'intégration des activités VIH dans le service maternel et infantile de l'hôpital de district de Homa bay au Kenya: cas de MSF-France. 55 pp.

Master en Santé Publique – Contrôle des Maladies (MSP-CM)

Afferri A. Le défi des ressources humaines pour la réduction de la mortalité maternelle en Afrique. Etudes de cas de l’Ethiopie et du Gabon, 69 pp.

Billy DAC. Conseil et dépistage de l’infection à VIH à l’initiative du client versus initiative du personnel de santé en Afrique sub-saharienne. Approche comparative des effets positifs et négatifs pour la population. Revue de la littérature, 61 pp.

Bonou Mahoudo JA. La rétention des patients VIH positifs à Angonia, un district rural du Mozambique : Leçons du passé et recommandations pour l’avenir, 68 pp.

Boubacar Moussa H. Planning familiale : priorité de santé et de développement au Niger, 40 pp.

Diarra SdB. Traitement de masse annuel contre les schistosomias et les géohelminthiases à Ségou/Mali est-il justifié ? Proposition des stratégies alternatives d’amélioration, 52 pp.

Ditekemena Dinanga J. La participation des hommes au conseil et dépistage volontaire du VIH, lors de la Prévention de la Transmission Mère et Enfant du VIH à la maternité de Kingasani, Kinshasa, République Démocratique du Congo, 53 pp.

Ebah-Aka GL. Stratégies de renforcement du conseil et dépistage du VIH/SIDA en Côte d’Ivoire, 49 pp.

Frederix K. Faut-il intégrer coûte que coûte ? Un cadre d’analyse pour des prises de décisions rationnelles, 60 pp.

Gasigwa Baneti Safari D. Faisabilité de l’introduction des tests de diagnostic rapide dans le Prise en Charge des cas de paludisme simple dans la communauté en République Démocratique du Congo. Revue de la littérature, 48 pp.

Gorse. Modélisation de la transmission de l’infection à VIH par un groupe de professionnelles de sexe : cas de Yaoundé, 28 pp.

Guifara G. Evaluation de l’efficacité du «Programme de renforcement de la prise en charge globale des personnes vivant avec le VIH en République Centrafricaine», 2003-2008 dans le domaine de la PTME et des ARV, 52 pp.

Lerebours-Joasil D. Comment renforcer mes mesures de lutte antivectorielle pour une réduction de la transmission du paludisme en Haïti ? 50 pp.

Loando Mboyo A. Efficacité après 5 ans d’un projet d’accès à la thérapie antirétrovirale en République Démocratique du Congo, 38 pp.

Lumbala Wa Mbuyi C. Déterminants de l’efficacité de la lutte contre la trypanosomiase humaine africaine. Cas du Kasai en République Démocratique du Congo, 51 pp.

Maccagno B. Les perdus de vue dans les programmes VIH/SIDA. Expérience de MSF-Suisse au Mozambique, 62 pp.

Me-Tahi BH. Les hommes qui ont des rapports sexuels avec d’autres hommes et l’épidémie du VIH en Afrique : Evidence et appel à l’action. 74 pp.

Ngomba AV. Les défis du système de distribution des moustiquaires imprégnées d’insecticide au Cameroun, 51 pp.

Osman Z. Réponse aux épidémies de rougeole. L’impact des campagnes de vaccination de masse pendant les épidémies, 56 pp.

Ouedraogo PE. Etat d’avancement et analyse opérationnelle du programme de prévention de la transmission mère-enfant du VIH au Burkina Faso en 2008, 50 pp.

Phanzy Mavinga D. Contribution à l’amélioration du contrôle de l’Ulcère de Buruli dans le territoire de Songololo en République Démocratique du Congo, 60 pp.

Andriamihantanirina-Rabenarivo B. Distribution à base communautaire en planning familial. Amélioration et pérennisation du programme à Madagascar, 52 pp.

Saadani Hassani A. Programme MSF de prise en charge de l’infection par le VIH dans un contexte à faible prévalence VIH, le cas du Laos, 52 pp.

Suarez Moreno VJ. Proposition d’une intervention pour améliorer la prescription d’antibiotiques dans les services de santé de premier échelon et les hôpitaux de la Province de Callao, Pérou, 67 pp.

Tshiteng Mashant E. Analyse des facteurs de risque et adhérence au programme MSF de prévention de la transmission du VIH de la mère à l’enfant à Kibera (Kenya), 52 pp.

Master of Science en Santé Animale Tropicale (MSSAT)

Adehan SB. Rhipicephalus (Boophilus) spp. et Babesia spp. chez le bétail du Département du Mono (République du Bénin). 46 pp.

Ahounou GS. Estimation de la prévalence de la cysticercose humaine et porcine à partir de différents tests diagnostiques. 43 pp.

Boka MO. Modélisation du remplacement de Rhipicephalus (Boophilus) decoloratus par Rhipicephalus (Boophilus) microplus, une tique exotique émergente en Côte d’Ivoire. 36 pp.

Kanyandekwe C. Contribution à la compréhension des mécanismes de résistance au chlorure d’isometamidium chez Trypanosoma congolense. 38 pp.

Kéita M. Evaluation de la réponse aux antigènes salivaires de la glossine comme outil pour mesurer le challenge des mouches tsé-tsé. 31 pp.

Konkobo PBIK. Modélisation bayésienne spatio-temporelle des foyers de fièvre aphteuse au Burkina Faso de 2004-2008. 50 pp.

Kouakou NDV. Typologie des éleveurs de cobayes (*Cavia porcellus* L.) des zones urbaines et périurbaines dans les régions centre et sud de la Côte d'Ivoire. 43 pp.

Lafia KB. Méthodes d'estimation de la prévalence d'infection de populations de vecteurs par l'utilisation de pools d'échantillons. 51 pp.

Loul S. Effets des paramètres écologiques et climatiques sur la densité des Culicoides en Belgique. 42 pp.

Massilongo Ngoie Kabwe S. Mise en place de la technique multiplex PCR pour le diagnostic des *Taenia* spp. 42 pp.

Pomalegni SCB. Culture in vitro de *Trypanosoma congolense*. 34 pp.

Sali N. Diagnostic moléculaire des maladies transmissibles par les tiques sur une cohorte de veaux aux alentours de Wakwa (Adamaoua) au Cameroun. 35 pp.

Savado J. Analyse spatio-temporelle de la péripneumonie contagieuse bovine au Burkina Faso de 2004-2008. 58 pp.

Teng T. Préparation d'une enquête de la connaissance, l'attitude et la perception de la cysticercose au Cambodge. 43 pp.

Toure A. Estimation de la prévalence de *Babesia bovis* chez *Rhipicephalus* (*Boophilus*) *microplus* dans le sud est de la Côte d'Ivoire. 109 pp.

Troukou PA. Identification de marqueurs biologiques pour la détection de l'atténuation des souches de *Theileria annulata* utilisées pour l'immunisation contre la theilériose tropicale au Maroc. 46 pp.

University Theses

Department of Parasitology

Regassa Gari F. Molecular characterization of trypanosomes causing equine trypanosomiasis in the Arsi-Bale highlands of Ethiopia, MSc Interuniversity Programme Molecular Biology, Katholieke Universiteit Leuven. ITM Promoter: P. Claes. 71 pp.

Campos Ponce M. Early helminth infection and atopy in later childhood in Cuba, Master of Science in Epidemiology, Netherlands Institute for Health Sciences - NTHS (University Medical Centre Rotterdam). ITM Promoter: K. Polman. 17pp.

Van den Broeck F. Sturen gastheer-specifieke factoren de verspreiding van de humane parasiet *Schistosoma* spp? Een studie in Pakh, Senegal, Master Biologie Katholieke Universiteit Leuven. ITM Promoter: K. Polman. 75pp.

Department of Clinical Sciences

Nguyen Y. Comparison of three algorithms for management of chronic cough in people living with HIV: increasing complexity improves accuracy and diminishes expected harm. An example from a reference hospital in Rwanda, Master na master inwendige ziekten, Université Libre de Bruxelles. ITM Promoter: J. Van den Ende. 24pp.

Department of Microbiology

Gabriel I.R. HIV and Tropism: Evaluation of HIV Fitness using recombinant viral constructs, MSc. Interuniversity Program on Molecular Biology, Vrije Universiteit Brussel, ITM Promoter: G. Vanham ITM, co-promoter: R. Van den Bergh. 60pp.

Chilije Maxwell FJ. Evaluation of viral parameters involved in the outcome of the HIV pseudovirus neutralization assay, MSc. Interuniversity Program on Molecular Biology. ITM Promoter: G. Vanham ITM, co-promoters: S. Balla, B. Willems 73. pp.

Goovaerts O. Characterisation of T-helper 17 cells during immune reconstitution in HIV-patients receiving antiretroviral therapy, Master Biomedical Sciences, Universiteit Antwerpen. ITM Promoter: L. Kestens. 46pp.

Nakiwala Kombowa J. Development and evaluation of a real-time PCR based method for the quantification of the T-cell receptor of HIV infected patients receiving HAART, MSc. Interuniversity Program on Molecular Biology, Vrije Universiteit Brussel. ITM Promoter: L. Kestens. 81pp.

Schlüsselhuber M. Etude de la régulation de l'expression des gènes impliqués dans la synthèse de la toxine de *Mycobacterium ulcerans*, Master Biologie Cellulaire / Microbiologie, Université de Caen Basse-Normandie. ITM Promoter: F. Portaels. 34 pp.

Vandelannootte K. Comparison of fingerprint profiles of human isolates for strain discrimination of *Mycobacterium ulcerans*, Implementation and application of two multiplex real-time PCR assays for the detection of *M. ulcerans* in small mammal/environmental samples. Master Faculteit Wetenschappen, Universiteit Antwerpen. ITM Promoter: F. Portaels. 57 pp.

Gryseels S. Amoeben als gastheren voor mycobacteriën in water, biofilms en detritus in relatie tot Buruli ulcus endemiciteit. Master Faculteit Wetenschappen, Universiteit van Antwerpen. ITM Promoter: F. Portaels. 76 pp.

Technical College Theses

Department of Parasitology

Heykers A. Optimalisatie van de indirecte ELISA voor de diagnose van de slaapziekte, Academische Bachelor Industriële Wetenschappen, Artesis Hogeschool Antwerpen. ITM Promoter: P. Büscher. 93pp.

Buyle J. Evaluation of peptides to replace variable surface glycoproteins in sleeping sickness diagnosis, Biomedische laboratorium technologie / Farmaceutische en biotechnologische laboratorium technologie, Hogeschool Gent. ITM Promoter: P. Büscher. 68pp.

Dausy A. Optimisation of the ELISA/Tbg kit for sleeping sickness diagnosis, Master in Industrial Science: Chemistry, Artesis Hogeschool Antwerpen. ITM Promoter: P. Büscher ITM Co-promoter: B. Van de Sande. 79pp.



Research

Introduction

Secondary Research Funding ITM (SOFI)

Until 2008, the 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 the ITM as well. This new research subsidy, which included a grant to consolidate the Clinical Trials Unit, is assured until the end of 2012. It 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 DGDC-ITM Framework Agreement and ITM's Medical Services to finalize their PhD, by granting them an internal 'write up' fellowship for up to 18 months. The other part, SOFI-B, is used to fund innovative and ground-breaking spearhead projects.

In 2009 we launched the second **SOFI-A** call, open to all disciplines, departments and units. In contrast to the 2008 call, also external candidates could apply. The mandates are granted for a maximum of 18 months (FTE), which can be spread part-time over a period of maximally two years.

Six eligible proposals (4 from external candidates) were submitted and evaluated by the ITM Research Committee. The following three projects were selected on the basis of the SOFI-A criteria, i.e. scientific quality, relevance and feasibility:

Bart Jacobs, *Did the poor benefit from innovative reforms in public health service delivery in rural Cambodia during social and economic transition?*
Promoters: W. Van Damme (ITM), Tony Mets (Vrije Universiteit Brussel); 6 months FTE (3x2 months), start 1.12.2009

Fabienne Richard, *Equitable access to high quality C-sections: thinking and acting beyond the quality of surgical intervention.*

Promoters: Vincent De Brouwere (ITM), Bruno Dujardin (Université Libre de Bruxelles); 18 months FTE, start 1.12.2009.

Philippe Gillet, *Malaria Rapid Diagnostic Tests: Technical aspects in the diagnostic setting.*

Promoters: Jan Jacobs (ITM), Cathrien Bruggeman (Maastricht University); 18 months FTE, start 1.12.2009





On 15 February 2009 the second **SOFI-B** call was launched. Fifteen promoters submitted a full proposal. The proposals were evaluated by an multidisciplinary panel of 5 international experts: Vinod Diwan (Health Systems, Karolinska Institute, Sweden), Rolf Horstmann (Parasitology and Genetics, Institute of Tropical Medicine Hamburg, Germany), Mark Woolhouse (Veterinary and Human Epidemiology, University of Edinburgh, UK), Frances Gotch (AIDS-immunology, Imperial College London, UK), Robert Sauwerwein (Clinical Sciences and malaria immunology, Nijmegen University, The Netherlands).

After preselection interviews and discussion 4 projects were ranked and 2 projects were funded:

Novel immunization strategy, using non-viral carriers for mRNA, encoding HIV protein variants.

Promoter: Guido Vanham, co-promoter: Ellen Van Gulck (Unit of Virology, Department Microbiology)

Budget: 1 million euro over 4 years

Polyclonal B-cell activation in human African trypanosomiasis: impact on acquired immunity and on rapid diagnostic tests.

Promoter: Philippe Büscher (Unit of Parasite Diagnostics, Department of Parasitology); co-promoter: Johan Van Griensven (Unit of HIV/AIDS & STD care, Department of Clinical Sciences)

Budget: 347 557 € over 2 years

Open Science Day

On 17 May, the ITM Science Day was for the first time organized as an 'Open Science Day'. ITM staff, their partners and children were invited to find out that Science is fun! An exciting programme was offered: interactive sessions 'Do the test' and 'The party spoilers', a science workshop for kids, a Speaker's Corner, Cinéma Scientifique, a Science Memory game, a Scientific Rally, historical tours and exhibitions. The numerous participants enjoyed this 'Science for All' Day and the party afterwards.

Departmental Research

The SOFI funding makes up only 3% of the ITM's budget. Most research at the 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 developing countries. Our department has four scientific units: Virology, Immunology, Mycobacteriology and Epidemiology and Control of HIV & STI. The fifth, more service oriented unit, is the Reference Laboratory for HIV & STI. In particular our multidisciplinary approach, combining epidemiology, virology, immunology and diagnostics, is an important asset to assure coherence and critical mass, two conditions for competitive research.

Unit of Virology

The main focus of the Unit of Virology is on translational research for HIV prevention, i.e. the development of vaccines and microbicides, and immunotherapy targeting dendritic cells. In support of these themes, we also work on the transmission of the virus factors protecting people against progressive disease and the role of monocytes/macrophages in the development of aids.

Katty **Terrazas** has successfully defended her PhD thesis on microbicides. Katty showed that two types of antiviral products (non-nucleoside reverse transcriptase inhibitors and integrase inhibitors) might be developed into a microbicide. As always, these candidate microbicides will induce resistance, which has consequences for remaining therapeutic options. Katty's research into this problem is being continued by MSc Philippe **Selhorst**. Philippe also plans a thorough evaluation of the differential sensitivity of cell-free and cell-associated HIV to various candidate microbicides.

Katrijn **Gruppig** induced resistance towards various AIDS inhibitors (CD4 binding site inhibitors, including CD4 miniproteins) and observed how patterns of cross-resistance depend on the HIV-strain. She did these studies in collaboration with Dr Martin Loic from Centre à l'Energie Atomique (CEA), Saclay, France, and with funding by two European projects (EMPRO and NGIN).

MSc Youssef **Gali** developed very sensitive *in vitro* assays to evaluate toxicity of candidate microbicides.

He did so in collaboration with GIMAP (Groupe sur l'Immunité des Muqueuses et Agents Pathogènes, St Etienne University). Gali showed that many commonly used excipients for vaginal gels are actually toxic and can increase HIV transmission across epithelial barriers. His assays are also used to study more fundamental aspects of HIV biology and transmission. This work is being sponsored by the Fonds voor Wetenschappelijk Onderzoek Vlaanderen (FWO) and the French AIDS Agency (ANRS).

From October 2009 on, Dr Kevin **Arien** joined us as a postdoc group leader of all projects on HIV transmission modeling and microbicides.

Dr Sunita **Balla** and Leo **Heyndrickx** develop assays for neutralizing antibodies, in the context of vaccine development projects. They are sponsored, respectively, by the Gates Foundation and the European Union (NGIN project). Thanks to their assay, Dr Sunita Balla and her group were able to select a number of patients with broad neutralizing antibodies against the most prevalent subtypes of the HIV-virus in Africa (subtype A, C and/or CRF02_AG). This work is part of a project headed by Prof Robin Weiss from University College London and sponsored by the Gates Foundation. Several new and promising monoclonal antibodies were obtained by Dr Davide Corti in Switzerland. They were characterized by various partners in the project with several techniques, including epitope mapping, binding studies, crystallization and structural analysis with NMR. Based

on these new neutralizing antibodies, scientists now develop new substances that will be tested on their capacity to stimulate the immune system.

Leo **Heyndrickx** is involved in two work packages of NGIN, a project sponsored by the FP7 program of the European Union. In the first work package we are looking for patients who are good in neutralizing the HIV-1 virus in their body. One such patient, included in this study, is a long term survivor infected by mother-to-child transmission. We did a thorough genetic analysis of the envelope of this patient's HIV-virus, in collaboration with Dr Guillaume Stewart-Jones (MRC, Oxford). We intend to produce those envelopes and use them to immunize rabbits. Of course our ultimate aim with this research is to design substances that stir the human immune system into effective action. The other work package we are involved in, tries to develop standardized neutralization assays. In our laboratory we focus on a neutralization assay making use of non-replicating (pseudo) viral particles. We will use this assay to test how well the sera coming from the immunized rabbits neutralize the virus (done in Denmark).

MSc Tessa **Dieltjens** characterized novel epitopes (parts of the mantle of the virus, which are recognized by the antibodies of our immune system). One of the problems with HIV is that the virus continuously changes its epitopes, each time forcing our body to design and produce new and matching antibodies. Dieltjens' epitopes are found on several strains of the virus, which means they can be attacked with one and the same antibody. They might be the basis of new substances that incite the immune system.

Dr Ellen **Van Gulck** continued her work on immunotherapy, based on patient-derived dendritic cells. Cells 'loaded' with our technique, based on messenger RNA, worked better than an existing technique. This *in vitro*, work was sponsored by the IUAP (Belgian Inter-University Attraction Poles). The next step is research *in vivo*, in living organisms. In collaboration with Dr Stefaan De Smedt and Dr Johan Grooten of the Ghent University, we intend to develop novel carriers to load messenger RNA into the dendritic cells, present in a living organism. MSc Winni **De Haes** and MSc Charlotte **Pollard** are preparing a PhD thesis on the *in vitro* and *in vivo* aspects of this project, respectively. This work is supported by a SOFI-B grant of the ITM.



Belgian and Ghanaese master students collect water samples in Ghana, searching for free living amoeba that can host the mycobacteria causing Buruli ulcer



Coordinators and participants take a break at the 4th Course of Retrovirology in Dakar.

In our patient cohort, some exceptional HIV-1 infected patients control their virus after stopping therapy. We call them secondary controllers. We aim to elucidate which factors of the virus and of the patient's immune system are vital to this status, and what they can tell us about the mechanisms of protection. This work is sponsored by FWO.

Rafaël **van den Bergh**, bio-engineer, successfully defended his PhD thesis, in which he used a micro-array (a 'gene chip') to detect which genes were active in monocytes (a subset of white blood cells) from HIV infected versus uninfected subjects. The virus appeared to incite the cells to produce visfatin. In a series of elegant functional studies, Van den Bergh suggested that visfatin is involved in 'turning a switch' to make the virus more aggressive (to switch it from CCR5 to CXCR4). He evaluated the effect of treatment and suggested some new markers of hypersensitivity to Abacavir treatment. These studies were carried out in close collaboration with Prof De Baetselier from VIB at the Vrije Universiteit Brussel (VUB).

Unit of Immunology

The Unit of Immunology continued its research on cellular immunology of HIV. We worked on HIV pathogenesis (how the virus induces disease), on reconstitution of the immune system and on features of the immune system that appear to be correlated with protection from HIV infection and disease.

We continued the institutional collaboration & capacity strengthening of the "Laboratoire de Virologie & Bactériologie" in "Le Dantec" in Dakar. Dr Pascale **Ondoa**, in charge of the capacity strengthening in

Dakar left ITM for an important shift in her career and moved to the Amsterdam Medical Center. In October 2009, Géraldine **Daneau** joined to unit to continue the work of Pascale Ondoa.

Wim **Jennes** continued the FWO project on innate factors of resistance to HIV infection in HIV-exposed populations in Africa. Some individuals remain uninfected despite unprotected exposure to the virus (HIV-exposed seronegative or ESN persons). Understanding the mechanisms of protection against HIV infection may lead the way for the development of preventive vaccines or therapies. We study ESN subjects from two African populations: a cohort of female sex workers in Abidjan, Côte d'Ivoire and a cohort of couples in Dakar, Senegal, of which one is infected and the other is not (so-called HIV-discordant couples). We finalised a study on the role of immune activation in the susceptibility to HIV infection. It has been suggested that the activation of CD4+ T cells increases the replication of the virus; at the same time however this activation could be deemed essential for mounting an effective antiviral response of the immune system. In ESN subjects in HIV-discordant couples, we observed a low-level activation of the CD4+ T cells, but this was found to be associated with an increase in safe sex behaviour in this population. Indeed, ESN subjects reported a higher frequency of condom use than low-risk controls – which is not unexpected given their higher risk perception for HIV infection. Our findings question the relevance of low-level CD4+ T cell activation in resistance to HIV infection, and underscore the need to take sexual behaviour into account when analysing biological correlates of protective immunity.

“Our multidisciplinary approach, combining epidemiology, virology, immunology and diagnostics, is an important asset”

Currently, we are continuing our efforts to map the genetic variability of the intrinsic anti-HIV factors APOBEC3G and TRIM5-alpha in our cohort of HIV-discordant couples. We also have started analysing the functional properties of a subset of immune cells known to exhibit powerful antiviral activities, the natural killer cells.

The FP6 EC project on the immunopathogenesis of the tuberculosis-associated Immune Reconstitution Inflammatory Syndrome (TBIRIS), which we coordinated by, has made substantial progress. In this project, we try to understand how and why the suppressed immune system of a HIV-patient overreacts when it gets boosted by treatment, and what the effect of a tuberculosis infection on this process is. In December 2009, 525 patients (100% of target) had been enrolled. The immunological studies on the collected and stored biological samples have started. The third plenary TBIRIS meeting with all the EC partners was organized at ITM on June 2. The study is going well, but a one year no-cost extension of the study will be necessary to compensate for a one year delay in patient enrolment. Luc **Kestens** travelled to Kampala two times to coordinate the field activities and to evaluate the study progress. The field project coordination of the TBIRIS study is assured by Marguerite **Massinga-Loembé**. Justine **Nakiwala** optimized qPCR techniques for studying the repertoire of T-cell receptors in TBIRIS patients as part of her master thesis, which she successfully defended in August 2009. In September, Odin **Goovaerts** joined the unit as a new IWT-PhD student, to work on immunological aspects of TBIRIS.

The institutional collaboration with the Centre Hospitalier Universitaire (CHU) de Dakar for laboratory capacity strengthening continued in 2009. We started research on the immunological diagnosis of tuberculosis (TB) in HIV patients co-infected with *M. tuberculosis* in sub-Saharan Africa. We will test the Quantiferon TB-Gold assay (IFN- γ release assay). This assay is used to exclude active tuberculosis in HIV-1 infected persons, but its performance in TB endemic areas in sub-Saharan Africa has not been tested. We obtained ethical approval in the spring of 2009; the first trial test runs were conducted at the end of 2009. In the same context, we evaluate the reliability of the CD4 primary gating method (for counting of CD4

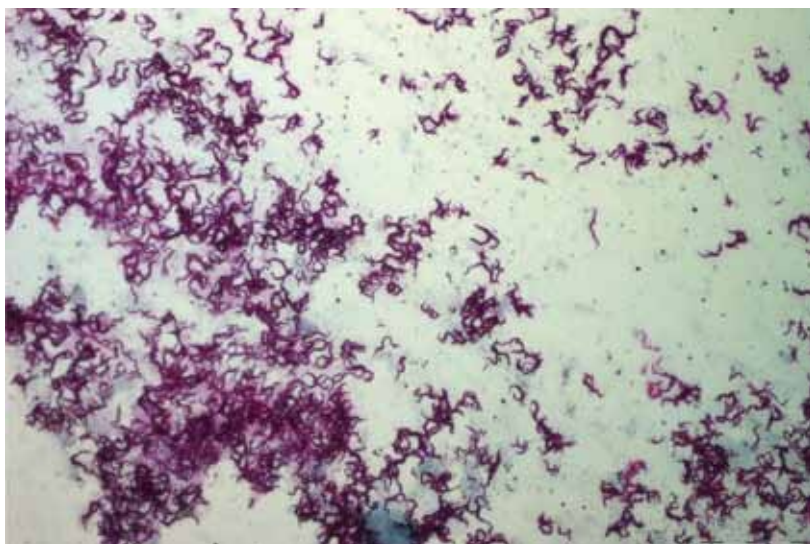
cells with flow cytometry) in Senegalese patients, co-infected with HIV and TB. Luc **Boel** assisted Aziz Diallo (Dakar) in setting up an external quality control assessment for CD4 counting in several Senegalese clinical centers. We negotiate with the Canadian international external quality assessment programme (QASI) for CD4 counting, to designate the CHU as Senegalese national coordinator of this quality programme. Luc **Kestens** travelled to Senegal twice, to discuss the project progress and to coordinate the CD4 teaching activities in the retrovirology course. In November, Géraldine **Daneau** accompanied Luc Kestens to Dakar to support the teaching activities, to get acquainted with the institutional collaboration project in Dakar and to plan the activities for 2010. Wim **Jennes** travelled to Dakar in January to follow-up on the discordant couple project. Sample collection has been finalised and focus will now shift to the scientific objectives. To this end, Makhtar **Camara** spent 3 months at ITM with Wim Jennes to study the role of immune activation and sexually transmitted infections in susceptibility to HIV-1 infection.

Unit of Epidemiology and Control of HIV & STI

A main priority of our unit is the development and evaluation of HIV prevention. In 2009, UNAIDS created a “Prevention Evaluation Think Tank” on how to measure the effectiveness of complex HIV prevention programs. Marie **Laga**, who has more than 20 years experience in this field, set out to play a prominent role in this working group.

We continued to work with highly vulnerable groups, including female sex workers and youngsters. In Ivory Coast and in Kenya, we strengthened local organizations that give prevention and care services to female sex workers. Our operational research included capture-recapture studies to estimate the size of the population of female sex workers, and surveys on condom use and the prevalence of HIV and sexually transmitted infections among them. In Ivory Coast we also provided technical assistance to the Ministry of AIDS and the Ministry of Health.

In Western Kenya, a local NGO took over the implementation of a program to improve the



Bacilli, detected with the slide-culture method for rapid detection of drug resistant *Mycobacterium tuberculosis*.

sexual and reproductive health of youngsters. In collaboration with the Kenya Medical Research Institute we continued to provide technical assistance and training to organizations for the implementation of "Families Matter!". This is an intervention to help parents communicate with their pre-teens about sex. In Kenya and Uganda we developed and evaluated an intervention to address the specific sexual and reproductive health needs of HIV infected adolescents. In Western Kenya we also carried out an ethnographic study on young people's sexual behaviour and livelihood. Writing up of the data should be finalized in the first quarter of 2010.

We started a study on the prevalence of HIV in men who have sex with men (MSM) in Flanders. We increase our involvement in interventions targeting MSM in developing countries, where they constitute a vulnerable group for HIV that has been neglected for too long. In line with this new focus, we help to survey the extent of the HIV epidemic in highly vulnerable groups, including MSM, female sex workers and youth, as well as in pregnant women, in the city of Esmeraldas (Ecuador).

In a different line of research, we characterize biomarkers for the safety of microbicides, in women in Africa and in Antwerp. We characterize the vaginal flora with standard methods such as pH, Nugent scoring and cultures, but also with pyrosequencing and quantitative real time PCR methods for various lactobacilli, *G. vaginalis* and *A. vaginae*. This study also looks at markers of inflammation, and at mononuclear cells present in the secretions of cervix and vagina.

We do not solely focus on HIV but also on other sexual and reproductive health problems. Together with Gent University and Mozambican colleagues we produced a two-week course on sexual and reproductive health within a Master of Public Health at the Eduardo

Mondlane University in Maputo, Mozambique. We provide technical assistance to the National AIDS Control Programme of Cambodia to strengthen and evaluate the Linked Response for prevention, care and treatment of HIV/AIDS, sexually transmitted diseases and reproductive health issues in the district of Kirivong.

Unit of Mycobacteriology

Tuberculosis research

We all but completed our prospective studies on acquired rifampicin resistance during the course of different standard first-line treatment regimens under direct observation. We sequenced the *rpoB* core region and completed the DNA-fingerprinting from sputum and/or isolates obtained before treatment and at the time of failure or relapse. Comparing true acquired rifampicin resistance between regimens, very low rates occur with the 8-month regimens (using isoniazid plus thioacetazone, or ethambutol in continuation phase). A 6-month daily regimen comprising isoniazid plus rifampicin in continuation resulted in almost the same low rate in Kinshasa, but in a significantly higher rate in Bangladesh (where it was administered thrice weekly in continuation phase). Surprisingly, a substudy for the Bangladesh cohort treated with this regimen did not result in additional protection by extending the intensive phase in case of sustained smear-positivity. This has important implications for current practice in tuberculosis control programmes around the globe.

We performed various studies on the rapid diagnosis of (drug-resistant) tuberculosis. Our study on fluoroquinolone resistance showed a high level of cross resistance for ofloxacin, gatifloxacin and moxifloxacin, with the latter two showing systematic lower minimal inhibitory concentrations compared to ofloxacin. Phenotypic resistance was linked to a mutation in the *gyrA* gene in 69 % of the cases. Further studies on the clinical significance of these findings will continue in 2010.

The EC-FP6 project (FASTEST-TB) on the development and evaluation of diagnostic Point Of Care tests is nearing completion. The test kits detect antibodies and antigens in body fluids. We evaluated a LHSD-LIONEX High Speed Device in several thousand clinical samples, mainly sputa and sera, from pulmonary TB patients. Final analysis of the results will be completed in the following months.

In the FASTXDR project, we designed and standardized a technique for the rapid detection of multiple-drug-resistant TB in sputum samples (based on multiplex PCR). We also validated a previously-described colorimetric method, adapted for the detection of extensive drug resistant TB in clinical samples. We intend to develop this PCR-test for extensive drug-resistant tuberculosis, and to apply the colorimetric test directly in sputum samples.

We further developed the operational research on vital staining and rapid Drug Susceptibility Testing (DST) on slides, as a simple and safe method to screen for resistant tuberculosis. To do so, we improved the differentiation between *Mycobacterium tuberculosis* and other mycobacteria, and the susceptibility test for pyrazinamide. We decentralized to field laboratories in Bangladesh and Cameroon – an encouraging experience – and we also successfully introduced the methods in national reference laboratories in Bangladesh, Benin and Cameroon, where evaluation with the gold standard (proportion method on LJ) is ongoing.

We continued to provide support for clinical trials of tuberculosis treatment. By fingerprinting of isolated positive cultures, we confirmed the excellent results in terms of cure, failure and relapse rates with the standardised treatment against multiple-drug-resistant tuberculosis in Bangladesh. The causes of the rare failures and relapses are being further investigated.

We continued our collaboration in the multicenter trial in five African countries on the treatment of pulmonary TB. This trial compares the efficacy and safety of a four month gatifloxacin-containing regimen against the standard 6-month regimen. Drug-susceptibility testing as well as DNA-fingerprinting of paired isolates from recurrent cases is in progress.

The second multicenter trial on first-line treatment of pulmonary TB with a fixed dose (Study C) is closed. Final data analysis is ongoing.

We also participate in a clinical trial of a newly-described antibiotic (TMC207 or diarylquinoline from

Tibotec) against multiple-drug-resistant tuberculosis. The first phase on its effectiveness has shown promising results. The study will continue in 2010 and 2011.

We performed a molecular epidemiological study on the dissemination of the Beijing genotype of *M. tuberculosis*, related to an increased capacity to acquire drug resistance. We fully characterized the strains in the study, compared their reproductive capacity and looked for contributing factors. The results are currently being analyzed.

In Zambia, we documented the predominance of the Southern African 1 genotype and a high cluster rate in the Ndola district, indicating the importance of recent transmission.

In our studies of bovine tuberculosis, we documented the prevalence of a single *M. bovis* strain (SB0980) among dairy cattle in the Mejia Canton in Ecuador, and the clonal spread of another strain (SB0944) among dairy cattle in Niger.

Buruli ulcer research

Buruli ulcer (BU), caused by *Mycobacterium ulcerans*, is one of the so-called Neglected Tropical Diseases, with Africa being the most affected continent. For endemic areas, the World Health Organization advises treatment of clinically defined cases with a combination of rifampicin and streptomycin, with surgery depending on certain criteria. In a rural zone of the Democratic Republic of Congo, we evaluated the effectiveness of this WHO guideline in a series of patients with large ulcers.

We showed that the predictive value of the WHO clinical case definition was low; only 2 in 3 clinically suspected cases were eventually confirmed. We also proved that delayed surgical treatment was detrimental in confirmed cases with large BU ulcers. We were the first to establish a relationship between a positive direct smear examination by Ziehl-Neelsen (ZN) and the clinical outcome after 4 weeks of antibiotic therapy. Therefore we recommend immediate confirmation of cases by ZN staining of smears at the rural health centres. We also recommend surgical intervention without delay on the ZN-confirmed cases, to avoid deterioration of the lesions.

Our findings are of major importance for the management of this neglected disease, as they highlight an urgent need to revise the current WHO clinical guidelines.



FEMPrEP team in the snow.

In our efforts to optimize growth conditions for the isolation of *M. ulcerans* from clinical specimens, we compared 2 decontamination methods and 2 growth media. The oxalic acid decontamination resulted in a lower contamination rate and a slightly higher positivity.

Studies on the presence of *M. ulcerans* in wild mammals in West Africa did not yield positive results, but more research should still be carried out on a higher number of specimens and species of (small) mammals. On the other hand, we confirmed the presence of *M. ulcerans* in a water sample collected in a BU endemic village in Ghana, by real-time PCR.

Reference laboratories

National Reference Laboratory for Mycobacteriology

We received 72 mycobacterial isolates from peripheral Belgian laboratories. We identified 19 of them as *Mycobacterium tuberculosis*, and found all of them susceptible to first-line drugs. The remaining isolates were either identified as other mycobacteria (n=20), contaminated (n=5) or negative (n=25). For three other, analysis is still ongoing.

In addition we received 334 clinical specimens, yielding 4 positive cultures. 12 out of 46 molecular diagnoses were positive.

Supranational Reference Laboratory for the Surveillance of Drug-resistant Tuberculosis

We further supported drug resistance surveillance and development of local capacity for culture and drug-susceptibility testing of *M. tuberculosis* in Bangladesh,

Burundi, Central African Republic, DR Congo, Niger, Nigeria, Tanzania and Uganda. We focussed on continuous surveillance among first-retreatment cases, which provides earlier diagnosis of multi-drug-resistant tuberculosis. We tested the susceptibility for first- and second-line drugs.

In Tanzania we compared drug resistance survey by conventional versus molecular techniques, showing some advantages for the latter.

Also, as coordinating laboratory for the supranational reference laboratories, we have completed the 15th round of quality assessment by panel testing under the WHO/IUATLD global project for TB drug resistance surveillance with 27 supranational, 30 national and other tuberculosis reference laboratories.

International Collaborating Centre for Buruli ulcer

We organized the "First round of EQA of molecular detection of *M. ulcerans* in clinical specimens". A panel of 35 specimens was sent to 17 laboratories in 15 countries; 11 (65 %) of the laboratories reported their results. Final analysis is ongoing and will be communicated during the next annual Global BU Initiative meeting in Geneva.

We continued supporting control programs from endemic countries for the laboratory-based diagnosis of Buruli ulcer. We successfully implemented PCR technology in the Laboratoire de Référence des Mycobactéries in Benin, and in the Noguchi Memorial Institute for Medical Research.



Working in a laboratory is like cooking. Fresh ingredients are the basis of a good restaurant but earning a 'star' is teamwork. Team building day of the Virology and Immunology Units and the AIDS Reference Laboratory (ARL).

Together with the 'Institut National de Recherche Biologique' in Kinshasa we organized a workshop on the control of Buruli ulcer in DR Congo. It was unanimously agreed to integrate the National Control Programmes for Buruli ulcer and Leprosy.

International Reference Laboratory for HIV & STI

We are a partner in the International Partnership for Microbicides (IPM), responsible for the laboratory aspects of the FEMPrEP phase III trial sponsored by Family Health International. Two of the five sites (Bondo, Kenya, and Pretoria, South Africa) have been successfully upgraded for the trial.

We collaborate with the Unit for Epidemiology and Control of HIV & STI in the prevalence study in MSM in Flanders, the HIV/STI survey in the city of Esmeraldas (Ecuador), the microbicide research and cross sectional surveys among sex workers in Ivory coast.

National Aids Reference Laboratory (ARL)

The Aids Reference laboratory of the ITM is one of the seven centers accredited and funded by the Belgian Ministry of Public Health and Social Affairs. Their task includes reference and confirmation diagnosis of HIV (serology, viral load, resistance); assessment, development and quality control of existing and new tests; data collection and surveillance. They collaborate in a national network coordinated by the national Scientific Institute of Public Health.

In 2009, we confirmed 334 new HIV infections. The number of screening and confirmation tests remains relatively stable. The increasing number of viral load

and resistance tests indicates the qualitative evolution of the clinical needs. An increasing number of patients are receiving anti-retroviral treatment and resistance patterns are becoming more complex.

WHO collaborating Centre for HIV/AIDS Diagnostic and Laboratory Support

This reference centre is hosted jointly by the Aids Reference Laboratory and the Unit of Immunology. We offer expert advice, reference service, quality control, research and training on the diagnosis and surveillance of retroviral diseases and blood-transmissible diseases, particularly HIV and HTLV-I/II.

In 2009 we attended three WHO meetings: one to review the Guidelines, the production process and the HIV testing strategies; a working group meeting on prequalification of HIV virological technologies; and a WHO technical working group on CD4 technologies.

National Reference laboratory for *Neisseria gonorrhoeae*

In 2008, we received 557 isolates for confirmation of identification; of those 516 (93 %) were confirmed. In 2009 we performed resistance tests on 516 isolates, against penicillin, tetracycline, spectinomycin, azithromycin, and ceftriaxone, using the agar dilution method. Antibiotic resistance against penicillin, tetracycline and ciprofloxacin was seen in 35.5%, 48.0% and 57.5% of the strains, respectively. Resistance against azithromycin decreased from 3.1% in 2007 to 1.6% in 2008. All strains were susceptible to ceftriaxone and spectinomycin.

Highlights



Unit of Virology

Who is at the receiving end of our innovation?

Rafael Van den Bergh was a laureate of the “Young Voices in Research for Health” essay competition 2009, organized by the Global Forum for Health Research and The Lancet, with the following essay:

Innovation. A good, solid word, that. Not as smarmy as many others in the lexicon of corporate buzz-speak (“proactive”, “incentivize”, the hardy perennial “empowerment”), but glitzy enough to get papers accepted, bring in grant money and successfully sell far-fetched concepts and ideas. And rightfully so, maybe – it’s what makes research exciting and keeps researchers on their toes; without innovation, without the continuous drive to approach problems in new and inventive ways, research would be reduced to nothing more than bookkeeping, an intellectually sterile task.

As applied to “health care for all”, though, I can’t help but wonder if it’s not a hollowed out term – a term designed to cash in on the grant money without necessarily delivering the goods. Allow me to clarify: biotech projects focussing on healthcare challenges (HIV being a case in point) in the developing world tend to rely heavily on new, emerging – yes, innovative technologies, without fail claiming that these pioneering approaches will lead to a substantial improvement in the healthcare situation of any number of patients. I used to buy into this idea – after all, I’m a molecular biologist working on HIV, I work with genome-wide microarray profiling systems, recombinant fluorescently tagged viruses and magnetic cell separation techniques all day long. Innovation is what I **do**. I remember choosing specifically for biotechnology at university precisely for its cutting edge allure, the idea that in such a fast-moving field sufficient intellectual effort and highly advanced technology could make an actual contribution to the living standards in many of the worst-hit areas in the world. But do they? Do they really? Is innovation in research, the constant development of new ways of doing science, really the answer to the problems of the developing world? Or are we maybe fooling ourselves (and our funders) and is the application of ground-breaking, cutting-edge technology in resource-poor settings no more than a justification for us to use said technology, without actually delivering a return for the people in the afflicted regions of interest? Certainly there are returns for the researchers in question, in terms of high-ranking publications, patent applications and scientific status, but how much of this flows back to the people who are actually involved? And, more importantly, are these innovative high-tech approaches to solve extant issues really what we’re waiting for?

I remember a drowsy course in parasitology, long ago, during which we were shown a set of illustrations which piqued my interest – a geographical map of sub-Saharan Africa showing the regions at risk for trypanosomiasis (in humans colloquially known as sleeping sickness), and a graph depicting the incidence of trypanosomiasis in – I think – the Democratic Republic of Congo over the past 80 years or so. What was striking is this: risk for trypanosomiasis is strongly associated with political instability. The higher the civil unrest in a specific region, the higher the rates of trypanosomiasis become. Worse still: trypanosomiasis dropped to its lowest incidence rates in the DRC during the relative political stability of the colonial years, when – despite the evils of colonialism – strict logistical measures were taken to control disease, and leapt up to staggering heights soon after independence and all associated civil unrest. Now, this is a dangerous thing to say. It’s a **terrible** thing to say. As a Belgian, I am only too aware of the nightmares of our colonial history and would never dream of defending this period of national shame. Nevertheless, what these graphs suggest is that the underlying **biology** of the disease, i.e. the aspect which we’re now targeting with our innovative and costly approaches, may not really be the challenge at hand.

In other words, these data raise a set of simple yet fundamental questions: if you want to combat a disease such as trypanosomiasis, is it better to fund an innovative molecular biological analysis of the interplay between parasite and the host immune system in the hopes that it will one day yield a possible (but probably expensive) therapeutic strategy? Or is it preferable to alleviate the social conditions of the regions at risk using non-innovative approaches (prevention strategies, logistical support, etc.) which we already have at our disposal? With the added benefit that trypanosomiasis is not the only disease which can be tackled in this fashion – many, many diseases go hand in hand with poverty, famine and war, and would be considerably reduced as social conditions are improved.

To take it to the personal level: should I really have studied biotechnology when I wanted to provide some form of aid (perhaps young and naively – I think William Blake's lines "Can I see another's woe/ And not be in sorrow too?/Can I see another's grief/And not seek for kind relief?" even came to mind at some point) to the disease-stricken regions of the world – a choice which so far has not delivered any actual benefits to anyone in the field? Or should I simply have studied Economics, skipped the lengthy PhD-process of scientific advancement and attempted to contribute something at the logistical level? I would like to stress that I do not know or pretend to know the answers to these questions. Presumably, there is no correct answer, or if there is it will be along the predictable lines of "both approaches are needed to efficiently combat disease in resourcepoor settings".

Nevertheless, I cannot help but feel frustrated about our focus on technological innovation as the be all, end all solution for the developing world's problems. On the one hand frustration that opportunities are being missed: while money is being spent on academic publication-oriented questions, albeit interesting ones, many problems could actually be solved using extant knowledge and extant technologies, albeit decidedly unsexy ones. On the other hand, but this might merely be a private gripe of mine, frustration concerning the dubious phrasing used in all project applications everywhere, in which newfangled technologies are being pushed forward as the solution to all the developing world's problems, when in fact they are just the newest toys that we'd like to play with. A project we're collaborating on now, for instance, focuses on HIV and tuberculosis coinfection in sub-Saharan Africa, and is an intellectually challenging amalgam of advanced molecular and cellular strategies designed to unravel a specific disorder associated with antiretroviral therapy in a resource-poor setting. It's an innovative project, certainly, with an accordingly high price tag. From a research point of view, it concerns work which indubitably needs to be performed. However, was it entirely honest of us to describe it in the project application as a direct contribution to HIV and therapy management in the field? Wouldn't it have been **more** honest to say that we will in the first place improve our track record in this field of research, rather than improve standards of care? And wouldn't the local population suffering from this disorder have been better off if the same kind of effort devoted to research was also devoted, again using non-innovative approaches, to improving their quality of life, thus bridging the gap between their current situation and the ten or fifteen years down the road when our results are translated into actual solutions.

In conclusion, I would like to state that in no way am I advocating a reduction in the research efforts in the "health care for all" context: I have always believed and continue to believe that scientific progress will shape the future – indeed, it is not an overstatement to say that it might determine whether we **have** a future. What I am questioning, however, is our focus on technological innovation as the quintessential solution to many of the developing world's challenges, a habit which in the long run might be more self-serving than public interest-serving. Selecting the best strategy for providing optimal health care for all in disregard of our own academic or other track records might be our biggest challenge yet.

Rafaël Van den Bergh,
Unit of Virology, Department of parasitology
Institute of Tropical Medicine, Antwerp.

Highlights

Unit of Mycobacteriology

Françoise Portaels emeritus

Françoise Portaels started her career at ITM as a research assistant of Prof. Stefan Pattyn in 1968. Her passion for Africa was triggered by an overseas assignment at the University of Kinshasa (then Zaire, now DRC). Stimulated by Profs Pattyn and Janssens (then director of the ITM), she became interested in infections causing leprosy, , and Buruli ulcer.

Upon her return to ITM, she obtained her PhD degree and continued working as a research assistant with a focus on leprosy, tuberculosis and other mycobacterial diseases. In 1973 she became Associate Professor, in 1983 full Professor and head of the newly created Mycobacteriology Unit. Under her leadership, this unit evolved into an international centre for research and teaching, and a worldwide reference centre for diagnosis and control of tuberculosis and Buruli ulcer.

Francoise Portaels authored over 350 peer-reviewed publications, and 33 monographs, chapters and books. Her high-ranking scientific research, her commitment to the world-wide control of tuberculosis and Buruli ulcer, and her special attention for patient care have been honoured with 11 scientific awards. Her lifelong quest for the source of *Mycobacterium ulcerans* eventually led to the first ever isolation and cultivation from a natural source i.e. a water insect.

Throughout her career she remained an enthusiast lecturer with a great sense of humor, much appreciated by the students. With her brilliant, analytical mind and meticulous approach to research, she was an inspiring model for many young scientists. From 1997 to 2009, 21 students obtained their PhD degree under her guidance. Several generations of postdoctoral scientists have benefited from her vast knowledge and experience. We hope that she will continue to share with us her expertise, knowledge, dynamism and enthusiasm.

Thank you 'mama Buruli'!



Professor Françoise Portaels, 'mama Buruli':
All dedication, no airs.

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 84210

European Microbicides Project

ITM promoter: Guido Vanham

Support: European Commission, Belgium

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 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: Research Foundation Flanders, Belgium

Reference number 424403

A phase I/II study of therapeutic vaccination with autologous dendritic cells of HIV-infected individuals under stable highly active antiviral therapy

ITM promoter: Guido Vanham

Support: Institute for the Promotion of Innovation by Science and Technology in Flanders, Belgium

Reference number 424405

Protective immunity after stop of highly active antiviral therapy

ITM promoter: Guido Vanham

Support: Research Foundation Flanders, Belgium

Reference number 754043

Novel immunization strategy, using non-viral carriers for mRNA, encoding HIV protein variants.

ITM promoter: Guido Vanham, co-promoter: Ellen Van Gulck

Support: ITM (SOFI)

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

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 100166

Buruli ulcer: multidisciplinary research for improvement of control in Africa

ITM promoter: Françoise Portaels

Support: European Commission, Belgium

Reference number 100179

Diagnosis of tuberculosis and drug resistance surveillance in Médecins Sans Frontières projects

ITM promoter: Françoise Portaels

Support: Médecins Sans Frontières France, France

Reference number 100180

Tuberculosis laboratory services for Union Clinical Trials (Study C)

ITM promoter: Françoise Portaels

Support: Union Internationale Contre la Tuberculose et les Maladies Respiratoires, France

Reference number 100225

Buruli ulcer: multidisciplinary research for improvement of control in Africa

ITM promoter: Françoise Portaels

Support: European Commission, Brussels

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: Research Foundation Flanders, Belgium

Reference number 424203

SialoTarg: advanced vaccines and pharmaceuticals targeted to macrophages via sialoadhesin.

ITM promoter: Françoise Portaels

Support: Agency for Innovation by Science and Technology, Flanders, Belgium.

Reference number 514202

Development and maintenance of a bank of highly characterised M. tuberculosis isolates

ITM promoter: Françoise Portaels

Support: World Health Organization, Switzerland

Reference number 514203

Multicenter RCT of gatifloxacin-containing short-course regimen for the treatment of pulmonary tuberculosis

ITM promoter: Françoise Portaels

Support: World Health Organization, Switzerland

Reference number 514204

14th, 15th, 16th & 17th Round Proficiency Testing of the WHO/IUATLD Global Project on Drug Resistance Surveillance

ITM promoter: Françoise Portaels

Support: World Health Organization, Switzerland

Reference number 514205

Technical assistance to Central African Republic, Democratic Republic of Congo and United Republic of Tanzania

ITM promoter: Françoise Portaels

Support: World Health Organization, 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: Technical support to Epicentre's mycobacteriology laboratory.

ITM promoter: Françoise Portaels

Support: Epicentre, France

Reference number 624222

Tuberculosis: drug resistance surveillance 2009

ITM promoter: Françoise Portaels

Support: Damien Foundation, Belgium

Unit of Epidemiology and Control of HIV & STI

Reference number 84211

European Microbicides Programme

ITM promoter: Anne Buvé

Support: European Commission, Belgium

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: Christiana Nöstlinger

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: European and Developing Countries Clinical Trials Partnership, The Netherlands

Reference number 324302

Characterisation of novel microbicide safety biomarkers in East and South Africa

ITM promoter: Anne Buvé

Support: European and Developing Countries Clinical Trials Partnership, 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 427509

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: Vlaams Agentschap Zorg en Gezondheid, Belgium

Reference number 434301

Strengthening of HIV/AIDS control in Kinshasa, DRC, and Paramaribo

ITM promoter: Marie Laga

Support: Centrum voor Informatie en Samenlevingsopbouw VZW, Belgium

Reference number 437519

Outreach HIV testing and counseling (VCT) for Sub Saharan African Migrants (SAM) in the Province of Antwerp

ITM promoter: Christiana Nöstlinger

Support: Province of Antwerp, Belgium

Reference number 437529

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 437539

Outreach HIV testing and counseling (VCT) for Sub Saharan African Migrants (SAM) in community settings.

ITM promoter: Christiana Nöstlinger

Support: Centrum voor Informatie en

Samenlevingsopbouw VZW, 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: Netherlands AIDS Foundation

Reference number 524305

Improving the prevention response

ITM promoter: Marie Laga

Support: UNAIDS, Switzerland

Reference number 524306

Prevention - Evaluation Think Thank

ITM promoter: Marie Laga

Support: UNAIDS, Switzerland

Reference number 744003

An integrated approach for impact assessment of HIV preventive interventions: application to interventions targeting female sex workers and their clients in Benin, West Africa

ITM promoter: Anne Buvé

Support: CIHR, others

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: Research Foundation Flanders, Belgium

Reference number 744002

Study of HAART-induced immune restoration in HIV patients

ITM promoter: Luc Kestens

Support: DGDC, others

Reference Laboratory for HIV & STI

Reference number 334501

IPM-ITM partner agreement on Good Clinical Laboratory Practice

ITM promoter: Katrien 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: World Health Organization, Switzerland

Reference number 514503

Assessment of HIV virological assays for prequalification (Phase I)

ITM promoter: Catharina Fransen

Support: World Health Organization, 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)

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)

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

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)

DIELTJENS Tessa. Identification of Human Immunodeficiency Virus vaccine peptides and human broad cross-neutralizing monoclonal antibodies using M13 peptide phage display libraries.

Promoter: G. Vanham (ITM/University of Antwerp)

DURNEZ Lies. The role of rodents and insectivores in the epidemiology of mycobacterial infections in Africa. Promoters: F. Portaels (ITM), H. Leirs (University of Antwerp)

GALI Youssef. Development of an in vitro model to study heterosexual HIV transmission.

Promoter: G. Vanham (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)

JUGHELI Levan. Improving control of multidrug-resistant (MDR) and extensively drug resistant (XDR) tuberculosis (TB): rapid detection of resistance to aminoglycosides and fluoroquinolones, and MDRTB treatment in a setting with a high prevalence of MDRTB.

Promoters: F. Portaels (ITM), L. Rigouts (ITM/University of Antwerp)

KIBADI KAPAY Anatole. Contribution à l'amélioration des traitements de l'infection à Mycobacterium ulcerans (ulcère de Buruli) en République Démocratique du Congo.

Promoters: F. Portaels, M. Boelaert (ITM), J.J. Muyembe-Tamfum (Institut National de Recherche Biomédicale and University of Kinshasa, DR Congo)

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)

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)

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 Liege), W. Bénítez-Ortiz (Universidad Central del Ecuador, Quito, Ecuador)

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

SOPOH Ghislain. Etude des facteurs de risque et de pronostic thérapeutique de l'ulcère de Buruli.

Promoters: F. Portaels (ITM), S. Anagonou (Laboratoire de Référence des Mycobactéries, Cotonou, Bénin)

SUYKERBUYK Patrick. Micro and macro study of the ecological niche of Mycobacterium ulcerans 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)

VON GROLL Andrea. Determination of the biological cost of Mycobacterium tuberculosis strains of the Beijing and non-Beijing genotypes: correlation with different levels of rifampicin and/or isoniazid resistance.

Promoters: F. Portaels, Juan Carlos Palomino (ITM), P. Vandamme (Ghent University), P. E. Almeida da Silva (Fundação Universidade Federal do Rio Grande, Rio Grande, Brazil)

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)

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 developing countries in this field. Our main research subjects are malaria, leishmaniasis, sleeping sickness, Chagas disease and schistosomiasis. 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.

Changes in staff

The postdoc staff of the department significantly increased in 2009. Saskia **Decuypere** reintegrated into the Unit of Molecular Parasitology after a 2-year postdoctoral fellowship in Strathclyde University (Glasgow) and is now leading the drug resistance research line. Hideo **Imamura** (physician, Japan) and Ruben **t'Kindt** (pharmacist, Belgium) joined the GeMInI project (see highlight in 2008 report) and are respectively responsible for the genomic and metabolomic components. David **Hendrickx** (manager of the Leishrisk project) moved to the department of Public Health, where he will coordinate the strategic network on neglected diseases.

In December 2009, Dr Sharleen **Braham** has joined the Unit of Epidemiology and Control of Parasitic Diseases. She is a molecular biologist and will support the important laboratory component within the unit. Dr Jean Pierre **Van Geertruyden** takes up a postdoctoral position at the University of Antwerp. He will continue to collaborate with the unit in a number of projects.

In the Unit of Parasite Diagnostics, Stijn **Deborggraeve** defended his PhD thesis and obtained a FWO postdoctoral grant. The FWO postdoctoral grant of Filip **Claes** was renewed. Thao **Tran** defended her PhD thesis and continues her career at the Vrije Universiteit Brussel.

In the Unit of Medical Entomology, Katrijn **Verhaeghen** defended her PhD thesis on 'Presence and role of knockdown resistance in Anopheles species of Africa and the Mekong region' at the University of Antwerp.

In the Unit of Molecular Parasitology, Narayan **Raj Bhattarai** defended his PhD thesis on 'Visceral leishmaniasis in Nepal: development and application of PCR-based tools to re-assess the paradigm of Leishmania infection' in the University of Antwerp. He then returned to BPKIHS, Dharan, where he is now responsible for the new laboratory of molecular biology.

Komlan **Akoda** defended his PhD thesis on 'Effect of nutritional stress on the tsetse fly's vector competence and its implications on trypanosome transmission in the field' at the University of Ghent.

“We have considerably expanded our research lines on worm diseases that jump from animals to humans”

Unit of Medical Entomology

We focus on one hand on the biology, control and insecticide resistance of malaria vectors, and on the other hand on the interactions between tsetse flies and the trypanosome parasites they carry.

MODIRISK, the project studying the taxonomic and functional biodiversity of mosquitoes (Culicidae) in Belgium, is now in its third year. Based on the results of this inventory, we developed the first spatial distribution models, and started their field validation. We mapped biodiversity hotspots, which clearly showed that mosquito species are not evenly distributed throughout Belgium. There is a higher biodiversity in the north-eastern part of Belgium, including parts of the provinces Antwerp and Limburg. From April till October 2009, we followed two exotic *Aedes* species present in Belgium, plus *Anopheles plumbeus*, which is becoming a nuisance in several parts of Belgium. The outcomes of these longitudinal studies will serve the development of pest risk assessments for the three species.

To consolidate the MODIRISK outcomes we took several new initiatives. Our unit is a partner of the VBORNET project, a growing European Network of entomological and public health specialists. This network intends to assist the European Centre for Disease Prevention and Control in its preparedness activities on vector borne diseases. Furthermore we set up a cluster project with the University of Liège, on an integrated approach of risk analysis of viral infections, including vector born diseases.

In the framework of an interuniversity collaboration with the universities of Ghent (Belgium) and Jimma (Ethiopia) we showed that the Gilgel-Gibe hydroelectric dam in Jimma has a clear impact on malaria transmission. In 2009 we assessed the insecticide resistance of the main vector, the mosquito *Anopheles arabiensis*. We also studied its knockdown resistance (*kdr*) gene. We detected the West African *kdr* mutation in almost all specimens (98.5%), whereas the East African *kdr* mutation was absent. This is the highest *kdr* allele frequency ever observed in *Anopheles arabiensis*.

In Southeast Asia we explored the distribution of *Anopheles dirus*, a principal malaria vector in the region. We used innovative methods derived from ecological niche modeling, and characterized the ecological requirements of this species (DYNMAP project). In Vietnam, we evaluated different long lasting insecticidal nets in experimental huts.

In Cambodia, in the province of Pursat, we started a Phase III study on the evaluation of two long lasting insecticidal nets. This study will last for 3 years, in collaboration with the National Center for Malaria Control.

We also contributed to the annual review of the WHO Pesticides Evaluation Scheme (WHOPES) of new products for vector control.

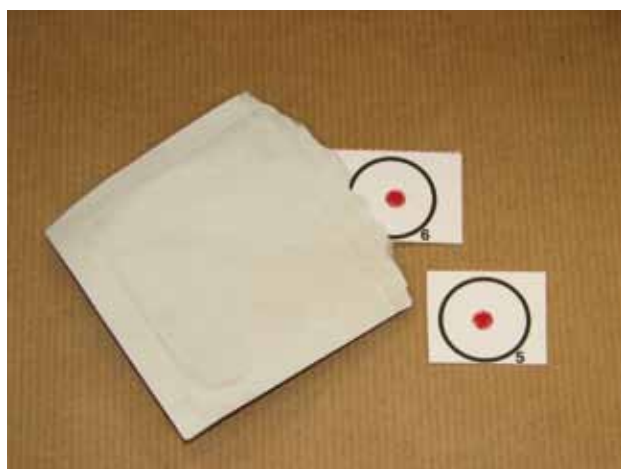


Insecticide resistance test in Ethiopia, using standard WHO bioassay tubes and innovative local technology.

We continued our studies on the biological relationship between the trypanosome parasite and the tsetse fly, and on the competence of the tsetse fly as a vector. Firstly, we investigated the biological role of proteins from tsetse fly saliva, in respect to the obligate feeding behaviour of the flies, and to the development of the trypanosomes. Here, we have fully characterized – from gene to biological function – a major tsetse salivary protein with a unique dual inhibitory action on human platelet aggregation.

In our studies on the relationship between the fly's physiological status and trypanosome development we showed that the maturation of a *Trypanosoma brucei* infection to the infectious metacyclic stage is favoured when flies are hungry. These results were the last in a series of experiments in which we clearly demonstrated that a hungry tsetse fly becomes a more potent vector to transmit the trypanosome parasite. This has important implications for the transmission of sleeping sickness in the field.

In the framework of an EC-INCO project we showed that two genetically different *Glossina fuscipes fuscipes* populations, from two separate regions along Lake Victoria with a different sleeping sickness situation, are both highly capable of transmitting *Trypanosoma brucei rhodesiense*. In our experimental work on the genetic transformation of the tsetse fly endosymbiont *Sodalis glossinidius*, we successfully expressed a trypanosome-targeting nanobody. In close collaboration with the University of Utrecht (Prof Tielens) we performed metabolic studies on trypanosomes derived from the tsetse fly midgut. We showed that these trypanosomes do not use a complete Krebs cycle and that the ingested stumpy blood stream forms are metabolically preadapted to adequate functioning in the tsetse fly.



The reagent for the LATEX/IgM is dried on a card, which allows individual packing of the test.

Our unit actively participated in the 7th WHO/TDR International *Glossina* Genomics Initiative consortium meeting (Washington DC, November 2009) on the progress of the *Glossina* full genome project. This tsetse fly genome is expected to be completed and made publicly available in September 2010.

Unit of Parasite Diagnostics

We work on African trypanosomiasis (sleeping sickness), leishmaniasis and Chagas' disease. We focus on markers for diagnosis, stage determination and follow-up after treatment. These markers can be parasitological, serological, bioclinical or genetic. Our unit collaborates with more than 20 partners in Europe, Latin America and Africa.

2009 was the final year of the European Commission FP6 TRYLEIDIAG project. In this project, coordinated by us, novel molecular diagnostics were developed for simplified diagnosis of sleeping sickness and leishmaniasis. These novel diagnostic tests, based on PCR- and NASBA-Oligochromatography, have gone through several evaluation studies in Europe and Africa to prove their diagnostic performance. A similar PCR-Oligochromatography method was designed for the diagnosis of Chagas disease, one of the most important parasitic diseases in South America. It will be extensively evaluated within the FP7 ChagasEpiNet consortium that was launched in 2009.

We closed a study on neuroinvasion in sleeping sickness (EC FP6 NEUROTRYP). In this study we developed bioluminescent strains of the trypanosome parasite; in this way we revealed unexpected tissue tropisms, i.e. to the testicles.

In addition, we discovered new biomarkers that are strongly associated with second stage sleeping sickness. We confirmed the value of these markers through collaboration with the University of Geneva. We successfully transformed LATEX/IgM into an individual test. LATEX/IgM is a card agglutination test for detection of immune globulin M in the cerebrospinal fluid, previously developed at ITM for improved disease staging.

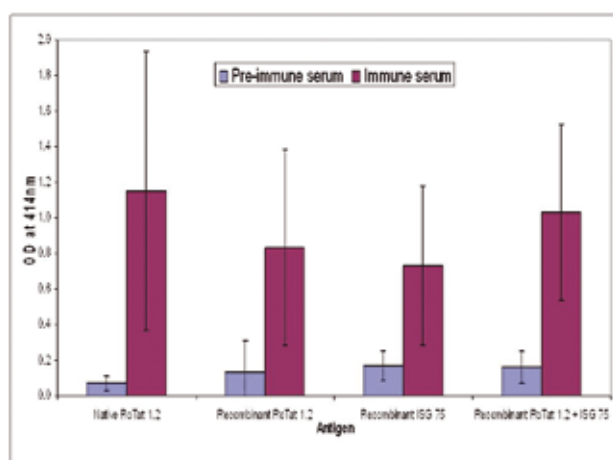
Further analyses performed on the samples collected in the THARSAT study, led us to two unexpected results. We examined if a negative CATT result (absence of specific trypanosome antibodies in blood) could be an indication for cure, after treatment for human African trypanosomiasis (sleeping sickness). We discovered that CATT titres also decrease in patients who experience a relapse after treatment, similar to cured patients.

A CATT negative result after treatment is therefore not a sign of cure and CATT is not reliable for post treatment follow-up.

While investigating HIV as a risk for treatment failure in sleeping sickness, we observed an elevated number of non-specific reactions in HIV diagnostic tests. In collaboration with our Reference Laboratory for HIV & STI, we demonstrated that sleeping sickness strongly decreases the specificity of individual HIV antibody detection tests. Both rapid and reference diagnostic tests are affected. It takes a combination of 3 independent HIV tests to achieve acceptable specificity; this combination should be applied for determining the HIV status of people with sleeping sickness.

In collaboration with the Technical University of Darmstadt, we selected RNase-resistant RNA aptamers for detection of antigens in the urine of visceral leishmaniasis patients. The high affinity aptamers are being cloned. In addition, we obtained a FWO postdoctoral fellowship to select aptamers against unique RNA molecules in the leishmaniasis parasites and to integrate these aptamers into innovative molecular diagnostics.

In the current detection tests for trypanosomiasis, we need purified proteins from the actual parasites (so-called epitopes). We hope to replace those by biotechnologically produced protein fractions and peptides. Therefore, we engineered two well-known organisms, the bacterium *Escherichia coli* and the yeast *Pichia pastoris*, to express the corresponding genes of the parasite and so produce the Invariable Surface Glycoproteins (ISG) and Variable Surface Glycoproteins (VSG) of *Trypanozoon*. The recombinant ISG 75 and N-terminal domain of RoTat 1.2 are recognised by goats and dromedary camels infected with *Trypanosoma*.



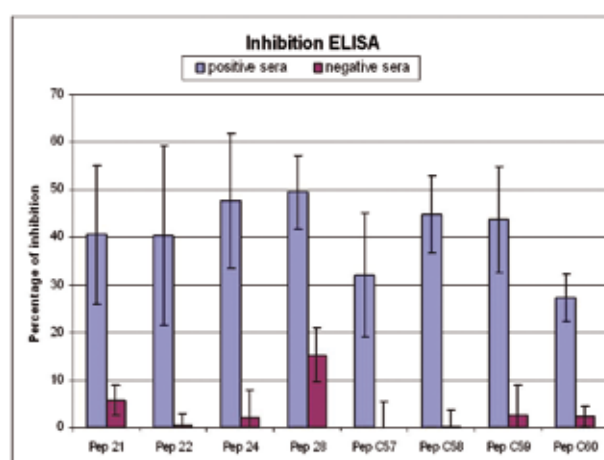
Goats infected with *Trypanosoma evansi* reacts with an artificial reagent, that no longer uses parts of living parasites.

evansi and show an added effect. Recombinant expression of other surface glycoproteins (ISG 65; VSGs LiTat 1.3 and LiTat 1.5) is underway and their diagnostic potential for sleeping sickness will be evaluated.

Alternatively, from random peptide phage display libraries we selected peptides that mimic diagnostic VSG epitopes (epitopes are the specific parts of parasites recognised by antibodies of an infected host). Several peptides are being assessed for their reactivity with sera from sleeping sickness patients.

In DR Congo, we support the National Reference Laboratory for human African trypanosomiasis and the mini Anion Exchange Centrifugation Technique (mAECT) Production Unit at the Institut National de Recherche Biomédicale in Kinshasa. Over 18,000 mAECT and MSC tests were produced in 2009. In Ethiopia, we participate in a project on the diagnosis and treatment of 'horse sleeping sicknesses'; i.e. dourine (caused by *Trypanosoma equiperdum*) and surra (caused by *T. evansi*). Within this study we analysed the epidemiological situation of dourine in Ethiopia and developed new drug schedules for the treatment of the disease.

Since 2006, the Unit of Parasite Diagnostics is a World Organization for Animal Health (OIE) reference centre for *Trypanosoma evansi* (surra). We deliver diagnostic services, in close collaboration with the Applied Technology and Production unit of our institute. Besides actual testing of animal specimens for *T. evansi* infection, we also advise on surra diagnosis and treatment. In 2009 we started collaboration with the European Community Reference Laboratory for Equine Diseases in order to establish a reference laboratory for dourine (*Trypanosoma equiperdum*) in Dozulé, France.



We developed an inhibition elisa test that distinguishes sera of people infected with sleeping sickness.

In 2009, we also became a WHO collaboration centre for Research and Training on Human African Trypanosomiasis (sleeping sickness). We facilitated three training courses on sleeping sickness, organised in Tanzania and Zambia by the WHO. The courses covered epidemiology, clinical presentation, treatment, and all aspects of diagnosis. We also assisted in the fifth International Course on African Trypanosomes (ICAT-5) in Nairobi, a 3 weeks training course developed by the WHO and the Association against Trypanosomiasis in Africa, to meet the need in human resources to combat the disease in the field. ITM organised theoretical and practical sessions on the diagnosis of sleeping sickness.

Unit of Molecular Parasitology

In 2009, we further developed our three main lines of research, essentially on *Leishmania*: drug resistance; molecular epidemiology; and integration of genomics, metabolomics and clinical research.

In our research on drug resistance, we aim to understand the mechanisms of drug resistance and its relationship with treatment outcome. Saskia **Decuypere** experimentally showed that natural antimony-resistance in *L. donovani* is heterogeneous on cell biological level; however changes in central players of oxidative stress defense are a recurrent feature. In *L. braziliensis*, Vanessa **Adaui** encountered very few molecular differences in antimony-resistant strains, and it is likely that in this model host factors play a more important role in treatment failure. In the frame of our new Kaladug-R project we started clinical and experimental work on resistance to miltefosine.

Our second research line concerns molecular epidemiology. We generated new species-specific tools and validated them for leishmania of the Old World as well as for the New World. We introduced two new

fingerprinting methods in the lab: AFLP (amplified fragment length polymorphism) and MLMT (multilocus microsatellite typing). We applied those for strain tracking (upcoming PhDs of Samwel **Odiwuor** and Vanessa **Adaui**, PhD of Narayan **Raj Bhattarai**). We deployed our whole battery of molecular tools in support of the Kalanet project and provided an innovative picture of the dynamics of the leishmania infection in humans as well as in domestic animals. In the new FP7-project “Chagasepinet”, our role will be to develop, evaluate and disseminate PCR-RFLP tools for the identification of the discrete typing units of *Trypanosoma cruzi*.

We continued to integrate genomics, metabolomics and clinical research. The GeMInI project (see highlight in 2008 report) ran the whole year, with alternation of stays of the two postdocs in the partner institutions. The reference genome of *L. donovani* BPK282/0 cl4 (a Nepalese strain from our previous clinical studies) is in the annotation phase; we combine high-throughput sequencing runs on 454 and Solexa technology. In addition, 20 DNA samples of the same species were fully sequenced. Comparison with the reference genome provided us a first glance on the diversity among *L. donovani* populations. Protocols for metabolomics are being optimized and the first analysis of 8 strains highlighted an extensive metabolomic diversity.

Networking remains a major activity of our unit. The Leishrisk project (www.leishrisk.net) ended in June 2009 after a last formal meeting of the steering committee, but a strategy was designed to further coordinate leishmaniasis research among European and Southern partners. One of its first fruits was the organisation of an EC thematic workshop on neglected diseases from Latin America in November 2009 in Lima, Peru.

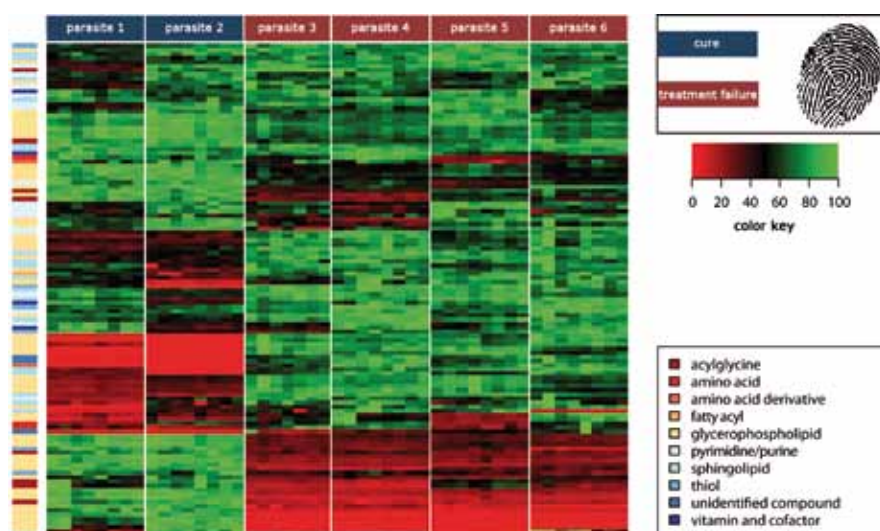
The GeMInI group organised a workshop to demonstrate the developed software for metabolomics analysis (December 2008, University of Strathclyde, Glasgow, Scotland). We also were co-convenors for a workshop to discuss standard operating protocols for analysis of parasite metabolomics (May 2009, University of Glasgow).

In the frame of the Leishepinet-SA project, Gert **Van der Auwera** co-organised a training course on molecular epidemiology of leishmaniasis (May 2009, Instituto Oswaldo Cruz, Rio de Janeiro).

We were also involved in the organization of the annual ITM colloquium on neglected tropical diseases of Latin America (November 2009, Lima, Peru). This was also an opportunity to celebrate 20 years of collaboration with the conference host, the Instituto



How to find a trypanosome. Training of paramedics in Mugumu, Tanzania.



Metabolomic fingerprint of 6 *L. donovani* strains, illustrating their important biochemical diversity.

de Medicina Tropical Alexander von Humboldt, and to celebrate Prof Dominique **Le Ray** who was a pioneer in the collaboration with Latin America (see highlight page 112). Directly after the colloquium, Jean-Claude **Dujardin** and Ole **Olesen** (European Commission) organised a workshop to list thematic priorities for research funding on neglected infectious diseases of Latin America,

Unit of Epidemiology and Control of Parasitic Diseases

We continued to work on malaria, along 4 main research lines, i.e. antimalarial drug resistance and the efficacy of new drugs or drug combinations; malaria in pregnancy; malaria epidemiology (including malaria-HIV interactions); the evaluation of new interventions. In addition, we continued our efforts to reproduce the *Plasmodium vivax* cycle *in vitro*, without the need to breed mosquitoes.

In July 2009, the EDCTP-funded project “Evaluation of 4 artemisinin-based combinations for treating uncomplicated malaria in African children” (4ABC) ended the follow-up of the patients (4 112 in total). We continued the genotyping of recurrent infections; the database lock is planned for April 2010. EDCTP has granted a no-cost extension until June 2010.

In Burkina Faso we continued the comparison of *in vivo* and *in vitro* efficacy of amodiaquine-artesunate and artemether-lumefantrine (as part of the MALACTRES project funded by the European Commission). We are looking at point mutations linked to drug resistance. Field work should end in 2010.

We prepare a clinical trial on the safety and efficacy of several artemisinin-based combination treatments in pregnant women with malaria, funded by the EDCTP and the Bill and Melinda Gates Foundation (Malaria in Pregnancy Consortium). In 2009, the clinical protocol

was developed and submitted to ethical committees, and the agreements finalized with pharmacological companies to provide the study drugs. The study will be carried out in 4 countries (Burkina Faso, Ghana, Malawi and Zambia) and has the target of recruiting and treating 3 480 pregnant women with a *Plasmodium falciparum* malaria infection.

We continued our work on the interaction between HIV and malaria in Zambia. We completed our study on the impact of mefloquine prophylaxis on the evolution towards full-blown AIDS. The dataset is now being analyzed. We started a study on cotrimoxazole prophylaxis in HIV infected pregnant women.

Our unit supports the Clinical Research Unit on Malaria in Nanoro, Burkina Faso, headed by Dr Halidou Tinto. Several projects are jointly run, including a phase III trial of the malaria vaccine RTS,S produced by GSK.

Outside of Africa, we focus on the epidemiology and treatment of *Plasmodium vivax*. Both in Peru and in Vietnam, a cohort of *P. vivax* patients has been treated with chloroquine and primaquine; we now follow them up to detect new clinical episodes.

Unit of Medical Helminthology

We work on the epidemiology and control of parasitic helminth (worm) diseases, along 3 main research lines: host-parasite relationship and transmission dynamics of the parasite; immuno-epidemiology of host resistance and pathology; and integration of control. Collaborative projects and field research take place in Senegal, Cuba and DR Congo, with focus on schistosomiasis, soil-transmitted helminths, and helminth zoonoses (cysticercosis and toxocarosis).

In 2009, we continued our research collaboration on schistosomiasis in Senegal and DR Congo. In a EC-funded project in Senegal, we investigate which

innate immune responses are associated with down-regulation of acquired immune response, or conversely the development of pathology. To do so, we compare immunological profiles in population groups with contrasting patterns of infection and morbidity. Immunological analyses are ongoing and will be finalized in 2010. We received a grant from FWO to continue our investigations on the role of parasite genetic diversity in human *Schistosoma* infection and pathology in Senegal, in collaboration with the K.U.Leuven.

In DR Congo, a WHO research capacity strengthening project on the re-emergence and control of schistosomiasis with the INRB in Kinshasa is ongoing. We conducted parasitological school surveys and questionnaire-based surveys in health services in Kinshasa province; these will now be extended to Bas Congo province. Within this programme, we have trained several Congolese master students.

In Cuba, we collaborate with the Instituto Nacional de Higiene, Epidemiología e Microbiología (INHEM) and the Instituto de Nutrición e Higiene (INHA) in Havana, and the VU University of Amsterdam on helminth-nutrition interactions in relation to atopy. We carried out two large-scale cross-sectional studies on rural schoolchildren; the data are currently analysed. Follow-up studies on intestinal helminths and atopy are planned for 2010.

In 2009 we have considerably expanded our research lines on zoonotic helminth diseases (worm diseases that jump from animals to humans). We carried out a range of studies on human and porcine cysticercosis in DR Congo, in collaboration with the Unit of Veterinary Helminthology of ITM, and the Institut National de Recherche Biologique and Labovet in Kinshasa. Based on these studies, we conclusively confirmed the link between neurocysticercosis and acquired epilepsy in Kinshasa. We also found unexpected high prevalences of active cysticercosis in rural Bas-Congo. Similar studies, on cysticercosis and toxocariasis, are under way in Cuba, in collaboration with the Instituto de Medicina Tropical Pedro Kourí. Finally, FWO has granted a project on host-parasite interactions in cysticercosis in cooperation with the ITM Unit of Veterinary Helminthology, and several Belgian and Dutch partners.

We have a close inter-departmental collaboration with the Public Health Department of ITM, to study the interface between global health initiatives, mass treatment campaigns and local health systems. The immediate reason were the integrated mass treatment campaigns of helminth infections, e.g. in Mali. These well-intended campaigns may disrupt the basal health services in these countries. For the next years we plan more collaborative research with our respective South partners in this field.



Sampling pigs in DR Congo for a study on human and porcine cysticercosis, caused by a pig tapeworm.

Highlights

Unit of Medical Entomology

Exploring the tsetse fly saliva: beyond the frontiers of knowledge

Many devastating parasitic diseases that affect humans and animals are transmitted by blood feeding insects. The insect is more than just a flying syringe: the parasite has to go through several rounds of differentiation and proliferation in different parts of the vector before it can be transferred to humans or cattle.

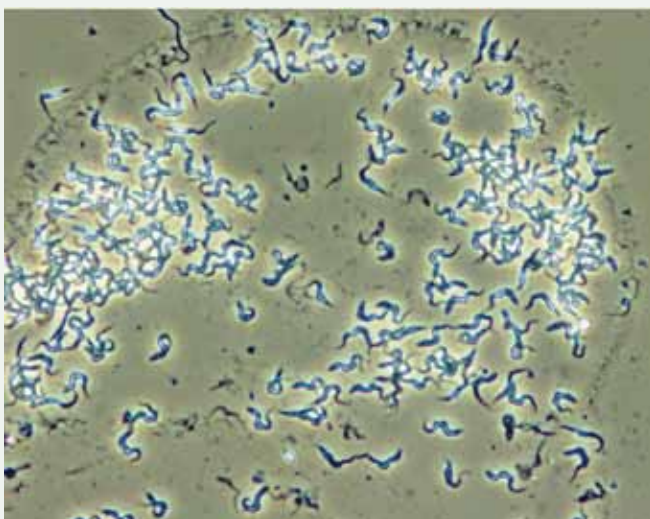
In the case of sleeping sickness (African trypanosomiasis), the protozoan parasite *Trypanosoma brucei* spp. is exclusively transmitted by the obligatory blood feeding tsetse fly (*Glossina* sp.), and only after successful completion of a complex developmental journey inside the tsetse fly.

Eventually, the parasite ends up in the salivary glands of the tsetse fly. These glands constitute a unique molecular environment that is needed for the development of a crucial stage of the parasite, the so-called metacyclic stage. Therefore, we focus on the salivary gland of the tsetse fly, and its molecular interplay with the parasite.

The tsetse fly 'salivary potion' contains at least 250 proteins. In most cases we do not know their function. Some of them may become novel pharmacologically active compounds, or innovative targets for blocking the transmission of the parasite, or immunological markers of vector exposure. Therefore, we try to unravel their biological role in the feeding behaviour of the fly and in the development of the trypanosome. We use a multidisciplinary experimental approach, from transcriptome to proteome and functional studies using recombinant technologies and RNAi silencing.

We also genetically modified *Sodalis glossinidius*, a bacterium that lives inside the tsetse flies (an endosymbiotic bacterium), and use it as a 'Trojan' horse to deliver peptides that target these trypanosome-tsetse fly interactions.

This kind of basic research is essential if we want to understand the intriguing biological relationship between vector and parasite, the key to disease transmission. The long-term goal of these novel insights is to identify alternative levers to disrupt transmission of the disease.



Metacyclic *Trypanosoma brucei* parasites extruded by a tsetse fly bite.

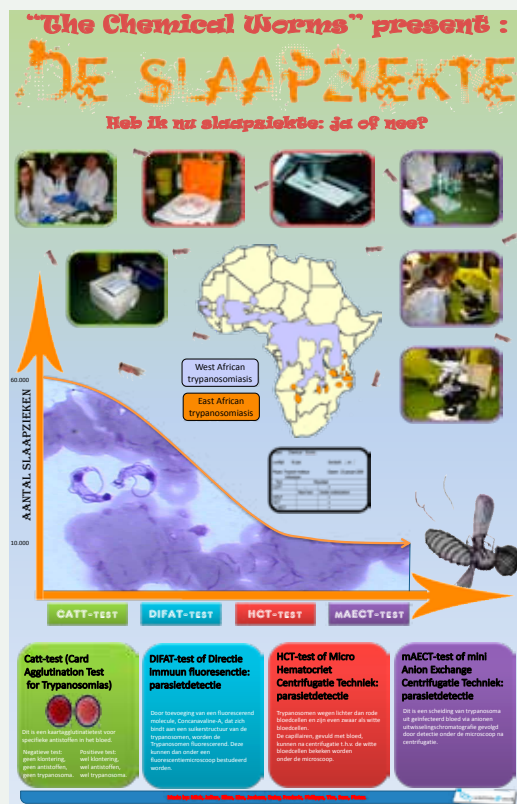
Highlights

Unit of Parasite Diagnostics

Successful “scientists for 1 day”

How to stimulate secondary school students to opt for a career in science or even in tropical medicine? Most secondary schools lack the facilities to carry out ‘real life’ experiments. In 2003, VIB launched an initiative called scientists@work that gives second and third grade secondary school students and their teachers the opportunity to visit academic and industrial laboratories and to carry out experiments. So they become “scientists for 1 day”. More information can be found on www.scientistsatwork.be.

Since 2005, the Unit of Parasite Diagnostics participates in this successful initiative and invite students to learn more about sleeping sickness. On January 23, 2009, 11 students from the Sint-Carolus School in Sint-Niklaas visited ITM. For a full day, they discovered the trypanosomes that cause sleeping sickness and performed a range of diagnostic techniques, from the card agglutination test for trypanosomiasis (a rapid screening test that was developed at ITM), to the mini-Anion Exchange Centrifugation Technique, a more sophisticated confirmation test. The students prepared an excellent report, for which they were selected as one of the 10 laureates that were invited to display a poster and to give an oral presentation on May 13 at the Catholic University of Leuven.



Poster displayed by the Sint-Carolus secondary school at the scientist@work happening.

Highlights

Unit of Molecular Parasitology

Are goats a reservoir of kala-azar in Nepal?

In the Indian subcontinent, visceral leishmaniasis is considered an anthroponosis, a disease carried by humans that can infect other animals. In other words, humans are considered to be the 'reservoir' of the infection. There is no agreement between scientists why and how the parasite persists in humans between epidemics.

Therefore, we mapped *Leishmania* infections among healthy humans and animals in an active transmission focus in Nepal. The study was part of the Kalanet project and the PhD thesis of Narayan **Raj Bhattarai**. He and his co-workers collected samples from humans, goats, cows and buffaloes in a peri-urban ward of Dharan (Terai region) over a 4-months period. We assessed *Leishmania* infections by a molecular technique, PCR.

We found infections among humans (6%), cows (5%), buffaloes (4%) and goats (16%). With the aid of an 'intelligent map', a Geographical Information System, we found that infected humans and cattle tended to appear at the same spots. We analyzed several risk factors for human infection in a classification tree analysis. Infected goats ranked as the most important risk factor. These results, based on PCR-data, were confirmed by a parallel serological study. Though our data do not necessarily mean that goats constitute a reservoir host of *Leishmania donovani*, these observations warrant further investigation. If their role is confirmed, the implications for the control of visceral leishmaniasis in the region could be very important.



In Nepal, many animals live close to humans, but goats seem to play a special role in the transmission of kala-azar.

Highlights

Unit of Epidemiology & Control of Parasitic Diseases

'4ABC' evaluates anti-malaria drugs in African children

'4ABC' is probably one of the largest clinical trials on antimalarials ever done in sub-Saharan Africa. This EDCTP-funded project started in December 2005, but the recruitment of the first patient occurred only in July 2007. Since then, we recruited more than 4 000 children with uncomplicated *P. falciparum* malaria in 10 sites, distributed over 7 African countries (Burkina Faso, Gabon, Mozambique, Nigeria, Rwanda, Uganda, Zambia). The ITM coordinated the study and acted as a legal sponsor but obviously this project is a concerted effort including 14 other partners, of which 5 European and 9 African.

In this study we compare, head-to-head, the safety and efficacy of available malaria treatments, based on artemisinin (derived from a Chinese herb). To avoid – or at least slow down – the development of resistance against this drug of last resort, this drug always is given in combination with another one. The treatments are called artemisinin-based combination treatments (ACT). We compared the combinations artemether-lumefantrine, amodiaquine-artesunate, dihydroartemisinin-piperaquine and chlorproguanil-dapsone-artesunate. The latter last combination was withdrawn by its producer early 2008.

We followed the children not only for the standard 28 days after treatment, but also for the following 6 months. Children attending a health facility during this period were systematically screened for malaria. If they had a clinical attack they were treated and again actively followed for 28 days. We did so to determine how often retreatment was needed for the different ACT, and to assess the safety and efficacy of re-treatment.

Such a trial would not have been possible without the support of our Clinical Trials Unit, which organized and supervised all activities related to compliance with 'Good Clinical Practices'. The genotyping of blood samples from patients with a recurrent infection is about to be completed and the dataset locked. We expect that the first results, available by mid-2010, can help policy makers in making an informed and evidence-based choice on the best ACT(s) for their own settings and country.

The 4ABC trial is also the first ever with the ITM acting as legal clinical sponsor, under the EU directive 40/100 and the Belgian legislation of 2004.

Highlights

Unit of Medical Helminthology

On the Origin of Worms

Tine Huyse and Bruno Gryseels took part in the VPRO/Canvas television project “Beagle – In Darwin’s wake” (“Beagle - In het kielzog van Darwin”) in which scientists recreated Charles Darwin’s historic voyage, while conducting or demonstrating evolutionary sciences. Tine and Bruno sailed between San Salvador de Bahia and Rio de Janeiro in Brazil, working on samples collected on shore with Brazilian colleagues, and demonstrating a unique evolutionary experiment. The human parasite *Schistosoma mansoni* was introduced to South America by African slaves in the 16th century. With modern molecular tools they compared DNA from *Schistosoma* worms from Senegal with those they collected in Brazil. They conclusively confirmed that the South American worms have their origin in West Africa. Also, they found a drastic reduction in genetic variation in South America as compared to Africa, indicating an ‘evolutionary bottleneck’ during the transatlantic slave trade. The South American parasites have thus descended from a limited number of worms that survived the atlantic crossing. The experiment shows us that modern genetic techniques allow us to study the evolutionary processes more precisely than ever, which in turn helps to tackle health problems much more directly. Their demonstration also referred to the important role of Darwin and his family in the fight against slavery.



Bruno Gryseels and Tine Huyse collecting snails in a favela in Salvador de Bahia, Brazil. The snails harbour the parasitic *Schistosoma* worm.

Highlights

Unit of Medical Helminthology

Crossing the species barrier

During our genetic studies of schistosomiasis in Senegal, we discovered a crossing (a bidirectional introgressive hybridization) between a livestock and a humane schistosome species. This implies that at least one of the worms switched from cattle to people or vice versa, raising the possibility of an emerging zoonosis. Hybridization between schistosomes under laboratory conditions has shown to result in hybrid vigour (higher fecundity, faster maturation time, wider intermediate host spectrum). A more vigorous parasite of course is bad news for patients and doctors. If this new hybrid exhibits the same hybrid vigour, it could develop into an emerging pathogen – think about flu pandemics, which also are caused by a new hybrid. This necessitates alternative control strategies in zones where both parental schistosome species overlap.

Our resulting PLoS paper was instantly recommended by the Faculty of 1000 Biology: 'The report by Huyse and coauthors is of potentially significant public health importance because it documents the emergence of hybrid strains of schistosomes that are evolving in Senegal and Mali through interbreeding between human schistosome *S. haematobium* and the cattle parasite *S. bovis*'



Lac de Guiers in northern Senegal, where the new hybrid worm was found. Intimate contact between humans and animals makes it easier for the parasite to jump from one host species to another.

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.

Unit of Epidemiology and Control of Parasitic Diseases

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, 80304

Evaluation of 4 artemisinin-based combinations for treating uncomplicated malaria in African children

ITM promoter: Umberto D'Alessandro

Support 525201: Medicines for Malaria Ventures, Switzerland

Support 80304: European and Developing Countries Clinical Trials Partnership, The Netherlands

Ref. 625201

Antimalarial combination treatments in African pregnant women with *P. 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: ITM (SOFI), others

Unit of Parasite Diagnostics

Ref. 315504

Comparative epidemiology of genetic lineages of *Trypanosoma cruzi* (ChagasEpiNet).

ITM promoter: Philippe Büscher

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. 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: VLIR, others

Ref. 755053

Polyclonal B-cell activation in human African trypanosomiasis: impact on acquired immunity and on rapid diagnostic tests.

ITM promoter: Philippe Büscher, co-promoter: Johan Van Griensven

Support: ITM (SOFI)

Unit of 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. 425401

Molecular exploration of *Leishmania donovani* parasites during a bednet intervention for the control of visceral leishmaniasis in Nepal and India

ITM promoter: Jean-Claude Dujardin

Support: Research Foundation Flanders, Belgium

Ref. 755043

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: Baillet Latour Foundation, ITM (SOFI), others

Unit of Medical Entomology

Ref. 100243

Tsetse flies and the control of African sleeping sickness

ITM promoter: Jan Van Den Abbeele

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. 415103

Dynamic predictive mapping using multi-sensor data fusion: demonstration for malaria vector habitat

ITM promoter: Marc Coosemans

Support: Federal Science Policy Office

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 arthropod vector surveillance for human public health.

ITM promoter: Marc Coosemans

Support: Avia-Gis, Belgium

Unit of 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. 745004

Epidemiology and control of schistosomiasis in DRC today

ITM promoter: Katja Polman

Support: WHO, ITM, others

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)

ASHENAFI TAFESSE Hagos. Control of equine trypanosomiasis in the highlands of Ethiopia.
Promoters: P. Büscher (ITM), B. Goddeeris (K.U.Leuven), G. Feseha (Addis Abeba University, Ethiopia)

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

DE VOOHT Linda. The construction of tsetse flies refractory to *Trypanosoma brucei* by expression of trypanolytic agents through their symbionts.
Promoters: M. Coosemans (ITM/University of Antwerp), J. Van den Abbeele (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 laboratory- and field strains of the zoonotic *Leishmania infantum* parasites.
Promoters: J-C Dujardin (ITM), L. Maes (University of Antwerp)

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)

MUMBA Dieudonné. Etude sur le raccourcissement du suivi des patients traités pour la Trypanosomiase Humaine Africaine.
Promoters: P. Büscher, M. Boelaert (ITM), P. Cras (University of Antwerp), J.J. Muyembe-Tamfum (Institut National de Recherche Biomédicale, Kinshasa, DR Congo)

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

NAHUM Alain. *Plasmodium falciparum* resistance to chloroquine : genetic determinants and implications for malaria morbidity among children living in the coastal lagoon area of Benin, Western Africa.
Promoters: U. D'Alessandro (ITM), M. Coosemans (University of Antwerp), A. Massougbodji (Université d'Abomey – Calavi, Cotonou, Bénin)

OBSOMER Valerie. Spatial temporal impact of environmental factors on malaria transmission dynamics.
Promoters: M. Coosemans (ITM), P. Defourny (Université Catholique de Louvain)

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, P. Van den Bossche (ITM), L. Maes (University of Antwerp), J. J. Muyembe-Tamfum (Institut National de Recherche Biomédicale, Kinshasa, DR Congo)

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

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, Ouagadougou, 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)

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

VAN DEN EEDE Peter. Developing an analytic method to distinguish reinfections from recrudescence and relapses.
Promoters: U. D'Alessandro (ITM), J. Anné (K.U.Leuven)

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)

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)

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

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. In 2009, we further developed an integrated quality system in our laboratories and became a partner of the “Collaborating Centre for Training in Integrated Livestock and Wildlife Health and Management” of the World Organization for Animal Health (OIE). We were also recognized as OIE reference laboratory for theileriosis.

Changes of staff

Stanny **Geerts**, current head of the Unit of Veterinary Protozoology and deputy chairman of the department, retired in July 2009, after a very fruitful career, of which 35 years were spent at the ITM. Other staff members who left the department are Nynke **Deckers**, after defending her PhD thesis and 9 months on a postdoctoral grant, and Ellen **Van Damme**, who worked for one and a half year in the Unit of Control of Livestock Diseases.

We also welcomed new staff members in 2009. Séverine **Thys** joined the unit of Control of Livestock Diseases, where she will work on socio-economic aspects of zoonotic diseases in developing countries. After defending his PhD thesis, Michiel **Janssens** was appointed as a postdoc researcher in the SOFI-B project on immune evasion of Trypanosomes. Ellen **Bakkers** and Inne **Pauwels** strengthened the laboratory support of the department.

Unit of Veterinary Protozoology

Our unit concentrates on bovine tick-borne diseases and on African animal trypanosomiasis (sleeping sickness). We used a molecular epidemiological approach to study the risk of classical *Theileria parva* introduction from the buffalo wildlife reservoir in Southern Africa. We developed a new Theileria

diagnostic assay (based on FRET); a characterization method based on a ‘gene chip’ (a micro-array); markers to follow attenuation of *annulata* cell cultures and virulence differences between *T. parva* isolates. We initiated a new approach towards vector control, by using oral vaccination against concealed tick antigens. A major Sofi-project aims at a model for transfections of *T. parva*.

In the field of animal sleeping sickness, we work on (i) the epidemiology of the disease, (ii) the epidemiology of the resistance of trypanosomes against drugs, (iii) molecular diagnostic tools for improved detection of this resistance, (iv) new therapeutic strategies and finally (v) support as FAO Reference Centre for Livestock Trypanosomiasis to Sub-Saharan regional laboratories, mainly in Burkina Faso and South Africa. With the Centre International de Recherche-Développement sur l’Élevage en zone Subhumide (CIRDES) in Burkina Faso, we set up a West African epidemio-surveillance network for a better diagnosis of infection and drug resistance in livestock trypanosomes. The partner countries are Benin, Burkina Faso, Ivory Coast, Ghana, Guinea Bissau, Mali, Niger and Togo. Blood samples are collected on filter paper and processed at CIRDES, for centralization of the data. We developed a new therapeutic strategy against resistance in trypanosomes, by associating tetracyclines or fluoroquinolones to isometamidium chloride.

“We initiated a new approach towards vector control by using oral vaccination against ticks”

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. We studied the transmission dynamics of this tapeworm, which infects humans and pigs, in Ecuador, Zambia and DR Congo, India and Nepal.

In November 2009, we organised an international workshop of our Strategic Network on Zoonoses. (www.onehealthnet.be). Following that workshop, we initiated a multi-country assessment of disease and economic burden of cysticercosis and neurocysticercosis (a cause of epilepsy) in Ecuador, Vietnam, India, DR Congo and Burkina Faso, using questionnaires, immunodiagnosis, neuro-imaging and electro-encephalograms.

In a large field study in North Cameroun we demonstrated that immunisation of village pigs with a recombinant vaccine against the tapeworm can break the life cycle of the parasite, and thus the transmission to humans.



Cattle passing the dipping tank

In the laboratory, we improved tests for diagnosis of taeniosis and cysticercosis in humans, cattle and pigs. Some of these tests detect circulating antigens with monoclonal antibodies or nanobodies. In another case, we collaborated with CDC Atlanta (USA) for the validation of the T24 ELISA for antibody detection in *T. solium* cysticercosis. We produced antibodies for coproantigen detection and developed better penside tests. We validated existing techniques for antigen detection in serum, urine and saliva.

In a collaborative study of the epidemiology of fasciolosis, an emerging zoonosis in Central Vietnam, we demonstrated the presence of *Fasciola* hybrids in cattle and goats, and proved the reservoir role of cattle. In North Vietnam, we started epidemiological studies on trichinellosis that has recently emerged in two provinces. We further worked on protozoan infections in non-human primates, including molecular identification of *Giardia* and *Entamoeba* spp.

Nynke **Deckers** successfully defended her PhD thesis on “Serological markers for improved diagnosis of porcine cysticercosis”. Our unit currently supervises 6 PhD students of which four are expected to defend in 2010.

Unit of Control of Animal Diseases

Our unit focuses on appropriate strategies for the control of major livestock diseases in developing countries. We study the local epidemiological situation, identify appropriate control tools and test them in priority areas. Research on the behaviour and perceptions of the people involved, supports the development and implementation of veterinary control interventions.

In collaboration with the University of Pretoria, we conducted a study in a subsistence farming area adjacent to the Kruger National Park (KNP). We assessed the particularities of the livestock production system, and determined the demand for animal health care and the decision making-process of the livestock owners.

In a similar area, we continued investigating factors contributing to outbreaks of foot and mouth disease at the wildlife/livestock/people interface. With remotely sensed tracking devices we determined the seasonal movement patterns of cattle in such subsistence livestock production systems.



Early morning gathering at a dipping tank before starting surveys with the farmers of the Mnisi community.

Our research on zoonoses was carried out in South Africa and Morocco. In South Africa (KwaZulu Natal), we sampled communal cattle and correlated the prevalence of tuberculosis and brucellosis to those of neighbouring buffaloes. In Morocco (High-Atlas), we organized focus group meetings to evaluate people's perception of hydatidosis and studied risk behaviours such as dog keeping and slaughtering hygiene. Hydatidosis is caused by *Echinococcus granulosus*, a tapeworm of dog and sheep, transmissible to man.

Livestock trypanosomiasis (nagana) is a major vector-borne endemic disease affecting large parts of sub-Saharan Africa and a cause of substantial economic loss. We investigated the role of environmental factors on the susceptibility of tsetse flies to trypanosomal infections, in collaboration with the Centre International de Recherche-Développement sur l'Élevage en zone Subhumide (CIRDES, Burkina Faso) and ITM's Department of Parasitology (Unit of Entomology).

Laboratory studies as well as field observations indicate that the trait for South Africa susceptibility to infection is not fixed but flexible, and that is affected by the environment of the tsetse fly. We examined a test to quantify tsetse challenge, the tsetse anti-saliva antibody ELISA.

In Burkina Faso, Ghana and Mozambique, we continued to support the development of appropriate strategies for the control of livestock trypanosomiasis, as part of the Pan African Tsetse and Trypanosomiasis Eradication Campaign (PATTEC).

We coordinated for the last time training. The courses in animal health and production for countries of the Southern African Development Community (SADC). Over the past three years, 172 trainees from 14 SADC countries attended the training courses. For this programme we worked together with the Sokoine University of Agriculture (Tanzania), the Centre for Ticks and Tick-Borne Diseases (Malawi), the Eduardo Mondlane University (Mozambique) and the University of Pretoria (South Africa). It is financially supported by the EU-funded PRINT programme (Promotion of Regional Integration).

Unit of Epidemiology and Biostatistics

We studied the incidence and risk factors of brucellosis in domestic species (cattle, water buffalo, goats, sheep and pigs) in Africa, South-East Asia and South America and demonstrated that the disease burden is clearly underestimated. We combined longitudinal studies in sentinel herds and cross-sectional surveys to study the evolution of incidence in time and space.

The absence of a 'gold standard' for the diagnosis of brucellosis remains a major hurdle. We continue to evaluate the standard diagnostic tests, in collaboration with the Belgian Central Veterinary and Agrochemical Research Institute (CODA-CERVA) and the University of Liège (Department of Animal Health). Special attention goes to the antigens used as they may not be optimal for use in the tropics.

In simulation studies we studied the negative relationship between total uncertainty in the system and optimal sample size, within a Bayesian framework. We further developed the Bayesian approach to the analysis of multi-testing results, to allow the inclusion of random effects into the models. We applied our approach to prevalence studies of canine leishmaniasis, campylobacteriosis, giardiasis and cryptosporidiosis.

We are also involved in a prioritisation study of zoonoses in Belgium. Furthermore, we developed rule-based simulation tools to better understand immunological responses against cysticercosis and interactions between vectors and human and animal hosts in leishmaniasis. In line with the latter work, we remain responsible for the vector ecology component in the Institutional University Cooperation Partnership with Ethiopia, a project of the Flemish Interuniversity Council.

We also continued our collaboration with the Institute of Health and Society of the Université Catholique de Louvain, allowing us to frame our work within a broader public health context.

We provide support for experimental and survey design and statistical analyses to other units and departments of ITM. Our staff members serve on national and international scientific bodies and committees dealing with zoonoses, animal health and food safety (FASFC, EFSA, WHO-FERG).



Looking for tapeworm larvae in the carcass of a calf.

Highlights

Unit of Veterinary Protozoology

Stanny Geerts emeritus

Stanny Geerts worked for more than 30 years in the Department of Animal Health. He obtained his doctorate from Utrecht University in 1980, with a landmark thesis on cysticercosis. He went on to full professorship and was head of the department from 1989 till 1999. He was president of the Association of Institutes for Tropical Veterinary Medicine, and of the International Trypanotolerance Centre in Banjul, Gambia. He was widely recognized as a world authority in his field, and led the department to an international status.

Apart from his academic qualities, Stanny was known to all as honest, straightforward and diplomatic. Love for nature and care for the environment were important values to him. He devoted much of his life to food safety and to fair markets for small farmers.

Stanny was a gifted teacher, adored by his students, for whom the door was always open.

Stanny was also a pillar for the ITM as a whole, playing a determining role in the Direction Committee and the Academic Board. It was his explicit wish to leave room for a younger generation, which he had trained and shaped so well.



Stanny Geerts (center) in the field.

Highlights

Department of Animal Health

OIE Collaborating Training Centre

In May 2009, the Department of Animal Health became a partner of the “Collaborating Centre for Training in Integrated Livestock and Wildlife Health and Management” of the World Organization for Animal Health (OIE). This consortium is headed by the Department of Veterinary Tropical Diseases of the Faculty of Veterinary Science at the University of Pretoria. The six other partners are also South-African.

The training will be partly based on the successful web-based MSc programme in Veterinary Tropical Diseases that is organized jointly by the University of Pretoria and our Department. The training material will be presented on an interactive electronic delivery platform called “VetHub”, which includes blogs, interactive course material, videos, quizzes, discussions, news bulletins on disease outbreaks or important research developments. The information will be presented at introductory as well as expert level, mostly free of charge. The VetHub should be opened by the end of 2010.



Collar cattle, entering the information age.

Highlights

Department of Animal Health

*Circumventing drug resistance in *Trypanosoma congolense**

The livelihood of millions of farmers in sub-Saharan Africa is more than ever affected by nagana or 'sleeping sickness' in their livestock, as trypanosome-parasites become resistant against drugs. The existing compounds, in use for more than half a century, have become virtually useless, and pharmaceutical companies do not invest in new ones.

We may have found a breakthrough in the treatment of nagana, by combining two affordable veterinary antibiotics. Used alone, these antibiotics are not toxic for the parasites, but they interfere with the drug resistance against isometamidium chloride (ISM).

Screening in a mouse model selected tetracycline and enrofloxacin as best chemosensitizers. Next, we tested these 2 agents in three groups of six cattle infected with ISM-resistant *T. congolense*. We treated group A with ISM only, group B with ISM plus oxytetracycline and group C with ISM plus enrofloxacin. All animals of group A (ISM) became infected. In groups B and C (ISM plus antibiotic), 50% of the animals were completely cured (PCR negative for 95 days). The positive animals from groups B and C had lower and slower parasite burden. The impact of the disease on the Packed Cell Volumes was lower in groups B and C. We hope to mobilise pharmaceutical companies for partnerships to optimize the cost effectiveness of the associations.



Nagana is an important economic burden in sub-Saharan Africa.

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 319001

Integrated control of neglected zoonoses: improving human health and animal production through scientific innovation and public engagement

ITM promoter: Stanny Geerts

Support: European Commission, Belgium

Reference number 100222

Integrated Consortium on Ticks and Tick-borne Diseases

ITM promoter: Dirk Geysen, Pierre Dorny

Support: European Commission, Belgium

Reference number 100168

Control of the most important bovine haemoparasites in Morocco through immunisation methods

ITM promoter: Dirk Geysen, Pierre Dorny

Support: Institut Agronomique et Vétérinaire Hassan II, Morocco

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: Stanny Geerts

Support: ITM (SOFI), others

Unit of Veterinary Helminthology

Reference number 419006

National Reference Laboratory for Trichinella

ITM promoter: Pierre Dorny

Support: Federal Agency for the Food Chain Safety

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 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 promoter : Pierre Dorny

Support : VLIR

Reference number 748005

Institutional collaboration with Jimma University, Ethiopia, sub-project Zoonotic and Helminth Diseases

ITM promoter: Pierre Dorny (for the project zoonosis)

Support: VLIR, others

Unit of Control of Animal Diseases

Reference number 85582

Environmental changes in Africa and tsetse habitat fragmentation: epidemiological consequences and perspectives for control

ITM promoter: Peter Van den Bossche

Support: The Wellcome Trust, UK

Reference number 339001

Implementation and coordination of a training programme in Animal Health and Animal Production for the Southern African Development Community Region

ITM promoter: Peter Van den Bossche
Support: SADC PRINT Project, Botswana

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

Reference number 748005

Institutional collaboration with Jimma university, Ethiopia, sub-project Zoonotic and Helminth Diseases

ITM promoter: Peter Van den Bossche (for the project animal trypanosomiasis)
Support: VLIR, others

Unit of Veterinary Epidemiology and Biostatistics

Reference number 429002

Flexible mathematical and statistical models for microbiological risk evaluation with emphasis on Bovine Spongiform Encephalopathy and variant Creutzfeld-Jacob Disease

ITM promoter: Dirk Berkvens
Support: Research Foundation Flanders, Belgium

Department of Animal Health

Ongoing PhD projects

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

ASSANA Emmanuel. Vaccination against porcine cysticercosis and analysis of immune correlates of protection in Cameroon. Promoters: S. Geerts (ITM), P. Dorny (Ghent University), A. Zoli (Université de Dschang, Cameroon)

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 (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. Van den Bossche, S. Geerts (ITM); S. Mukaratirwa (University of Zimbabwe, Zimbabwe)

CURAY-CARRERA Pablo. The role of cysticercosis as a cause of neurological disorders in Ecuador. Promoters: P. Dorny (ITM, Ghent University), W. Bénitez-Ortiz (CIZ Universidad Central del Ecuador, Quito, Ecuador)

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

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 Trypanotolerance Centre, Banjul, Gambia)

GONDWE Nkwachi. Study of the epidemiology of human and animal trypanosomiasis at the game/cattle/domestic interface of the Nkhotakota Game Reserve, Malawi. Promoter: P. Van den Bossche (ITM)

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

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

LEVECKE Bruno. Gastrointestinal parasitic infections in captive non-human primates.
Promoters: P. Dorny (ITM), J. Vercruysse (Ghent University), F. Vercammen (Royal Zoological Society of Antwerp)

MWAPE Kabemba. Epidemiological study of human tapeworm infections in communal areas of Zambia.

Promoters: P. Dorny (ITM), J. Boomker (University of Pretoria, South Africa)

MWEEMPWA Cornelius. Environmental changes in Africa and tsetse habitat fragmentation: epidemiological consequences and perspectives for control.

Promoter: P. Van den Bossche (ITM)

NGUYEN Thi Giang Thanh. Zoonotic fasciolosis 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'une réseau d'épidémio-surveillance.

Promoters : D. Berkvens (ITM), C. Saegerman (University of Liege), Kiram Djibrine (Laboratoire de Recherches Vétérinaires et Zootechniques de Farcha, N'Djamena, Chad)

PRAET Nicolas. Epidemiology of *Taenia solium* cysticercosis : transmission dynamics and burden of disease.

Promoters: P. Dorny (ITM), C. Saegerman (University of Liège)

RAHMAN Anisur. Brucellosis in Bangladesh.

Promoters: D. Berkvens (ITM), C. Saegerman (University of Liege), 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)

SANOGO Moussa. Contribution à l'étude de l'épidémiologie de la brucellose animale en Côte d'Ivoire : caractérisation bactériologique et moléculaire des souche de *Brucella* ssp. présentes chez le bétail.

Promoters: D. Berkvens (ITM), C. Saegerman (University of Liege), Y. L. Atse-Achi (Laboratoire National d'Appui au Développement Agricole, Abidjan, Côte d'Ivoire)

SECKA Arss. The prevalence, risk factors and options for the control and prevention of porcine cysticercosis in the Gambia and Senegal.

Promoters: S. Geerts (ITM), E. Van Marck (University of Antwerp), A. Schönefeld (International Trypanotolerance Centre, Banjul, the Gambia)

SIBEKO Kgomo. 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)

VANDAMME Ellen. Contributions to understanding decision-making in animal disease control.

Promoters: P. Van den Bossche (ITM); G. Van Huylenbroeck (Ghent University)

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, W. Van Bortel (ITM), L. Duchateau (Ghent University)





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 diagnostics and preventive tasks in these fields 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 specialisation course on medical mycology, the international short course on antiretroviral treatment (SCART) with its distance learning counterpart e-SCART, and the short course in clinical research and evidence based medicine (SCREM). Overseas, education concentrates on HIV/AIDS, tuberculosis and malaria care, clinical decision making and evidence based medicine.

Unit of Tropical and Travel Medicine

We focus on imported diseases, travel risks, tuberculosis and malaria. Within the TropNetEurop, we collaborated on criteria for ambulatory treatment of malaria, the imported schistosomiasis and dengue fever. Together with the Unit of Tropical Laboratory Medicine, we finalised studies on molecular diagnostics for intestinal parasites and of rapid malaria tests. 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 finalised and the KABISA decision aid for imported diseases was tested in several clinics in Europe.

In Rwanda, we continued our research on the diagnosis of tuberculosis in children, HIV diagnosis in infants, delay and adverse reactions of tuberculosis treatment in adults. In Nepal, we collaborated in a meta-analysis of delay in tuberculosis treatment. In Burkina Faso we analyzed the data of a clinical trial of rapid diagnostic tests for malaria.

Unit of Tropical Laboratory Medicine

We completed the 'Problem Based Learning' course for biomedical students in the course of Tropical Medicine and International Health.

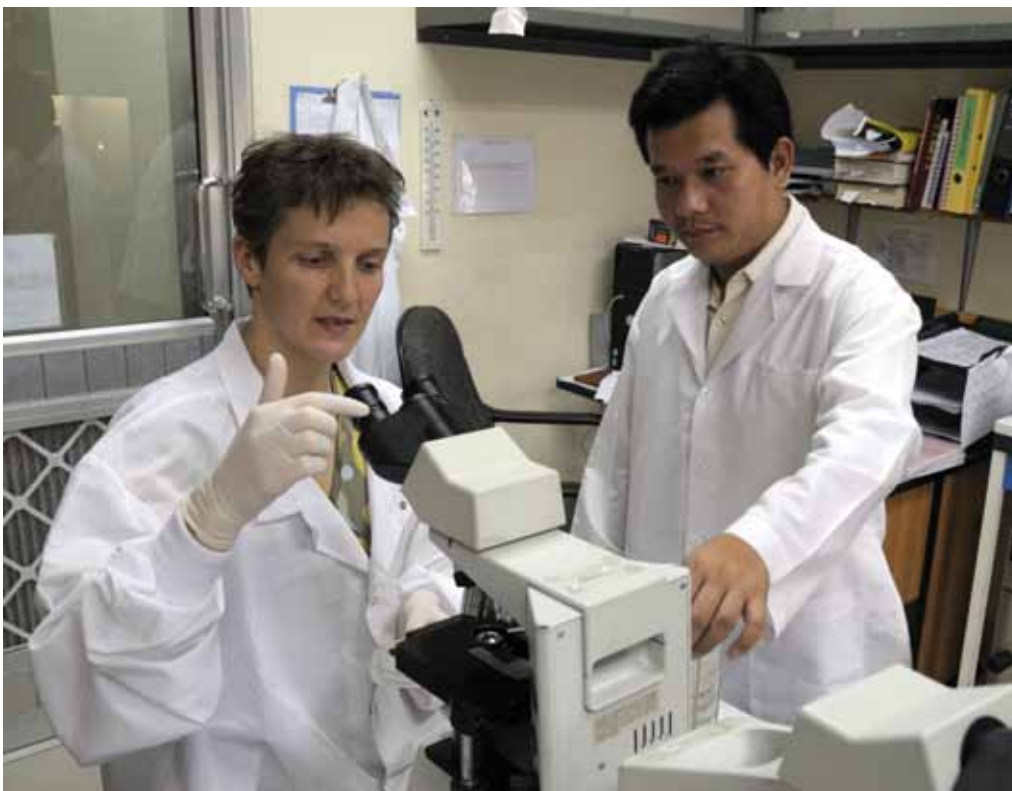
We expanded our overseas activities, with a focus on antimicrobial resistance in resource poor settings. We set up of microbiological analyses with resistance typing in the DR Congo, Cambodia and Peru, including the implementation of standard antibiotic treatment guidelines. In Cambodia, special attention was paid to the microbiological aspects of melioidosis, caused by *Burkholderia pseudomallei*. In addition, we expanded our activities in laboratory quality management with projects on biosafety. We included the Provincial Hospital in Tete, Mozambique in the partnership.

“We expanded our activities in laboratory quality management with projects on biosafety”

Unit of HIV/AIDS & STD Care

The ITM STD/HIV outpatient clinic participated in several multi-centre clinical trials on HIV/AIDS, including treatment strategy studies, therapeutic vaccination and investigational drug trials. We participate also in the EuroSIDA network. In the South, our main focus is on AIDS, tuberculosis and related diseases. We concentrate our efforts on institutional collaborations with clinical or diagnostic centres in Lima, Peru (Institute of Tropical Medicine of the Universidad Peruana Cayetano Heredia); 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); Ethiopia (Jimma University); Mozambique (Tete Regional Hospital).

We investigate the co-infection of HIV and tuberculosis, the immune reconstitution inflammatory syndrome (IRIS) and antimicrobial resistance surveillance. We coordinate the International Network for the Study of HIV related IRIS (INSHI) and contribute to the International epidemiological database to evaluate AIDS (IeDEA) network of the Central African region. Our portfolio includes several EDCTP projects, a project to prepare a site in Uganda for Phase III tuberculosis vaccination trials and two antiretroviral second line treatment trials. 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.



Evaluating of the ‘Thin Layer Agar’ method to quickly check the drug sensitivity of the tuberculosis bacillus, in the Sihanouk Center of HOPE Hospital in Phnom Penh, Cambodia

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 of HIV/AIDS & STD Care

Reference number 83541

Treatment of HIV tuberculosis co-infection

ITM promoter: Robert Colebunders

Support: Research Foundation Flanders, Belgium

Reference number 100251

Antiretroviral therapy adherence study

ITM promoter: Robert Colebunders

Support: Family Health International, USA

Reference number 437308

Consolidation of HIV/AIDS treatment on public health level in Paramaribo, Suriname 2008-2009

ITM promoter: Robert Colebunders

Support: Centrum voor Informatie en Samenlevingsopbouw VZW, Belgium

Reference number 517308

Operational study of the 2006 WHO algorithm to improve the diagnosis of tuberculosis in adults in HIV prevalent settings

ITM promoter: Lutgarde Lynen

Support: World Health Organization, Switzerland

Reference number 747001

Outreach HIV testing for men having sex with other men

ITM promoter: Christiane Nöstlinger

Support: RIZIV, ITM, others

Reference number 747003

Epidemiologic database to evaluate AIDS, Regional Center in Region 9 - Central Africa

ITM promoter: Robert Colebunders

Support: various

Reference number 747004

Antiretroviral treatment and monitoring in the Democratic Republic of the Congo

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: European and Developing Countries Clinical Trials Partnership, The Netherlands

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: European and Developing Countries Clinical Trials Partnership, The Netherlands

Reference number 741903

A phase II trial of a new TB vaccine in African infants

ITM promoter: Robert Colebunders

Support: European and Developing Countries Clinical Trials Partnership, The Netherlands

Unit of Tropical and Travel Medicine

Reference number 427307

Rede Integrada II: AIDS care project in Tete, Mozambique

ITM promoter: Emmanuel Bottieau

Support: Flemish International Cooperation Agency, Belgium

Reference number 627108

Side effects and paradoxal reactions of the TB treatment in HIV-negative and positive patients in Rwanda

ITM promoter: Jan Clerinx

Support: Tibotec BVBA, Belgium, Unit of Tropical Laboratory Medicine

Department of Clinical Sciences

Ongoing PhD projects

AYANA ABEBE Gemed. 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)

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

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

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

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

MUWANGA Alice. Identification of optimal models for care for persons with HIV infection in limited resource settings.
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 Peruana 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)

TADDEGE DERIBUW 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)

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

WANYENZE Rhoda. Implementation of provider-initiated HIV testing and counselling (PITC) in Uganda: assessment of feasibility, approaches and outcomes of implementation.
Promoter: 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)

Department of Public Health



The Department of Public Health contributes to 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. Our research projects often involve several units, other ITM departments and external partners. In close interaction with research and policy development, teaching is a major activity especially through our Master in Public Health.

Unit of Public Health Management

Next to our normal teaching, we also taught at foreign universities (e.g. the Public Health Institute at the Pontificia Universidad Católica del Ecuador, Quito, and the Universidad de Antioquia, Medellín). The PhD thesis of Herland Tejerina (Bolivia) on the role of international aid in fragmentation and segmentation of the Bolivian health sector reached its final phase.

We finalised the EU-project HEPVIC on health policy making in Vietnam, India and China. The follow-up EU-project HESVIC will focus on regulatory governance capacity of China, India and Vietnam in maternal health, together with partners in Leeds, Amsterdam, Hanoi, Bangalore and Fudan. Also, we started the EU-project Equity-LA, to study the impact on equity of access and efficiency of integrated health care networks in Colombia and Brazil with partners in Barcelona, Bogotá and Recife.

We finalised our collaboration with the NGO CUAMM on a global health advocacy network, and consolidated the IDESAL network on research, teaching and service delivery for health in Latin America. PAHO pledged moral and political support to this network.

As in previous years, we supported the Public Health Institute of the Pontificia Universidad Católica del Ecuador, which developed an e-learning programme in public health. They also started up a field research project to retrieve lessons from successful health organisation projects.

Finally, we continued the coaching of 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 double nutritional burden in many developing countries: persisting under-nutrition on 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, children under the age of two, including the effect of improved maternal nutrition during pregnancy. We finalized two randomised clinical trials in Burkina Faso, one comparing a micronutrient mix with iron and folic acid supplements, the second assessing fortified food supplements during pregnancy. The studies are embedded in an international network under the auspices of WHO/UNU/UNICEF.

“Poor housing and socio-economic conditions were major risk factors for visceral leishmaniasis”

A second set of projects targets the improvement of nutritional quality and energy density of complementary foods, with particular emphasis on micronutrients. We study processing techniques and contaminants such as mycotoxins in a variety of contexts. A third set concerns promotional and preventive strategies that health systems can adopt to improve child growth and development. In Burkina Faso, we studied community based detection and rehabilitation of malnourished children and growth monitoring through the existing health system.

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 set up school based intervention studies in Ecuador.

Unit of Epidemiology and Disease Control

We study the integration, acceptability, cost-effectiveness and sustainability of disease control measures. In 2009, we finalised the visceral leishmaniasis (VL) KALANET intervention trial for VL in South Asia. We showed that long-lasting insecticide-treated bed nets are no alternative to indoor residual spraying in high-endemic regions in India and Nepal. In Bihar, India, we found that poor housing and socio-economic conditions were major risk factors, whilst keeping animals indoors was not.

In DR Congo we optimised control strategies on sleeping sickness, with the 'Institut National de Recherche Biomédicale' and other partners. We validated a thermostable screening test for use in peripheral health facilities, initiated health care seeking behaviour study, and evaluated serological tools for epidemiological surveillance. In collaboration with the National HAT Control Program, we initiated a pharmacovigilance project to improve monitoring of adverse effects and treatment outcomes of sleeping sickness care.



A health care worker talking to a young mother in Bangalore, India.



Studying the epidemiology of kala-azar (visceral leishmaniasis) in Bihar, India.

We started a validation study on diagnostic algorithms for tuberculosis meningitis and pleuritis, with the Institute of Tropical Medicine Alexander von Humboldt in Lima, Peru. In the same partnership we also study the roles of re-infection, household transmission and acquired drug resistance in the recurrence of tuberculosis. In Cuba, we collaborate with the Instituto Nacional de Higiene, Epidemiología y Microbiología (INHEM) and the Instituto Pedro Kourí (IPK) on tuberculosis transmission patterns, risk factors, and spatial distribution of tuberculosis. We also assess the impact and cost-effectiveness of active case finding in high risk groups. In Indonesia we validate new diagnostic tests for tuberculosis in field conditions.

We investigated environmental management strategies for the prevention of dengue fever with our partners in Cuba, and set up an intervention strategy combining insecticide treated curtains with targeted routine vector control. In South-East Asia and Latin America, we finalised randomised community trials on the acceptability and cost-effectiveness of various strategies for delivering new, insecticide-treated mosquito control tools.

We continued collaborative research with INHEM to guide the ongoing reorganization of the Cuban first line health services: evaluation of demand and use of health services, intervention research on the prevention

and follow-up of chronic diseases, introduction of participatory planning and evaluation in local health systems.

Unit of Health Care Management

We studied the impact of fair procedures in priority setting on general and human resources management in Tanzania, Kenya and Zambia, through the EU funded REACT consortium. The role of leadership style and people management of a commitment-eliciting type was further investigated in hospitals in Ghana and Tanzania. We finalised and published a study on the interaction between disease control programmes and general health care services in West Africa.

A randomized controlled trial of clinical audits in obstetrics is ongoing in Burkina Faso, Benin and Niger. We concluded and evaluated action-research on reproductive and sexual health of adolescents in urban settings in Cameroon, Mali and Burkina Faso.

A new research line, involving several PhD projects, was started up on how health care systems deal with chronicity. We collaborated with the Bangalore Institute of Public Health on the organization of community-based participation of pluralistic urban health systems.

We explored theory-based evaluation and synthesis to guarantee external validity when drawing lessons from particular field experience and case studies.

“Under-nutrition on one hand, and an explosive increase of diet-related chronic diseases and overweight on the other”

We provide scientific guidance to Belgian Technical Cooperation projects in Senegal and Niger. Our support to an EU-funded project in Thailand on quality primary care was finalised in 2009. One of the unit's members is since 2007 on a sabbatical at the Institut National d'Administration Sanitaire in Rabat, Morocco, for a project of capacity building and PhD training. We developed short courses in monitoring and evaluation of maternal and neonatal health programmes.

Unit of Health Policy and Financing

In 2009, we mainly consolidated our projects, focusing on four areas. A first one is health care delivery systems, with special attention for the impact of antiretroviral treatment and the human resource challenges of disease-specific programmes (EC project ARVMAC). In this area we started several PhD projects with our institutional partners in Uganda, India and DR Congo.

Social health protection is our second focus, with subjects as community health insurance, social assistance and free health care. We contributed vigorously to the international debate on user fees. A review of six recent experiences of user fee reforms in sub-Saharan Africa, commissioned by UNICEF, was released. We shared the findings with key actors, in New York in February, and in Dakar in November 2009. In the New York meeting, a consensus emerged that international agencies, including UNICEF, should actively assist governments that decide to remove user fees for children younger than 5 years and pregnant women.

The POVILL project (EC project Poverty & Illness) is coming to an end; findings are being processed for publication. The new HEFPA-project (Health Equity and Financial Protection in Asia), in consortium with 11 partners, was launched in Beijing in July. We will evaluate the impact of health equity funds in Cambodia. We also were involved in the organisation of the annual Belgian event “Be-Cause Health”, this year on Universal Coverage.

The third area of study is the changing role for government, private actors and civil society in increasingly pluralistic health systems. We explore the potential of performance-based financing in low-income countries. We act as a global knowledge broker in this rapidly developing field and co-organised a workshop at the Centre d'Etudes et de Recherches sur le Développement International (CERDI), Clermont-Ferrand (France). We provided feedback on the results of the study commissioned by the Medicus Mundi Internationalis network, on contracting between public health authorities and faith-based health care organizations. A national restitution workshop was organized in Kampala, Uganda, in collaboration with the Makerere University School of Public Health.

Our fourth theme is international health policy, which we follow up as part of the support to the Belgian Directorate-General for Development Cooperation, and within the European research consortium on the impact of Global Health Initiatives on African health systems. We participated actively in the WHO initiative “Maximising positive synergies between global health initiatives and health systems strengthening”. With the Helen De Beir Foundation we organized a conference in Brussels on “Global Responsibilities for Global Health Rights”. As part of the Strategic Network on International Health Policies, we compile a weekly Newsletter, and promote the involvement of Southern partners in international policies.

In collaboration with the Institute of Development Policy and Management of the University of Antwerp, we prepared a new short course focusing on health aid policies in low-income countries.

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 2009, we significantly expanded our activities, especially in ITM-sponsored studies. The 4-ABC malaria trial, looking at the efficacy and safety of several antimalarials in children, has recruited more than 4 000 patients in seven African countries and will be completed in June 2010. The PREGACT trial, aiming at determining the safety and efficacy of antimalarials in pregnant women, will start soon in Burkina Faso, Ghana, Malawi and in Zambia. The scientific supervision of those studies was assured by the Unit of Epidemiology and Control of Parasitic Diseases. With the Unit of HIV/AIDS in the Clinical Department and colleagues in Ethiopia we are preparing also a drug trial in HIV-leishmaniasis co-infection, to be sponsored by the ITM.

We are actively involved in the international debate on ethics of research and ICH/GCP standards in vulnerable populations.

Major questions we have to face, as a Belgian legal clinical sponsor, include:

- How to respect the universal standards in resource-constrained settings?
- How to avoid double standards?
- How to translate universal principles in contextualized procedures?
- How to maximize mutual learning between North-South and South-South?

We address these concerns through a Clinical Research Strategic Network, which brings together researchers from nine countries, and aims to build the capacity to conduct public health-oriented clinical research, according to universal ethical principles and methodological requirements.

Non-commercial clinical research in the South is of paramount importance, because major questions would otherwise not be addressed. In 2009, the network actively participated in two congresses (see the chapter on congresses).



In 2009 the 4ABC project was intensively audited, at the ITM and at the various trial sites. On the picture: site visit of auditors to Jinja, Uganda.

Highlights

Unit of Nutrition and Child Health

Food supplements during pregnancy can help

Maternal malnutrition in rural areas in low-income countries remains persistent, and has a negative influence on the growth of the foetus. Between 2002 and 2009 we implemented two randomised controlled trials in the Houndé health district in Burkina Faso, evaluating the effect of maternal nutritional supplementation on intrauterine and infant growth. These studies, including 2850 pregnancies, were conducted in collaboration with the Centre Muraz and the Institute for Research in Health Sciences in Burkina Faso, and the NGO Medicus Mundi Castilla-La Mancha. The first trial (2003-2006) compared the effect on birth outcome of prenatal multiple micronutrients with daily supplementation of iron/folic acid. The second trial (2006-2009) evaluated the effect of a food supplement enriched with multiple micronutrients, relative to those micronutrients in tablet form. Both studies demonstrated modest improvements in foetal growth. More importantly, we found that multiple micronutrients are only efficacious if the women initiate pregnancy in a well-nourished state. If undernourished mothers become pregnant, micronutrient supplementation appears only helpful if offered together with an additional energy and protein support. These results advocate a targeted supplementation approach for pregnant women in low-income countries.



Following up young mothers in Burkina Faso.

Highlights

Unit of Health Policy and Financing

Doctors from the South study Belgian social and health care services

Fourteen participants in the Master in Public Health at the ITM were invited to the village of Kruikebe to observe social and health care services in the average Belgian municipality. The students visited a pharmacy, a physiotherapist, the mother & child facility and a home for the elderly. They also interviewed service providers and policymakers.

The students were struck by the patient-oriented way of working, the continuity of care, the easy access to services, the fact that people actively seek medical help, and the institutionalized solidarity. But they also wondered whether the system is (financially) sustainable and how abuse can be avoided. And is there still a place for personal and familial solidarity if society provides all care?

By holding up a mirror to each other, both visitors and visitees learned a lot from the exchanges.



Interrogating local health care workers in Kruikebe.

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.

Unit of Epidemiology and Disease Control

Reference number 84590

KALANET: a community trial to assess the efficacy, acceptability and cost-effectiveness of long lasting insecticidal nets in the prevention of Kala-azar

ITM promoter: Marleen Boelaert

Support: European Commission, Belgium

Reference number 100164

Towards successful dengue control

ITM promoter: Patrick Van der Stuyft

Support: European Commission, Belgium

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 - TMRC Banaras Hindu University, India

ITM promoter: Marleen Boelaert

Support: National Institute of Health, USA

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

Unit of 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

ITM promoter: Bart Criel

Support: Belgian Technical Cooperation, Belgium

Reference number 526701

Policy analysis of user fee abolition in sub-Saharan Africa

ITM promoter: Wim Van Damme

Support: UNICEF, USA

Reference number 626601

Contracting study Ministries of Health and private non-for-profit sector

ITM promoter: Bart Criel

Support: Medicus Mundi International

Reference number 716115

Community health insurance in sub-Saharan Africa

ITM promoter: Bart Criel

Support: various

Unit of Health Care Management

Reference number 85541

EU Health Care Reform Project - Kingdom of Thailand

ITM promoter: Guy Kegels

Support: GTZ International Services, Germany

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: Guy Kegels

Support: European Commission, Belgium

Reference number 100182

Projet d'Approche Solidaire en Santé GENésique (PASSAGE): a project for the solidarity approach in reproductive health

ITM promoter: Guy Kegels on behalf of Vincent De Brouwere

Support: European Union, Belgium

Reference number 100230

Scientific follow-up of 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: Guy Kegels, Vincent De Brouwere

Support: European Commission, Belgium

Reference number 100261

Prevalence of circumcised women and of girls at risk of circumcision in Belgium

ITM promoter: Guy Kegels, Vincent De Brouwere

Support: Ministry of Social Affairs and Public Health, Belgium

Unit of Public Health Management

Ref. 100123

Health policy-making in Vietnam, India and China: key determinants and their inter-relationships

ITM promoter: Jean-Pierre Unger

Support: European Commission, Belgium

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

Unit of Nutrition and Child Health

Reference number 746007

Inter University collaboration Jimma, Ethiopia: nutrition and child health project

ITM promoter: Patrick Kolsteren

Support: VLIR, various

Department of Public Health Ongoing PhD projects

ASSAFA 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)

BALY Alberto. Cost and cost-effectiveness of vertical and participatory Aedes aegypti control and dengue prevention. Promoters: P. Van der Stuyft (ITM/Ghent University), S. Flessa (Ernst Moritz Arndt University of Greifswald, Greifswald, Germany)

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)

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)

DEVOS Pol. Strengthening public health systems: operational research in Cuban first line health services.
Promoter: P. Van der Stuyft (ITM/Ghent University)

HASKER Epco. Control of chronic infectious diseases in resource constrained settings.
Promoters: M. Boelaert (ITM); M. Borgdorff (Amsterdam University)

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)

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

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. Muyembe-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. Dietary 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)

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

MARCHAL Bruno. Well-performing healthcare organizations: What is 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 (K.U.Leuven)

MISRA Samarendra Nath. Aids care in the private sector, India.
Promoters: W. Van Damme, M. Boelaert (ITM), Preeti Mehta (Seth GS Medical College and KEM Hospital, Mumbai, India)

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)

OUEDRAOGO NIKIEMA Laetitia. 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. Contrôle 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)

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

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)

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)

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)

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)

Library and bibliometrics

Library and bibliometrics

In 2009, print and online journal subscriptions remained stable, with an overall availability range of over 6 000 online journals (including open access journals). The *EbscoHost Biomedical Reference Library* was replaced by the larger *Medline with Full Text* (over 1 400 journals, but often with embargoes). There was more change regarding database access: the *CABI* databases *Global Health* and *Veterinary Science* are no longer available from the *ERL* platform but now have a radically new retrieval interface named *OvidSP*. The twelve ITM library databases, however, remain accessible with *ERL's WebSpirs* and *WinSpirs* interfaces, but from late 2009 onwards also in a *Reference Manager* version. ITM researchers and students can now easily download from the library databases to their own *Reference Manager* bibliographic systems.

In comparison to journals and databases, electronic books remain rather scarce in the library. Next to the various CD-ROM editions, we acquired a number of online titles from publishers such as *Elsevier* and *Springer*. We also organized a trial of *Ingram's MyiLibrary*, a major e-books forum.

TropMed Central Antwerp (TMCA), the open access repository of ITM's scientific publications, now counting over 2 600 items. It was promoted internally with a workshop, an *ITGa-zet* feature and many appeals to ITM researchers. This resulted in hundreds of additional author pre- and post-prints, increasing the full-text ratio to over 30%. Externally, *TMCA* was incorporated in international harvesters such as *Driver*, *OAIster* and *Base*, resulting in 12 344 visits from 166 countries. In 2009 *TMCA* full text items were downloaded 40 655 times, 296 of which at least 50 times, 48 items over 100 times.

On the *DGDC Framework* front, collaboration with the *Centre de Documentation en Santé de l'Institut National d'Administration Sanitaire (CDS-INAS)* in Rabat, Morocco was intensified. In January the ITM librarian visited INAS and in June INAS librarian Mouloud Ben Abbou enjoyed a two weeks training at the ITM library.

Table: Summary of research output of the ITM, 2001-2009

Indicator	2001	2002	2003	2004	2005	2006	2007	2008	2009
Total number of publications	245	223	206	252	235	227	272	308	319
All journal contributions	164	180	166	205	191	203	240	262	275
Research papers only *	147	158	142	175	165	183	220	240	253
Papers in JIF - journals **	121	135	138	161	151	166	201	217	221
Research papers in JIF - journals *	107	114	117	135	130	149	183	198	198
Sum JIF values all contributions	425	490	510	596	561	790	897	833	1060
Average JIF all contributions	3.5	3.6	3.7	3.7	3.7	4.8	4.5	3.8	4.8
Sum JIF research papers *	327	317	348	364	338	626	642	730	743
Average JIF research papers *	3.1	2.8	3.0	2.7	2.6	4.2	3.5	3.6	3.8
Journal Impact factor (JIF) values based on	avg 01-05 JIFs					2006 JIFs	2007 JIFs	2007 JIFs	2008 JIFs

* excluding editorials, letters and published abstracts.

** JIF = Journal Impact Factor according to ISI Journal Citation Report

As a large part of our core literature has become available online on a 24/7 basis and attendance during evening hours and on Saturday mornings has decreased substantially in recent years, from this autumn onwards library opening hours have been reduced to weekdays only, from 8.30 AM to 6 PM.

Bibliometrics 2009

The publications output of 2009 was slightly above the level of the already excellent year 2008 (see table). The overall sum of journal impact factor (JIF) values is substantially higher, but when looking at full-text research papers only (i.e. excluding letters, editorials and comments) the results for both years are fairly close. Necessarily, these preliminary JIF totals and averages for 2009 were calculated on the *ISI Journal Citation Reports (JCR)* values for 2008, as those relating to 2009 have not yet been published. Also, certain recently established journals (e.g. *PLoS ONE*, with 8 ITM contributions) may gain JIF status from 2009 onwards and further improve current results.

The Malaria Journal has now joined *Tropical Medicine and International Health* as the most popular publication outlet. Then follow *PLoS Neglected Tropical Diseases*, *PLoS ONE*, *The American Journal of Tropical Medicine*, *International Journal of Tuberculosis and Lung Disease*, *Journal of Clinical Microbiology* and *Transactions of the Royal Society of Tropical Medicine and Hygiene*. 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. This year the electronic-only publications more than trebled to 64 items (20%) with *BioMed Central's The Malaria Journal* as the most popular title (14 articles), followed by the two *Public Library of Science (PLOS)* titles mentioned above.

Library Publications

- Schoonbaert D. Pubmed growth patterns and visibility of journals of sub-Saharan African origin [letter]. *J Med Libr Assoc* 2009; 97(4): 241-243.

- Schoonbaert D, Eysers AE, Eysers JE. Sources of information in tropical medicine. In: Cook GC, Zumla A, editors. *Manson's tropical diseases*; 22nd ed. [Philadelphia]: W.B. Saunders; 2009. p. 1783-1798.



ITM librarian Dirk Schoonbaert receives his colleague from the Moroccan Institut National d'Administration Sanitaire.

Library statistics 2009

Books

Acquisitions	410
Purchased	308
Donated	102
Total number of books	21283
Total number of CD-ROMs	269
Total number of videos	382
Total number of ITM dissertations	2739
Total number of digital master theses	1918

Journals

Print subscriptions	331
Volumes bound in 2009	401
Total number of volumes	35500
Online subscriptions	ca. 2200
Online package subscriptions	3
Open access journals	ca.4600

Databases

Electronic Reference Library (ERL)	
Number of databases	12
ITG Staff Publications: no. of records	12582
TropMed Antwerp: no. of records	2637
ERL logins	3880
Database logins	18997
Other database subscriptions*	4
Major free online databases	5

Document Delivery

Incoming requests	1532
Outgoing requests	1576
Success rate	96.9%
DGDC Framework requests	643
Success rate	97.5%
Photocopies & prints**	64980
Scans**	39039

User training

Teaching hours	35
----------------	----

* ISI Web of Knowledge (Thomson), Cochrane Library (Wiley)

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

ITM publications in 2008

Department of Microbiology

Publications in international peer-reviewed journals with impact factor

Affolabi D, Anyo G, Faïhun F, Sanoussi N, Shamputa IC, Rigouts L, Kestens L, Anagonou S, Portaels F. First molecular epidemiological study of tuberculosis in Benin. *Int J Tuberc Lung Dis* 2009;13(3):317-22.

Affolabi D, Faïhun F, Sanoussi N, Anyo G, Shamputa IC, Rigouts L, Kestens L, Anagonou S, Portaels F. Possible outbreak of streptomycin-resistant *Mycobacterium tuberculosis* Beijing in Benin. *Emerg Infect Dis* 2009;15(7):1123-5.

Best I, López G, Verdonck K, González E, Tipismana M, Gotuzzo E, Vanham G, Clark D. IFN-gamma production in response to Tax 161-233, and frequency of CD4+ Foxp3+ and Lin-HLA-DR high CD123+ cells, discriminate HAM/TSP patients from asymptomatic HTLV-1-carriers in a Peruvian population. *Immunology* 2009;128(1(pt2)):e777-86.

Delvaux T, Elul B, Ndagije F, Munyana E, Roberfroid D, Asimwe A. Determinants of nonadherence to a single-dose nevirapine regimen for the prevention of mother-to-child HIV transmission in Rwanda. *J Acquir Immun Defic Syndr* 2009;50(2):223-30.

Diacon AH, Pym A, Grobusch M, Patientia R, Rustonjee R, Page-Shipp L, Pistorius C, Krause R, Bogoshi M, Churchyard G, Venter A, Allen J, Palomino JC, De Marez T, van Heeswijk RPG, Lounis N, Meyvisch P, Verbeeck J, Parys W, De Beule K, Andries K, McNeeley DF. The diarylquinoline TMC207 for multidrug-resistant tuberculosis. *N Engl J Med* 2009;360(23):2397-405.

Dieltjens T, Heyndrickx L, Willems B, Gray E, Van Nieuwenhove L, Gruppig K, Vanham G, Janssens W. Evolution of antibody landscape and viral envelope escape in an HIV-1 CRF02_AG infected patient with 4E10-like antibodies. *Retrovirology* 2009;6(113):13.

Dieltjens T, Loots N, Vereecken K, Gruppig K, Heyndrickx L, Bottieau E, Vanham G, Davis D, Janssens W. HIV type 1 subtype A envelope genetic evolution in a slow progressing individual with consistent broadly neutralizing antibodies. *AIDS Res Hum Retroviruses* 2009;25(11):1165-9.

Durnez L, Sadiki H, Katakweba A, Machang'u RR, Kazwala RR, Leirs H, Portaels F. The prevalence of *Mycobacterium bovis*-infection and atypical mycobacterioses in cattle in and around Morogoro, Tanzania. *Trop Anim Health Prod* 2009;41(8):1643-59.

Durnez L, Stragier P, Roebben K, Abiordey A, Leirs H, Portaels F. A comparison of DNA extraction procedures for the detection of *Mycobacterium ulcerans*, the causative agent of Buruli ulcer, in clinical and environmental specimens. *J Microbiol Methods* 2009;76(2):152-8.

Eddyani M, Fraga AG, Schmitt F, Uwizeye C, Fissette K, Johnson C, Aguiar J, Sopoh G, Barogui Y, Meyers WM, Pedrosa J, Portaels F. Fine-needle aspiration, an efficient sampling technique for bacteriological diagnosis of nonulcerative Buruli ulcer. *J Clin Microbiol* 2009;47(6):1700-4.

Elul B, Delvaux T, Munyana E, Lahuerta M, Horowitz D, Ndagije F, Roberfroid D, Mugisha V, Nash D, Asimwe A. Pregnancy desires, and contraceptive knowledge and use among prevention of mother-to-child transmission clients in Rwanda. *AIDS* 2009;23(Suppl.1):S19-S26.

Freeman EE, White RG, Bakker R, Orroth KK, Weiss HA, Buvé A, Hayes RJ, Glynn JR. Population-level effect of potential HSV2 prophylactic vaccines on HIV incidence in sub-Saharan Africa. *Vaccine* 2009;27(6):940-6.

Hurtado Ortiz R, Aguilar Leon D, Orozco Estevez H, Martin A, Luna Herrera J, Flores Romo L, Portaels F, Hernandez Pando R. Differences in virulence and immune response induced in a murine model by isolates of *Mycobacterium ulcerans* from different geographic areas. *Clin Exp Immunol* 2009;157(2):271-81.

Huygen K, Adjei O, Affolabi D, Bretzel G, Demangel C, Fleisher B, Johnson RC, Pedrosa J, Phanuz DM, Phillips RO, Pluschke G, Siegmund V, Singh M, van der Werf TS, Wansbrough-Jones M, Portaels F. Buruli ulcer disease: prospects for a vaccine. *Med Microbiol Immunol* 2009;198(2):69-77.

Jallow S, Alabi A, Sarge-Njie R, Peterson K, Whittle H, Corrah T, Jaye A, Cotten M, Vanham G, McConkey SJ, Rowland-Jones S, Janssens W. Virological response to highly active antiretroviral therapy in patients infected with human immunodeficiency virus type 2 (HIV-2) and in patients dually infected with HIV-1 and HIV-2 in The Gambia and emergence of drug-resistant variants. *J Clin Microbiol* 2009;47(7):2200-8.

Jallow S, Vincent T, Leligdowicz A, De Silva T, Van Tienen C, Alabi A, Sarge-Njie R, Aaby P, Corrah T, Whittle H, Jaye A, Vanham G, Rowland-Jones S, Janssens W. Presence of a multidrug-resistance mutation in an HIV-2 variant infecting a treatment-naïve individual in Caio, Guinea Bissau. *Clin Infect Dis* 2009;48(12):1790-3.

Jenabian MA, Saïdi H, Charpentier C, Van Herrewwege Y, Son JC, Schols D, Balzarini J, Vanham G, Bélec L. *In vitro* synergistic activity against CCR5-tropic HIV-1 with combinations of potential candidate microbicide molecules HHA, KRV2110 and enfuvirtide (T20). *J Antimicrob Chemother* 2009;64(6):1192-5.

Jugheli L, Bzekalava N, de Rijk P, Fissette K, Portaels F, Rigouts L. High level of cross-resistance between kanamycin, amikacin, and capreomycin among *Mycobacterium tuberculosis* isolates from Georgia and a close relation with mutations in the *rrs* gene. *Antimicrob Agents Chemother* 2009;53(12):5064-8.

Kam KM, Yip CW, Tang HS, Van Deun A. Bulk acid-fast staining of sputum smears: time to end a taboo. *Int J Tuberc Lung Dis* 2009;13(9):1119-23.

Kendall EA, González E, Espinoza I, Tipismana M, Verdonck K, Clark D, Vermund SH, Gotuzzo E. Early neurologic abnormalities associated with human T-cell lymphotropic virus type 1 infection in a cohort of Peruvian children. *J Pediatr* 2009;155(5):700-6.

Kibadi K, Boelaert M, Kayinua M, Minuku JB, Muyembe-Tamfum JJ, Portaels F, Lefèvre P. Therapeutic itineraries of patients with ulcerated forms of *Mycobacterium ulcerans* (Buruli ulcer) disease in a rural health zone in the Democratic Republic of Congo. *Trop Med Int Health* 2009;14(9):1110-6.

Lynen L, An S, Koole O, Thai S, Ros S, De Munter P, Sculier D, Arnould L, Fransen K, Menten J, Boelaert M, Van den Ende J, Colebunders R. An algorithm to optimize viral load testing in HIV-positive patients with suspected first-line antiretroviral therapy failure in Cambodia. *J Acquir Immun Defic Syndr* 2009;52(1):40-8.

Marcotty T, Matthys F, Godfroid J, Rigouts L, Ameni G, van Pittius NG, Kazwala R, Muma J, van Helden P, Walravens K, de Klerk LM, Geoghegan C, Mbotha D, Otte M, Amenu K, Samra NA, Botha C, Ekron M, Jenkins A, Jori F, Kriek N, McCrindle C, Michel A, Morar D, Roger F, Thys E, Van den Bossche P. Zoonotic tuberculosis and brucellosis in Africa: neglected zoonoses or minor public-health issues? The outcomes of a multi-disciplinary workshop. *Ann Trop Med Parasitol* 2009;103(5):401-11.

Martin A, Fissette K, Varaine F, Portaels F, Palomino JC. Thin layer agar compared to BACTEC MGIT 960 for early detection of *Mycobacterium tuberculosis*. *J Microbiol Methods* 2009;78(1):107-8.

Martin A, Paasch F, Von Groll A, Fissette K, Almeida P, Varaine F, Portaels F, Palomino JC. Thin-layer agar for detection of resistance to rifampicin, ofloxacin and kanamycin in *Mycobacterium tuberculosis* isolates. *Int J Tuberc Lung Dis* 2009;13(10):1301-4.

Martin A, Waweru PM, Okatch FB, Ouma NA, Bonte L, Varaine F, Portaels F. Implementation of the thin layer agar method for diagnosis of smear-negative pulmonary tuberculosis in a setting with a high prevalence of human immunodeficiency virus infection in Homa Bay, Kenya. *J Clin Microbiol* 2009;47(8):2632-4.

Matthys F, Van der Stuyft P, Van Deun A. Universal tuberculosis control targets: not so smart [editorial]. *Int J Tuberc Lung Dis* 2009;13(8):923-4.

McGann H, Stragier P, Portaels F, Gascoyne-Binzi D, Collyns T, Lucas S, Mawer D. Buruli ulcer in United Kingdom tourist returning from Latin America [dispatch]. *Emerg Infect Dis* 2009;15(11):1827-9.

Moens B, López G, Adaui V, González E, Kerremans L, Clark D, Verdonck K, Gotuzzo E, Vanham G, Cassar O, Gessain A, Vandamme AM, Van Dooren S. Development and validation of a multiplex real-time PCR assay for simultaneous genotyping and human T-lymphotropic virus type 1, 2, and 3 proviral load determination. *J Clin Microbiol* 2009;47(11):3682-91.

Montes M, Sanchez C, Verdonck K, Lake JE, Gonzalez E, Lopez G, Terashima A, Nolan T, Lewis DE, Gotuzzo E, White AC. Regulatory T cell expansion in HTLV-1 and strongyloidiasis co-infection is associated with reduced IL-5 responses to *Strongyloides stercoralis* antigen. *PLoS Negl Trop Dis* 2009;3(6):e456.

Munyeme M, Muma JB, Salui KL, Skjerve E, Nambota AM, Phiri IGK, Rigouts L, Tryland M. Prevalence of bovine tuberculosis and animal level risk factors for indigenous cattle under different grazing strategies in the livestock/wildlife interface areas of Zambia. *Trop Anim Health Prod* 2009;41(3):345-52.

Munyeme M, Rigouts L, Shamputa IC, Muma JB, Tryland M, Skjerve E, Djonne B. Isolation and characterization of *Mycobacterium bovis* strains from indigenous Zambian cattle using Spacer oligonucleotide typing technique. *BMC Microbiol* 2009;9:144.

Müller B, Hilty M, Berg S, Garcia-Pelayo MC, Dale J, Boschirolu ML, Cadmus S, Ngandolo BNR, Godreuil S, Diguimbaye-Djaibé C, Kazwala R, Bonfoh B, Njanpop-Lafourcade BM, Sahraoui N, Guetarni D, Aseffa A, Mekonnen MH, Razanamparany VR, Ramarokoto H, Djonne B, Oloya J, Machado A, Mucavele C, Skjerve E, Portaels F, Rigouts L, Michel A, Müller A, Källénus G, van Helden PD, Hewinson RG, Zinsstag J, Gordon SV, Smith NH. African 1, an epidemiologically important clonal complex of *Mycobacterium bovis* dominant in Mali, Nigeria, Cameroon, and Chad. *J Bacteriol* 2009;191(6):1951-60.

Njue C, Voeten HACM, Remes P. Disco funerals: a risk situation for HIV infection among youth in Kisumu, Kenya. *AIDS* 2009;23(4):505-9.

Noeske J, Dopico E, Torrea G, Wang H, Van Deun A. Two vs. three sputum samples for microscopic detection of tuberculosis in a high HIV prevalence population. *Int J Tuberc Lung Dis* 2009;13(7):842-7.

Ondoa P, Vereecken C, Asahchop EL, Litzroth A, Diallo A, Fransen K, Dieye T, Ryder R, Mboup S, Kestens L. Proof of principle: an HIV p24 microsphere immunoassay with potential application to HIV clinical diagnosis. *Cytometry B Clin Cytom* 2009;76(3):231-6.

Palomino JC. Molecular detection, identification and drug resistance detection in *Mycobacterium tuberculosis*. *FEMS Immunol Med Microbiol* 2009;56(2):103-11.

Palomino JC, Ramos DF, da Silva PA. New anti-tuberculosis drugs: strategies, sources and new molecules. *Curr Med Chem* 2009;16(15):1898-904.

Portaels F, Silva MT, Meyers WM. Buruli ulcer. *Clin Dermatol* 2009;27(3):291-305.

Proaño-Perez F, Benitez-Ortiz W, Celi-Erazo M, Ron-Garrido L, Benitez-Capistros R, Portaels F, Rigouts L, Linden A. Comparative intradermal tuberculin test in dairy cattle in the north of Ecuador and risk factors associated with bovine tuberculosis. *Am J Trop Med Hyg* 2009;81(6):1103-9.

Rigouts L. Clinical practice: diagnosis of childhood tuberculosis. *Eur J Pediatr* 2009;168(11):1285-90.

Shikama ML, Ferro e Silva, Villela G, Sato DN, Martins MC, Giampaglia MS, da Silva RFAM, Ferro e Silva, da Silva Telles MA, Martin A, Palomino JC. Multicentre study of nitrate reductase assay for rapid detection of rifampicin-resistant *M. tuberculosis*. *Int J Tuberc Lung Dis* 2009;13(3):377-80.

Shikama Mde L, Silva RR, Conceição Martins M, Saraiva Giampaglia CM, Siqueira Oliveira R, Silva RFAM, Silva PF, Telles MA, Martin A, Palomino JC. Rapid detection of resistant tuberculosis by nitrate reductase assay performed in three settings in Brazil. *J Antimicrob Chemother* 2009;64(4):794-6.

Silva MT, Portaels F, Pedrosa J. Pathogenetic mechanisms of the intracellular parasite *Mycobacterium ulcerans* leading to Buruli ulcer. *Lancet Infect Dis* 2009;9(11):699-710.

Suykerbuyk P, Wambacq J, Phanhu DM, Haruna H, Nakazawa Y, Ooms K, Kamango K, Stragier P, Singa JN, Ekwanzala F, De Herdt E, De Maeyer P, Kestens L, Portaels F. Persistence of *Mycobacterium ulcerans* disease (Buruli ulcer) in the historical focus of Kasongo territory, the Democratic Republic of Congo. *Am J Trop Med Hyg* 2009;81(5):888-94.

Tebeu PM, de Bernis L, Doh AS, Rochat CH, Delvaux T. Risk factors for obstetric fistula in the Far North Province of Cameroon. *Int J Gynecol Obstet* 2009;107(1):12-5.

Van Deun A, Barrera L, Bastian I, Fattorini L, Hoffmann H, Kam KM, Rigouts L, Rüsch-Gerdes S, Wright A. *Mycobacterium tuberculosis* strains with highly discordant rifampin susceptibility test results. *J Clin Microbiol* 2009;47(11):3501-6.

van Ingen J, Boeree MJ, de Lange WCM, de Haas PEW, van der Zanden AGM, Mijns W, Rigouts L, Dekhuijzen PNR, van Soolingen D. *Mycobacterium noviomagense* sp. nov.; clinical relevance evaluated in 17 patients. *Int J Syst Evol Microbiol* 2009;59(4):845-9.

Verdonck K, González E, Maldonado F, Agapito D, Van Dooren S, Vandamme AM, Silva-Santisteban A, Vanham G, Clark D, Gotuzzo E. Comparison of three ELISAs for the routine diagnosis of human T-lymphotropic virus infection in a high-prevalence setting in Peru. *Trans R Soc Trop Med Hyg* 2009;103(4):420-2.

Vermeire K, Van Laethem K, Janssens W, Bell TW, Schols D. Human immunodeficiency virus type 1 escape from cyclosporin-induced CD4-targeted entry inhibition is associated with increased neutralizing antibody susceptibility. *J Virol* 2009;83(18):9577-83.

Von Groll A, Martin A, Jureen P, Hoffner S, Vandamme P, Portaels F, Palomino JC, Almeida da Silva P. Fluoroquinolone resistance in *Mycobacterium tuberculosis* and mutations in *gyrA* and *gyrB*. *Antimicrob Agents Chemother* 2009;53(10):4498-500.

Walsh DS, Eyase F, Onyango D, Odindo A, Otieno W, Waitumbi JN, Bulimo WD, Schnabel DC, Meyers WM, Portaels F. Clinical and molecular evidence for a case of Buruli Ulcer (*Mycobacterium ulcerans* infection) in Kenya. *Am J Trop Med Hyg* 2009;81(6):1110-3.

Wright A, Signol M, Van Deun A, Falzon D, Ruesch Gerdes S, Feldman K, Hoffner S, Drobniewski F, Barrera L, van Soolingen D, Boulabhal F, Paramasivan CN, Kam KM, Mitarai S, Nunn P, Raviglione M. Epidemiology of antituberculosis drug resistance 2002-07: an updated analysis of the Global Project on Anti-Tuberculosis Drug Resistance Surveillance. *Lancet* 2009;373(9678):1861-73.

Other publications

Affolabi D. Development of simple and inexpensive tools for the control of mycobacterial diseases in a low-resource country [dissertation]. Antwerp: University of Antwerp, Faculty of Pharmaceutical, Biomedical and Veterinary Sciences; 2009: 210 pp.

Amornkul PN, Vandenhoude H, Nasokho P, Odhiambo F, Mwaengo D, Hightower A, Buvé A, Misore A, Vulule J, Vitek C, Glynn J, Greenberg A, Slutsker L, De Cock KM. HIV prevalence and associated risk factors among individuals aged 13-34 years in rural western Kenya. *PLoS ONE* 2009;4(7):e6470.

Conesa-Botella A, Mathieu C, Colebunders R, Moreno-Reyes R, van Etten E, Lynen L, Kestens L. Is vitamin D deficiency involved in the immune reconstitution inflammatory syndrome? *AIDS Res Ther* 2009;6:4.

Defraye A, Crucitti T, Ducoffre G, Mak R, Sasse A. Incidence des infections à *Neisseria gonorrhoeae* en Belgique: tendances 2000-2006. *Rev Méd Bruxelles* 2009;30(2):93-8.

Delvaux T. Linking sexual and reproductive health and HIV services: from needs to feasibility and evidence of benefits [dissertation]. Gent: Universiteit Gent, Faculteit Geneeskunde en Gezondheidswetenschappen; 2009: 178 pp.

Eddyani M. Development of better methods for the laboratory diagnosis of *Mycobacterium ulcerans* disease (Buruli ulcer) and search for environmental reservoirs of *Mycobacterium ulcerans* [dissertation]. Antwerpen: Universiteit Antwerpen, Faculteit Farmaceutische, Biomedische en Diergeneeskundige Wetenschappen; 2009: 183 pp.

Fenyö EM, Heath A, Dispinseri S, Holmes H, Lusso P, Zolla-Pazner S, Donners H, Heyndrickx L, Alcami J, Bongertz V, Jassoy C, Malnati M, Montefiori D, Moog C, Morris L, Osmanov S, Polonis V, Sattentau Q, Schuitemaker H, Sutthent R, Wrin T, Scarlatti G. International network for comparison of HIV neutralization assays: the NeutNet report. *PLoS ONE* 2009;4(2):e4505.

Kibadi K, Mputu-Yamba JB, Mokassa B, Panda M, Muyembe-Tamfum JJ. Rechutes après traitement chirurgical exclusif de l'infection à *Mycobacterium ulcerans* (ulcère de Buruli): étude des facteurs de risque chez 84 patients congolais. *Med Trop* 2009;69(5):471-4.

Kibadi K, Muyembe-Tamfum JJ, Ibungu D, Mukanga J, Kayinua E, Minuku JB, Portaels F. Mise en place d'un réseau national de confirmation des cas d'infection à *Mycobacterium ulcerans* en République Démocratique du Congo; phase pilote: zone de santé rurale de Nsona-Mpangu, Province du Bas-Congo. *Bull ALLF* 2009;24:72-4.

Laga M. Rethinking approaches to HIV prevention. In: Marlink RG, Teitelman SJ, editors. From the ground up: building comprehensive HIV/AIDS care programs in resource-limited settings. Volume 2: Establishing a framework for success. [Washington D.C.]: Elizabeth Glaser Pediatric AIDS Foundation; 2009:599-603.

Matthys F, Rigouts L, Sizaïre V, Vezhnina N, Lecoq M, Golubeva V, Portaels F, Van der Stuyt P, Kimerling M. Outcomes after chemotherapy with WHO category II regimen in a population with high prevalence of drug resistant tuberculosis. PLoS ONE 2009;4(711):e7954.

Portaels F. L'infection à *Mycobacterium ulcerans* (ulcère de Buruli): maladie négligée en 2009? Méd Trop 2009;69(5):429-30.

Ridderhof JC, Van Deun A. Laboratory systems and strategies for tuberculosis. In: Schaaf HS, Zumla AI, editors. Tuberculosis; a comprehensive clinical reference. [s.l.]: Saunders Elsevier; 2009:738-45.

Sopoh GE, Dossou AD, Johnson RC, Brun LV, Barogui YT, Houezo JG, Affolabi D, Anagonou SY, Asiedu K, Portaels F. Forme multifocale et dissémination des lésions d'ulcère de Buruli après traitement à la streptomycine et rifampicine: à propos d'un cas. Bull ALLF 2009;24:75-80.

Stragier P. Heterogeneity and molecular characteristics of *Mycobacterium ulcerans* and related species [dissertation]. Antwerpen: Universiteit Antwerpen, Faculteit Geneeskunde; 2009: 189 pp.

Terrazas-Aranda K. Development of microbicides for the prevention of HIV transmission in an in vivo system of dendritic cells and CD4+ T cells with emphasis on synergistic activity and avoidance of viral resistance [dissertation]. Antwerpen: Universiteit Antwerpen, Faculteit Farmaceutische, Biomedische en Diergeneeskundige Wetenschappen, Biomedische Wetenschappen; Prins Leopold Instituut voor Tropische Geneeskunde, Departement Microbiologie, Eenheid Virologie; 2009: 257 pp.

Van den Bergh R. Transcriptome analysis of monocyte-HIV interactions [dissertation]. Brussels: Vrije Universiteit Brussel, Faculty of Science and Bio-Engineering Sciences, Department of Cellular and Molecular Immunology; Antwerp: Institute of Tropical Medicine, Department of Microbiology, Unit of Virology; 2009: 199 pp.

Van den Bergh R. Who is at the receiving end of our innovation? In: Global Forum for Health Research, Young Voices in Research for Health, 2009. Geneva: Global Forum for Health Research; 2009:145-7.

Van den Berghe W, Laga M. HIV/AIDS bij homo's en biseksuele mannen - Uit het verleden naar de toekomst. Pink Power: geschiedenis en toekomst van de halebeweging; colloquium, Antwerpen, 25 juni 2009. [s.l.]: Cavia; 2009.

Van den Ende J, Laganà S, Blot K, Bisoffi Z, Van den Enden E, Vermeulen L, Kestens L. Development of KABISA: a computer-based training program for clinical diagnosis in developing countries. In: Tan F, editor. Global information technologies: concepts, methodologies, and applications. Hershey: IGI Global; 2008.

Vuylsteke B, Das A, Dallabetta G, Laga M. Preventing HIV among sex workers. In: Mayer KH, Pizer HF, editors. HIV prevention; a comprehensive approach. Amsterdam: Elsevier; 2009:376-406.

Webb BJ, Hauck FR, Houp E, Portaels F. Buruli ulcer in West Africa: strategies for early detection and treatment in the antibiotic era. East Afr J Public Health 2009;6(2):144-7.

Gabrysch S, Edwards T, Glynn JR, Study Group on Heterogeneity of HIV Epidemics in African Cities. The role of context: neighbourhood characteristics strongly influence HIV risk in young women in Ndola, Zambia. Trop Med Int Health 2008; 13(2): 162-70. [ITM collaborators: Buvé A, Laga M, Van Dyck E, Janssens W, Heyndrickx L]

Savage EJ, van de Laar MJ, Gallay A, van der Sande M, Hamouda O, Sasse A, Hoffmann S, Diez M, Borrego MJ, Lowndes CM, Ison C, European Surveillance of Sexually Transmitted Infections (ESSTI) network. *Lymphogranuloma venereum* in Europe, 2003-2008. Euro Surveill 2009;14(48):19428. [ITM collaborator: Crucitti T]

Savage EJ, Hughes G, Ison C, Lowndes CM, European Surveillance of Sexually Transmitted Infections (ESSTI) network. Syphilis and gonorrhoea in men who have sex with men: a European overview. Eurosurveillance 2009;14(47):19417. [ITM collaborator: Crucitti T]

Van Damme L, Govinden R, Mirembe FM, Guédou F, Solomon S, Becker ML, Pradeep BS, Krishnan AK, Alary M, Pande B, Ramjee G, Deese J, Crucitti T, Taylor D. Lack of effectiveness of cellulose sulfate gel for the prevention of vaginal HIV transmission. N Engl J Med 2008; 359(5): 463-72. [ITM collaborators: Fransen K, Beelaert G, Abdellati S, Mangelschots M, Buvé A]

Vercauteren J, Wensing AMJ, van de Vijver DAMC, Albert J, Balotta C, Hamouda O, Kücherer C, Struck D, Schmit JC, Åsjö B, Bruckova M, Camacho RJ, Clotet B, Coughlan S, Grossman Z, Horban A, Korn K, Kostrikis L, Nielsen C, Paraskevis D, Poljak M, Puchhammer-Stöckl E, Riva C, Ruiz L, Salminen M, Schuurman R, Sonnerborg A, Stanekova D, Stanojevic M, Vandamme AM, Boucher CAB, SPREAD Programme. Transmission of drug-resistant HIV-1 is stabilizing in Europe. J Infect Dis 2009;200(10):1503-8. [ITM collaborators: De Roo A, Fransen K, Vekemans, M]

Watson-Jones D, Weiss HA, Rusizoka M, Chagalucha J, Baisley K, Mugeye K, Tanton C, Ross D, Everett D, Clayton T, Balira R, Knight L, Hambleton I, Le Goff J, Belec L, Hayes R. Effect of herpes simplex suppression on incidence of HIV among women in Tanzania. N Engl J Med 2008; 358(15): 1560-71. [ITM collaborators: Buvé A, Van Dyck E, Crucitti T]

Department of Parasitology

Publications in international peer-reviewed journals with impact factor

Achan J, Tibenderana JK, Kyabayinze D, Mangen FW, Kanya MR, Dorsey G, D'Alessandro U, Rosenthal PJ, Talisuna AO. Effectiveness of quinine versus artemether-lumefantrine for treating uncomplicated falciparum malaria in Ugandan children: randomised trial. *BMJ* 2009;339(7715):283-9.

Akoda K, Van Den Abbeele J, Marcotty T, De Deken R, Sidibe I, Van den Bossche P. Nutritional stress of adult female tsetse flies (Diptera: Glossinidae) affects the susceptibility of their offspring to trypanosomal infections. *Acta Trop* 2009;111(3):263-7.

Akoda K, Van den Bossche P, Marcotty T, Kubi C, Coosemans M, De Deken R, Van Den Abbeele J. Nutritional stress affects the tsetse fly's immune gene expression. *Med Vet Entomol* 2009;23(3):195-201.

Akoda K, Van den Bossche P, Lyaruu EA, De Deken R, Marcotty T, Coosemans M, Van Den Abbeele J. Maturation of a *Trypanosoma brucei* infection to the infectious metacyclic stage is enhanced in nutritionally stressed tsetse flies. *J Med Entomol* 2009;46(6):1446-9.

Alam MZ, Kuhls K, Schweynoch C, Sundar S, Rijal S, Shamsuzzaman AKM, Raju BVS, Salotra P, Dujardin JC, Schönian G. Multilocus microsatellite typing (MLMT) reveals genetic homogeneity of *Leishmania donovani* strains in the Indian subcontinent. *Infect Genet Evol* 2009;9(1):24-31.

Amin DN, Rottenberg ME, Thomsen AR, Mumba D, Fenger C, Kristensson K, Büscher P, Finsen B, Masocha W. Expression and role of CXCL10 during the encephalitic stage of experimental and clinical African trypanosomiasis. *J Infect Dis* 2009;200(10):1556-65.

Antoine-Moussiaux N, Büscher P, Desmecht D. Host-parasite interactions in trypanosomiasis: on the way to an antidisease strategy. *Infect Immun* 2009;77(4):1276-84.

Bhattarai NR, Das ML, Rijal S, Van der Auwera G, Picado A, Khanal B, Roy L, Speybroeck N, Berkvens D, Davies CR, Coosemans M, Boelaert M, Dujardin JC. Natural infection of *Phlebotomus argentipes* with *Leishmania* and other trypanosomatids in a visceral leishmaniasis endemic region of Nepal. *Trans R Soc Trop Med Hyg* 2009;103(11):1087-92.

Bhattarai NR, Van der Auwera G, Khanal B, De Doncker S, Rijal S, Das ML, Uranw S, Ostyn B, Praet N, Speybroeck N, Picado A, Davies C, Boelaert M, Dujardin JC. PCR and direct agglutination as *Leishmania* infection markers among healthy Nepalese subjects living in areas endemic for kala-azar. *Trop Med Int Health* 2009;14(4):404-11.

Bonnet M, van den Broek I, Van Herp M, Palma Urrutia PP, Van Overmeir C, Kyomuhendo J, Ndosimao CN, Ashley E, Guthmann JP. Varying efficacy of artesunate+amodiaquine and artesunate+sulphadoxine-pyrimethamine for the treatment of uncomplicated falciparum malaria in the Democratic Republic of Congo: a report of two in-vivo studies. *Malar J* 2009;8:192.

Büscher P, Ngoyi DM, Kaboré J, Lejon V, Robays J, Jamonneau V, Bebronne N, Van der Veken W, Biéler S. Improved models of mini anion exchange centrifugation technique (mAECT) and modified single centrifugation (MSC) for sleeping sickness diagnosis and staging. *PLoS Negl Trop Dis* 2009;3(11):e471.

Caljon G, Broos K, De Goeysse I, De Ridder K, Sternberg JM, Coosemans M, De Baetselier P, Guisez Y, Van Den Abbeele J. Identification of a functional Antigen5-related allergen in the saliva of a blood feeding insect, the tsetse fly. *Insect Biochem Mol Biol* 2009;39(5-6):332-41.

Chalwe V, Van geertruyden JP, Mukwamataba D, Menten J, Kamalamba J, Mulenga M, D'Alessandro U. Increased risk for severe malaria in HIV-1-infected adults, Zambia. *Emerg Infect Dis* 2009;15(5):749-55.

Claes F, Vodnala SK, van Reet N, Boucher N, Lunden-Miguel H, Baltz T, Goddeeris BM, Büscher P, Rottenberg ME. Bioluminescent imaging of *Trypanosoma brucei* shows preferential testis dissemination which may hamper drug efficacy in sleeping sickness. *PLoS Negl Trop Dis* 2009;3(7):e486.

D'Alessandro U. Existing antimalarial agents and malaria-treatment strategies. *Expert Opin Pharmacother* 2009;10(8):1291-306.

D'Alessandro U. Progress in the development of piperazine combinations for the treatment of malaria. *Curr Opin Infect Dis* 2009;22(6):588-92.

da Luz RI, Vermeersch M, Dujardin JC, Cos P, Maes L. *In vitro* sensitivity testing of *Leishmania* clinical field isolates: preconditioning of promastigotes enhances infectivity for macrophage host cells. *Antimicrob Agents Chemother* 2009;53(12):5197-203.

Deborggraeve S, Coronado X, Solari A, Zulantay I, Apt W, Mertens P, Laurent T, Leclipteux T, Stessens T, Dujardin JC, Herdewijn P, Büscher P. *T. cruzi* OligoC-Test: a simplified and standardized polymerase chain reaction format for diagnosis of Chagas disease. *PLoS Negl Trop Dis* 2009;3(6):e450.

Dieltjens T, Heyndrickx L, Willems B, Gray E, Van Nieuwenhove L, Gruppig K, Vanham G, Janssens W. Evolution of antibody landscape and viral envelope escape in an HIV-1 CRF02_AG infected patient with 4E10-like antibodies. *Retrovirology* 2009;6:113.

Dujardin JC. Structure, dynamics and function of *Leishmania* genome: resolving the puzzle of infection, genetics and evolution? [discussion]. *Infect Genet Evol* 2009;9(2):290-7.

Espinosa D, Boggild AK, Deborggraeve S, Laurent T, Valencia C, Pacheco R, Miranda-Verástegui C, Llanos-Cuentas A, Leclipteux T, Dujardin JC, Büscher P, Arévalo J. *Leishmania* OligoC-Test as a simple, rapid, and standardized tool for molecular diagnosis of cutaneous leishmaniasis in Peru. *J Clin Microbiol* 2009;47(8):2560-3.

García AL, Parrado R, Rojas E, Delgado R, Dujardin JC, Reithinger R. Leishmaniasis in Bolivia: comprehensive review and current status. *Am J Trop Med Hyg* 2009;80(5):704-11.

- Gies S, Coulibaly SO, Ky C, Ouattara FT, Brabin BJ, D'Alessandro U. Community-based promotional campaign to improve uptake of intermittent preventive antimalarial treatment in pregnancy in Burkina Faso. *Am J Trop Med Hyg* 2009;80(3):460-9.
- Gies S, Coulibaly SO, Ouattara FT, D'Alessandro U. Individual efficacy of intermittent preventive treatment with sulfadoxine-pyrimethamine in primi- and secundigravidae in rural Burkina Faso: impact on parasitaemia, anaemia and birth weight. *Trop Med Int Health* 2009;14(2):174-82.
- Giroud C, Ottonnes F, Coustou V, Dacheux D, Biteau N, Moezan B, van Reet N, Carrington M, Doua F, Baltz T. Murine models for *Trypanosoma brucei gambiense* disease progression; from silent to chronic infections and early brain tropism. *PLoS Negl Trop Dis* 2009;3(9):e509.
- Hagos A, Yilkal A, Esayass T, Alemu T, Fikru R, Ab Feseha G, Goddeeris BM, Claes F. Parasitological and serological survey on trypanosomiasis (surra) in camels in dry and wet areas of Bale Zone, Oromyia Region, Ethiopia. *Rev Med Vet* 2009;160(12):569-73.
- Hainard A, Tiberti N, Robin X, Lejon V, Ngoyi DM, Matovu E, Enyaru JC, Fouda C, Ndung'u JM, Lisacek F, Müller M, Turck N, Sanchez JC. A combined CXCL10, CXCL8 and H-FABP panel for the staging of human African trypanosomiasis patients. *PLoS Negl Trop Dis* 2009;3(6):e459.
- Huyse T, Webster BL, Geldof S, Stothard JR, Diaw OT, Polman K, Rollinson D. Bidirectional introgressive hybridization between a cattle and human schistosome species. *PLoS Pathog* 2009;5(9):e1000571.
- Imamura H, Karro JE, Chuang JH. Weak preservation of local neutral substitution rates across mammalian genomes. *BMC Evol Biol* 2009;9:89.
- Laurent T, Van der Auwera G, Hide M, Mertens P, Quispe Tintaya W, Deborggraeve S, De Doncker S, Leclipteux T, Bañuls AL, Büscher P, Dujardin JC. Identification of Old World *Leishmania* spp. by specific polymerase chain reaction amplification of cysteine proteinase B genes and rapid dipstick detection. *Diagn Microbiol Infect Dis* 2009;63(2):173-81.
- Maurer-Cecchini A, Decuypere S, Chappuis F, Alexandrenne C, De Doncker S, Boelaert M, Dujardin JC, Loutan L, Dayer JM, Tulliano G, Arevalo J, Llanos-Cuentas A, Chizzolini C. Immunological determinants of clinical outcome in Peruvian patients with tegumentary leishmaniasis treated with pentavalent antimonials. *Infect Immun* 2009;77(5):2022-9.
- Moons CPH, Peremans K, Büscher P, Vermeire S, Vandermeulen E, Audenaert K, Hermans K, Odberg FO. Refinement recommendations for intravenous injection and body heat conservation in Mongolian gerbils used in SPECT studies. *Scand J Lab Anim Sci* 2008;35(4):251-7.
- Msyamboza KP, Savage EJ, Kazembe PN, Gies S, Kalanda G, D'Alessandro U, Brabin BJ. Community-based distribution of sulfadoxine-pyrimethamine for intermittent preventive treatment of malaria during pregnancy improved coverage but reduced antenatal attendance in southern Malawi. *Trop Med Int Health* 2009;14(2):183-9.
- Mumba Ngoyi D, Lejon V, N'Siesi FX, Boelaert M, Büscher P. Comparison of operational criteria for treatment outcome in *gambiense* human African trypanosomiasis. *Trop Med Int Health* 2009;14(4):438-44.
- Nahum A, Erhart A, Ahounou D, Bonou D, Van Overmeir C, Menten J, Akogbeto M, Coosemans M, Massougbdji A, D'Alessandro U. Extended high efficacy of the combination sulphadoxine-pyrimethamine with artesunate in children with uncomplicated falciparum malaria on the Benin coast, West Africa. *Malar J* 2009;8:37.
- Olsen A, van Lieshout L, Marti H, Polderman T, Polman K, Steinmann P, Stothard R, Thybo S, Verweij JJ, Magnussen P. Strongyloidiasis; the most neglected of the neglected tropical diseases? *Trans R Soc Trop Med Hyg* 2009;103(10):967-72.
- Owen A, Ochong E, Bell DJ, Johnson DJ, D'Alessandro U, Mulenga M, Muangnoicharoen S, Van geertruyden JP, Winstanley PA, Bray PG, Ward SA. *Plasmodium falciparum* and dihydrofolate reductase I164L mutations in Africa [reply]. *Antimicrob Agents Chemother* 2009;53(4):1722-3.
- Picado A, Kumar V, Das M, Burniston I, Roy L, Suman R, Dinesh D, Coosemans M, Sundar S, Shreekant K, Boelaert M, Davies C, Cameron M. Effect of untreated bed nets on blood-fed *Phlebotomus argentipes* in kala-azar endemic foci in Nepal and India. *Mem Inst Oswaldo Cruz* 2009;104(8):1183-6.
- Ravinetto R, Lodesani C, D'Alessandro U, De Filippi L, Pontiroli A. Access to health care for undocumented migrants in Italy [correspondence]. *Lancet* 2009;373(9681):2111-2.
- Rougeron V, De Meeûs T, Hide M, Waleckx E, Bermudez H, Arevalo J, Llanos-Cuentas A, Dujardin JC, De Doncker S, Le Ray D, Ayala FJ, Bañuls AL. Extreme inbreeding in *Leishmania braziliensis*. *Proc Natl Acad Sci USA* 2009;106(25):10224-9.
- Thang ND, Erhart A, Hung LX, Thuan LK, Xa NX, Thanh NG, Ky PV, Coosemans M, Speybroeck N, D'Alessandro U. Rapid decrease of malaria morbidity following the introduction of community-based monitoring in a rural area of central Vietnam. *Malar J* 2009;8:3.
- Tran T, Claes F, Verloo D, De Greve H, Büscher P. Towards a new reference test for surra in camels. *Clin Vaccine Immunol* 2009;16(7):999-1002.
- Valéa I, Tinto H, Nikiema M, Yamuah L, Rouamba N, Drabo M, Guigumde RT, D'Alessandro U. Performance of OptiMAL-IT (R) compared to microscopy, for malaria detection in Burkina Faso. *Trop Med Int Health* 2009;14(3):338-40.
- Van Bortel W, Chinh VD, Berkvens D, Speybroeck N, Trung HD, Coosemans M. Impact of insecticide-treated nets on wild pyrethroid resistant *Anopheles epiroticus* population from southern Vietnam tested in experimental huts. *Malar J* 2009;8:248.
- Van den Eede P, Van HN, Van Overmeir C, Vythilingam I, Thang ND, Hung LX, Manh HN, Anné J, D'Alessandro U, Erhart A. Human *Plasmodium knowlesi* infections in young children in central Vietnam. *Malar J* 2009;8:249.
- Van geertruyden JP, Colebunders R, D'Alessandro U. HIV-1-infected individuals traveling to malaria endemic areas [letter]. *J Acquir Immun Defic Syndr* 2009;51(2):234-5.

Van geertruyden JP, Mulenga M, Chalwe V, Michael N, Moerman F, Mukwamataba D, Colebunders R, D'Alessandro U. Impact of HIV-1 infection on the hematological recovery after clinical malaria. *J Acquir Immun Defic Syndr* 2009;50(2):200-5.

Van geertruyden JP, Van Eijk E, Yosaatmadja F, Kasongo W, Mulenga M, D'Alessandro U, Rogerson S. The relationship of *Plasmodium falciparum* humeral immunity with HIV-1 immunosuppression and treatment efficacy in Zambia. *Malar J* 2009;8:258.

van Grinsven KWA, Van Den Abbeele J, Van den Bossche P, van Hellemond JJ, Tielens AGM. Adaptations in the glucose metabolism of procyclic *Trypanosoma brucei* isolates from tsetse flies and during differentiation of bloodstream forms. *Eukaryot Cell* 2009;8(8):1307-11.

Vennervald BJ, Polman K. Helminths and malignancy. *Parasite Immunol* 2009;31(11):686-96.

Verhaeghen K, Van Bortel W, Trung HD, Sochantha T, Coosemans M. Absence of knockdown resistance suggests metabolic resistance in the main malaria vectors of the Mekong region. *Malar J* 2009;8:84.

Versteirt V, Schaffner F, Garros C, Dekoninck W, Coosemans M, Van Bortel W. Introduction and establishment of the exotic mosquito species *Aedes japonicus japonicus* (Diptera: Culicidae) in Belgium. *J Med Entomol* 2009;46(6):1464-7.

Verweij JJ, Canales M, Polman K, Ziem J, Brienens EAT, Polderman AM, van Lieshout L. Molecular diagnosis of *Strongyloides stercoralis* in faecal samples using real-time PCR. *Trans R Soc Trop Med Hyg* 2009;103(4):342-6.

Vodnala SK, Ferella M, Lundén-Miguel H, Betha E, van Reet N, Amin DN, Öberg B, Andersson B, Kristensson K, Wigzell H, Rottenberg ME. Preclinical assessment of the treatment of second-stage African trypanosomiasis with cordycepin and deoxycoformycin. *PLoS Negl Trop Dis* 2009;3(8):e495.

Yeka A, Achan J, D'Alessandro U, Talisuna AO. Quinine monotherapy for treating uncomplicated malaria in the era of artemisinin-based combination therapy: an appropriate public health policy? *Lancet Infect Dis* 2009;9(7):448-52.

Yewhalaw D, Legesse W, Van Bortel W, Gebre-Selassie S, Kloos H, Duchateau L, Speybroeck N. Malaria and water resource development: the case of Gilgel-Gibe hydroelectric dam in Ethiopia. *Malar J* 2009;8:21.

Zwang J, Oliaro P, Barennes H, Bonnet M, Brasseur P, Bukirwa H, Cohuet S, D'Alessandro U, Djimdé A, Karema C, Guthmann JP, Hamour S, Ndiaye JL, Martensson A, Rwagacondo C, Sagara I, Same Ekobo A, Sirima SB, van den Broek I, Yeka A, Taylor WRJ, Dorsey G, Randrianarivelojosia M. Efficacy of artesunate-amodiaquine for treating uncomplicated falciparum malaria in sub-Saharan Africa: a multi-centre analysis. *Malar J* 2009;8:203.

Other publications

Bassat Q, Mulenga M, Tinto H, Piola P, Borrmann S, Menéndez C, Nambozi M, Valéa I, Nabasumba C, Sasi P, Bacchieri A, Corsi M, Ubben D, Talisuna A, D'Alessandro U. Dihydroartemisinin-piperaquine and artemether-lumefantrine for treating uncomplicated malaria in African children: a randomised, non-inferiority trial. *PLoS ONE* 2009;4(11):e7871.

Bhatt R, Boakye D, Chandre F, Coosemans M, Corbel V, Gimnig J, Nkuni J, Lines J, Pigeon O, Rowland M, Velayudhan R, Yadav R, Zaim M. Report of the thirteenth WHOPES working group meeting: WHO/HQ, Geneva, 28-30 July 2009: review of Olyset® LN, Dawaplu® 2.0 LN, Tianjin Yorkool® LN. Geneva: World Health Organization (WHO), 2009: 73 pp.

Bhattarai NR. Visceral leishmaniasis in Nepal: development and application of PCR-based tools to re-assess the paradigm of *Leishmania* infection [dissertation]. Antwerpen: Universiteit Antwerpen, Faculty of Pharmaceutical, Biomedical and Veterinary Sciences, Department of Biomedical Sciences; 2009: 166 pp.

Deborggraeve S. Towards simplified and standardised molecular diagnosis of human African trypanosomiasis, leishmaniasis and Chagas disease [dissertation]. Leuven: Katholieke Universiteit Leuven, Group Biomedical Sciences, Faculty of Pharmaceutical Sciences, Laboratory of Medicinal Chemistry; 2009: 202 pp.

Gies S. Preventing malaria in pregnancy by health promotion and intermittent preventive treatment: a community-based intervention in rural Burkina Faso [dissertation]. Antwerp: University of Antwerp, Faculty of Medicine; 2009: 160 pp.

Montalvo AM, Monzote L, Fraga J, Montano I, Muskus C, Marín M, De Doncker S, Vélez ID, Dujardin JC. PCR-RFLP y RAPD para la tipificación de *Leishmania* neotropical. *Biomédica* 2008;28(4):597-606.

Protopopoff N, Van Bortel W, Speybroeck N, Van geertruyden JP, Baza D, D'Alessandro U, Coosemans M. Ranking malaria risk factors to guide malaria control efforts in African highlands. *PLoS ONE* 2009; 4(11): e8022.

Sow S. The behavioral determinants of intestinal schistosomiasis transmission: water contact, hygienic practices and risk prevention; a study in northern Senegal [dissertation]. Rotterdam: Erasmus Universiteit Rotterdam; 2009: 204 pp.

Thang ND. Long-lasting insecticidal hammocks for controlling forest malaria in Vietnam [dissertation]. Antwerpen: Universiteit Antwerpen, Faculteit Wetenschappen, Geneeskunde; 2009: 135 pp.

Thang ND, Erhart A, Speybroeck N, Xa NX, Thanh NN, Ky PV, Hung LX, Thuan LK, Coosemans M, D'Alessandro U. Long-lasting insecticidal hammocks for controlling forest malaria: a community-based trial in a rural area of central Vietnam. *PLoS ONE* 2009; 4(10): e7369.

Tran T. The invariant surface glycoprotein ISG75: a target for vaccination and diagnosis of trypanosomiasis [dissertation]. Brussels: Vrije Universiteit Brussel, Faculty of Science and Bio-engineering Sciences, Department of Biotechnology, Laboratory of Cellular and Molecular Immunology; 2009: 149 pp.

Van Bortel W, Chandre F, Coosemans M, Corbel V, Gimnig J, Hougard JM, Ichimori K, Jambulingam P, Ladonni H, Mulla MS, Nkuni J, Pigeon O, Rowland M, Zaim M. Report of the twelfth WHOPES working group meeting: WHO/HQ, Geneva, 8-11 December 2008: review of Bioflash® GR, Permanet® 2.0, Permanet® 3.0, Permanet® 2.5, Lambda-Cyhalothrin LN. Geneva: World Health Organization (WHO), 2009: 120 pp.

Van Bortel W, Versteirt V, Van Gompel A, Coosemans M. Changement climatique et maladies émergentes: un concours complexe de facteurs. J Pharm Belg 2009;2:48-53.

Van Bortel W, Versteirt V, Van Gompel A, Coosemans M. Klimaatverandering en oprukkende ziekten: een complex samenspel van factoren. Farm Tijdschr Belg 2009;2:40-5.

Van den Bossche P, Geerts S, Claes F. Equine trypanosomiasis. In: Mair TS, Hutchinson RE, editors. Infectious diseases of the horse. Ely: Equine Veterinary Journal; 2009:354-65.

Verhaeghen K. Presence and role of knockdown resistance in *Anopheles* species of Africa and the Mekong region [dissertation]. Antwerpen: Universiteit Antwerpen, Faculteit Farmaceutische, Biomedische en Diergeneeskundige Wetenschappen, Departement Biomedische Wetenschappen; 2009: 198 pp.

Zwang J, Ashley EA, Karema C, D'Alessandro U, Smithuis F, Dorsey G, Janssens B, Mayxay M, Newton P, Singhasivanon P, Stepniewska K, White NJ, Nosten F. Safety and efficacy of dihydroartemisinin-piperaquine in falciparum malaria: a prospective multi-centre individual patient data analysis. PLoS ONE 2009;4(7):e6358.

Publications with acknowledged ITM collaboration (2008-2009)

Bouvard V, Baan R, Straif K, Grosse Y, Secretan B, El Ghissassi F, Benbrahim-Tallaa L, Guha N, Freeman C, Galichet L, Coglianò V, WHO International Agency for Research on Cancer Monograph Working Group. A review of human carcinogens: Part B: biological agents. Lancet Oncol 2009;10(4):321-2. [ITM collaborator: Polman K]

Priotto G, Kasparian S, Mutombo W, Ngouama D, Ghorashian S, Arnold U, Ghabri S, Baudin E, Buard V, Kazadi-Kyanza S, Ilunga M, Mutangala W, Pohlig G, Schmid C, Karunakara U, Torreele E, Kande V. Nifurtimox-eflornithine combination therapy for second-stage African *Trypanosoma brucei gambiense* trypanosomiasis: a multicentre, randomised, phase III, non-inferiority trial. Lancet 2009;374(9683):56-64. [ITM collaborators: Boelaert M, Menten J, Büscher P, Lejon V, Bebronne N]

World Health Organization Maximizing Positive Synergies Collaborative Group. An assessment of interactions between global health initiatives and country health systems. Lancet 2009;373(9681):2137-69. [ITM collaborators: Boelaert M, Cavalli A, Ooms G, Pirard M, Polman K, Van Damme W, Van Dormael M, Vermeiren P]

Department of Animal Health

Publications in international peer-reviewed journals with impact factor

Akoda K, Van Den Abbeele J, Marcotty T, De Deken R, Sidibe I, Van den Bossche P. Nutritional stress of adult female tsetse flies (Diptera: Glossinidae) affects the susceptibility of their offspring to trypanosomal infections. Acta Trop 2009;111(3):263-7.

Akoda K, Van den Bossche P, Lyaruu EA, De Deken R, Marcotty T, Coosemans M, Van Den Abbeele J. Maturation of a *Trypanosoma brucei* infection to the infectious metacyclic stage is enhanced in nutritionally stressed tsetse flies. J Med Entomol 2009;46(6):1446-9.

Akoda K, Van den Bossche P, Marcotty T, Kubi C, Coosemans M, De Deken R, Van Den Abbeele J. Nutritional stress affects the tsetse fly's immune gene expression. Med Vet Entomol 2009;23(3):195-201.

Bhattarai NR, Das ML, Rijal S, Van der Auwera G, Picado A, Khanal B, Roy L, Speybroeck N, Berkvens D, Davies CR, Coosemans M, Boelaert M, Dujardin JC. Natural infection of *Phlebotomus argentipes* with *Leishmania* and other trypanosomatids in a visceral leishmaniasis endemic region of Nepal. Trans R Soc Trop Med Hyg 2009;103(11):1087-92.

Bhattarai NR, Van der Auwera G, Khanal B, De Doncker S, Rijal S, Das ML, Uranw S, Ostyn B, Praet N, Speybroeck N, Picado A, Davies C, Boelaert M, Dujardin JC. PCR and direct agglutination as *Leishmania* infection markers among healthy Nepalese subjects living in areas endemic for kala-azar. Trop Med Int Health 2009;14(4):404-11.

Cabrera L, De Witte J, Victor B, Vermeiren L, Zimic M, Brandt J, Geysen D. Specific detection and identification of African trypanosomes in bovine peripheral blood by means of a PCR-ELISA assay. Vet Parasitol 2009;164(2-4):111-7.

Carabin H, Millogo A, Praet N, Hounton S, Tarnagda Z, Ganaba R, Dorny P, Nitiéma P, Cowan LD, EFECAB. Seroprevalence to the antigens of *Taenia solium* cysticercosis among residents of three villages in Burkina Faso: a cross-sectional study. PLoS Negl Trop Dis 2009;3(11):e555.

Cardoen S, Van Huffel X, Berkvens D, Quoilin S, Ducoffre G, Saegerman C, Speybroeck N, Imberechts H, Herman L, Ducatelle R, Dierick K. Evidence-based semiquantitative methodology for prioritization of foodborne zoonoses. Foodborne Pathog Dis 2009;6(9):1083-96.

Castillo Y, Rodriguez S, García HH, Brandt J, Van Hul A, Silva M, Rodriguez-Hidalgo R, Portocarrero M, Melendez DP, Gonzalez AE, Gilman RH, Dorny P. Urine antigen detection for the diagnosis of human neurocysticercosis. Am J Trop Med Hyg 2009;80(3):379-83.

Cobbaut K, Berkvens D, Houf K, De Deken R, De Zutter L. *Escherichia coli* O157 prevalence in different cattle farm types and identification of potential risk factors. J Food Protect 2009;72(9):1848-53.

- Deckers N, Saerens D, Kanobana K, Conrath K, Victor B, Wernery U, Vercruysse J, Muyldermans S, Dorny P. Nanobodies, a promising tool for species-specific diagnosis of *Taenia solium* cysticercosis. *Int J Parasitol* 2009;39(5):625-33.
- Dione MM, Ieven M, Garin B, Marcotty T, Geerts S. Prevalence and antimicrobial resistance of *Salmonella* isolated from broiler farms, chicken carcasses, and street-vended restaurants in Casamance, Senegal. *J Food Protect* 2009;72(11):2423-7.
- Dorny P, Praet N, Deckers N, Gabriel S. Emerging food-borne parasites. *Vet Parasitol* 2009;163(3):196-206.
- Ducheyne E, Mweempwa C, De Pus C, Vernieuwe H, De Deken R, Hendrickx G, Van den Bossche P. The impact of habitat fragmentation on tsetse abundance on the plateau of eastern Zambia. *Prev Vet Med* 2009;91(1):11-8.
- Foubert K, Vermeersch M, Theunis M, Apers S, Cos P, Claeys M, Van Puyvelde L, Pieters L, Maes L. LC-MS analysis of 13,28-epoxy-oleanane saponins in *Maesa* spp. extracts with antileishmanial activity. *Phytochem Anal* 2009;20(2):159-67.
- Geerts S, Osaer S, Goossens B, Faye D. Trypanotolerance in small ruminants of sub-Saharan Africa. *Trends Parasitol* 2009;25(3):132-8.
- Goethals K, Ampe B, Berkvens D, Laevens H, Janssen P, Duchateau L. Modeling interval-censored, clustered cow udder quarter infection times through the shared gamma frailty model. *J Agric Biol Environ Stat* 2009;14(1):1-14.
- Levecke B, Geldhof P, Claerebout E, Dorny P, Vercammen F, Cacciò SM, Vercruysse J, Geurden T. Molecular characterisation of *Giardia duodenalis* in captive non-human primates reveals mixed assemblage A and B infections and novel polymorphisms. *Int J Parasitol* 2009;39(14):1595-601.
- Marcotty T, Matthys F, Godfroid J, Rigouts L, Ameni G, van Pittius NG, Kazwala R, Muma J, van Helden P, Walravens K, de Klerk LM, Geoghegan C, Mbotha D, Otte M, Amenu K, Samra NA, Botha C, Ekron M, Jenkins A, Jori F, Kriek N, McCrindle C, Michel A, Morar D, Roger F, Thys E, Van den Bossche P. Zoonotic tuberculosis and brucellosis in Africa: neglected zoonoses or minor public-health issues? The outcomes of a multi-disciplinary workshop. *Ann Trop Med Parasitol* 2009;103(5):401-11.
- Masumu J, Geysen D, Van den Bossche P. Endemic type of animal trypanosomiasis is not associated with lower genotype variability of *Trypanosoma congolense* isolates circulating in livestock. *Res Vet Sci* 2009;87(2):265-9.
- Masumu J, Marcotty T, Geerts S, Vercruysse J, Van den Bossche P. Cross-protection between *Trypanosoma congolense* strains of low and high virulence. *Vet Parasitol* 2009;163(1-2):127-31.
- Nguyen BK, Saegerman C, Pirard C, Mignon J, Widart J, Thirionet B, Verheggen FJ, Berkvens D, De Pauw E, Haubruge E. Does imidacloprid seed-treated maize have an impact on honey bee mortality? *J Econ Entomol* 2009;102(2):616-23.
- Nguyen TGT, De NV, Vercruysse J, Dorny P, Le TH. Genotypic characterization and species identification of *Fasciola* spp. with implications regarding the isolates infecting goats in Vietnam. *Exp Parasitol* 2009;123(4):354-61.
- Praet N, Speybroeck N, Manzanedo R, Berkvens D, Nforninwe DN, Zoli A, Quet F, Preux PM, Carabin H, Geerts S. The disease burden of *Taenia solium* cysticercosis in Cameroon. *PLoS Negl Trop Dis* 2009;3(3):e406.
- Rodriguez S, Dorny P, Tsang VCW, Pretell EJ, Brandt J, Lescano AG, Gonzalez AE, Gilman RH, Garcia HH. Detection of *Taenia solium* antigens and anti-*T. solium* antibodies in paired serum and cerebrospinal fluid samples from patients with intraparenchymal or extraparenchymal neurocysticercosis. *J Infect Dis* 2009;199(9):1345-52.
- Sumbu J, De Deken R, Deckers N, Mpiana S, Kabambi P, Tshilenge G, Boelaert M. Variation spatiale du risque pour les porcs de contracter la trypanosomiase dans la zone périurbaine de Kinshasa. *Parasite* 2009;16(2):153-9.
- Thang ND, Erhart A, Hung LX, Thuan LK, Xa NX, Thanh NG, Ky PV, Coosemans M, Speybroeck N, D'Alessandro U. Rapid decrease of malaria morbidity following the introduction of community-based monitoring in a rural area of central Vietnam. *Malar J* 2009;8:3.
- Toté K, Vanden Berghe D, Deschacht M, de Wit K, Maes L, Cos P. Inhibitory efficacy of various antibiotics on matrix and viable mass of *Staphylococcus aureus* and *Pseudomonas aeruginosa* biofilms. *Int J Antimicrob Agents* 2009;33(6):525-31.
- Toté K, Vanden Berghe D, Levecque S, Bénéré E, Maes L, Cos P. Evaluation of hydrogen peroxide-based disinfectants in a new resazurin microplate method for rapid efficacy testing of biocides. *J Appl Microbiol* 2009;107(2):606-15.
- Van Bortel W, Chinh VD, Berkvens D, Speybroeck N, Trung HD, Coosemans M. Impact of insecticide-treated nets on wild pyrethroid resistant *Anopheles epiroticus* population from southern Vietnam tested in experimental huts. *Malar J* 2009;8:248.
- Van de Poel E, Speybroeck N. Decomposing malnutrition inequalities between scheduled castes and tribes and the remaining Indian population. *Ethn Health* 2009;14(3):271-87.
- Van den Bossche J, Bogaert P, van Hengel J, Guerin CJ, Berx G, Movahedi K, Van den Bergh R, Pereira-Fernandes A, Geuns JM, Pircher H, Dorny P, Grooten J, De Baetselier P, Van Ginderachter JA. Alternatively activated macrophages engage in homotypic and heterotypic interactions through IL-4 and polyamine-induced E-cadherin/catenin complexes. *Blood* 2009;114(21):4664-74.
- van Grinsven KWA, Van Den Abbeele J, Van den Bossche P, van Hellemond JJ, Tielens AGM. Adaptations in the glucose metabolism of procyclic *Trypanosoma brucei* isolates from tsetse flies and during differentiation of bloodstream forms. *Eukaryot Cell* 2009;8(8):1307-11.
- Vermeersch M, Foubert K, da Luz RI, Van Puyvelde L, Pieters L, Cos P, Maes L. Selective antileishmania activity of 13,28-epoxy-oleanane and related triterpene saponins from the plant families Myrsinaceae, Primulaceae, Aceraceae and Icacinaeae. *Phytother Res* 2009;23(10):1404-10.

Vik A, Prosenyak A, Vermeersch M, Cos P, Maes L, Gundersen LL. Screening of agelastin D and analogs for inhibitory activity against pathogenic protozoa; identification of hits for visceral leishmaniasis and Chagas disease. *Molecules* 2009;14(1):279-88.

von Samson-Himmelstjerna G, Coles GC, Jackson F, Bauer C, Borgsteede F, Cirak VY, Demeler J, Donnan A, Dorny P, Epe C, Harder A, Höglund J, Kaminsky R, Kerboeuf D, Küttler U, Papadopoulos E, Posedi J, Small J, Várady M, Vercruysse J, Wirtherle N. Standardization of the egg hatch test for the detection of benzimidazole resistance in parasitic nematodes. *Parasitol Res* 2009;105(3):825-34.

Yewhalaw D, Legesse W, Van Bortel W, Gebre-Selassie S, Kloos H, Duchateau L, Speybroeck N. Malaria and water resource development: the case of Gilgel-Gibe hydroelectric dam in Ethiopia. *Malar J* 2009;8:21.

Other publications

Abatih NE. Assessment of the impact of the non-human use of antimicrobial agents on the selection, transmission and distribution of antimicrobial resistant bacteria: executive summary. *Arch Public Health* 2009;67(1):45-8.

Barry AM, Diaby K, Diallo B, Thys E, Dorny P. Etude sur les maladies parasitaires dans les fermes avicoles périurbaines de Conakry (Guinée). *Bull Anim Health Prod Africa* 2009;57(1):93-5.

Deckers N. Serological markers for improved diagnosis of porcine cysticercosis [dissertation]. Merelbeke: Universiteit Gent, Faculteit Diergeneeskunde, Vakgroep Virologie, Parasitologie en Immunologie; 2009: 154 pp.

Protopopoff N, Van Bortel W, Speybroeck N, Van geertruyden JP, Baza D, D'Alessandro U, Coosemans M. Ranking malaria risk factors to guide malaria control efforts in African highlands. *PLoS ONE* 2009;4(11):e8022.

Thang ND, Erhart A, Speybroeck N, Xa NX, Thanh NN, Ky PV, Hung LX, Thuan LK, Coosemans M, D'Alessandro U. Long-lasting insecticidal hammocks for controlling forest malaria: a community-based trial in a rural area of central Vietnam. *PLoS ONE* 2009;4(10):e7369.

Van den Bossche P. Tsetse-transmitted trypanosomiasis: variations on a theme. *Bull Séances Acad R Sci Outre Mer* 2008;54(4):523-36.

Van den Bossche P, Geerts S, Claes F. Equine trypanosomiasis. In: Mair TS, Hutchinson RE, editors. *Infectious diseases of the horse*. Ely: Equine Veterinary Journal; 2009:354-65.

Vanbinst T, Vandenbussche F, Vandemeulebroecke E, De Leeuw I, Deblauwe I, De Deken G, Madder M, Haubruge E, Losson B, De Clercq K. Bluetongue virus detection by real-time RT-PCR in *Culicoides* captured during the 2006 epizootic in Belgium and development of an internal control. *Transbound Emerg Dis* 2009;56(5):170-7.

Department of Clinical Sciences

Publications in international peer-reviewed journals with impact factor

Bisoffi Z, Gobbi F, Angheben A, Van den Ende J. The role of rapid diagnostic tests in managing malaria [perspective]. *PLoS Med* 2009;6(4):e1000063.

Bisoffi Z, Sirima BS, Angheben A, Lodesani C, Gobbi F, Tinto H, Van den Ende J. Rapid malaria diagnostic tests vs. clinical management of malaria in rural Burkina Faso: safety and effect on clinical decisions; a randomized trial. *Trop Med Int Health* 2009;14(5):491-8.

Callens SF, Shabani N, Lusiana J, Lelo P, Kitetele F, Colebunders R, Gizlice Z, Edmonds A, Van Rie A, Behets F. Mortality and associated factors after initiation of pediatric antiretroviral treatment in the Democratic Republic of the Congo. *Pediatr Infect Dis J* 2009;28(1):35-40.

Callens SF, Westreich D, Kitetele F, Lusiana J, Shabani N, Belhorn T, Colebunders R, Behets F, Van Rie A. A visual dosing aid for first-line pediatric antiretroviral treatment in resource-poor settings. *J Trop Pediatr* 2009;55(2):135-7.

Castelnuovo B, Babigumira J, Lamorde M, Muwanga A, Kambugu A, Colebunders R. Improvement of the patient flow in a large urban clinic with high HIV seroprevalence in Kampala, Uganda. *Int J STD AIDS* 2009;20(2):123-4.

Conesa-Botella A, Colebunders R. Response to "Case of yellow fever vaccine-associated viscerotropic disease with prolonged viremia, robust adaptive immune responses, and polymorphisms in CCR5 and RANTES genes" [letter]. *J Infect Dis* 2009;199(4):601.

Deribew A, Tesfay M, Hailemichael Y, Negussu N, Daba S, Woji A, Belachew T, Apers L, Colebunders R. Tuberculosis and HIV co-infection: its impact on quality of life. *Health Qual Life Outcomes* 2009;7:105.

Dieltjens T, Loots N, Vereecken K, Gruppings K, Heyndrickx L, Bottieau E, Vanham G, Davis D, Janssens W. HIV type 1 subtype A envelope genetic evolution in a slow progressing individual with consistent broadly neutralizing antibodies. *AIDS Res Hum Retroviruses* 2009;25(11):1165-9.

Dorizzi RM, Maconi M, Giavarina D, Loza G, Aman M, Moreira J, Bisoffi Z, Gennuso C. An electronic thesaurus of evidence based laboratory medicine hematological and biochemical diagnostic tests. *Int J Lab Hematol* 2009;31(5):544-51.

Gillet P, Bosselaers K, Cnops L, Bottieau E, Van Esbroeck M, Jacobs J. Evaluation of the SD FK70 malaria Ag *Plasmodium vivax* rapid diagnostic test in a non-endemic setting. *Malar J* 2009;8:129.

Gillet P, Mori M, Van Esbroeck M, Van den Ende J, Jacobs J. Assessment of the prozone effect in malaria rapid diagnostic tests. *Malar J* 2009;8:271.

Gillet P, van Dijk DPJ, Bottieau E, Cnops L, Van Esbroeck M, Jacobs J. Test characteristics of the SD FK80 *Plasmodium falciparum/Plasmodium vivax* rapid diagnostic test in a non-endemic setting. *Malar J* 2009;8:262.

Gordillo V, Fekete EM, Platteau T, Antoni MH, Schneiderman N, Nöstlinger C, Eurosupport Study Group. Emotional support and gender in people living with HIV: effects on psychological well-being. *J Behav Med* 2009;32(6):523-31.

Heyman P, Baert K, Plyusnina A, Cochez C, Lundkvist A, Van Esbroeck M, Goossens E, Vandenvelde C, Plyusnin A, Stuyck J. Serological and genetic evidence for the presence of Seoul hantavirus in *Rattus norvegicus* in Flanders, Belgium. *Scand J Infect Dis* 2009;41(1):51-6.

Krusche-Mandl I, Decramer A, Boltuch-Sherif J, Vlieghe E, Brands C, Vandenberghe D. Nicht-tuberkulöse mykobakterielle infektionen an hand und handgelenk: eine retrospektive analyse von fünf fällen. *Handchir Mikrochir Plast Chir* 2009;41(5):283-7.

Loutfy M, Ribera E, Florence E, De Wit S, Castagna A, Ryan R, Hill A, Vanaken H, van Delft Y, Marks S. Sustained HIV RNA suppression after switching from enfuvirtide to etravirine in the early access programme [letter]. *J Antimicrob Chemother* 2009;64(6):1341-4.

Lynen L, An S, Koole O, Thai S, Ros S, De Munter P, Sculier D, Arnould L, Fransen K, Menten J, Boelaert M, Van den Ende J, Colebunders R. An algorithm to optimize viral load testing in HIV-positive patients with suspected first-line antiretroviral therapy failure in Cambodia. *J Acquir Immun Defic Syndr* 2009;52(1):40-8.

Manirankunda L, Loos J, Alou TA, Colebunders R, Nöstlinger C. "It's better not to know": perceived barriers to HIV voluntary counseling and testing among sub-Saharan African migrants in Belgium. *AIDS Educ Prev* 2009;21(6):582-93.

Michielsen P, Bottieau E, Van Vlierberghe H, Van Marck E, Vandemaele E, Denys M, Brasseur JP, Popan M, Steering Committee of the Belgian Association for the Study of the Liver. Treatment of chronic hepatitis C in patients with human immunodeficiency virus (HIV) with weekly peginterferon alpha-2b plus ribavirin: a multi-centred Belgian study. *Acta Gastroenterol Belg* 2009;72(4):389-93.

Moreira J, Bisig B, Muwawenimana P, Basinga P, Bisoffi Z, Haegeman F, Kishore P, Van den Ende J. Weighing harm in therapeutic decisions of smear-negative pulmonary tuberculosis. *Med Decis Making* 2009;29(3):380-90.

Nakanjako D, Colebunders R, Coutinho AG, Kanya MR. Strategies to optimize HIV treatment outcomes in resource-limited settings. *AIDS Rev* 2009;11(4):179-89.

Sreeramareddy CT, Panduru KV, Menten J, Van den Ende J. Time delays in diagnosis of pulmonary tuberculosis: a systematic review of literature. *BMC Infect Dis* 2009;9:91.

ten Hove RJ, Van Esbroeck M, Vervoort T, Van den Ende J, van Lieshout L, Verweij JJ. Molecular diagnostics of intestinal parasites in returning travellers. *Eur J Clin Microbiol Infect Dis* 2009;28(9):1045-53.

Thai S, Koole O, Un P, Ros S, De Munter P, Van Damme W, Jacques G, Colebunders R, Lynen L. Five-year experience with scaling-up access to antiretroviral treatment in an HIV care programme in Cambodia. *Trop Med Int Health* 2009;14(9):1048-58.

Theunissen C, Janssens P, Demulder A, Nouboussié D, Van Esbroeck M, Van Gompel A, Van den Ende J. Falciparum malaria in patient 9 years after leaving malaria-endemic area [letter]. *Emerg Infect Dis* 2009;15(1):115-6.

Torpey K, Lartey M, Amenyah R, Addo NA, Obeng-Baah J, Rahman Y, Suzuki C, Mukadi YD, Colebunders R. Initiating antiretroviral treatment in a resource-constrained setting: does clinical staging effectively identify patients in need? *Int J STD AIDS* 2009;20(6):395-8.

Van den Enden E. Pharmacotherapy of helminth infection. *Expert Opin Pharmacother* 2009;10(3):435-51.

Van der Linden D, Callens S, Brichard B, Colebunders R. Pediatric HIV: new opportunities to treat children. *Expert Opin Pharmacother* 2009;10(11):1783-91.

Van der Palen M, Gillet P, Bottieau E, Cnops L, Van Esbroeck M, Jacobs J. Test characteristics of two rapid antigen detection tests (SD FK50 and SD KF60) for the diagnosis of malaria in returned travellers. *Malar J* 2009;8:90.

Van Dijk DP, Gillet P, Vlieghe E, Cnops L, Van Esbroeck M, Jacobs J. Evaluation of the Palutop+4 malaria rapid diagnostic test in a non-endemic setting. *Malar J* 2009;8:293.

Van geertruyden JP, Colebunders R, D'Alessandro U. HIV-1-infected individuals traveling to malaria endemic areas [letter]. *J Acquir Immun Defic Syndr* 2009;51(2):234-5.

Van geertruyden JP, Mulenga M, Chalwe V, Michael N, Moerman F, Mukwamataba D, Colebunders R, D'Alessandro U. Impact of HIV-1 infection on the hematological recovery after clinical malaria. *J Acquir Immun Defic Syndr* 2009;50(2):200-5.

van Griensven J, Lynen L, Colebunders R. Substituting tenofovir for stavudine in resource-limited settings: there are challenges ahead [correspondence]. *AIDS* 2009;23(8):1027.

van Griensven J, Un P, Phe T, Thai S, Lynen L. Substituting nevirapine for efavirenz: risk factors for toxicity in nonnaive patients in a resource-constrained setting [correspondence]. *AIDS* 2009;23(17):2374-6.

Vlieghe E, Phoba MF, Muyembe Tamfum JJ, Jacobs J. Antibiotic resistance among bacterial pathogens in Central Africa: a review of the published literature between 1955 and 2008. *Int J Antimicrob Agents* 2009;34(4):295-303.

Other publications

Apers L, Colebunders R, Nachega JB. Prophylaxis with antituberculous drugs in special situations. In: Schaaf HS, Zumla AI, editors. *Tuberculosis; a comprehensive clinical reference*. [s.l.]: Saunders Elsevier; 2009:780-5.

Bottieau E, Van Esbroeck M, Cnops L, Clerinx J, Van Gompel A. Chikungunya infection confirmed in a Belgian traveller returning from Phuket (Thailand). *Eurosurveillance* 2009;14(25):19248.

Bottieau E, Van Gompel A. Bilan de santé chez le voyageur asymptomatique de retour des tropiques. *Rev Méd Suisse* 2009;5(202):1016-21.

- Buntinx F, Aertgeerts B, Aerts M, Bruyninckx R, Knottnerus JA, van den Bruel A, Van den Ende J. Multivariable analysis in diagnostic accuracy studies: what are the possibilities? In: Knottnerus JA, Buntinx F, editors. *The evidence base of clinical diagnosis; theory and methods of diagnostic research*; 2nd ed. Chichester: Wiley-Blackwell; London: BMJ Books; 2009:146-66.
- Callens S. Pediatric antiretroviral treatment in resource-limited settings [dissertation]. Antwerp: University of Antwerp, Faculty of Medicine, Department of Infectious Diseases; 2009: 185 pp.
- Castelnuovo B, John L, Lutwama F, Ronald A, Spacek LA, Bates M, Kamya MR, Colebunders R. Three-year outcome data of second-line antiretroviral therapy in Ugandan adults: good virological response but high rate of toxicity. *J Int Assoc Physicians AIDS Care* 2009;8(1):52-9.
- Clarebout G, Elen J, Lowyck J, Van den Ende J, Van den Enden E. Tropical medicine open learning environment. In: Tan J, editor. *Medical Informatics: concepts, methodologies, tools, and applications*. Hershey: IGI Global; 2009:1445-50.
- Conesa-Botella A, Mathieu C, Colebunders R, Moreno-Reyes R, van Etten E, Lynen L, Kestens L. Is vitamin D deficiency involved in the immune reconstitution inflammatory syndrome? *AIDS Res Ther* 2009;6:4.
- de Waard I, Zolfo M. Integrating gender and ethnicity in mobile courses ante-design: a TELearning instrument. *Int J Interact Mobile Technol* 2009;3(1):77-8.
- Gautret P, Clerinx J, Caumes E, Simon F, Jensenius M, Loutan L, Schlagenhauf P, Castelli F, Freedman D, Miller A, Bronner U, Parola P. Imported human African trypanosomiasis in Europe, 2005-2009. *Eurosurveillance* 2009;14(36):19327.
- Katwere M, Kambugu A, Piloya T, Wong M, Hendel-Paterson B, Sande MA, Ronald A, Katabira E, Were EM, Menten J, Colebunders R. Clinical presentation and aetiologies of acute or complicated headache among HIV-seropositive patients in a Ugandan clinic. *J Int AIDS Soc* 2009;12:21.
- Luyckx G, Vanhoenacker FM, Parizel PM. Chain mail calcifications in dracunculiasis. *JBR-BTR* 2009;92(4):231.
- Lynen L. Challenges of HIV care in low-income countries; experience from a pilot project in Cambodia 2003-2007 [dissertation]. Antwerpen: Universiteit Antwerpen, Faculteit Geneeskunde; 2009: 168 pp.
- Meya D, Spacek LA, Tibenderana H, John L, Namugga I, Magero S, Dewar R, Quinn TC, Colebunders R, Kambugu A, Reynolds SJ. Development and evaluation of a clinical algorithm to monitor patients on antiretrovirals in resource-limited settings using adherence, clinical and CD4 cell count criteria. *J Int AIDS Soc* 2009;12:3.
- Moreira J. Threshold thinking in medicine: time for a paradigm change [dissertation]. Antwerpen: Universiteit Antwerpen, Faculteit Medische Wetenschappen; 2009: 118 pp.
- Peltier CA, Omes C, Ndimubanzi PC, Ndayisaba GF, Stulac S, Arendt V, Courteille O, Muganga N, Kayumba K, Van den Ende J. Validation of 2006 WHO prediction scores for true HIV infection in children less than 18 months with a positive serological HIV test. *PLoS ONE* 2009;4(4):e5312.
- Shihab HM, Feld JJ, Lutwama F, Piloya T, Colebunders R. Successful treatment of psoriasis-like lesions in HIV infected patients in Uganda with chloroquine. *Open Infect Dis J* 2009;3:50-4.
- Shihab HM, Lutwama F, Piloya T, Castelnuovo B, Kambugu AD, Colebunders R. Bilateral pedal edema in an HIV patient: lopinavir/ritonavir-containing treatment regimen as a potential cause? *J Infect Dev Countries* 2009;3(5):405-7.
- Toovey S, Van Gompel A. Post-travel assessment. In: Shaw M, editor. *Resources for beginning and operating a traveler's health clinic*. [s.l.]: [International Society of Travel Medicine]; 2009:92-9.
- Torpey K. Delivering HIV prevention, care and treatment program in resource limited settings: lessons from Ghana and Zambia [dissertation]. Antwerpen: Universiteit Antwerpen, Faculteit Geneeskunde; 2009: 169 pp.
- Van Bortel W, Versteirt V, Van Gompel A, Coosemans M. Changement climatique et maladies émergentes: un concours complexe de facteurs. *J Pharm Belg* 2009;2:48-53.
- Van Bortel W, Versteirt V, Van Gompel A, Coosemans M. Klimaatverandering en oprukkende ziekten: een complex samenspel van factoren. *Farm Tijdschr Belg* 2009;2:40-5.
- Van den Ende J, Laganà S, Blot K, Bisoffi Z, Van den Enden E, Vermeulen L, Kestens L. Development of KABISA: a computer-based training program for clinical diagnosis in developing countries. In: Tan F, editor. *Global information technologies: concepts, methodologies, and applications*. Hershey: IGI Global; 2008.
- Van den Enden E, Vlieghe E, Demeester R, Ieven G, Jansens H, Van den Hauwe L. A traveler with neurobrucellosis. *Travel Med Infect Dis* 2009;7(4):215-8.
- Van Gompel A. Reisvaccinatie; actualisering 2009. *Vax-Info* 2009;53:1-3.
- Van Gompel A. Tuberculose; vaccination et voyages. *Vax-Info* 2009;53:3-5.
- Van Gompel A. Vaccinatie tegen tuberculose. *Vax-Info* 2009;53:3-5.
- Van Gompel A. Vaccination du voyageur; actualisation 2009. *Vax-Info* 2009;53:1-3.
- Van Gompel A. Vaccination of immunocompromised patients with inflammatory diseases; adapted and updated, version 19th November 2009. In: *Risk assessment and prevention; Eight National Seminar on Travel Medicine*, 19th November 2009, Brussels, Belgium. [Brussels]: [s.n.]; 2009.
- Van Gompel A, Geerts P. *Gezond op reis*. Antwerpen: Houtekiet, 2009: 319 pp.
- Van Meensel B, Van Gompel A, Lontie M. Chemoprophylaxe van malaria. *Wet Tijd* 2009;251:2-4.
- Worodria W, Conesa-Botella A, Kitembo H, McAdam KPWJ, Colebunders R. Coping with TB immune reconstitution inflammatory syndrome. *Expert Rev Resp Med* 2009;3(2):147-52.

Zolfo M, Renggli V, Koole O, Lynen L. Telemedicine in low-resource settings: experience with a telemedicine service for HIV/AIDS care. In: Wooton R, Patil NG, Scott RE, Ho K, editors. *Telehealth in the developing world*. Ottawa: International Development Research Centre (IDRC); London: Royal Society of Medicine Press; 2009:91-100.

Publications with acknowledged ITM collaboration (2008-2009)

Antiretroviral Therapy Cohort Collaboration (ART-CC). Does short-term virologic failure translate to clinical events in antiretroviral-naïve patients initiating antiretroviral therapy in clinical practice? *AIDS* 2008;22(18):2481-92. [ITM collaborator: Colebunders R]

Antiretroviral Therapy Cohort Collaboration (ART-CC). Variable impact on mortality of AIDS-defining events diagnosed during combination antiretroviral therapy: not all AIDS-defining conditions are created equal. *Clin Infect Dis* 2009;48(8):1138-51. [ITM collaborator: Colebunders R]

Bannister WP, Ruiz L, Cozzi-Lepri A, Mocroft A, Kirk O, Staszewski S, Loveday C, Karlsson A, D'Arminio-Monforte A, Clotet B, Lundgren JD, EuroSIDA Study Group. Comparison of genotypic resistance profiles and virological response between patients starting nevirapine and efavirenz in EuroSIDA. *AIDS* 2008;22(3):367-76. [ITM collaborator: Colebunders R]

Bannister WP, Cozzi-Lepri A, Clotet B, Mocroft A, Kjær J, Reiss P, von Wyl V, Lazzarin A, Katlama C, Phillips AN, Ruiz L, Lundgren JD, EuroSIDA Study Group. Transmitted drug resistant HIV-1 and association with virologic and CD4 cell count response to combination antiretroviral therapy in the EuroSIDA study. *J Acquir Immun Defic Syndr* 2008;48(3):324-33. [ITM collaborator: Colebunders R]

Cooper DA, Steigbigel RT, Gatell JM, Rockstroh JK, Katlama C, Yeni P, Lazzarin A, Clotet B, Kumar PN, Eron JE, Schechter M, Markowitz M, Loutfy MR, Lennox JL, Zhao J, Chen J, Ryan DM, Rhodes RR, Killar JA, Gilde LR, Strohmaier KM, Meibohm AR, Miller MD, Hazuda DJ, Nessly ML, DiNubile MJ, Isaacs RD, Teppler H, Nguyen BY, BENCHMRK Study Teams. Subgroup and resistance analyses of raltegravir for resistant HIV-1 infection. *N Engl J Med* 2008;359(4):355-65. [ITM collaborator: Colebunders R]

Cozzi-Lepri A, Phillips AN, Clotet B, Mocroft A, Ruiz L, Kirk O, Lazzarin A, Wiercinska-Drapalo A, Karlsson A, Lundgren JD, EuroSIDA Study Group. Detection of HIV drug resistance during antiretroviral treatment and clinical progression in a large European cohort study. *AIDS* 2008;22(16):2187-98. [ITM collaborator: Colebunders R]

Cozzi-Lepri A, Phillips AN, Martinez-Picado J, Monforte A, Katlama C, Eg Hansen AB, Horban A, Bruun J, Clotet B, Lundgren JD, EuroSIDA Study Group. Rate of accumulation of thymidine analogue mutations in patients continuing to receive virologically failing regimens containing zidovudine or stavudine: implications for antiretroviral therapy programs in resource-limited settings. *J Infect Dis* 2009;200(5):687-97. [ITM collaborator: Colebunders R]

D A D Study Group. Use of nucleoside reverse transcriptase inhibitors and risk of myocardial infarction in HIV-infected patients enrolled in the D:A:D study: a multi-cohort collaboration. *Lancet* 2008;371(9622):1417-26. [ITM collaborator: Colebunders R]

Data Collection on Adverse Events of Anti-HIV Drugs (D A D) Study Group. HIV-induced immunodeficiency and mortality from AIDS-defining and non-AIDS-defining malignancies. *AIDS* 2008;22(16):2143-53. [ITM collaborator: Colebunders R]

Data Collection on Adverse Events of Anti-HIV Drugs (D A D) Study Group. Changes over time in risk factors for cardiovascular disease and use of lipid-lowering drugs in HIV-infected individuals and impact on myocardial infarction. *Clin Infect Dis* 2008;46(7):1101-10. [ITM collaborator: Colebunders R]

Fox Z, Phillips A, Cohen C, Neuhaus J, Baxter J, Emery S, Hirschel B, Hullsiek KH, Stephan C, Lundgren J, SMART Study Group. Viral resuppression and detection of drug resistance following interruption of a suppressive non-nucleoside reverse transcriptase inhibitor-based regimen. *AIDS* 2008;22(16):2279-89. [ITM collaborators: De Roo A, Lynen L]

Gredig D, Nideröst S, Rickenbach M, Swiss HIV Cohort Study, Eurosupport Study Group. Parents living with HIV in a high-income country: do patients need specific support? *Swiss Med Wkly* 2008;138(3-4):38-46. [ITM collaborators: Colebunders R, Nöstlinger C]

INSIGHT-ESPRIT Study Group, SILCAAT Scientific Committee. Interleukin-2 therapy in patients with HIV infection. *N Engl J Med* 2009;361(16):1548-59. [ITM collaborator: Colebunders R]

Katlama C, Haubrich R, Lalezari J, Lazzarin A, Madruga JV, Molina JM, Schechter M, Peeters M, Picchio G, Vingerhoets J, Woodfall B, De Smedt G, DUET-1 study group, DUET-2 study group. Efficacy and safety of etravirine in treatment-experienced, HIV-1 patients: pooled 48 week analysis of two randomized, controlled trials. *AIDS* 2009;23(17):2289-300. [ITM collaborator: Colebunders R]

Kesselring AM, Wit FW, Sabin CA, Lundgren JD, Gill MJ, Gatell JM, Rauch A, Montaner JS, de Wolf F, Reiss P, Mocroft A, Nevirapine Toxicity Multicohort Collaboration. Risk factors for treatment-limiting toxicities in patients starting nevirapine-containing antiretroviral therapy. *AIDS* 2009;23(13):1689-99. [ITM collaborator: Colebunders R]

Mocroft A, Horban A, Clotet B, D'Arminio-Monforte A, Bogner JR, Aldins P, Staub T, Antunes F, Katlama C, Lundgren JD, EuroSIDA Study Group. Regional differences in the risk of triple class failure in European patients starting combination antiretroviral therapy after 1 January 1999. *HIV Med* 2008;9(1):41-6. [ITM collaborator: Colebunders R]

Mocroft A, Kirk O, Aldins P, Chies A, Blaxhult A, Chentsova N, Vetter N, Dabis F, Gatell J, Lundgren JD, EuroSIDA Study Group. Loss to follow-up in an international, multicentre observational study. *HIV Med* 2008;9(5):261-9. [ITM collaborator: Colebunders R]

Mocroft A, Wyatt C, Szczech L, Neuhaus J, El-Sadr W, Tracy R, Kuller L, Shlipak M, Angus B, Klinker H, Ross M, INSIGHT SMART study group. Interruption of antiretroviral therapy is associated with increased plasma cystatin C. *AIDS* 2009;23(13):71-82. [ITM collaborators: De Roo A, Lynen L]

Peters L, Mocroft A, Soriano V, Rockstroh JK, Losso M, Valerio L, Aldins P, Reiss P, Ledergerber B, Lundgren JD, EuroSIDA Study Group. Hepatitis C virus coinfection does not influence the CD4 cell recovery in HIV-1-infected patients with maximum virologic suppression. *J Acquir Immun Defic Syndr* 2009;50(5):457-63. [ITM collaborator: Colebunders R]

Podlekareva D, Bannister W, Mocroft A, Abrosimova L, Karpov I, Lundgren JD, Kirk O, EuroSIDA Study Group. The EuroSIDA study: regional differences in the HIV-1 epidemic and treatment response to antiretroviral therapy among HIV-infected patients across Europe; a review of published results. *Cent Eur J Public Health* 2008;16(3):99-105. [ITM collaborator: Colebunders R]

Podlekareva D, Mocroft A, Kirk O, Reiss P, Aldins P, Katlama C, Kovari H, Stellbrink HJ, D'Arminio-Monforte A, Lundgren JD, EuroSIDA Study Group. Fungal infection as a risk factor for HIV disease progression among patients with a CD4 count above 200/μl in the era of cART. *Scand J Infect Dis* 2008;40(11-12):908-13. [ITM collaborator: Colebunders R]

Reekie J, Mocroft A, Sambatakou H, Machala L, Chiesi A, van Lunzen J, Clumeck N, Kirk O, Gazzard B, Lundgren JD, EuroSIDA Study Group. Does less frequent routine monitoring of patients on a stable, fully suppressed cART regimen lead to an increased risk of treatment failure? *AIDS* 2008;22(17):2381-90. [ITM collaborator: Colebunders R]

Rodger AJ, Fox Z, Lundgren JD, Kuller LH, Boesecke C, Gey D, Skoutelis A, Goetz MB, Phillips AN, INSIGHT Strategies for Management of Antiretroviral Therapy (SMART) study group. Activation and coagulation biomarkers are independent predictors of the development of opportunistic disease in patients with HIV infection. *J Infect Dis* 2009;200(6):973-83. [ITM collaborators: De Roo A, Lynen L]

SMART Study Group. Risk for opportunistic disease and death after reinitiating continuous antiretroviral therapy in patients with HIV previously receiving episodic therapy; a randomized trial. *Ann Intern Med* 2008;149(5):289-99. [ITM collaborators: De Roo A, Lynen L]

Smith CJ, Olsen CH, Mocroft A, Viard JP, Staszewski S, Panos G, Staub T, Blaxhult A, Vetter N, Lundgren JD. The role of antiretroviral therapy in the incidence of pancreatitis in HIV-positive individuals in the EuroSIDA study. *AIDS* 2008;22(1):47-56. [ITM collaborator: Colebunders R]

Soriano V, Mocroft A, Rockstroh J, Ledergerber B, Knysz B, Chaplinskas S, Peters L, Karlsson A, Katlama C, Toro C, Kupfer B, Vogel M, Lundgren J, EuroSIDA Study Group. Spontaneous viral clearance, viral load, and genotype distribution of hepatitis C virus (HCV) in HIV-infected patients with anti-HCV antibodies in Europe. *J Infect Dis* 2008;198(9):1337-44. [ITM collaborator: Colebunders R]

Steigbigel RT, Cooper DA, Kumar PN, Eron JE, Schechter M, Markowitz M, Loutfy MR, Lennox JL, Gatell JM, Rockstroh JK, Katlama C, Yeni P, Lazzarin A, Clotet B, Zhao J, Chen J, Ryan DM, Rhodes RR, Killar JA, Gilde LR, Strohmaier KM, Meibohm AR, Miller MD, Hazuda DJ, Nessly ML, DiNubile MJ, Isaacs RD, Nguyen BY, Teppler H, BENCHMRK Study Teams. Raltegravir with optimized background therapy for resistant HIV-1 infection. *N Engl J Med* 2008;359(4):339-54. [ITM collaborator: Colebunders R]

Strategies for Management of Antiretroviral Therapy (SMART) Study Group. Major clinical outcomes in antiretroviral therapy (ART)-naïve participants and in those not receiving ART at baseline in the SMART study. *J Infect Dis* 2008;197(8):1133-44. [ITM collaborators: De Roo A, Lynen L]

Strategies for Management of Antiretroviral Therapy (SMART) Study Group. Inferior clinical outcome of the CD4 cell count-guided antiretroviral treatment interruption strategy in the SMART study: role of CD4 cell counts and HIV RNA levels during follow-up. *J Infect Dis* 2008;197(8):1145-55. [ITM collaborators: De Roo A, Lynen L]

Vercauteren J, Wensing AMJ, van de Vijver DAMC, Albert J, Balotta C, Hamouda O, Kücherer C, Struck D, Schmit JC, Åsjö B, Bruckova M, Camacho RJ, Clotet B, Coughlan S, Grossman Z, Horban A, Korn K, Kostrikis L, Nielsen C, Paraskevis D, Poljak M, Puchhammer-Stöckl E, Riva C, Ruiz L, Salminen M, Schuurman R, Sonnerborg A, Stanekova D, Stanojevic M, Vandamme AM, Boucher CAB, SPREAD Programme. Transmission of drug-resistant HIV-1 is stabilizing in Europe. *J Infect Dis* 2009;200(10):1503-8. [ITM collaborators: De Roo A, Franssen K, Vekemans M]

Department of Public Health

Publications in international peer-reviewed journals with impact factor

Ahmad RA, Mahendradhata Y, Cunningham J, Utarini A, de Vlas SJ. How to optimize tuberculosis case finding: explorations for Indonesia with a health system model. *BMC Infect Dis* 2009;9:87.

Assefa Y, Jerene D, Lulseged S, Ooms G, Van Damme W. Rapid scale-up of antiretroviral treatment in Ethiopia: successes and system-wide effects. *PLoS Med* 2009;6(4):e1000056.

Baly A, Toledo ME, Vanlerberghe V, Ceballos E, Reyes A, Sanchez I, Carvajal M, Maso R, La Rosa M, Denis O, Boelaert M, Van der Stuyft P. Cost-effectiveness of a community-based approach intertwined with a vertical *Aedes* control program. *Am J Trop Med Hyg* 2009;81(1):88-93.

Baya Botti A, Pérez-Cueto FJA, Vasquez Monllor PA, Kolsteren PW. Anthropometry of height, weight, arm, wrist, abdominal circumference and body mass index, for Bolivian adolescents 12 to 18 years; Bolivian adolescent percentile values from the MESA study. *Nutr Hosp* 2009;24(3):304-11.

Beltaïfa L, Traissac P, El Ati J, Lefèvre P, Romdhane HB, Delpeuch F. Prevalence of obesity and associated socioeconomic factors among Tunisian women from different living environments. *Obes Rev* 2009;10(2):145-53.

Bhattarai NR, Das ML, Rijal S, Van der Auwera G, Picado A, Khanal B, Roy L, Speybroeck N, Berkvens D, Davies CR, Coosemans M, Boelaert M, Dujardin JC. Natural infection of *Phlebotomus argentipes* with *Leishmania* and other trypanosomatids in a visceral leishmaniasis endemic region of Nepal. *Trans R Soc Trop Med Hyg* 2009;103(11):1087-92.

- Bhattarai NR, Van der Auwera G, Khanal B, De Doncker S, Rijal S, Das ML, Uranw S, Ostyn B, Praet N, Speybroeck N, Picado A, Davies C, Boelaert M, Dujardin JC. PCR and direct agglutination as *Leishmania* infection markers among healthy Nepalese subjects living in areas endemic for kala-azar. *Trop Med Int Health* 2009;14(4):404-11.
- Boelaert M, Meheus F, Sanchez A, Singh SP, Vanlerberghe V, Picado A, Meessen B, Sundar S. The poorest of the poor: a poverty appraisal of households affected by visceral leishmaniasis in Bihar, India. *Trop Med Int Health* 2009;14(6):639-44.
- Cometto G, Ooms G, Starrs A, Zeitz P. A global fund for the health MDGs? [comment]. *Lancet* 2009;373(9674):1500-2.
- Cometto G, Ooms G, Starrs A, Zeitz P. Towards a global fund for the health MDGs? [correspondence]. *Lancet* 2009;374(9696):1146.
- De Brouwere V, Dieng T, Diadhiou M, Witter S, Denerville E. Task shifting for emergency obstetric surgery in district hospitals in Senegal. *Reprod Health Matt* 2009;17(33):32-44.
- De Ceukelaire W, De Vos P. Governments, civil society, and social determinants of health [letter]. *Lancet* 2009;373(9660):298-9.
- De Ceukelaire W, De Vos P. Social movements are key towards universal health coverage. *Lancet* 2009;374(9705):1888.
- De Vos P, Van der Stuyft P. The right to health in times of economic crisis: Cuba's way [comment]. *Lancet* 2009;374(1575):1576.
- Delvaux T, Elul B, Ndagije F, Munyana E, Roberfroid D, Asimwe A. Determinants of nonadherence to a single-dose nevirapine regimen for the prevention of mother-to-child HIV transmission in Rwanda. *J Acquir Immun Defic Syndr* 2009;50(2):223-30.
- Elul B, Delvaux T, Munyana E, Lahuerta M, Horowitz D, Ndagije F, Roberfroid D, Mugisha V, Nash D, Asimwe A. Pregnancy desires, and contraceptive knowledge and use among prevention of mother-to-child transmission clients in Rwanda. *AIDS* 2009;23(Suppl.1):S19-26.
- Filippi V, Richard F, Lange I, Ouattara F. Identifying barriers from home to the appropriate hospital through near-miss audits in developing countries. *Best Pract Res Clin Obstet Gynaecol* 2009;23(3):389-400.
- Gidwani K, Rai M, Chakravarty J, Boelaert M, Sundar S. Evaluation of leishmanin skin test in Indian visceral leishmaniasis. *Am J Trop Med Hyg* 2009;80(4):566-7.
- González Ochoa E, Brooks JL, Matthys F, Calisté P, Armas L, Van der Stuyft P. Pulmonary tuberculosis case detection through fortuitous cough screening during home visits. *Trop Med Int Health* 2009;14(2):131-5.
- Hanson C, Van Damme W, Van Dormael M, Van der Roost D, Songane F. Three global health reports: towards a growing consensus? [editorial]. *Trop Med Int Health* 2009;14(7):710-2.
- Hasker E, Khodjikhonov M, Usarova S, Asamidinov U, Yuldashova U, Van der Werf MJ, Uzakova G, Veen J. Drug prescribing practices for tuberculosis in Uzbekistan. *Int J Tuberc Lung Dis* 2009;13(11):1405-10.
- Huybregts L, Roberfroid D, Lanou H, Menten J, Meda N, Van Camp J, Kolsteren P, MISAME Study Group. Prenatal food supplementation fortified with multiple micronutrients increases birth length: a randomized controlled trial in rural Burkina Faso. *Am J Clin Nutr* 2009;90(6):1593-600.
- Huybregts LF, Roberfroid DA, Kolsteren PW, van Camp JH. Dietary behaviour, food and nutrient intake of pregnant women in a rural community in Burkina Faso. *Maternal Child Nutr* 2009;5(3):211-22.
- Johns B, Probandari A, Mahendradhata Y, Ahmad RA. An analysis of the costs and treatment success of collaborative arrangements among public and private providers for tuberculosis control in Indonesia. *Health Pol* 2009;93(2-3):214-24.
- Joshi AB, Das ML, Akhter S, Chowdhury R, Mondal D, Kumar V, Das P, Kroeger A, Boelaert M, Petzold M. Chemical and environmental vector control as a contribution to the elimination of visceral leishmaniasis on the Indian subcontinent: cluster randomized controlled trials in Bangladesh, India and Nepal. *BMC Med* 2009;7:54.
- Keugoung B. The availability of drugs for rich and poor people in developing countries [reflection and reaction]. *Lancet Infect Dis* 2009;9(10):586-7.
- Kibadi K, Boelaert M, Kayinua M, Minuku JB, Muyembe-Tamfum JJ, Portaels F, Lefèvre P. Therapeutic itineraries of patients with ulcerated forms of *Mycobacterium ulcerans* (Buruli ulcer) disease in a rural health zone in the Democratic Republic of Congo. *Trop Med Int Health* 2009;14(9):1110-6.
- Kimanya ME, De Meulenaer B, Baert K, Tiisekwa B, Van Camp J, Samapundo S, Lachat C, Kolsteren P. Exposure of infants to fumonisins in maize-based complementary foods in rural Tanzania. *Mol Nutr Food Res* 2009;53(5):667-74.
- Kimanya ME, De Meulenaer B, Tiisekwa B, Ugullum C, Devlieghere F, Van Camp J, Samapundo S, Kolsteren P. Fumonisin exposure from freshly harvested and stored maize and its relationship with traditional agronomic practices in Rombo District, Tanzania. *Food Addit Contam A* 2009;26(8):1199-208.
- Lachat C, Khanh LNB, Khan NC, Dung NQ, Anh NDV, Roberfroid D, Kolsteren P. Eating out of home in Vietnamese adolescents: socioeconomic factors and dietary associations. *Am J Clin Nutr* 2009;90(6):1648-55.
- Lachat C, Roberfroid D, Huybregts L, Van Camp J, Kolsteren P. Incorporating the catering sector in nutrition policies of WHO European region: is there a good recipe? *Public Health Nutr* 2009;12(3):316-24.
- Lachat CK, Huybregts LF, Roberfroid DA, Van Camp J, Remaut-De Winter AME, Debruyne P, Kolsteren PW. Nutritional profile of foods offered and consumed in a Belgian university canteen. *Public Health Nutr* 2009;12(1):122-8.

Lachat CK, Verstraeten R, De Meulenaer B, Menten J, Huybregts LF, Van Camp J, Roberfroid D, Kolsteren PW. Availability of free fruits and vegetables at canteen lunch improves lunch and daily nutritional profiles: a randomised controlled trial. *Br J Nutr* 2009;102(7):1030-7.

Luboga S, Macfarlane SB, von Schreeb J, Kruk ME, Cherian MN, Bergström S, Bossyns PBM, Denerville E, Dovlo D, Galukande M, Hsia RY, Jayaraman SP, Lubbock LA, Mock C, Ozgediz D, Sekimpi P, Wladis A, Zakariah A, Dade NB, Donkor P, Gatumbu JK, Hoekman P, IJsselmuiden CB, Jamison DT, Jessani N, Jiskoot P, Kakande I, Mabweijano JR, Mbembati N, McCord C, Mijumbi C, de Miranda H, Mkony CA, Mocumbi P, Ndiokubwayo JB, Ngeumachi P, Ogbaselassie G, Okitombahe EL, Toure CT, Vaz F, Zikusooka CM, Debas HT. Increasing access to surgical services in sub-Saharan Africa: priorities for national and international agencies recommended by the Bellagio Essential Surgery Group [policy forum]. *PLoS Med* 2009;6(12):e1000200.

Lynen L, An S, Koole O, Thai S, Ros S, De Munter P, Sculier D, Arnould L, Fransen K, Menten J, Boelaert M, Van den Ende J, Colebunders R. An algorithm to optimize viral load testing in HIV-positive patients with suspected first-line antiretroviral therapy failure in Cambodia. *J Acquir Immun Defic Syndr* 2009;52(1):40-8.

Marchal B, Cavalli A, Kegels G. Global health actors claim to support health system strengthening; is this reality or rhetoric? *PLoS Med* 2009;6(4):e1000059.

Marcotty T, Matthys F, Godfroid J, Rigouts L, Ameni G, van Pittius NG, Kazwala R, Muma J, van Helden P, Walravens K, de Klerk LM, Geoghegan C, Mbothe D, Otte M, Amenu K, Samra NA, Botha C, Ekron M, Jenkins A, Jori F, Kriek N, McCrindle C, Michel A, Morar D, Roger F, Thys E, Van den Bossche P. Zoonotic tuberculosis and brucellosis in Africa: neglected zoonoses or minor public-health issues? The outcomes of a multi-disciplinary workshop. *Ann Trop Med Parasitol* 2009;103(5):401-11.

Matthys F, Peralta Pérez M, Valdés Díaz S, García Silvera E, Crespo Díaz T, Armas Pérez L, González Ochoa E, Van der Stuyft P. Diagnostic validity of an expert tuberculosis commission that assists the diagnosis of bacteriologically negative suspected TB cases in Havana, Cuba. *Trans R Soc Trop Med Hyg* 2009;103(1):52-8.

Matthys F, Van der Stuyft P, Van Deun A. Universal tuberculosis control targets: not so smart [editorial]. *Int J Tuberc Lung Dis* 2009;13(8):923-4.

Maurer-Cecchini A, Decuyper S, Chappuis F, Alexandrenne C, De Doncker S, Boelaert M, Dujardin JC, Loutan L, Dayer JM, Tulliano G, Arevalo J, Llanos-Cuentas A, Chizzolini C. Immunological determinants of clinical outcome in Peruvian patients with tegumentary leishmaniasis treated with pentavalent antimonials. *Infect Immun* 2009;77(5):2022-9.

Mondal D, Singh SP, Kumar N, Joshi A, Sundar S, Das P, Siddhivinayak H, Kroeger A, Boelaert M. Visceral leishmaniasis elimination programme in India, Bangladesh, and Nepal: reshaping the case finding/case management strategy. *PLoS Negl Trop Dis* 2009;3(1):e355.

Moreno-Reyes R, Carpentier YA, Boelaert M, El Moumni K, Dufourny G, Bazelmans C, Levêque A, Gervy C, Goldman S. Vitamin D deficiency and hyperparathyroidism in relation to ethnicity: a cross-sectional survey in healthy adults. *Eur J Nutr* 2009;48(1):31-7.

Mumba Ngoyi D, Lejon V, N'Siesi FX, Boelaert M, Büscher P. Comparison of operational criteria for treatment outcome in *gambiense* human African trypanosomiasis. *Trop Med Int Health* 2009;14(4):438-44.

Ooms G, Van Damme W. Global responsibilities for global health rights [correspondence]. *Lancet* 2009;374(9690):607.

Ooms G, Hammonds R. Scaling up global social health protection: prerequisite reforms to the International Monetary Fund. *Int J Health Serv* 2009;39(4):795-801.

Pérez-Cueto FJA, Bayá Botti A, Verbeke W. Prevalence of overweight in Bolivia: data on women and adolescents. *Obes Rev* 2009;10(4):373-7.

Pérez D, Lefèvre P, Romero MI, Sánchez L, De Vos P, Van der Stuyft P. Augmenting frameworks for appraising the practices of community-based health interventions. *Health Pol Plann* 2009;24(5):335-41.

Raguenaud ME, Isaakidis P, Reid T, Chy S, Keuky L, Arellano G, Van Damme W. Treating 4,000 diabetic patients in Cambodia, a high-prevalence but resource-limited setting: a 5-year study. *BMC Med* 2009;7:33.

Richard F, Ouédraogo C, Zongo V, Ouattara F, Zongo S, Gruénais ME, De Brouwere V. The difficulty of questioning clinical practice: experience of facility-based case reviews in Ouagadougou, Burkina Faso. *BJOG* 2009;116(1):38-44.

Rintiswati N, Mahendradhata Y, Suharna, Susilawati, Purwanta, Subronto Y, Varkevisser CM, Van der Werf MJ. Journeys to tuberculosis treatment: a qualitative study of patients, families and communities in Jogjakarta, Indonesia. *BMC Public Health* 2009;9:158.

Roberfroid D, Huybregts L, Kolsteren P. Effect of preventive supplementation on young children in Niger [letter]. *JAMA* 2009;301(21):2208.

Sanchez L, Perez D, Cruz G, Castro M, Kourí G, Shkedy Z, Vanlerberghe V, Van der Stuyft P. Intersectoral coordination, community empowerment and dengue prevention: six years of controlled interventions in Playa Municipality, Havana, Cuba. *Trop Med Int Health* 2009;14(11):1356-64.

Schopper D, Upshur R, Matthys F, Singh JA, Bandewar SS, Ahmad A, van Dongen E. Research ethics review in humanitarian contexts: the experience of the independent ethics review board of Médecins Sans Frontières. *PLoS Med* 2009;6(7):e1000115.

Sieleunou I, Souleymanou M, Schönenberger AM, Menten J, Boelaert M. Determinants of survival in AIDS patients on antiretroviral therapy in a rural centre in the Far-North Province, Cameroon. *Trop Med Int Health* 2009;14(1):36-43.

Sumbu J, De Deken R, Deckers N, Mpiana S, Kabambi P, Tshilenge G, Boelaert M. Variation spatiale du risque pour les porcs de contracter la trypanosomiase dans la zone périurbaine de Kinshasa. *Parasite* 2009;16(2):153-9.

Thai S, Koole O, Un P, Ros S, De Munter P, Van Damme W, Jacques G, Colebunders R, Lynen L. Five-year experience with scaling-up access to antiretroviral treatment in an HIV care programme in Cambodia. *Trop Med Int Health* 2009;14(9):1048-58.

Tun-Lin W, Lenhart A, Nam VS, Rebollar-Téllez E, Morrison AC, Barbazan P, Cote M, Midega J, Sanchez F, Manrique-Saïde P, Kroeger A, Nathan MB, Meheus F, Petzold M. Reducing costs and operational constraints of dengue vector control by targeting productive breeding places: a multi-country non-inferiority cluster randomized trial. *Trop Med Int Health* 2009;14(9):1143-53.

Unger JP, Van Dessel P, Sen K, De Paepe P. International health policy and stagnating maternal mortality: is there a causal link? *Reprod Health Matt* 2009;17(33):91-104.

Vandevijvere S, Lachat CK, Kolsteren PW, Van Oyen H. Eating out of home in Belgium: current situation and policy implications. *Br J Nutr* 2009;102(6):921-8.

Vanlerberghe V, Toledo ME, Rodríguez M, Gomez D, Baly A, Benitez JR, Van der Stuyft P. Community involvement in dengue vector control: cluster randomised trial. *BMJ* 2009;338(7709):1477-80.

Vázquez ML, Vargas I, Unger JP, Mogollón A, Ferreira da Silva MR, De Paepe P. Integrated health care networks in Latin America: toward a conceptual framework for analysis. *Rev Panam Salud Pública* 2009;26(4):360-7.

Virues-Ortega J, Hogan AM, Baya-Botti A, Kirkham FJ, Baldeweg T, Mahillo-Fernandez I, Bucks RS. Survival and mortality in older adults living at high altitude in Bolivia: a preliminary report [letter]. *J Am Geriatr Soc* 2009;57(10):1955-6.

Wouters E, Van Damme W, Van Loon F, van Rensburg D, Meulemans H. Public-sector ART in the Free State Province, South Africa: community support as an important determinant of outcome. *Soc Sci Med* 2009;69(8):1177-85.

Other publications

Alvarez Pérez AG, Fariñas AG, Rodríguez Salvá A, Bonet Gorbea M, De Vos P, Van der Stuyft P. Los estudios organizacionales en el abordaje de los determinantes de la salud. *Rev Cubana Hig Epidemiol* 2009;47(1).

Basaza R, Pariyo G, Criel B. What are the emerging features of community health insurance schemes in East Africa? *Risk Manag Healthcare Pol* 2009;2(1):47-53.

Baya Botti A, Perez Cueto FJA, Vasquez Monllor PA, Kolsteren PW. Antropometría de importancia cardio-metabólica. Referencias bolivianas para adolescentes. Actualización en *Nutrición* 2009;10(2):130-54.

Boulenger D, Keugoung B, Criel B. Contracting between faith-based and public health sector in sub-Saharan Africa: an ongoing crisis? The cases of Cameroon, Tanzania, Chad and Uganda. Basel: Medicus Mundi International Network, 2009: 139 pp.

Boulenger D, Keugoung B, Criel B. La contractualisation entre secteur confessionnel et secteur public de la santé en Afrique sub-saharienne: un processus en crise? Les cas du Cameroun, de la Tanzanie, du Tchad et de l'Ouganda. Bâle: Réseau Medicus Mundi International, 2009: 138 pp.

Byskov J, Bloch P, Blystad A, Hurtig AK, Fylkesnes K, Kamuzora P, Kombe Y, Kvåle G, Marchal B, Martin DK, Michelo C, Ndawi B, Ngulube TJ, Nyamongo I, Olsen ØE, Onyango-Ouma W, Sandøy IF, Shayo EH, Silwamba G, Songstad NG, Tuba M. Accountable priority setting for trust in health systems - the need for research into a new approach for strengthening sustainable health action in developing countries. *Health Res Pol Syst* 2009;7:23.

Criel B, Waelkens MP, Soors W, Devadasan N, Atim C. Community health insurance in developing countries. In: Carrin G, Buse K, Heggenhougen HK, Quah SR, editors. *Health systems policy, finance, and organization*. Amsterdam: Elsevier / Academic Press; 2009:236-45.

De Vos P. Las nuevas oportunidades para América Latina. In: Hardoy A, editor. *Salud para todos. Una meta posible. Pueblos movilizados y gobiernos comprometidos en un nuevo contexto global*. Buenos Aires: ILED - América Latina Publicaciones; 2009:161-75.

De Vos P, De Ceukelaire W, Malaise G, Pérez D, Lefèvre P, Van der Stuyft P. Health through people's empowerment: a rights-based approach to participation. *Health Hum Rights* 2009;11(1):23-35.

De Vos P, Malaise G, De Ceukelaire W, Perez D, Lefèvre P, Van der Stuyft P. Participación y empoderamiento en la atención primaria en salud: desde Alma Ata hasta la era de la globalización. *Med Soc* 2009;4(2):127-34.

De Vos P, Malaise G, De Ceukelaire W, Perez D, Lefèvre P, Van der Stuyft P. Participation and empowerment in primary health care: from Alma Ata to the era of globalization. *Soc Med* 2009;4(2):121-7.

Hammonds R, Ooms G. Global solidarity for health. *Glob Future* 2009;2(2):6-7.

Hermann K, Van Damme W, Pariyo GW, Schouten E, Assefa Y, Cirera A, Massavon W. Community-health workers for ART in sub-Saharan Africa: learning from experience; capitalizing on new opportunities. *Hum Resources Health* 2009;7:31.

Hounton SH, Newlands D, Meda N, De Brouwere V. A cost-effectiveness study of caesarean-section deliveries by clinical officers, general practitioners and obstetricians in Burkina Faso. *Hum Resources Health* 2009;7:34.

Kimanya M, De Meulenaer B, Tiisekwa B, Ndomondo-Sigonda M, Kolsteren P. Human exposure to fumonisins from home grown maize in Tanzania. *World Mycotoxin J* 2008;1(3):307-13.

Lachat CK, Kolsteren PW. Does the nutritional profile of food offered a canteen determine what is consumed? A case study in Belgian university canteen. *IFAVA Sci News* 2009;31:3.

Lehmann U, Van Damme W, Barten F, Sanders D. Task shifting: the answer to the human resources crisis in Africa? *Hum Resources Health* 2009;7:49.

Marchal B. Falling numbers of health workers: facing the crisis; what can we learn from magnet hospitals? (*E*)*Hospital* 2009;11(1):21-2.

Matthys F, Rigouts L, Sizaire V, Vezhnina N, Lecoq M, Golubeva V, Portaels F, Van der Stuyt P, Kimerling M. Outcomes after chemotherapy with WHO category II regimen in a population with high prevalence of drug resistant tuberculosis. *PLoS ONE* 2009;4(711):e7954.

Meessen B. An institutional economic analysis of public health care organisations in low-income countries [dissertation]. Louvain-la-Neuve: Université Catholique de Louvain, Département des Sciences Economiques, Facultés des Sciences Economiques, Sociales et Politiques; 2009: 223 pp.

Meessen B. Removing user fees in the health sector in low-income countries: a policy guidance note for programme managers. New York: United Nations Children's Fund (UNICEF), 2009: 38 pp.

Meessen B, Hercot D, Noirhomme M, Ridde V, Tibouti A, Bicaba A, Tashobya CK, Gilson L. Removing user fees in the health sector in low-income countries: a multi-country review. New York: United Nations Children's Fund (UNICEF), 2009: 37 pp.

Muyembe-Tamfum JJ, Veyi J, Kaswa M, Lunguya O, Verhaegen J, Boelaert M. An outbreak of peritonitis caused by multidrug-resistant *Salmonella Typhi* in Kinshasa, Democratic Republic of Congo. *Travel Med Infect Dis* 2009;7(1):40-3.

Pérez AGA, Fariñas AG, Salvá AR, Bonet Gorbea M, De Vos P, Van der Stuyt P. Algunas evidencias cualitativas acerca de la determinación de la salud en Cuba (1989 a 2000). *Rev Cubana Hig Epidemiol* 2009;47(1).

Tejerina Silva H, Soors W, De Paepe P, Aguilar Santacruz E, Closos MC, Unger JP. Reformas de gobiernos socialistas a las políticas de salud en Bolivia y Ecuador: el potencial subestimado de la Atención Primaria Integral de Salud para impactar los determinantes sociales en salud. *Med Soc* 2009;4(4):273-82.

Tejerina Silva H, Soors W, De Paepe P, Aguilar Santacruz E, Closos MC, Unger JP. Socialist government health policy reforms in Bolivia and Ecuador: the underrated potential of comprehensive primary health care to tackle the social determinants of health. *Soc Med* 2009;4(4):226-34.

Vogel T, Widmer E, Criel B, Boulenger D, Perrot J. Renforcer les systèmes de santé en y intégrant les acteurs privés à but non lucratif. *Rev Méd Suisse* 2009;5(Suppl.):S57-S59.

Publications with acknowledged ITM collaboration (2008-2009)

Priotto G, Kasparian S, Mutombo W, Ngouama D, Ghorashian S, Arnold U, Ghabri S, Baudin E, Buard V, Kazadi-Kyanza S, Ilunga M, Mutangala W, Pohlig G, Schmid C, Karunakara U, Torreele E, Kande V. Nifurtimox-eflornithine combination therapy for second-stage African *Trypanosoma brucei gambiense* trypanosomiasis: a multicentre, randomised, phase III, non-inferiority trial. *Lancet* 2009;374(9683):56-64. [ITM collaborators: Boelaert M, Menten J, Büscher P, Lejon V, Bebronne N]

World Health Organization Maximizing Positive Synergies Collaborative Group. An assessment of interactions between global health initiatives and country health systems. *Lancet* 2009;373(9681):2137-69. [ITM collaborators: Boelaert M, Cavalli A, Ooms G, Pirard M, Polman K, Van Damme W, Van Dormael M, Vermeiren P]

Conferences

and workshops organized by the ITM

Colloquium on Neglected Tropical Diseases of Latin America

Lima, Peru, 12-14 November 2009

The 51th ITM colloquium was held abroad, for the third time, after Benin (2005) and Vietnam (2007). This time the venue was Latin America, more specifically the Instituto de Medicina Tropical Alexander von Humboldt at the University Cayetano Heredia in Lima, Peru, a longstanding and highly valued partner of the ITM.

Never before the Lima institute received so many foreign visitors at the same time. We registered 218 participants from four continents. 60% came from Peru, 20% from Latin America, and 20% from Europe, Africa and Asia. From ITM, 18 persons travelled to Lima. Thirty speakers were invited on the basis of their expertise, six others were selected via an open call for abstracts. The central question of the colloquium was: "Which new insights can contribute to the understanding and control of neglected tropical diseases in Latin America?" This topic was further elaborated on in eight sessions:

1. How can we better estimate the impact of neglected tropical diseases?
2. Are the diagnostics for neglected tropical diseases well established?
3. Are vaccine strategies applicable to neglected tropical diseases?
4. How could the prevention of transmission and diseases be improved?
5. Where treatment is available, what are the obstacles to optimal treatment efficiency?
6. What are the prospects regarding new therapeutic agents including natural products?
7. Why and how can we promote local research?
8. How can we narrow the gap between researchers and policy makers?

The colloquium offered a nice opportunity to organise satellite conferences. The European Commission coordinated a workshop of Latin American and European researchers to define research priorities. The Strategic Network on Neglected Diseases held a workshop, allowing the partners to meet face to face. We also held a reunion of Latin American alumni of ITM master courses. Not least, the directors of a dozen institutes of tropical medicine in Europe and South America met to discuss networking and coordination.

In 2009 the cooperation between ITM and the Instituto de Medicina Tropical Alexander von Humboldt celebrated its 20th anniversary. Dominique Le Ray, founding father of the cooperation, was honorary guest of the colloquium and received a laudatio during the official dinner.



Participants of the colloquium.



Members of the Network of Neglected Diseases visiting the hospital ward of the Instituto de Medicina Tropical Alexander von Humboldt.



Dominique Le Ray (left) honoured by Eduardo Gotuzzo, co-organizer of the colloquium.

Conferences

Insecticide resistance in malaria vectors

Huế, Vietnam, October 2009

The Unit of Medical Entomology of the Department of Parasitology organized an interregional workshop on monitoring insecticide resistance, in Huế city, Vietnam, in collaboration with the NIMPE (Vietnam), Asian Collaborative Training Network for malaria (ACT Malaria) and WHO. 23 participants from 12 countries participated in the workshop, which aimed to improve knowledge on insecticide resistance and increasing the capacity for monitoring. We reviewed trial results on long-lasting treated hammocks for controlling forest malaria, and discussed their application with different stakeholders. During the meeting Prof Marc Coosemans received the National medal of “People’s Health Protection” for his contribution to the Vietnam’s malaria control and research. Coosemans is the second Belgian ever to receive this Vietnamese honour.



During the workshop, the Vietnamese authorities paid honour to Marc Coosemans.

Conferences

AIDS Prevention, or progress in technologies and impact of programmes

Antwerp, 1 December 2009, World Aids Day

On 1 December 2009 the Unit of Epidemiology and Control of HIV & STI held its yearly symposium in the Aula Janssens of ITM.

Marie Laga (ITM) welcomed some 200 participants and gave a status questionis on the world-wide battle against HIV and AIDS. Guido Vanham (ITM) reported on the search for a vaccine. Vicky Jespers (ITM) presented the situation regarding the role of antiretroviral drugs in prevention. Anne Buvé (ITM) lectured about universal testing. Mit Philips (Médecins sans Frontières) gave a presentation: "Waning international support for AIDS programs: punishing success?" Harper Hospers (Maastricht University) reviewed the worrying trends in risk behaviour and response on preventive actions of Men who have Sex with Men. Wim Van Damme (ITM) talked on "AIDS programs and strengthening health systems : progress in countries and current debates". Mono Nyambe (GNP+) closed the seminar with his presentation on "Postive health, dignity and prevention, for and by HIV+ people".



A full Aula Janssens for the World Aids Day symposium.

Conferences

Workshop on the assessment of zoonotic disease burden

Antwerp, 12-15 October 2009

The workshop on the “Prioritization of zoonoses through burden and costs estimations” was a joint organization of ITM’s strategic network zoonoses and the EU-funded FP7 project “Integrated Control Of Neglected Zoonoses”. It aimed at proposing standardized methods for the evaluation of the impact of zoonotic diseases in poor countries. While disease impact on animal health can be estimated in economic terms (loss of animals or production, cost of treatment and vaccination...), the veterinary profession is not acquainted with the estimation of human disease burden. Yet, the decision to control a zoonotic disease and how to control it (in animals, animal products or people) depends on the cost of the intervention, the benefits in terms of animal production and the reduction of the human disease burden. Therefore, this workshop also aimed at defining how to integrate the benefits of an intervention on human and animal health in a single model. The World Health Organisation uses the DALY (Disability Adjusted Life Years) as a single metric for disease morbidity and mortality in people. In spite of some limitations, comparing the cost per DALY averted is still the most convenient way of prioritizing control interventions against a zoonosis.

The workshop attracted 25 participants from 15 countries. It combined lectures and hands-on sessions, given by international experts in the field of zoonosis control – including ITM staff members. The participants were given a thorough introduction to the DALY methodology, evaluation of cost-effectiveness of zoonosis control interventions. The participants were confronted with real case studies, such as cysticercosis in Cameroon, echinococcosis in Kazakhstan, rabies in Chad, brucellosis in Mongolia and zoonotic trypanosomiasis in Uganda.



Participants of the “Prioritization of zoonoses through burden and costs estimations”

Conferences

Universal standards for clinical trials in practice

Arusha, Tanzania, 12 October 2009

The “Switching the Poles” Clinical Research Strategic Network started going public with its reflections. This worldwide network was created in 2008 under the DGDC/ITM Framework Agreement to conduct non-commercial clinical trials, addressing the priority health needs in developing countries, in compliance with international Good Clinical Practices. The countries represented in the network are Burkina Faso, Cambodia, Cuba, the Democratic Republic of Congo, Indonesia, Nepal, Peru, Uganda and Zambia.

We gave three oral presentations at the 6th European Conference of Tropical Medicine in Verona (October 2009), respectively on the challenges linked to informed consent in vulnerable populations, on the ethical review practices for clinical research in developing countries sponsored by Northern organizations, and on the challenges of ethical review in DR Congo.

Secondly, we held a public workshop during the 2009 EDCTP Forum, in Arusha. The workshop, attended by some 100 people, covered a broad range of topics which are crucial for clinical research carried out in research-poor contexts, including the gap between standards and resources, the challenges linked to the ethical review and the informed consent process, and the responsibilities of Northern sponsors of non-commercial clinical trials in resource-constrained countries. The presentations raised a lot of interest, and the subsequent debate resulted in suggestions for additional subjects to be investigated (e.g. guidance on the no-fault liability insurance for clinical trials).

Conferences

Livestock Week

Antwerp, 12 to 15 May 2009

This year, the 'Livestock Week' was jointly organized by the Department of Animal Health of the ITM and by the Belgian platform on tropical animal health and production, Be-troplive. The motto was: "If you want to drink milk, you need a cow".

Only the academic session on the first day was open to all individuals interested in livestock research in the tropics. A hundred experts of 26 different countries attended the session. The theme of this open academic session was "Hunger, Health and Climate Change: prioritizing research effort in the livestock sector". Twenty specialists gave a presentation.

The first two days of the event were further reserved for meetings of the Livestock Inter-Agency Donor Group, which supports innovative and collaborative approaches to livestock research in the developing world. It encourages active collaboration with poor farmers to generate new technologies and policies. The last two days were devoted to meetings of the EU Expert Group on Livestock Matters in Developing Countries.

The principal purpose of these annual gatherings is to exchange information directed at poverty alleviation and the attainment of the Millennium Development Goals regarding nutrition and agriculture.



Professor Stanny Geerts at the livestock week, during one of his last lectures before his retirement.

Conferences

e-SCART Facilitators Workshop

ITM, 19-23 October 2009

Since 2008, the Unit of HIV/AIDS & STD care (Department of Clinical Sciences) develops an online course, the e-SCART, which aims at offering training in clinical HIV care in low-resource settings via online learning. Participants do not have to leave their workplace, and are able to study at their own pace. In such online courses, the students need the guidance of experts who have relevant and up-to-date field experience and who know how to communicate in an e-learning environment. A course in HIV care also needs annual updating, in collaboration with HIV-experts working in low-income countries. We can fortunately rely on competent alumni with relevant experience as facilitators for e-SCART, together with the lecturers at ITM. However, they need additional training in e-learning skills. With a first 1-week workshop for facilitators we strengthened their capacities in this field and made sure that the course was updated, wherever needed. Seven facilitators from six countries and three from ITM, took part in the workshop. Together they elaborated on the concepts and their roles. They thoroughly revised the content, and took 'ownership' of the course.



Medicine in cyberspace, ITM-version.



Medical Services

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, mostly by the same people. The Medical Services consist of the Travel Clinic, the Service for Tropical and Import Pathology (including dermatology and pediatrics), the Service for HIV/AIDS & STD Care, the Medical Laboratory and the Hospital Ward. The latter is located in the Antwerp University Hospital. The Medical Services also comprise the national reference centre for tropical and infectious diseases and the provincial reference centres for HIV/AIDS treatment and diagnosis.

In 2009 we performed 32 356 consultations, of which:

Pre-travel advice	15 916 (49%)
Tropical/import pathology	6 031 (19%)
Dermatology	390 (1%)
Dermatology/HIV	23 (0.1%)
Pediatrics	204 (0.6%)
STD	1 434 (4%)
HIV	6 441 (20%)
Helpcenter	1 917 (6%).

The **Service for Tropical and Import Pathology** provides specialized outpatient, diagnostic, clinical and preventive care to returning travelers, expatriates and migrants. As national reference centre for tropical and infectious diseases, we are permanently on call to advise other healthcare workers throughout Belgium on diagnostic and therapeutic problems, and the authorities on the surveillance and management of imported diseases.

As in previous years, we participated in the main national and international scientific meetings on import pathology and travel medicine (see chapter on the Department of Clinical Sciences). We contributed in various ways to international travel health publications, including the WHO manual.

The pre-travel advice and care is provided by the **Travel Clinic**, staffed by a team of specialised doctors, nurses and clerks. They offer general, country-specific and disease-specific information, vaccinations, chemoprophylaxis, advice about treatment, and anything else to promote healthy travelling. Beside the 15 916 consultations the Travel Clinic administered 34 443 vaccines.

The **Travel Phone** system for tourists received over 10 000 calls, of which 20% were transferred to the specialist staff for a “live” dialogue. The information was permanently updated to incorporate acute information on outbreaks such as the A H1N1 flu pandemic.

We continuously updated, expanded and fine-tuned the extensive information on travel health on our **travel websites**, www.reisgeneeskunde.be (Dutch), www.medicinedesvoyages.be (French) and www.travelhealth.be (English), which received over 270 000 pageviews. The website includes separate fact sheets for more than 200 countries, lists of obligatory and recommended vaccinations, an overview of malaria risks and prophylactic measures, and many other items and recommendations. The texts are based on the directives of the World Health Organisation (WHO) and the consensus policy of the Belgian Scientific Study Group on Travel Medicine, chaired by the ITM.

The **Service for HIV/AIDS & STD Care** performed 7 875 outpatient consultations in 2009, of which 6 441 from HIV patients and 1 434 for other Sexually Transmitted Diseases.

Our ‘AIDS Reference Centre’ (ARC) followed up 1 844 HIV-infected patients, of which 1 361 (74%) 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. These patients are seen on average three times a year to monitor their clinical, immunological and viral status. In 2009 we registered 201 new HIV-positive patients.

“Our ‘AIDS Reference Centre’ (ARC) followed up 1 844 HIV-infected patients, of which 1 361 (74%) were on anti-viral treatment”

The extra-muros **Helpcenter** aims at improving secondary HIV prevention, in particular for groups with high risk behaviour. In 2009 we focused on men having sex with men (MSM) and on migrants coming from Sub Saharan Africa (SAM).

More people came to the Helpcenter than ever before. We had 2 051 patient contacts in 2009, with 1 268 different persons, of which 26% were MSM. The number of SAM reached by Helpcenter in 2009 almost doubled, as compared to 2008, and made up 12% of the total group of patients. To both groups, we offered also outreach testing. For MSM, outreach in high risk settings was done in collaboration with the NGO Sensoa.

We performed 1 257 HIV-tests in Helpcenter, of which 20 tests were positive (1.7%). In the outreach testing sessions of MSM 9/97 (9.3%) were found HIV-positive, and 0% of SAM (29 persons tested).

In Helpcenter 89 sexological consultations took place with 38 different persons.

In the **Tropical Disease and HIV/AIDS Ward** at the University Hospital of Antwerp (UZA) we took care of about 206 inpatients in 2009. 110 of them had HIV-related problems, the remainder suffered from severe tropical or travel related diseases, most frequently malaria.

Since 2005, the ITM and UZA have extended their clinical collaboration to general and hospital associated infectious diseases, in association with the UZA departments of Microbiology and General Internal Medicine. On a daily basis, hospital-wide laboratory results are reviewed and joint rounds are made to selected patients. The team also provides in-house consultancies on demand (bedside 400; ambulatory 100), as well as postgraduate training in clinical infectious diseases.



An outing of the Medical Services, in the old sewer system of Antwerp city.

Medical Laboratory

We ensure routine and expert diagnosis for our own outpatients, and referral services for laboratories, clinics and hospitals throughout Belgium. In 2009, we processed samples of 13.748 internal and 18.571 external patients (total 32.319). Besides routine biochemistry, haematology and microbiology, we performed 122 255 specific serological and parasitological tests for tropical and imported diseases. In 2009, the specialised Laboratory of Mycology processed 6 153 samples including 404 cultures for identification and 12 yeast cultures for sensitivity testing.

Typical laboratory diagnoses in 2009

Species	nr.
Ancylostomidae	20
Ascaris lumbricoïdes	17
Blastocystis	717
Chilomastix mesnili	47
Cryptosporidium	17
Cyclospora	10
Dientamoeba fragilis	63
Endolimax nana	199
Entamoeba coli	384
Entamoeba hartmanni	98
Entamoeba histolytica/dispar	225
Entamoeba histolytica	5
Enterobius vermicularis	11
Giardia lamblia	295
Heterophyes heterophyes	2
Hymenolepis nana	34
Iodamoeba butschlii	55
Isospora belli	3
Leishmania	14
Loa loa	7
Mansonella perstans	5
Microsporidium	2
Onchocerca volvulus	1
Plasmodium falciparum	126
Plasmodium malariae	2
Plasmodium ovale	15
Plasmodium vivax	12
Schistosoma haematobium	6
Schistosoma mansoni	40
Strongyloides stercoralis	12
Taenia saginata	1
Taenia spp.	1
Trichomonas vaginalis	2
Trichostrongylus spp.	2
Trichuris trichiura	29
Dengue virus	50
Chikungunya virus	6
Leptospira	8



Development Cooperation

Development Cooperation



Since 1998, the ITM works together with the Belgian Directorate-General for Development Cooperation (DGDC) 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 2009 was the second year.

The third Framework Agreement

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, amounts to 36 million €. The motto is 'Switching the Poles', the theme of our 2006 centennial colloquium. It means we do not only want to transfer expertise and resources to our South partners, but also ownership and leadership, in line with the Declaration of Paris (2005) and the Accra Agenda (2008). 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 multipliers; (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

After some red tape delays in 2008, by 2009 all projects were up and running. The progress of individual projects can be followed on www.itg.be, by filling in the project reference number in the search box.

“We aim not just to transfer expertise and resources to our South partners, but also ownership and leadership”

New policy in University and Scientific Cooperation

As mentioned in the 2008 Annual Report, the minister of Development Cooperation and DGDC have started a consultation with ITM and the Belgian universities (united in VLIR-UOS and CIUF-CUD) over new policies for the University and Scientific Cooperation (UWOS). The aim is to incorporate the 2005 Declaration of Paris and the 2008 Accra Agenda into the programmes of indirect development actors that receive public money, like UWOS and NGOs.

This policy means that partner countries, North and South strive for more efficient development cooperation, by better aligned and coordinated programmes, stronger ownership by the ‘recipient’ countries and high mutual accountability. These intentions are crystallized in a number of measurable goals and indicators that are monitored by the OECD. This policy does not just imply ‘better’ help, but a real paradigm shift towards ‘country-owned development’.

ITM fully endorses this viewpoint and accepts the (far-reaching) operational consequences. We have tried to play a constructive and sometimes mediating role in the ministerial consultation. This resulted in March 2009 into a fair and hopeful consensus text, reorienting the university multi-annual programs. For ITM the change was small, because we already took the Paris and Accra principles as starting point of the FA3 programme, under the motto ‘Switching the Poles’. Our budgets and geographical focus only needed minor adjustment.

Scholarships

In the 2009 governmental budget, the minister of Development Cooperation raised the budget for developmental help to 0,6% of GDP, in spite of the financial crisis. Belgium has, by law, put the target on 0,7% by 2010. ITM received 1 million euro extra for its scholarships in 2009, as did the Flemish and Francophone university umbrellas VLIR-UOS and CIUF-CUD. As ITM works with multi-annual programmes, we budgeted another 1 million euro for 2010.

In view of the FA3 objectives and the new UWOS policy, we focused the extra scholarships on the middle- and

top staff of the health systems and knowledge centres in developing countries.

They allow us to increase the accessibility of international experts to our master and expert courses, doctoral and postdoctoral programmes. We also adapted our existing scholarships to the increased costs of living, and further invested in short courses and continuous learning.

We also funded new South-South exchanges through regional scholarships and staff exchanges, e.g. in Burkina Faso, Uganda and Zambia.



Weighing the patients to calculate the right dose of praziquantel, a deworming medicine.

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



Instituto Nacional de Higiene, Epidemiología y Microbiología (INHEM), Havana, Cuba and Instituto Pedro Kourí (IPK), Havana, Cuba

Centro Internacional de Zoonosis (CIZ), Universidad Central, Quito, Ecuador

Institute of Public Health, Pontificia Universidad Católica del Ecuador (IPH-PUCE), Quito, Ecuador

Instituto de Medicina Tropical "Alexander von Humboldt" (IMTA vH), Universidad Cayetano Heredia, Lima, Peru

Post-Graduate Medical School, Universidad Mayor de San Simón (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'Élevage 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 Malaria, 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 Collaboration or the Strategic Programmes visit www.itg.be and enter the project reference number in the search field.

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 Venet

Reference number 910600

Educational networking

ITM promoter: Hilde Buttiëns (Direction - Education Coordination)

Reference number 910700

Student support

ITM promoter: Helga Bödges (Student Services)

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 / Guy Kegels (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 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 (DVT), 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 trypanosomiasis and trypanocide resistance in West Africa of the Centre International de Recherche Développement de l'Élevage en zone Subhumide (CIRDES), Bobo Diolassou, Burkina Faso

ITM promoter: Stanny Geerts (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, Epidemiología y Microbiología (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 Simón (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 Parasitology – Unit of Medical Entomology)

Strategic Projects

Africa

Reference number 930100

Preventive interventions targeting HIV uninfected and HIV infected young people in Kenya and Uganda

ITM promoter: Marie Laga (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: Stanny Geerts (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)

Impulse Programmes

Reference number 933100

Human African trypanosomiasis impulse programme

ITM promoter: Marc Coosemans (Department Parasitology – Department Entomology)

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: Jan Coenen (Direction – South Programme)

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)

A photograph of two Black women in a professional setting. One woman, wearing a red top and dark skirt, stands and points at a document held by the other woman. The second woman, wearing a vibrant yellow and black patterned dress and a matching headwrap, is seated on a wooden chair. Both women are smiling and looking at the document. The background is a plain, light-colored wall with a window on the left. A semi-transparent white box with the word 'Management' in red text is overlaid on the bottom left of the image.

Management

Support Services

We began the year with the self evaluation for the external management audit imposed by the Ministry of Education. The shortage of affordable quality housing led us to invest in student accomodation. Three suitable properties were acquired, all situated near the ITM.

Routine administrative tasks become ever more numerous and complex, and kept our hands more than full. We started the preparation of a full cost model, required for external funders as well as for improving internal management. To help us with this challenge, An **De Bie** joined our financial staff.

The Purchasing, IT and Graphic Services worked together on an in-depth reform of the ITM's policy regarding printing and photocopying. To that end they conducted internal consultations as well as external audits.

The **Purchasing Service** handled 4 937 orders, 984 express shipments, 10 large export dispatches, 51 dangerous goods batches, 2 032 imports and 95 air freight consignments. Dangerous goods shipments can only be handled by persons with an IATA-certificate, which is owned by several of our employees. The Travel Service booked 650 journeys and arranged all related travel documents. Stock management was updated and rationalized while internal billing of stock supplies is now entirely processed via the IVAN (ERP) system.

The **General Accounts Service** implemented new accounting regulations and write-down policies, in accordance with the new rules for the Flemish universities. The day to day tasks became more complex compounded by integration problems of the IVAN (ERP) system. They processed 9 991 invoices, 2 267 expense claims, 353 compounded payment lists, 685 reports and claims to sponsors, 94 manual payments to students and 589 internal invoices.

As last year the **Medical Accounts Service** was involved in the digitalisation of the radiology unit and helped pave the way for new software for patient administration. They processed 4 205 supplier invoices, 62 680 patient invoices, 44 729 other client bills and 44 081 to social insurance companies.

Our **Human Resources Service** managed the salary administration for 451 staff members, coordinated the recruitment of 64 new staff members and the departure of 37 staff members. They introduced an electronic holiday registration system, revised the intake procedures for new employees and implemented a new contract policy for administrative and technical staff on external funds. Together with the IT service they set up integrated databases for HR management.

The **Project Management Service** supervised 177 externally funded projects, 32 of which started up in 2009. The 3rd ITM-DGDC Framework Agreement became fully operational and an extra fellowship programme was administered. The service tested out and implemented time registration software. They were the subject of a number of specialized audits and an in-depth control of our European research projects. The Intellectual Property Procedures were revised and fine-tuned.

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

“Routine administrative tasks became even more numerous and complex”

The **Graphics Service** produced the layout for this annual report, various scientific publications and posters, brochures and other things. They added another 5 000 indexed pictures to the ITM's digital imaging archive (the total now stands at 38 000 pictures). The unit also coordinates Office training sessions, helps staff with the use of our house style and lends support to new and existing e-learning projects (e.g. Illustrated lecture notes on tropical diseases) and videoconferencing.

To avoid crowding and “traffic jams” on our network, the **Information Technology Service (IT)** has upgraded existing infrastructure to an even more performing network. The wireless network was extended to all buildings. The quality and integrity of network software including the ERP “IVAN” system was improved. They upgraded critical software applications and/or installed additional modules such as the programme for electronic holiday and time registration, CPO, patient pricing, and they prepared the introduction of a new electronic patient file (EPD).

Due to rising quality standards, they started up extra quality control processes, such as software validation, change management and integrity assurance. These processes were positively reviewed during several audits. The unit recruited Greta **Gondol** as new database administrator. She will help the Clinical Trials Unit with applications trial data and registration.

The main activity of the **Applied Technology and Production Unit** is the production and distribution of non-commercial diagnostic kits for sleeping sickness and visceral leishmaniasis. The unit also provides services to the ITM research departments and the Central Clinical Laboratory. The unit produced 2 500 000 Card Agglutination Tests for *Trypanosoma gambiense* (CATT), of which 1 785 250 were shipped to different control programmes.



It is a challenging job to give ever more employees and fellows an enjoyable workplace.



More and more samples are kept in cryo-storage.

Other tests distributed were the CATT/*T.evansi* (26 000), the Latex/IgM (750), and the DAT/VL (99 360). The unit carried out a field evaluation of the CATT/*T.b.gambiense* D10 kit in DR Congo. The D10 kit was found fit for distribution to local health and production has now been scheduled into our planning. Requests for testing on *T.evansi* increased with 60%.

In addition, the unit took care of the logistics of a WHO evaluation of different Rapid Dipstick Tests (RDT) for visceral leishmaniasis. RTDs from companies worldwide (approximately 25 000) were centralised in Antwerp and shipped to participating laboratories in Sudan, Nepal, India, Bangladesh and Brazil.

In the **Laboratory Animals Maintenance** unit, the rabbit cages were renewed and rat cages adapted to new EU regulations. On average 442 mice, 195 rats and 44 rabbits were cared for on a monthly basis.

By the end of 2009, 61 000 vials were stored in **Cryobiology**, 11% more than in 2008.

The activities of the **Laboratory Kitchen** are no longer on the increase. Laboratory accreditation imposes time-consuming batch-to-batch controls, which makes it more cost-efficient to procure medium from commercial firms.

The **Technical Services** carried out an endless list of tasks and projects. To cite but a few: the encapsulation of asbestos pipes in the basement; the extension of the alarm system to Campus Rochus; the floor renovation in the central laboratory; painting of the classrooms in Campus Rochus and the staircase in Campus Mortelmans; renovation of Animals Maintenance, and the L3 and L2 laboratories, without interruption of the normal activities. They also renovated our magnificent auditorium C and Broden Hall in the central building, installed ventilation systems and replaced the roofing of Campus Mortelmans. Extensive building and renovation works started on the second floor above the clinic. The inconvenience for the staff was kept to a minimum.

Coördination cells

Besides its daily advisory and supervisory tasks, the **Unit for Safety, Prevention and Wellbeing** looks back on a number of successful projects. With the help of a quantitative risk analysis (SIMPH survey), the stress risks for employees were mapped and an action plan was drawn up. We produced a "Safe travel" checklist for all staff and disinfection procedures, installed safety signs, organized an evacuation exercise and set up a crisis management cell. The latter fits in the ITM's global emergency and intervention plan, which will be further developed in 2010.

Besides safety, we worked on environmental, biosafety, transport of dangerous goods and related issues, together with the units and coordinators concerned.

In 2009, the **Quality Assurance Unit** mainly worked on general issues towards a fully accredited quality system for all ITM activities. The latter should be in place by 2012 and all support services now follow a tight integration schedule. We mapped the ITM's drug management policy, thoroughly reviewed procedures of the Clinical Trials Unit and the Institutional Review Board and established a statutory frame of reference. We further aligned, expanded and prepared general laboratory procedures for the accredited laboratories. The number of in-house calibrations and equipment validations increased significantly; they were extended from the accredited labs to the research laboratories and the clinic. Several software validations were carried out in the reference laboratories, the Clinical Trials Unit and the IT service.

We successfully organized the biennial audit of the Belgian Accreditation Organisation (BELAC) at the beginning of 2009. The ITM obtained additional accreditations for 13 laboratory tests and ISO43 for carrying out ring tests for the Nationally Recognized Laboratory Testing. We furthermore accompanied the Family Health International auditors at the HIV/STD reference laboratory and the 4ABC study in the Clinical Trials Unit. Both obtained a positive audit report.

The Quality Assurance Unit also took part in several institutional projects in which quality and standardization aspects are promoted such as Laboratory Quality Network, Clinical Trial Network, the drafting of the Hercules III proposal, the start-up of the Quamed project, etc.

The **Communication Unit** is responsible for internal and external communications; the production of brochures, reports and newsletters (including this annual report); the development and maintenance of the institutional and linked websites (e.g. from research units or interdepartmental groups, colloquia, travel medicine); the organisation of events; the relations with the press and the production of press releases.

We coordinated the ITM's participation in the national science website 'Ikhebeenvraag', as well as several PR and charity events such as the renewed Antwerp Diner (a charity event for AIDS-research and therapy). Others included the 'Knowledge for Growth' congress and fair; an exposition around Capucine missionaries in Congo; the 'Researchers Day' organised by the Fund for Scientific Research and ITM's own 'Open Science Day'. In September, the position of Communications Officer – which had been open for more than a year – was at last filled in, by science journalist Pieter **Van Dooren**. This led to a restart of the press releases, and a surge in press coverage.

ITM took part in the yearly 'Music for Life' event of the StuBru radio station, this year for a Red Cross campaign to introduce insecticide-treated bed nets against malaria in Burundi. In one day, employees and students of our institute bicycled the distance to Bujumbura. Their sponsored kilometres and an after-work party yielded a substantial sum (€ 7 075) that was donated to the Red Cross. As well as giving advice to the radio makers, several of our malaria specialists were interviewed by the press.

Next to a series of smaller online projects, a lot of time went into the overhaul of the ITM website. At the end of 2009, the structure, concept and Dutch pages were virtually ready. The last database and software fine-tuning, plus the English and French translations are scheduled for early 2010.



The management support staff scrutinises a progress report on the large screen in the director's meeting room.

Human Resources

On December 31 2009, the ITM employed 451 people, equal to 410,7 FTEs. This figure includes grantees with 'bursary' status from Belgian funding agencies as FWO, IWT and universities, and 9 expatriates in field projects. Compared to 2008, the number of employees rose by 40,7 FTE (+11%). Of these 14,9 FTE are on institutional funds, 25,8 FTE on project and programme funds.

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.

Figure 1 shows the number of employees on 31/12/2009 per category and per funding source. Half the ITM staff (51% or 209,4 FTE) are paid by institutional funds, a quarter (23% or 93,8 FTE) by external research projects and 6% (22,8 FTE) on internal secondary research funds. Medical services employ 12% of our staff (50,0 FTE) and 8% (34,8 FTE) is paid by funds from the Federal Ministry of Development Cooperation.

Figure 1: Staff (FTE) per category and financing source on 31/12/2009

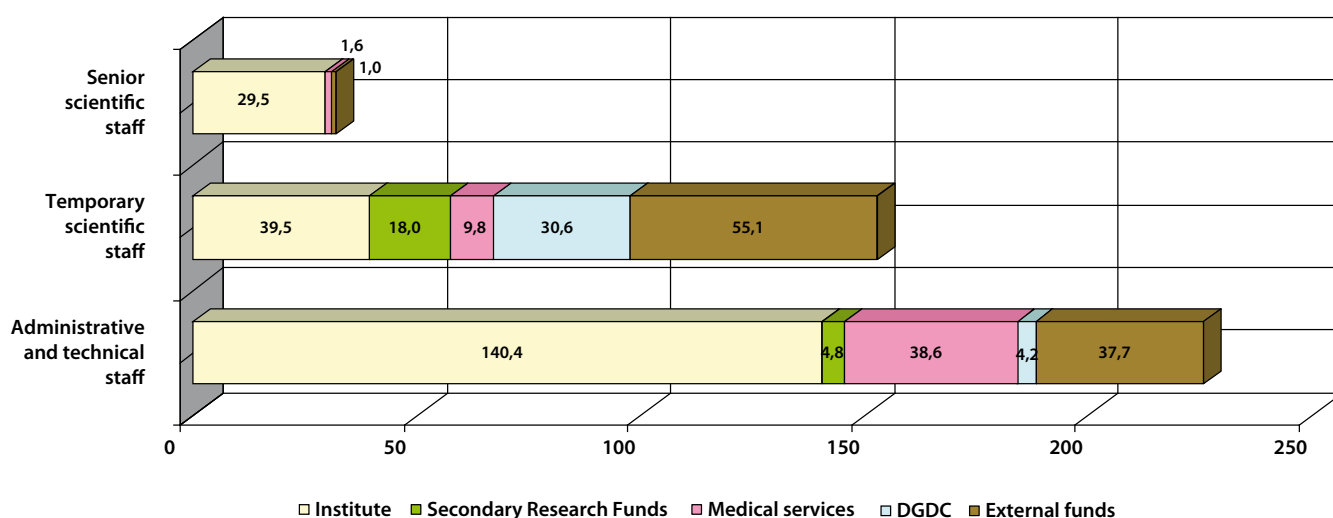


Figure 2: Senior scientific staff (FTE) 1999-2009 according to financing source

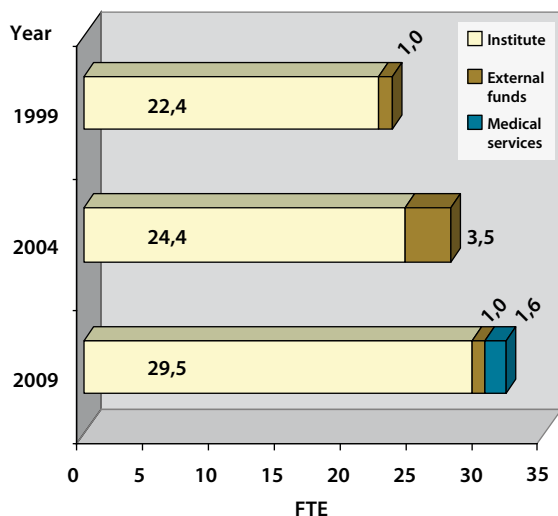
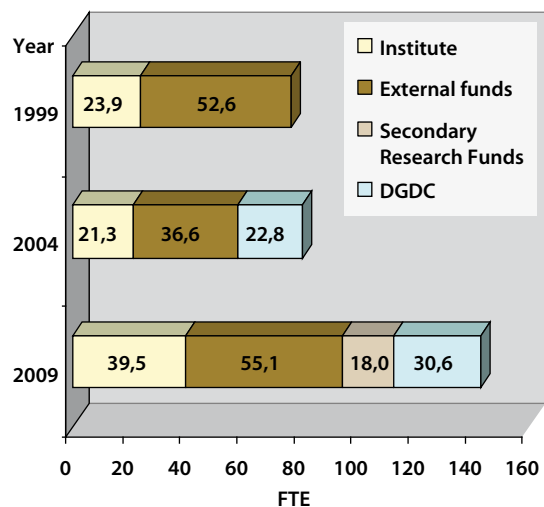


Figure 2 shows the evolution of senior academic staff over the last 10 years. The senior scientific staff consists of 32,1 FTE or 8% of total staff, an increase of 37% in the past ten years. They are mainly paid by institutional funds.

Figure 3 shows the evolution of junior scientific staff over the past ten years. We counted 153,0 FTE researchers on 31 December 2009, or 37% of total staff. This does not include 84 “sandwich” PhD students. They are mainly paid by external project and programme money. The new secondary research funds created 18,0 FTE extra positions.

Figure 3: Junior scientific staff (FTE) 1999-2009 according to financing source



The junior scientific staff almost doubled over the last ten years (a 93% increase). This figure contrasts starkly with the modest increase in senior scientific staff, which saw its ‘supervisory’ role almost tripled.

Figure 4 shows the evolution of administrative and technical staff over the past 10 years. On 31 December 2009, there were 225,6 FTE administrative and technical staff at the ITM, or 55% of the total staff. This percentage is higher than at most universities, due to the integration of medical services, reference tasks, laboratory and production activities. The institutional budget and the production unit pay for 62% of this category which has grown by 21% since 2004. Since 2008, there is a shift of staff allocation (10 FTE) from DGDC to institutional management costs.

Figure 4: Administrative and technical staff (FTE) 1999-2009 according to financing source

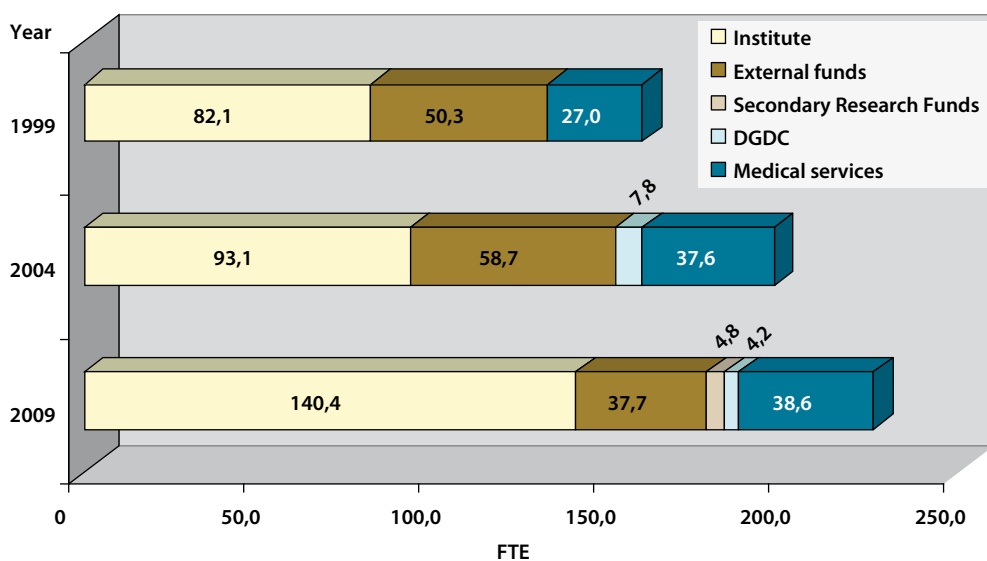


Figure 5 compares staff numbers at the ITM (including 84 “sandwich” PhD students) and at the Flemish universities.

The incongruent staff increases substantially affected the proportions of staff categories. A senior scientific staff member is now surrounded, on average, by 13,4 FTE administrative, technical and scientific staff and “sandwich” PhD students. This is a high figure in comparison with the Flemish universities, showing that the ITM has a relative shortage of senior scientists.

	Senior Academic Staff (Sr)	Junior Academic Staff (Jr) (institute)	Junior Academic Staff (Jr) (external)	Administrative and Technical Staff (AT) (Institute)	AT (external)	(AT+Jr) / Sr	Sr / Jr	(Sr+Jr) / AT
KULeuven	1 003,8	467,2	3 763,0	1 547,8	1 122,3	6,9	0,24	1,96
UGent	739,1	773,5	2 587,2	1 273,3	890,4	7,5	0,22	1,89
UAntwerp	401,4	244,6	973,1	544,8	392,2	5,4	0,33	1,73
VUBrussels	317,7	219,8	915,7	467,9	342,9	6,1	0,33	1,73
UHasselt	106,0	72,6	265,5	109,3	88,1	5,1	0,31	2,25
ITG	29,5	39,5	186,9	133,8	34,7	13,4	0,13	1,52
KUBrussel	21,2	10,6	10,7	19,4	6,1	2,2	0,99	1,67
total	2 618,7	1 827,7	8 702,1	4 096,3	2 876,7	6,7	0,25	1,89

Source: VLIR, Statistical data personnel Flemish Universities, October 2009, Brussels



Election of staff representatives for the (OR) employees council.

Figure 6 shows the number of staff according to age and staff category. 126 of the 451 staff members are 50 and older. Between now and 15 years, at least 28% of the staff will thus have to be replaced. For senior scientific staff that replacement coefficient is no less than 82%.

Figure 6: Number of staff according to age and staff category (FTE)

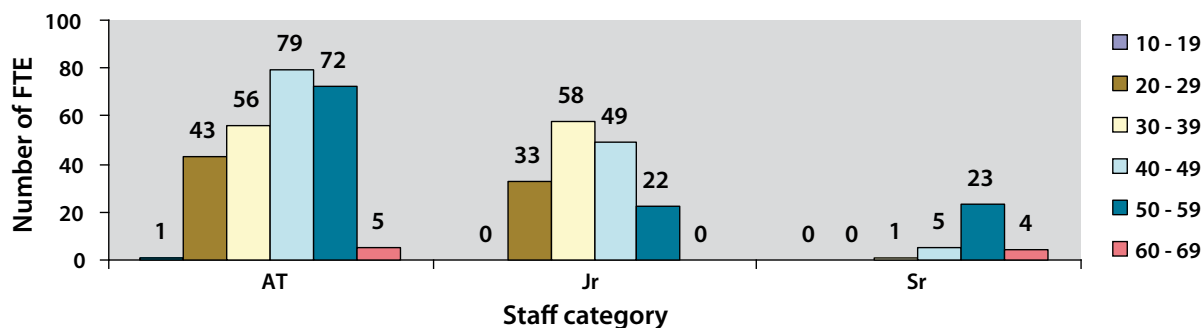
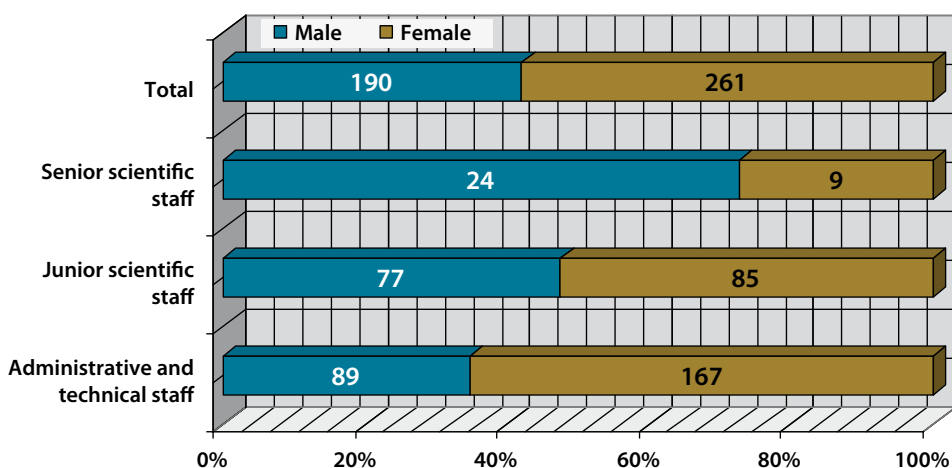


Figure 7 shows the male/female ratio per staff category. There are more women (58%) than men (42%) at the ITM. This ratio is quite different according to staff category. Of administrative and technical staff 65% are women, of junior scientific staff 52%, of senior scientific staff only 27%.

Figure 7: Gender ratio per staff category on 31/12/2009



Monique Senecaut and Patricia De Lathouwer, highly valued maintenance staff, retired in 2009.

Finances

For the first time, the annual accounts follow the new rules and plan for the Flemish universities, while remaining consistent with the legal standard for foundations (the legal status of the ITM). This conformation requested numerous adaptations and modifications of the accounting methods and presentations.

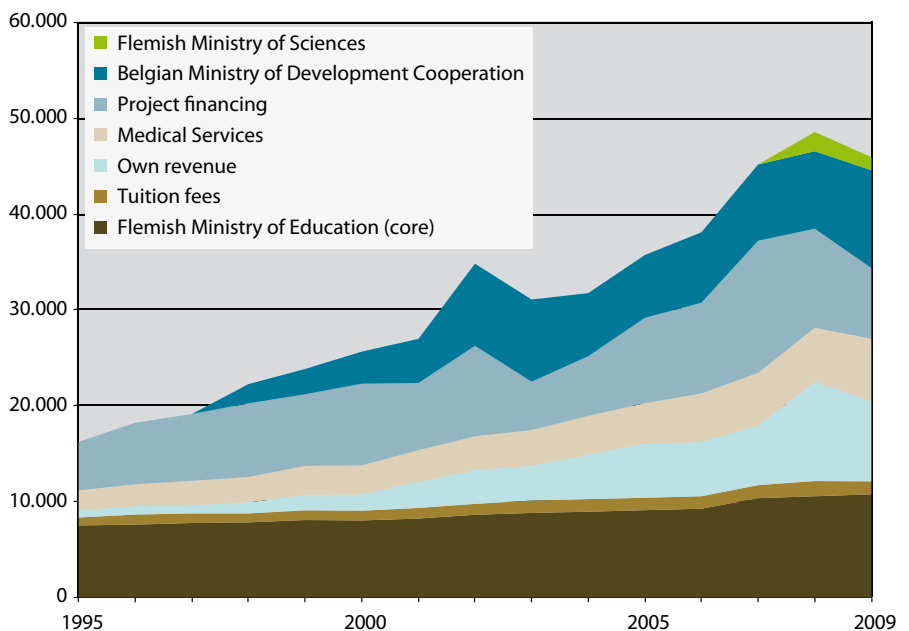
All double counts (overhead, tuition fees, remittances of balances, internal billings) were eliminated. For the sake of comparison, a similar exercise was done, a posteriori, for the 2008 accounts. In addition, investments were for the first time depreciated following new valorisation rules defined by the Board of Directors, i.e. 3% for buildings, 33% for software and IT hardware, 10% for large maintenance and 20% for equipment (> €2 500). The Medical Services distinguish between medical (10%) and non medical equipment (20%).

Income

The net income of the ITM totalled 46,3 million Euros in 2009, a reduction of 7% compared to (exceptional) 2008 but still an increase with 283% compared to 1995. The reduction in 2009 is due to less Project Funding and Institutional Income.

Figure 8 shows the recent evolution of ITM's net income and the respective contributions of the main funding sources. In 2009, 23% of our financial resources came from the Flemish Ministry of Education (core funding), 3% from the Flemish Ministry of Science and Innovation, 22% from the Federal Ministry of Development Cooperation (development aid). Own revenues (overhead, social and fiscal rebates) amounted for 16%, tuition fees for 3%, the medical services for 14% and external project funding for 16%.

Figure 8: Overview of the income since 1995 (X 1.000 euro)



“The core funding of the Flemish Ministry of Education makes up 23% of the total revenue ”

The **core funding of the Flemish Ministry of Education** makes up 23% of the total revenue and increased nominally with 43% over the past 15 years, but decreased in real value with almost 20% due to inflation.

Own revenue (non earmarked), including overhead, internal billing, fiscal and social rebates, and revenue from production of diagnostics, accounts for 18% in 2009. In 2008 and 2009, we had one-shot peaks due to the arrear payments of social security rebates. The own revenue has risen from 4 to 18% over the past 15 years, and has become a substantial pillar for the institutional budget, especially the fiscal and para-fiscal rebates. These rebates, allocated by the Federal Government for the promotion of scientific research, amount to no less than 4,1 million Euros yearly. As intended by the government, the ITM spends this income entirely on the recruitment of scientists.

The income of the **Medical Services** has tripled since 1995, due to the increase in activities and subsidies, 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 14% of the total turnover.

The income through **Project Funding** has increased with 146% since 1995. The European Framework Programmes for Research play an important role in this evolution. The funding cycle of the Framework Programmes explains the fluctuation of these revenues. The **DGDC Framework Agreement** bundles the activities financed by the Belgian Ministry for Development Cooperation since 1998 in one coherent programme. In 2009, it amounts to 22% of the income, excluding tuition fees and overhead from this source. The new funding through the **Flemish Ministry of Science Policy (EWI)** counts for 3% of the total turnover and has been specifically reserved for innovative research and the “Clinical Trial Unit”.



A few of the 'Bike for Life' organisers present the yield of their virtual ride to Bujumbura at the 'glass house' of the 'Music for Life' campaign. It will be used to buy mosquito nets against malaria.

Figure 9: Research and project funding 2005-2009 (excluding DGDC programme)

Projects and SOFI according to official categories for Flemish Universities	2005	2006	2007	2008	2009	%
Government funding for basic research (2nd funding source)						22%
BOF / SOFI (Secondary Research Funding ITM)				2.000.004	1.355.877	16%
IUAP (Inter University Attraction Poles, Federal)	0	0	47.893	182.122	140.017	2%
FWO (Fund for Scientific Research Flanders)	281.852	255.108	409.938	293.913	323.084	4%
Government funding for applied research (3rd funding source)						56%
Other Federal Government	767.903	983.418	1.810.181	1.206.896	992.532	11%
Flemish government	666.468	561.739	643.812	1.163.166	855.346	10%
Cities & provinces	35.024	34.676	10.636	24.000	55.965	1%
European Union	1.837.020	613.958	2.888.862	2.537.203	1.645.429	19%
International organisations	124.183	204.287	224.590	134.167	406.121	5%
Other foreign governments	260.392	542.498	453.772	857.694	881.223	10%
Contract research with the private sector and scientific services (4th funding source)						17%
Contract research - non profit organisations	819.685	1.059.915	1.803.977	3.045.786	1.289.191	15%
Contract research companies	109.704	140.800	136.666	142.028	189.126	2%
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	7%
Other income						
Other income Institute (Bank interests)	0	26.836	0	47.755		
Totaal	5.614.074	5.021.983	9.284.442	12.332.555	8.726.792	100%

Figure 9 illustrates the evolution of the project funding (including SOFI, the secondary research funding of the Ministry of Science and Innovation) and its most important sources since 2005. The categories are those used in the **accounting systems** of the Flemish Universities.

The governmental funding for basic research (**2nd funding source**) accounts for 22% of the project funding, compared to 5% in 2005, thanks to the new SOFI funding.

The **3rd funding source** accounts for 56%. The ITM scientists especially score in the European Framework programmes (19% of all project revenues). The federal and Flemish governments each account for 11% in this category, and foreign governments for 15%.

The **4th funding source** shows a decline (17%), partly because of large advance payments received in 2008 and the ending of an important tuberculosis project. These projects are funded through international Public Private Partnerships, "Global Health Initiatives" and NGOs like the Bill & Melinda Gates Foundation, the Foundation for Innovative New Diagnostics (FIND), 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 10 shows ITM's expenditure in 2009, which amounted to 45,6 million Euros. Financial transfers to partner institutes are not included in this graph. The distribution over the various expenditures remains stable as compared to previous years: 65% for education and research, 14% for the medical services and 18% for the support services.

Figure 11 shows in more detail the expenditure of the programme funded by the Direction-General for Development Cooperation (DGDC). 2009 was the second year in the third multi-annual programme (FA3, 2008-2013). The table compares the expenditures in the second and third FA programmes. Of the DGDC funds, 66% go directly to institutes and students from the South, of which 44% go to Africa, 20% to Asia and 32% to South-America.

Figure 10: Overview of expenditures since 1995 (x1,000 euro)

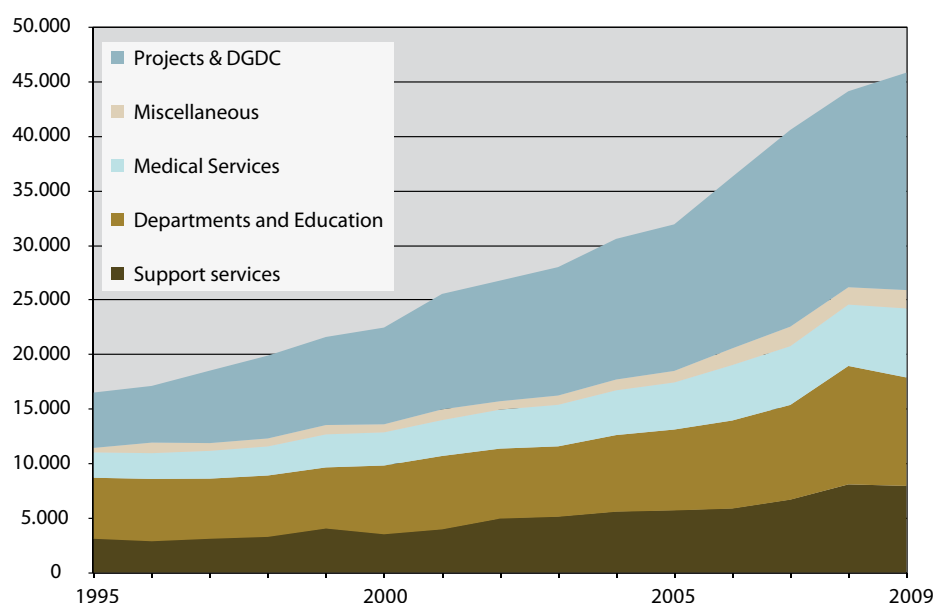


Figure 11: DGDC Framework Agreement (FA) expenditures (x 1,000 euro)

	FA2	2003	2004	2005	2006	2007	2008	2009	FA3 2008-2013
Training in Belgium		1,022	1,145	1,172	1,212	1,455	2,499	2,814	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	Institutional Collaboration
Other projects		866	1,034	1,115	1,220	1,752	679	897	Strategic Programmes
Policy support		98	180	212	177	263	97	155	Policy Support & Advocacy
General expenses & scientific support		2,437	2,913	2,975	3,593	3,446	2,825	3,693	Management & Scientific support
Total		6,903	8,085	8,442	8,973	10,143	9,313	11,940	
AIDS Impulse Programme		1,470							

Figure 12: Results account (according to Flemish University template)

	2009	2008
Company income (+)	46.082.675,21	49.828.344,99
Income from training, research and service provision	42.616.025,58	44.827.621,38
Government allocations and subsidies - basic funding (primary funding source)	10.787.000,00	10.682.745,40
Government contribution to fundamental basic research (second funding source)	1.818.977,70	2.476.038,46
Government contribution to applied scientific research (third funding source)	16.110.824,97	15.060.275,13
Contract research with the private sector and scientific services (fourth funding source)	1.478.316,52	3.187.814,59
Other income from training, research and services	12.420.906,39	13.420.747,80
Funds & legacies	13.315,02	679.541,45
Other company income	3.453.334,61	4.321.182,16
Other company income Institute	3.323.234,98	4.086.211,58
Other company income Medical Services	130.099,63	234.970,58
Company costs (-)	45.395.557,63	42.171.719,90
Purchase of goods	13.993,10	538.285,00
Services and various goods	15.278.066,44	14.535.790,72
Salaries, social dues and retirement contributions	26.208.108,56	23.854.074,62
ZAP / VWK (Senior Academic Staff)	3.334.871,26	3.154.852,04
Projects	5.019,42	39.923,94
Institute	3.329.851,84	3.114.928,10
AAP / BAP / TWP (Temporary Scientific Staff)	9.816.860,60	8.542.163,64
DGDC	2.206.870,25	1.491.557,00
Projects	2.759.552,90	2.564.017,81
Institute	3.682.786,69	3.642.899,35
SOFI	1.166.750,76	843.689,48
ATP (Administrative and Technical Staff)	9.624.540,38	8.746.252,00
DGDC	273.809,82	214.906,00
Projects	1.855.413,50	1.780.786,00
Institute & Production	7.339.101,92	6.750.560,00
SOFI	156.215,14	
Visiting lecturers	-	704,00
Staff Medical Services	3.284.112,40	2.948.766,05
Other staff costs (provision holiday pay and early retirement)	148.623,92	461.336,89
Depreciation and value devaluations on start-up costs, intangible and tangible fixed assets	777.088,46	264.305,80
Value depreciation on stocks and commercial dues (additions +, withdrawals -)	-82.600,30	
Provisions for risks and costs (additions +, expenses and withdrawals -)	54.991,40	20.490,16
Other company costs	3.145.909,97	2.958.773,60
Payments to DGDC partners	3.145.909,97	2.958.773,60
Company surplus (deficit)	687.117,58	7.656.625,09
Financial profits (+)	218.266,26	135.284,09
Financial costs (-)	137.202,04	525.428,65
Surplus (deficit) from regular activities	768.181,80	7.266.480,53
Exceptional profits (+)	2.356,32	-
Other exceptional income	2.356,32	
Exceptional costs (-)	37.651,04	1.314,48
Devaluation on the realisation of the fixed assets	27.755,36	
Other exceptional costs	9.895,68	1.314,48
Surplus (deficit) of the financial year	732.887,08	7.265.166,05
Transfers (PROJECT FUNDING/DGDC/SOFI/INVESTMENTS)	-273.904,85	4.288.941,13
RESULT	1.006.791,93	2.976.224,92

Financial results 2009

Figure 12 summarizes the 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 +€1 006 792, of which €799 095 in the section Institute and € 207 697 in the section Medical Services. This exceptional result is partly due to the arrear payments of social security rebates (€530 000) and partly to increased overhead income (€380 000). The relatively high result in the Medical Services is due to the inclusion of all income from performances delivered in 2009. Over the past years, only income received in the same book year was included.

The result in the section Institute is reserved mainly for planned investments (renovation of the clinical laboratory, building of student rooms) and an additional allocation to the research departments based on external project funding and staff. The result of the Medical Services is decreased with the transferred losses of past years to €172 552. It is reserved as a buffer for lesser results in coming years.

In 2009, the personnel costs totalled 59% of the total expenditure in all sections combined, 76% of the expenditure (73% of the income) in the section Institute and 57% in the section Medical Services. The section Institute paid 54% of the total personnel costs: SOFI 5%, DGDC 9%, Project Funding 17% and the Medical Services 13%.

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 results account. As this depreciation amounts to only 3%, costs enter very slowly and are spread over 33 years.

Annual account following the model for Foundations

Results account

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 differences between both presentations are due to varying 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 result.

Balance

The revaluation of the buildings booked in 2007, was reconsidered in consultation with the financial auditors (-8.2 million Euros) and reduced to the value of the land. They are therefore renamed "revaluation on land" as from 2009. Land (and subsequently revaluation on land) does not need to be depreciated and so the accounts are freed from this cost. This re-estimation does not devalue the real assets of the institute, however.

Due to the transferred results of past years, the own assets remain at 17.5 million € and the decrease of the assets/liabilities is limited to 41.4 million, contrary to 49 million € in 2008.

The payments due from project funding are registered under the account "Provisions and payments due". The advance payments received from Project Funding, SOFI and DGDC are registered on the liabilities side under "Received advance payments".

The liquid assets have increased due to advance payments for externally funded project funding and the DGDC programme. The financial indicator for "Floating assets", calculated as the ratio between "Floating assets" (22 million Euros) and "Short term debts" (17.9 million Euros) is 1.23. This means that sufficient funds are available to pay off short term debts.

Figure 13: Results account (template Foundations)

	2009	2008
Company income (+)	47.210.855,86	46.749.976,73
Turnover	6.460.739,78	5.839.190,46
Stock goods in execution and ready product and orders in execution (additions +, withdrawals -)	1.603.287,52	-2.676.808,90
Member fees, funds, legacies and subsidies	27.792.371,23	30.616.736,36
Other company income	11.354.457,33	12.970.858,81
Company costs (-)	45.720.358,25	42.673.276,62
Commodities, raw and helping materials	1.640.811,23	1.759.169,69
Purchases	1.650.356,65	1.770.620,95
Stock (withdrawal +, addition -)	-9.545,42	-11.451,26
Services and variable goods	15.843.087,59	15.438.164,62
Salaries, social contributions and pensions	26.812.918,15	23.783.099,38
Depreciation and value devaluation on start-up costs, on intangible and tangible fixed assets	1.718.818,53	1.688.262,11
Value depreciation on stock, orders in execution and commercial receivables (additions +, withdrawals -)	10.924,94	10.345,09
Provisions (additions +, expenditures and withdrawals -)	-325.418,49	-18.822,89
Other company costs	28.761,72	24.509,88
Company costs activated as reorganisation cost (-)	-	
Company profit (loss)	1.490.497,61	4.076.700,11
Financial income (+)	271.361,45	153.121,49
Income from fluid assets	27.406,17	6.630,66
Other financial income	243.955,28	146.490,83
Financial costs (-)	110.930,60	250.942,24
Costs of debts	89.552,02	86.928,87
Value depreciations on fluid assets other than stocks, orders in execution and commercial receivables (additions +, withdrawals -)	4.876,89	128.389,94
Other financial costs	16.501,69	35.623,43
Profit (loss) from regular company activities	1.650.928,46	3.978.879,36
Exceptional income (+)	46.389,52	1.722,79
Other exceptional income	46.389,52	1.722,79
Exceptional costs (-)	9.895,68	1.314,48
Other exceptional costs (explanation XIV, B)	9.895,68	1.314,48
Profit (loss) of the financial year	1.687.422,30	3.979.287,67

Figure 14: Balance sheet (template Foundations)

ASSETS	2009	2008
Fixed assets	19.371.701,04	25.354.342,39
Intangible fixed assets	52.107,16	14.037,57
Tangible fixed assets (investments)	19.319.593,88	25.340.304,82
Land and buildings	16.092.675,85	24.892.787,82
Installations, machines and equipment	466.136,73	290.058,70
Furniture and rolling stock	568.282,60	147.903,32
Leasing	-	9.554,98
Assets in course of construction and advance payments	2.192.498,70	-
Floating assets	22.002.645,36	23.669.101,77
Stocks and orders in execution	4.175.402,25	3.502.505,16
Stocks	140.178,02	130.632,60
Orders in execution (project funding)	4.035.224,23	3.371.872,56
Receivables on maximum one year	2.185.524,71	3.019.695,63
Commercial receivables	2.089.013,95	2.951.031,26
Other receivables	96.510,76	68.664,37
Deposits	4.869.267,82	6.942.857,26
Liquid assets	9.405.907,95	8.095.787,71
Prepayments and accrued income	1.366.542,63	2.108.256,01
TOTAL ASSETS	41.374.346,40	49.023.444,16
LIABILITIES		
Capital and reserves	17.552.169,24	23.954.342,06
Funds of the Foundation	345.711,60	345.711,60
Revaluation surpluses	11.891.000,00	20.095.725,78
Reserves	2.135.550,70	2.099.731,51
Profit (Loss) brought forward	1.426.092,30	-225.510,81
Capital allowances	1.753.814,64	1.638.683,98
Provisions	1.566.942,78	1.892.360,97
Provisions	1.566.942,78	1.892.360,97
Provision for pensions and similar obligations	1.526.388,32	1.769.206,51
Other provisions	40.554,46	123.154,46
Debts	22.255.234,38	23.176.741,13
Debts on more than one year	2.942.939,99	3.261.632,08
Financial debts	2.797.152,94	2.990.845,03
Other debts	145.787,05	270.787,05
Debts on maximum one year	17.900.666,68	18.643.215,38
Debts on more than one year due within a year	356.231,60	328.493,20
Commercial debts	2.268.962,23	2.971.180,62
Received advanced payments on orders (Project funding)	12.258.645,71	12.690.257,56
Debts in reference to taxes, salaries and social contributions	2.958.082,21	2.589.157,06
Various debts	58.744,93	64.126,94
Accruals and deferred income	1.411.627,71	1.271.893,67
TOTAL LIABILITIES	41.374.346,40	49.023.444,16

Statutory auditor's report to the Board of Governors of the Prince Leopold Institute of Tropical Medicine on the financial statements for the year ended on 31 december 2009



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 2009, prepared in accordance with the financial reporting framework applicable in Belgium, which show a balance sheet total of 41.374.346,40 and a profit for the year of EUR 1.687.422,30.

The 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 2009 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 to the board of governors 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, 21 May 2010

PKF bedrijfsrevisoren CVBA
Statutory Auditors
Represented by

A handwritten signature in blue ink, appearing to read 'De Weerd', enclosed within a blue oval stamp.

Paul De Weerd
Registered Auditor

Board of Governors

Chairperson

Mrs. C. Berx (*)

Governor, and representative of the Province of Antwerp

Vice-Chairpersons

Prof Dr A. Verschoren (*)

Rector, and representative of the University of Antwerp

Members

Baron L. Bertrand

CEO Ackermans & van Haaren nv, co-opted member

Baron Th. Bracht (until 27/10/2009)

Chairman, SIPEF nv, co-opted member

Prof Dr M. Casteels (from 28/10/2009) (*)

Vice-rector, and representative of the Catholic University of Louvain

Mrs. E. Coopman (from 28/10/2009)

Representative of the Administrative and Technical Staff of the ITM

Prof M. Coosemans (*)

Representative of the Academic Staff of the ITM

Dr D. Cuypers (until 27/10/2009)

Representative of the Federal Ministry of Public Health

Prof Dr P. De Baetselier

Representative of the Free University of Brussels (VUB)

Mrs. L. De Kock

Representative of the Flemish Minister of Education

Mr. M. De Coninck

Representative of the City Council of Antwerp

Mrs. K. D'Hondt

Representative of the Flemish Ministry of Sciences and Innovation

Prof P. Goubau, Catholic University of Louvain (UCL), co-opted member of the Scientific Advisory Council

Prof Dr B. Gryseels (*)

Director of the ITM

Mrs. D. Jacquet (until 27/10/2009)

Representative of the Administrative and Technical Staff of the ITM

Dr R. Lagasse

Free University of Brussels (ULB), co-opted member of the Scientific Advisory Council

Prof B. Losson

University of Liege, co-opted member of the Scientific Advisory Council

Dr S. Maes (from 28/10/2009)

Representative of the Federal Ministry of Public Health

Prof Dr A. Meheus

Representative of the Flemish Ministry of Welfare

Mr. P. Moors (*)

Director-General and Representative of the Federal Ministry of Development Cooperation

Prof F. Reyntjens (until 27/10/2009)

Institute of Development Policy and Management, co-opted member

Dr W. Soors (from 28/10/2009)

Representative of the Assisting Academic Staff of the ITM

Mrs. A. Stas (from 28/10/2009) (*)

Director Marketing and Commercial Operations, Antwerp Zoo (KMDA)

Prof Dr M. Temmerman

Representative of the University of Ghent (Ugent)

Dr E. Thys (until 27/10/2009)

Representative of the Assisting Academic Staff of the ITM

Dr A. Van Gysel (from 15/12/2009)

General Manager FlandersBio, co-opted member

Prof Ph. Vandekerckhove (from 15/12/2009)

Director-General Red Cross Flanders, co-opted member

Prof M. Waer (until 27/10/2009) (*)

Vice Rector and Representative of the Catholic University of Leuven (KUL)

Liason official of the Government

Mrs. E. Barbé ()**

Counselor, Flemish Ministry of Education

Permanent Secretary

Mrs. L. Schueremans ()**

General Administrator of the ITM

(*) Member of the Bureau

(**) Observer in the Bureau and the Board of Governors

Scientific Advisory Council

Chairperson

Dr G. Thiers

Honorary Director, Federal Scientific Institute of Public Health, Brussels

Belgian Universities

Prof P. Goubau

Catholic University of Louvain (UCL)

Prof P. Lacor

Free University of Brussels (VUB)

Prof R. Lagasse

Free University of Bruxelles (ULB)

Prof B. Losson

University of Liège (ULg)

Prof E. Van Marck

University of Antwerp (UA)

Prof M. Van Ranst

Catholic University of Leuven (K.U.Leuven)

Prof J. Vercruysse

University of Gent (UGent)

International members

Prof H. Dockrell

London School of Hygiene & Tropical Medicine, UK

Dr F. Nafo-Traoré

WHO, Addis Abeba, Ethiopia

Prof Dr V. Prado

University of Chile, Santiago, Chile

Dr S. Pukrittayakamee

Mahidol University, Bangkok, Thailand

Prof S. Solomon

YRG CARE, Chennai, India

Prof P. Van de Perre

Université de Montpellier, France

Prof Dr J. Zinnstag

Swiss Tropical Institute, Basel, Switzerland



The Board of Governors and the direction committee in the garden of Campus Rochus.

Staff list

Director

Gryseels Bruno

General Administrator

Schueremans Lieve

General administration

Bogaerts Willy
De Bie An
De Deken Marie-Joëlle
Goeyers Pascale
Simons Patricia
Wynants Kristien

Coordination, Safety and Quality

Anthonis Kathleen
Bosmans Kristien
Boulenger Delphine
Brouwers Nathalie
Buttiëns Hilde
Buys-Deville Sarah
Caron Ann
Cobbaut Katrijn
Coenen Jan
Hanson Claudia
Hendrix Luc
Lepage Bernadette
Piessens An
Ralston Patricia
Roels Britt
Van Aerde Nico
Van de Velde Titania
Van den Sande Björn
Van der Roost Dirk
Van Dooren Pieter
Van Heusden Govert
Van Peer Nadine
Verdonck Kristien
Verellen Jef
Verlinden Ann
Vermaelen An

Department of Animal Health

Abatih Emmanuel Nji
Bakkers Ellen
Berkvens Dirk
Claes Marleen
De Deken Gill
De Deken Reginald
De Pus Claudia
De Witte Jacobus

Deblauwe Isra
Debois Danielle
Deckers Nynke
Delespaul Vincent
Dorny Pierre
Ehlinger Nadia
Gabriël Sarah
Geerts Stanny
Geysen Dirk
Janssens Michiel
Madder Maxime
Marcotty Tanguy
Pauwels Inne
Praet Nicolas
Speybroeck Niko
Thys Eric
Thys Séverine
Van Binsbergen Renée
Van de Velde Willem
Van den Bossche Peter
Van Hul Anke
Vandamme Ellen
Vermeiren Lieve
Victor Bjorn

Department of Clinical Sciences

Bottieau Emmanuel
Carrillo Casas Esther
Colebunders Robert
Coopman Els
Cox Janneke
De Boeck Hilde
De Ryck Iris
De Smet Birgit
De Weggheleire Anja
Gillet Philippe
Hermans Veerle
Huyskens Liesbeth
Jacobs Jan
Kiyan Tsunami Carlos
Koole Olivier
Lequarré Françoise
Lorent Natalie
Lynen Lutgarde
Moonen Annick
Mori Marcella
Potters Idzi
Scheirlinck Annelies
Stokx Jocelyn
Swinne Danielle
Van den Ende Jozef
Van der Meer Anne
Van Esbroeck Marjan
Van Griensven Johan
Vervecken Eva
Wuytack Christiane
Zolfo Maria

Medical Services

Adams Kris
Anthonissen Frank
Apers Ludwig
Baeten Greta
Borguet Pascale
Caluwaerts Séverine
Clerinx Joannes
Cloetens Marina
Cnops Lieselotte
Collier Ilse
Cox Hilde
D'hondt Agnes
Dahchour Nadia
De Greef Gertrudis
De Schrijver Marjolein
Delporte Erika
Demeulemeester Kathy
Desmet Patrick
di Bakambo Sembo
Feyens Anne-Marie
Florence Eric
Geenen Greet
Goetghebeur Jolaine
Goffin Bernadette
Guetens Pieter
Hemelaer Eva
Hoste Jessy
Huyst Veerle
Kara Dursun
Kinif Michèle
Kint Ilse
Konings Johan
Kouraich Ahmed
Laaziz Karima
Lamonte Cora
Le Beer Inge
Meersman Kathleen
Mertens Liesbet
Mertens Wendy
Opregt Bart
Piot Sofie
Platteau Tom
Praats Christel
Robbens Gregory
Roovers Miek
Spruyt Sarah
Thijs Eddy
Van Bogaert Candy
Van den Daele Alex
Van den Enden Erwin
Van Dingenen Martine
Van Ghyseghem Christiane
Van Gompel Alfons
Van Hoyweghen Cindy
Van Humbeeck Veerle
Van Keilegom Katrien

Van Lent Kurt
Van Loon Kim
Van Looveren Karin
Van Rompaey Sandra
Vandenbrouaene Marc
Vekemans Marc
Vereecken Henk
Verhaegen Nadine
Verlinden Marleen
Vermeulen Anita
Vlieghe Erika
Wouters Kristien

Department of Microbiology

Abdellati Saïd
Alou Assebide
Ardizzoni Elisa
Ariën Kevin
Atkinson Derek
Baeten Yvette
Beelaert Greta
Bernaerts Gertjan
Blommaert Ellen
Boel Luc
Bombeek Deirdre
Buvé Anne
Ceulemans Ann
Ceulemans Monique
Claus Maarten
Coppens Sandra
Crabbé François
Crucitti Tania
Cuylaerts Vicky
Daneau Géraldine
De Deken Bénédicte
De Rijk Willem Bram
de Rooy Maria
De Vos Valérie
Delvaux Thérèse
Docx Sven
Eddyani Miriam
Fissette Kristina
Fransen Catharina
Garcia Ribas Sergio
Goovaerts Odin
Gumusboga Aysel
Gumusboga Mourad
Hanquart Viviane
Hardy Liselotte
Heyndrickx Leo
Heyndrickx Liesbeth
Ielegems An
Janssens Karin
Janssens Nancy
Jennes Wim
Jespers Veronica

Jhagjhoorsingh Sunita
Kestens Luc
Laga Marie
Langat Chepkemai Lilian
Loos Jasna
Maeckelbergh Ciska
Mangelschots Marianne
Manirankunda Lazare
Martin Anandi
Massinga Loembé Marguerite
Merlin Céline
Michiels Johan
Mulders Wim
Nduwamahoro Elie
Nöstlinger Christiana
Nys Patrick
Ondoa Pascale
Paasch Fabienne
Palomino Juan Carlos
Penne Godelieve
Pollard Charlotte
Poradosú Sabrina
Portaels Françoise
Ramaekers Ellen
Rigouts Leen
Salomez Sabien
Smet Hilde
Stragier Pieter
Suykerbuik Patrick
Thys Wendy
Uwizeye Cécile
Van Aerde Anita
Van Den Heuvel Annelies
Van Deun Armand
Van Gulck Ellen
Van Schaverbeeck Christel
van Wijk Veronica
Vandelannoote Koen
Vanden Berghe Wim
Vandenhoudt Hilde
Vanham Guido
Vereecken Christiane
Vereecken Katleen
Vermoesen Tine
Vuylsteke Bea
Willems Elisabeth

Department of Parasitology

Balharbi Fatima
Bebronne Nicolas
Borlon Céline
Braham Sharleen
Burm Christophe
Büscher Philippe
Caljon Guy
Coosemans Marc

D'Alessandro Umberto
De Doncker Simonne
De Ridder Karina
De Winne Koen
Deborggraave Stijn
Decuyperie Saskia
Denis Leen
Desager Sabine
Dujardin Jean-Claude
Elouakad Meriem
Erhart Annette
Gies Sabine
Imamura Hideo
Kanobana Kirezi
Koyen Tom
Lejon Veerle
Maes Ilse
Meurs Lynn
Mostmans Eva
Obsomer Valérie
Peeters Koen
Pockelé Evi
Polman Katja
Protopopoff Natacha
Roelants Patricia
Rogé Stijn
t'Kindt Ruben
Talisuna Ambrose
Van Bortel Wim
Van den Abbeele Jan
Van den Eede Peter
Van der Auwera Gerard
Van Geertruyden Jean-Pierre
Van Hees Josephus
Van Overmeir Chantal
Van Reet Nick
Vereecken Kim

Department of Public Health

Boelaert Marleen
Bogaert Isa
Campos da Silveira Valéria
Claeys Yves
Cremonini Laura
Criel Bart
De Brouwere Vincent
De Crop Maaïke
De Greef Godelieva
De Kinder Linde
De Paepe Pierre
De Vos Pol
Decoster Kristof
Denerville Gerard
Dubourg Dominique
Everaert Renilde
Hasker Epco
Hendrickx David

Hercot David
 Hilgert Marianne
 Hoérée Tom
 Huys Arabella
 Idiong Ntak
 Jacobs Bart
 Kegels Guy
 Kober Katharina
 Kolsteren Patrick
 Lachat Carl
 Laleman Geert
 Lefèvre Pierre
 Lelubre Benjamin
 Marchal Bruno
 Marinus Mary Ann
 Matthys Francine
 Meessen Bruno
 Meheus Filip
 Menten Joris
 Ndiaye Pascal
 Nuyts Nadine
 Ooms Gorik
 Ostyn Bart
 Pirard Marianne
 Ravinetto Raffaella
 Richard Fabienne
 Roberfroid Dominique
 Segers Gerlinde
 Sen Kasturi
 Somers Chris
 Soors Werner
 Trooskens Anne Marie
 Unger Jean-Pierre
 Van Belle Sara
 Van Damme Wim
 Van der Stuyft Patrick
 van der Veer Casper
 Van der Vennet Jean
 Van Dessel Patrick
 Van Dormael Monique
 Van Hul Kathleen
 Van Leemput Luc
 van Loen Harry
 Van Maerken Marie Claire
 Van Melle Danielle
 Van Olmen Josefien
 Vanlerberghe Veerle
 Verhulst Greta
 Verlinden Rita
 Vermeiren Paul
 Vermeulen Peter
 Waelkens Maria-Pia
 Zinnen Véronique

Library

Demedts Veerle
 Didden Kris
 Goemaere Eleonore
 Mannaerts Elisabeth
 Schoonbaert Dirk

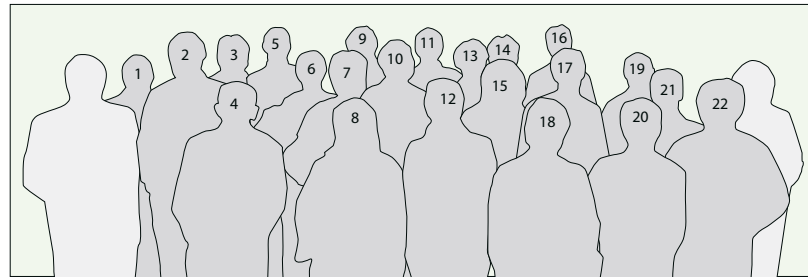
Support Services

Assayag Joseph
 Baelmans Rudy
 Blijweert Marc
 Blockhuys Wendy
 Bödges Helga
 Braat Patricia
 Bruyneel Michèle
 Cabello Luis
 Casier Godelieve
 Claes Jean
 Claes Mike
 Cornelis Marie-Louise
 Correwyn San-Ho
 Croes Peter
 Croonen Vicky
 Cryns Martien
 Daems Patrick
 De Meester Anneke
 De Paepe Danielle
 De Pauw Stefan
 De Smedt Eric
 De Smet Alexina
 De Somer Annick
 de Waard Inge
 Depuydt Henri
 Desager Jan
 Dieltiens Herman
 Dierckx Jan
 Dillen Carina
 Dumez Mathieu
 Floré Luc
 Frederickx Niels
 Gabriëls Kirsten
 Geerinckx Goele
 Gentjens Hilde
 Gondol Greta
 Hendriks Davy
 Ilegems Peter
 Jacquet Diane
 Jansegers Ivo
 Janssens Nicole
 Joosens Dirk
 Kraus Saskia
 Lamot Ingrid

Laureys Christoph
 Lenaerts Machteld
 Lezaire Filip
 Lezaire Robert
 Lucas Leo
 Maes Yolanda
 Mertens Irène
 Michiels Marc
 Mol Nadia
 Nelen Leonardus
 Ollevier Henk
 Peeters Yvonne
 Pottiez Linda
 Rabijns Annemieke
 Robertson Fiona
 Schellinckx Anne
 Schreurs Annie
 Soykenç Saime
 Stoffelen Tim
 Swiers Jeroen
 Van Acker Rudy
 Van Beeck Marc
 Van Boxel Vera
 Van Breda Pascale
 Van Den Bogaerde Maarten
 Van Eyndhoven Peter
 Van Lint Jozef
 Van Puymbroeck Peter
 Vercammen Marc
 Verdick Bert
 Verhelst Luc
 Verheyen Hilde
 Vermeulen Louis
 Vermeulen Rita
 Verstraete Lore
 Verwerft Lisette
 Vleeschouwer Daphné
 Wenseleers Jean-Pierre
 Wouters Ingrid
 Zavala Peña Andrea

Retirees and Jubilees

- 1 Patrick Kolsteren
- 2 Guy Kegels
- 3 Redgi De Deken
- 4 Guido Vanham
- 5 Van der Stuyft Patrick
- 6 Hilde Gentjens
- 7 Maria De Rooy
- 8 Greet Verhulst
- 9 Pierre Lefèvre
- 10 Yvette Baeten
- 11 Bénédicte De Deken
- 12 Marie Laga
- 13 Katrien Fransen
- 14 Lieve De Greef
- 15 Anita Van Aerde
- 16 Robert Lezaire
- 17 Hilde Cox
- 18 Denise Boons *
- 19 Bob Colebunders
- 20 Marina Cloetens
- 21 Leen Rigouts
- 22 Jean Claes



* Retired in 2009

Jubilees = 20, 25, 30 of 35 years of service

Not on the picture: Stanny Geerts*, Patricia De Lathouwer*,
Monique Senecaut *, Louis Vermeulen*, Françoise Portaels*

Alexandre Fain

° 9/8/1912

† 4/1/2009



Harrie Van Balen

° 16/8/1930

† 20/6/2009



Yvette Jacob

° 21/10/1943

† 12/11/2009



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.

Abbott NV • Ackermans & van Haaren NV • Agence Nationale des Recherches sur le Sida (ANRS) • American Foundation for AIDS Research (AMFAR) • Antwerp Aids Foundation • Antwerp Dinner Foundation • Armand Féron Foundation • Artsen zonder Grenzen / Médecins sans Frontières • Belgische Nationale Bond tegen TB • Belgische Technische Coöperatie (BTC/CTB) • Becton Dickinson Benelux • Bill & Melinda Gates Foundation • Bio Merieux Benelux NV • Boehringer Ingelheim • Bristol-Myers Squibb • Centers for Disease Control & Prevention (CDC), USA • Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD) • Central Science Laboratory, UK (The Food & Environment Research Agency, UK) • Centrum voor Informatie en Samenlevingsopbouw vzw (CISO) Stad Antwerpen • Conrad, USA • Cordaid • Damiaanactie • Danish National Research Foundation • Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) • Dries Van Noten • Eurogenetics • European Commission • European & Developing Countries Clinical Trials Partnership (EDCTP) • Family Health International (FHI) • Federaal Agentschap voor de Veiligheid van de Voedselketen (FAVV) • Federaal Wetenschapsbeleid • Foundation for Innovative New Diagnostics (FIND) • Fonds Bastanie-Cant • Fonds voor Wetenschappelijk Onderzoek – Vlaanderen (FWO) • Fortis Bank • Glaxo SmithKline NV • INBEV-Baillet Latour Fund • Institut Pour la Recherche au Développement, (IRD), France • International Atomic Energy Agency (IAEA) • International Fund for Agricultural Development (IFAD) • Intervet International BV • The International Union against Tuberculosis and Lung Diseases (UNION) • Innogenetics NV • InWEnt, Capacity Building International, Germany • Janssen-Cilag NV • Janssen Pharmaceutica NV • KBC Bank • Koninklijke Maatschappij voor Dierkunde Antwerpen (KMDA) • Lalemant NV • M.A.C. Cosmetics • Medicus Mundi Belgium • Merck Sharp & Dohme Interpharma • Nutricia Research Foundation • Pfizer Ltd • Provincie Oost-Vlaanderen • Provincie Antwerpen • Rijksinstituut voor Ziekte- en Invaliditeitsverzekering (RIZIV) • Roche NV • Roche Diagnostics Belgium • Stad Antwerpen • Tibotec/Virco BVBA • The Medicines for Malaria Venture (MMV) • The World Bank • UBS Foundation • UCB Pharma NV • UNAIDS • Unicef • United Nations Population Fund (UNFPA) • United States Agency for International Development (USAID) • University of North Carolina at Chapel Hill, USA • Van Breda International • Instituut voor de Aanmoediging van Innovatie door Wetenschappen Technologie in Vlaanderen (IWT) • Vlaamse Interuniversitaire Raad (VLIR) • Vlaams Agentschap voor Internationale Samenwerking (VAIS) • Vlaams Ministerie voor Welzijn • Voeding Derde Wereld/Nutrition Tiers Monde • World Health Organization (WHO) • WHO Special Programme for Research and Training in Tropical Diseases (WHO/TDR) • The Wellcome Trust • World AIDS Foundation and many other organisations, companies and individuals.

Notes

Notes

Notes

Notes

Notes

Notes

Notes