



INSTITUTE
OF TROPICAL
MEDICINE
ANTWERP

Annual report

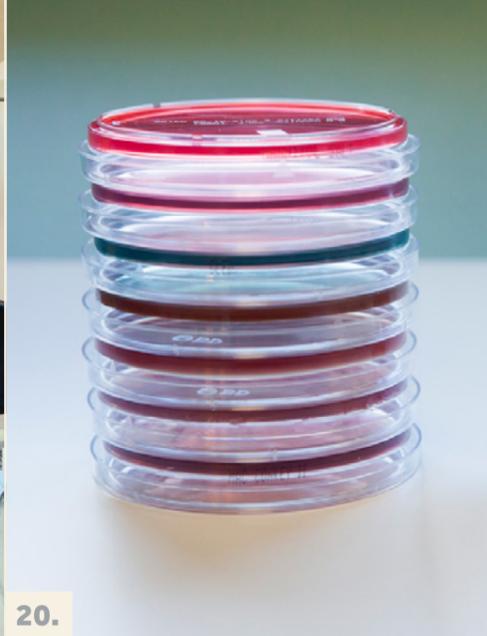
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Global Science for Health Worldwide

Tropical diseases, HIV/AIDS, tuberculosis and inadequate health care influence the lives of billions of people worldwide.

The Institute of Tropical Medicine in Antwerp, Belgium, promotes the advancement of science and health for all, through innovative research, advanced education, professional services and capacity building of partner institutions in the South.

For us, scientific excellence and societal impact are two sides of the same coin.



Our values

Excellence & Relevance

We strive to stand at the international forefront in key scientific domains and pursue the highest quality in research, education and services with the ultimate aim to solve actual health problems.

Integrity

We want to comply with international ethical standards and aim for critical sense, honesty and transparency in all our activities.

Fairness

We value equity, diversity, solidarity and well-being of students and employees and in partnerships.

Sustainability & Persistence

We aim for longterm progress without compromising the ability of future generations.



Our vision

Equal chances at a healthy life for all.



Our mission

Scientific progress in tropical medicine and public health.



Our core tasks

Scientific research; higher education; medical and scientific service provision.

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Foreword by the Chair

Cathy Berx

Welcome! It is always a pleasure to greet readers and share insights of the past year in this Foreword. Alas, this will be the last time I get the honour of doing this, as 2022 encompasses my final mandate and last six months as Chair of the Board of Governors in this remarkable institution after 14 years of service. So, this is a special Foreword – one where I will reflect on 2021 on the governance level and indulge in some reminiscence.

To begin, what has 2021 brought the institute? As for most people, a year of COVID-19 2.0 meant another long period of fewer face-to-face encounters – between staff, for students and professors and for our partnerships – and I think we all suffered under this pressure. Nonetheless, projects moved ahead and all-in-all it has turned out to be a positive year of strengthening the organisation and continuing our pursuit of scientific excellence and relevance in the field of “Global Science for Health Worldwide”, in line with the ambitions of our policy plan. The fruits of this can be found in the pages to come.

In terms of organisational fitness, a swathe of new appointments on different management levels have meant that the necessary fortification of our team took place. In terms of the strength of our physical infrastructure, with new laboratories needing to be housed, we also started working on an out-of-the-box ‘Masterplan’ project, with possible new locations coming onto the horizon for 2022.

On the governance front, the new structure, which started in 2018, continued to prove its worth. The General Council is now in full swing and has worked well in keeping ITM faithful to its vision, mission and values. This year, we ran a mandated structural evaluation of the Board. I’m pleased to say this went well. With this, the Board of Governors proved itself as an independent decision-making body providing valuable strategic direction through another pandemic-riddled year. My thanks go to everyone involved in these two bodies, for your expertise, openness and commitment in 2021.

On this note, along with my departure, 2021 saw the ending of other Board mandates. This includes Patricia Lanssiers and Dirk Moens, to whom I would like to extend my sincere gratitude for their excellent and extremely professional contributions. In turn, a call for new Board Member applications closed at the end of January 2022 with the General Council set to finalise the appointments on 30 May.

In my own case, it is with sadness that I will leave this position as I must admit I have become some-

what besotted with ITM – such a wonderfully fascinating place with unique people that will always remain in my heart.

Over the 14 years that I have had the great honour to be the Chair of the Board, I have seen the institute define and deliver on its strategy towards being a science-driven organisation and have worked together with many amazingly driven people – inside and outside the institute – to have this embedded in its governance and management structure. As is the case today, ensuring the institute evolves and thrives in tumultuous times has been a consistent theme that has required persistence and unwavering commitment.

So, it is my turn to hand over the governance of ITM’s next evolutions. Despite my heavy heart, I am pleased that a fresh wind, in the form of a new Chair, will begin this year and I am curiously excited to see who that will be.

I wish the new Board well in facing the very real challenges of our time in creating a healthier world on a global scale – I’m sure the strength of the institute will bode them very well. With this, I would like to take the opportunity to thank: the entire Board for the wonderful and inspiring collaboration, for their dedication, professionalism,

friendship and wisdom, the members of the General Council, and in particular the representatives of the low- and middle-income countries, and all those who, due to their daily work, research and commitment, make and shape ITM.

All said and done, this is only an ‘au revoir’ as I stay committed to a smooth transition (and am forever enamored with ITM) and will remain available to provide help whenever and wherever I can.

Au revoir, tot ziens, until we meet again!

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

“ It is with sadness that I will leave this position as I must admit I have become somewhat besotted with ITM – such a wonderfully fascinating place with unique people that will always remain in my heart.

Director's note

Marc-Alain Widdowson



It seems that at the beginning of 2021 I looked down and when I looked up again the year was over. 2021 was a 'nose to the grindstone' year for all at ITM. Not only were we working on realising our Institutional Policy Plan along with the added demands brought by COVID-19, but also on securing new funding and initiatives to grow and ensure our future. What has this meant for us at ITM? Non-stop commitment and delivery. With this we made quantum steps towards ITM's key annual goals of continuing to build a strong ITM team given expected retirements, delivering excellence in education, moving towards more sustainable funding, and of strengthening our robust partnerships across our ecosystem to collaborate and co-create on solutions to health challenges across the world.

We said goodbye to several senior academic and management staff and welcomed new staff to carry on the mission. We saw the appointment of two new departmental heads. Lut Lynen handed on the baton to Johan van Griensven who became the new Head of Department of Clinical Sciences. Similarly, Kevin Ariën has succeeded Jean-Claude

Dujardin as Head of Department of Biomedical Sciences. Both Jean-Claude Dujardin and Lut Lynen have gone above and beyond as founding leaders of their respective departments in making them the centres of excellence they are today, and a key part of ITM's identity. Our General Manager Ann Peters has worked tirelessly to consolidate the General Management Offices with new staff and more efficient processes ITM-wide.

2021 also saw the mandated evaluations of many of our professors and it was gratifying to see many of them rewarded for their accomplishments with promotions. Very excitingly, ITM has expanded its footprint to work more closely with partners, with the official recognition of the new ITM office by the Democratic Republic of the Congo (DRC). The ITM-DRC Office is now a self-standing unit of ITM and is almost fully staffed.

While sharing my gratitude for those leaving, I am excited to see those in new positions getting their teams off to good starts.

In education, a thank you goes to the students who came to Antwerp amid pandemic chaos. Despite COVID-19, we had the first 17 students graduating from our new Master's in Tropical Medicine and we recruited 25 to the newly named Master's in Global One Health. I congratulate the teaching staff for our second year of having to move to hybrid education. As for many educational establishments, this has stimulated our thinking on our overall strategy of creating the most impact with our educational offering.

Of course, to continue to achieve our ambitions, we are focusing on ensuring sustainable funding. Here the year ended well. I would like to thank the Flanders Department of Economy, Science and Innovation (EWI) who in December allocated an extra 1 million euros to boost our infrastructure by setting up a Clinical Trials Centre and by completely rene-ewing our immunology laboratory. In addition, EWI will give 1 million euros a year structural subsidy, for the hiring of a number of research professors including in 'One Health', (Re-)Emerging Infectious

Diseases and Healthy Ageing. The extra amount will also mean the establishment of a new Population Data Science Hub. This recognises ITM's commitment to excellence in research.

2021 also brought the closure of our fourth framework agreement between the Directorate-General for Development Cooperation and Humanitarian Aid (DGD) and ITM. Our 2021 work centred on research capacity building in Africa, Asia and Latin America. The last year has also brought another financial commitment from the Bill and Melinda Gates Foundation and the Belgian Government to sleeping sickness to continue to push this historic disease towards oblivion.

With the end of our previous agreement comes a new commitment and I am pleased that our fifth five-year agreement with DGD has been approved (2022-2026). For this new agreement with new countries and new mechanisms, we recognise the increasing capacity and strength of our partners and want to emphasise two words for our future work: collaboration and co-creation. These best describe the modus operandi of the ITM partnerships we will continue to grow and foster. These are partnerships where all parties bring additional value and strengths, striving for academic and scientific excellence in order to provide evidence to improve people's lives. With this I thank our partners for their commitment and partnership and I very much look forward to working with you and our strengthened ITM team into 2022 and beyond.

Finally, I would like to congratulate everyone for keeping the eye on the ball through another unpredictable year. It is easy to get excited about increased funding and opportunities, but equally easy to forget that the management and administration of the work is at least as much work as the implementation. Success depends on commitment across all of ITM. COVID has not only proven ITM's strengths of excellence and partnerships, which anchors all we do and allows us to pivot to new challenges, but also the resilience of management and administrative staff.

Last but not least, thank you to the Board of Governors for their support, and especially to those who will be leaving us in 2022. A particular thank you goes, of course, to Cathy Berx who has untiringly chaired the Board for 14 years through considerable reorganisation, a new director and a pandemic. ITM will miss you.

Marc-Alain Widdowson
Director

ITM under the lens

Pathogens, Patients, Populations = P³

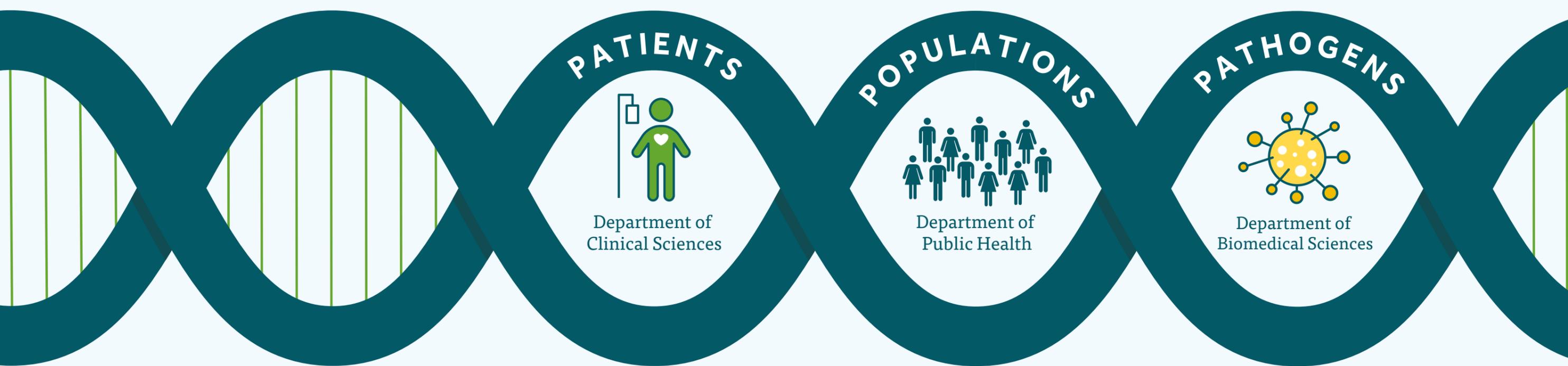
RESEARCH

422 scientific publications



INTERNATIONAL COOPERATION

19 institutional partners



PATIENTS



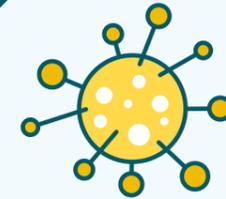
Department of
Clinical Sciences

POPULATIONS



Department of
Public Health

PATHOGENS



Department of
Biomedical Sciences

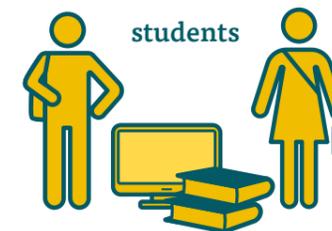
MEDICAL SERVICES

33,029
patient consultations



EDUCATION

543
students



Our three scientific departments focus on Pathogens, Patients and Populations (P³) and all contribute to our four core tasks of research, education, medical services and international cooperation.

Research & innovation

Scientific progress in the fields of tropical medicine and international health is at the heart of our institute's academic mission. ITM's research activities range from basic to operational research and all aim to tackle important health challenges, with a particular focus on low-resource settings and vulnerable populations. Our research policy in 2020–2024 underpins our pursuit of conducting excellent and relevant science, with continued emphasis on equitable partnerships throughout the world. Our research aims to respond to the formidable challenges and opportunities in today's rapidly changing world: researching (re-)emerging infections and outbreaks, designing sustainable health systems and strategies, accelerating disease elimination, and tackling antimicrobial resistance in viruses, bacteria and parasites.

In 2021, the coronavirus pandemic accelerated ITM's ambitions to develop vaccine research. Our institute became a trial site in three COVID-19 vaccine-related clinical trials, involving more than 800 participants. It supported Belgian vaccination policy and studied vaccine hesitancy. In 2021 the institute was awarded an extra 1 million euro from the Flemish government to boost our infrastructure, some of which will help build a Clinical Trials Centre (CTC) to further strengthen these activities. Thanks to a structural increase of the research funds from the Flemish government, approved in 2021, ITM can invest in research professor positions in the areas of One Health, (re-)emerging infectious diseases and healthy ageing, involving vulnerable groups in Flanders and worldwide. The funds will also support a new Global Population Data Science Hub.

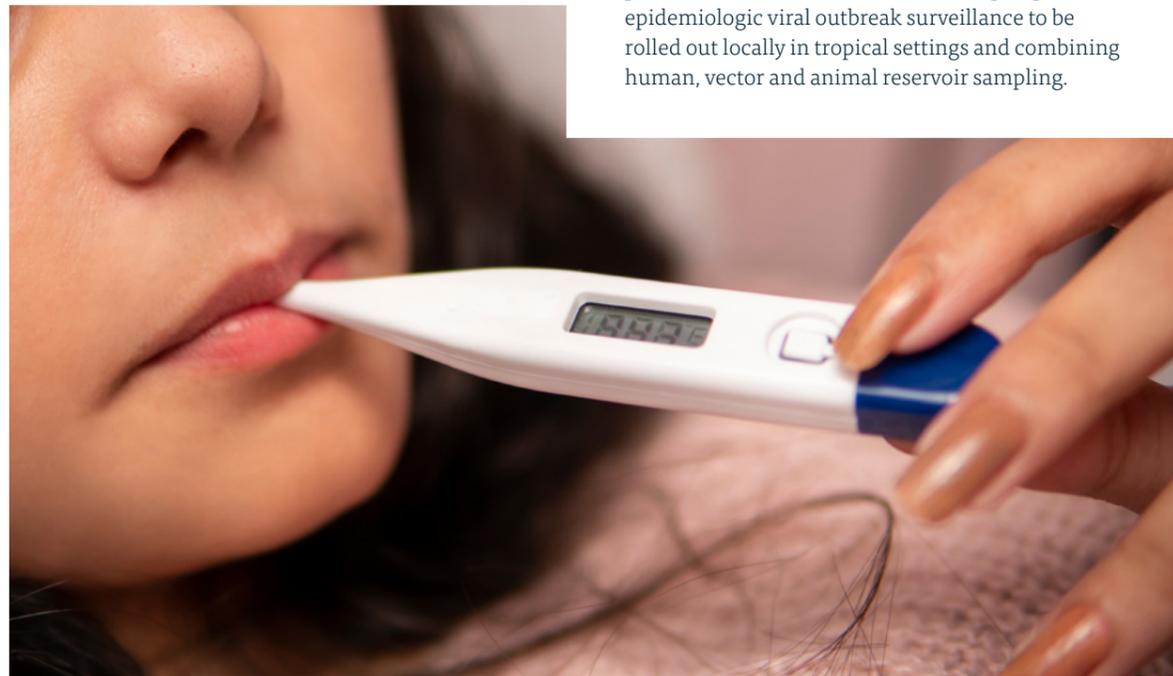
Emerging and re-emerging diseases and outbreaks

A clinical research platform for virus detection in tropical fever patient populations

Important patient sample collections have been gathered over recent years through collaborative ITM research projects on acute undifferentiated febrile illness with partner institutions in the South (sub-Saharan Africa, Asia and Latin America) and

clinical studies in the ITM travel clinic. Interestingly, targeted diagnostic tools (e.g. rapid tests, serology and PCR) have failed to identify underlying causative agents of febrile illness in most patient samples.

Within the framework of the new METATROPICS project financed by EWI, ITM aims to build a platform that uncovers and describes endemically circulating viral pathogens and potentially also new viruses causing febrile illnesses. The research will be carried out by sequencing all nucleic acid sequences in a patient sample. Beyond available samples, this platform will form the basis for future prospective epidemiologic viral outbreak surveillance to be rolled out locally in tropical settings and combining human, vector and animal reservoir sampling.



Emerging and re-emerging diseases and outbreaks

ITM and COVID-19

In 2021 globally, more than three million people died of COVID-19 - the novel coronavirus disease. Our scientists have been fully committed to limiting the impact of the disease and have joined forces with experts in Belgium and abroad to map the epidemic, find treatments through biomedical research and clinical trials and study its impact on people and society.

ITM is a part of **BelCoVac** - a consortium of nine Belgian research, public health and higher education institutions. This initiative brought together several non-commercial clinical trials and follow-up projects in the context of COVID-19 vaccines marketed in Belgium. Thanks to their work, research on COVID-19 vaccines is conducted, recorded and reported in a uniform way. The ITM virology lab was instrumental in providing the virus-neutralising antibody results in our high-security laboratories.

The **IMCOVAS** study investigated whether vaccines already approved in Europe are equally effective when administered according to a different schedule or dosage than prescribed in the package leaflet. ITM was one of the four test centres in Belgium. This clinical trial was one of the three on COVID-19 vaccines at ITM. Altogether they involved more than 800 participants.

Our project on '**vulnerable populations and COVID-19**' continued in 2021. The project team assisted the cities of Antwerp and Lier in training volunteers of different ethnic back-

grounds to promote COVID-19 prevention in their communities. Furthermore, within a transdisciplinary collaboration, ITM researchers assessed **vaccine sentiments** to guide Belgian public health authorities on how to promote vaccine acceptance among the population. ITM has also been involved in many COVID-19 studies worldwide, working with international partners.

The **ANTICOV** consortium aims to identify COVID-19 treatments that can prevent hospitalisation and disease progression in mild to moderate but higher risk COVID-19 patients. The trial is currently being conducted in 13 African countries with researchers from leading African institutions in the driver's seat. ITM has been working closely with its partners in Ethiopia and is sponsor of the clinical trials in Gondar and Bahir Dar. ITM is also leading both nested studies on the impact of early treatment on patient immunity generation in six African countries, and on the transmission of the virus in households in five further African countries.



Journal highlights

THE LANCET Global Health

Challenges in interpreting
SARS-CoV-2 serological results
in African countries

Antoine Nkuba Ndaye et al.



Journal of Virological Methods

Evaluating SARS-CoV-2 spike and
nucleocapsid proteins as targets
for antibody detection in severe
and mild COVID-19 cases using a
Luminex bead-based assay

Joachim Mariën et al.



The search for exotic mosquitoes in Belgium continues



Exotic mosquitoes are spreading as a result of increased globalisation and climate change. An example is the tiger mosquito or *Aedes albopictus*, which can carry pathogens such as dengue, chikungunya and Zika virus. This species was able to establish itself in Southern Europe and has also been spotted in Belgium. Early detection enables better control.

The first Monitoring of Exotic Mosquitoes in Belgium (MEMO) project was finalised in December 2020. The monitoring restarted within the framework of MEMO+ in September 2021. In this study, active monitoring is coordinated by ITM, and passive monitoring is overseen by Sciensano. Passive monitoring means raising awareness among the general population and stimulating citizens to track exotic mosquitoes via a website. In 2021, the project included fieldwork in parking lots, creating educational material, organising workshops and training Sciensano researchers in mosquito identification.

The MEMO+ project is funded by the Flemish, Walloon and Brussels governments and the Federal Public Service (FPS) Public Health, Food Chain Safety and Environment in the context of the National Environment and Health Action Plan (NEHAP) in Belgium. ITM carries out the MEMO+ project together with Sciensano and Barcoding of Organisms and Tissues of Policy Concern and integrates field and laboratory data to understand the distribution of these insects that are known as vectors.

40 years HIV research at ITM - from the AIDS epidemic to sustainable HIV infection care and research innovation

The importance of ITM in HIV and AIDS research cannot be overestimated. It is thanks to ITM that this disease was recognised as an African heterosexual disease which affects poor people. ITM has also been a medical services provider and a taboo-breaking champion of HIV-infected people in Belgium for decades. The institute has a strong commitment to HIV/AIDS research in the areas of virology, epidemiology, prevention, education, diagnosis, therapy and social issues.

In 2012, pre-exposure prophylaxis (PrEP) was developed. This ground-breaking pill-based treatment is highly effective in reducing the risk of an HIV infection. The question remains how the clinical efficacy of PrEP translates into population-level impact. PROMISE, a four-year FWO project run by ITM and the University of Antwerp, aims to learn how PrEP roll-out can be optimised to maximise its impact on HIV and sexual health. First results showed that 90% of men that have sex with men are aware of PrEP's existence and 27% have taken it.

In cooperation with four West African research teams, ITM researchers also found that PrEP uptake and use is hampered by stigma associated with HIV, homosexuality and promiscuity. To fight



stigma and commemorate World AIDS Day 2021, ITM launched the "Best smile" campaign. Participants wore colourful pins to show that they are open to talk about HIV without stigmatising those who live with it.

Also in 2021, in the framework of another FWO-funded project, ITM researchers demonstrated that Belgian men who have sex with men had less sex with non-steady partners during the first COVID-19 lockdown. As it provided evidence on the reduction in HIV diagnoses in 2020, the study won a prize for "Best Publication in Public Health" at the 9th Belgium Research on AIDS and HIV Consortium (BREACH) symposium.

Journal highlights

frontiers in Nutrition

The Burden of Malnutrition and
Fatal COVID-19: A Global Burden of
Disease Analysis

Elly Mertens and José L. Peñalvo



BMJ Global Health

A double-edged sword-
telemedicine for maternal care
during COVID-19: findings from a
global mixed-methods study of
healthcare providers

Anna Galle et al.



Sustainable health systems and strategies

Towards a new state-of-the-art, versatile and safe blood self-sampling device

Home-based self-tests for infectious diseases are on the rise. Currently, even WHO recommends integrating self-tests and home-based self-sampling into health care for the control of HIV and STIs (sexually transmitted infections). Nowadays, a microcontainer and the free-fall method are still used to collect whole blood at home for the detection of HIV and syphilis. This is very unhygienic, uncomfortable and often collects an insufficient amount of blood to carry out all the necessary tests. ITM researchers are developing a new device that circumvents



these shortcomings. The new device would still use the finger stick method but will integrate it with a collection tube, sparing patients from having to put the blood into the tube themselves.

This method would be more hygienic and could double the amount of blood collected. Researchers aim to facilitate the diagnostic process and to make the device available in lower-resource settings as a cheaper diagnostic alternative. For its development, ITM is collaborating with Voxdale. Financial support comes from the Flemish Agency for Innovation and Entrepreneurship (VLAIO).



Sustainable health systems and strategies

A promising new tool for tuberculosis testing

The Lung Flute®, a flute-shaped hand-held device that helps reduce thin mucus, is a promising tool to increase the volume and quality of tuberculosis testing. ITM researchers are testing a simple and inexpensive paper version of the Lung Flute®, the Lung Flute ECO®, to enable sputum sample collection for tuberculosis testing. Initial testing showed similar performance of the Lung Flute ECO® at lower cost and reduced environmental impact. Researchers will evaluate its performance in target groups in Cameroon to determine its potential contribution to the volume of molecular testing, diagnostic yield, as well as safety, acceptability, and cost-effectiveness. If viable, the Lung Flute ECO® will be an affordable and eco-friendly tool for the early detection of tuberculosis.

The study is funded by the Global Health Innovation Technology Fund. The partners for the study are the Research Institute of Tuberculosis (Japan), the Center for Health Promotion and Research (Cameroon), and Acoustic Innovations (US).

Sustainable health systems and strategies

Ensuring the continuity of care for women and newborns during disruptive unforeseen events

The COVID-19 pandemic shook health systems worldwide, including the care for pregnant women and newborns. To understand the impact of the pandemic on the provision of essential maternal and newborn care globally, ITM launched a global study - a collaboration of two European and seven African institutions. One of the sub-studies was carried out in 2020-2021, and it prospectively assessed how maternal healthcare was provided in six referral hospitals in Guinea, Nigeria, Tanzania and Uganda during the first year of the COVID-19 pandemic. These hospitals are located in crowded urban areas, which were often epicentres of the pandemic.

This study also serves as a platform for the exchange of information and experiences across the contexts studied. Furthermore, this research contributes



to more people-centred, integrated, accountable, equitable and resilient health systems that lead to responsive and high-quality care for all mothers and newborns. This study was made possible by ITM's COVID-19 Pump Priming Fund supported by EWI and by the Embassy of the United Kingdom in Belgium.

Sustainable health systems and strategies

Preventing type 2 diabetes among women in the DRC

Noncommunicable diseases (NCDs) such as diabetes, cardiovascular diseases, respiratory diseases, cancer and others kill 41 million people annually, and 77% of these deaths occur in low- and middle-income countries.

In a new project called Kis-Santé, ITM researchers aim to develop and implement a programme for the prevention of type 2 diabetes and gestational diabetes among women in Kisantu, DRC, through the promotion of a healthy lifestyle and the maintenance of a healthy weight.

The programme will also be evaluated through a cluster-randomised clinical trial in six primary healthcare facilities in Kisantu, where 300 participants will be recruited. Researchers are partnering with Memisa-DRC for the operational activities, the local health systems, and the DRC's Ministry of Health for outreach and potential scaling up. The project is sponsored by the City of Antwerp.



Disease elimination

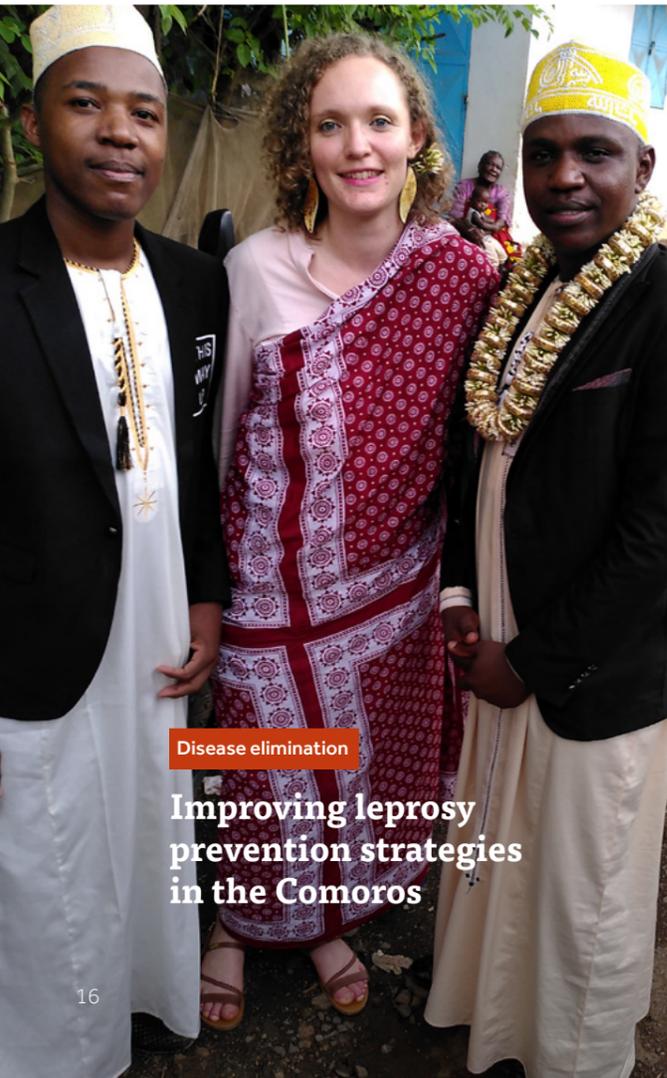
An interdisciplinary take on malaria

Malaria is a tropical disease spread by mosquitoes (as vectors) that still kills more than half a million people every year.

ITM is part of the interdisciplinary CEASE project, led by the Liverpool School of Tropical Medicine (LSTM), which aspires to map the spread of the malaria mosquito vector *Anopheles stephensi* in Ethiopia and Sudan. The social science work package, led by ITM researchers, aims to understand how social and ecological factors affect the spread of the mosquito in this region. They will also model the public health impact and the cost-effectiveness of different emerging vector control strategies. Besides LSTM and ITM, the collaboration brings together experts from the Jimma University and Armauer Hansen Research Institute (Ethiopia), the University of Khartoum (Sudan), Imperial College London and Lancaster University (UK). The project is funded by the Wellcome Trust.



The SWARM study, financed by the International Human Frontier Science Program, researches how malaria mosquitoes swarm and mate. The project combines expertise from neuroscience, engineering/machine vision, behavioural ecology and medical entomology, from laboratories across three continents. Researchers aim to provide crucial knowledge about the mechanisms that underlie the vast reproduction of malaria vectors and hereby support the development of malaria vector control strategies, such as gene-drive, acoustic lures, and monitoring. The study is being conducted with partners from the University of Washington (USA) and the Institut de Recherche en Sciences de la Santé, Centre Muraz (Burkina Faso).



Disease elimination

Improving leprosy prevention strategies in the Comoros

Since 2018, ITM researchers have been conducting research into leprosy, an ancient infectious disease transmitted by *Mycobacterium leprae*. Although it is assumed that humans transmit the disease to other humans, it is still poorly understood exactly how this happens.

ITM is currently involved in an ongoing cluster randomised trial in the Comoros (PEOPLE study). Here the study team is producing spatial-epidemiology data and phylogenetic trees - diagrams representing evolutionary relationships between organisms. The institute has now also started a follow-up study called SNA Leprosy, financed by EWI. This is to compliment the data emerging from the PEOPLE study with the analysis of social networks. Here, they will study entire villages combining qualitative and quantitative research methods. By understanding how transmission occurs, researchers will know who benefits most from leprosy screening within the patient's social network - beyond those living nearest. They will be able to formulate concrete recommendations to improve leprosy prevention and control efforts in the Comoros, and more generalisable recommendations that could benefit leprosy interventions globally. For this study ITM is teaming up with the Damien Foundation.

Disease elimination

ITM prepares for final phase in fight against sleeping sickness

Human African trypanosomiasis (HAT) or sleeping sickness is a disease caused by the *Trypanosoma* parasite, which is transmittable by the tsetse fly. The disease is fatal when left untreated. ITM has taken a major role in the fight against sleeping sickness for decades and has a long tradition in developing and manufacturing diagnostic tests, which are now used in all HAT control programs.

ITM plays a leading role in supporting the control of the disease in the Democratic Republic of the Congo (DRC). Together with Congolese and international partners, ITM reduced the number of cases there, meeting the WHO goal of eliminating sleeping sickness as a public health problem in the country. The final objective of the sleeping sickness agenda is to sustainably eliminate the transmission of the disease by 2030, by interrupting the transmission of the parasite between tsetse flies and humans.

All projects on HAT control, financed by the Belgian Government and the Bill & Melinda Gates Foundation and coordinated by ITM, have been renewed in 2021.

This requires a system to improve testing and treatment and deal with operational issues in



the DRC. Field testing of new tools and operational research providing new insights in transmission of disease, parasites limited to the skin, and social aspects such as out of pocket costs for patients, will further influence strategic choices in the following years. Several lines of research helping to determine those choices are the **Costs and Outcomes of Integrated Human African Trypanosomiasis Surveillance System Using Rapid Diagnostic Tests** and the **Feasibility of a dried blood spot strategy to monitor elimination of HAT in the DRC**.

In 2021, our researchers published a paper of a new **gambiense-iELISA** test that can potentially replace the current reference test. This new test has a higher throughput, is less hazardous and does not require the use of rats and mice. Major progress has been made in the development of **new molecular tests** which will be essential for the endgame.

Also in 2021, ITM's recognition as WHO Collaborating Centre for Research and Training in HAT Diagnostics has been renewed.

Disease elimination

Journal highlights

Nucleic Acids Research

High throughput single-cell genome sequencing gives insights into the generation and evolution of mosaic aneuploidy in *Leishmania donovani*
Gabriel H Negreira et al.



Clinical Infectious Diseases

Trypanosoma brucei gambiense-iELISA: A Promising New Test for the Post-Elimination Monitoring of Human African Trypanosomiasis
Manon Geerts et al.



Research & innovation in numbers

422

articles in top scientific journals



41

new international projects



29

clinical trials coordinated by ITM

Disease elimination

New basic research projects to underpin new innovations for *Leishmania* elimination

Leishmaniasis is a neglected tropical disease, spread by sandfly bites. Its most common form in people is cutaneous leishmaniasis, which causes painful skin sores, and visceral leishmaniasis, which affects internal organs and is lethal if left untreated. Visceral leishmaniasis is the second-largest parasitic killer in the world after malaria, responsible for 30,000 deaths each year.

In 2021, the Research Foundation Flanders (FWO) awarded a grant to ITM scientists to study quiescence in *L. donovani*, the parasite responsible for visceral leishmaniasis. Quiescence is a survival strategy adopted by several pathogens which renders parasites less susceptible to chemotherapy and allows them to survive for years unnoticed in the host organism, complicating clinical management and jeopardising elimination programmes. By understanding the mechanisms behind quiescence and its role in parasite adaptation to environmental insults, the researchers in LeishQ aim to provide knowledge

and tools paving the way for future clinical studies on novel treatment or vaccine strategies.

Cutaneous leishmaniasis manifestations range from self-healing skin ulcers to diffusely spread chronic lesions. In a new study financed by the Dioraphte Foundation, researchers aim to, for the first time, track the *L. aethiopicus* parasite in its spatial environment and make a comprehensive ecological picture on where the parasite is residing in the skin of patients and how it is escaping or adapting to our immune response, and how all this is influencing the clinical presentation. This study will be instrumental in finding new and warranted targets for therapy. The Spatial CL consortium is lead by ITM and includes the University of Gondar (Ethiopia), University of York (UK) and Maastricht University (NL).



Antimicrobial resistance

Research inspiring solutions in the fight against antimicrobial resistance

Antimicrobial resistance (AMR) is an urgent global health threat that develops when bacteria, viruses, fungi and parasites change over time and no longer respond to treatment. Globalisation, migration and (medical) tourism will inevitably lead to the world-wide spread of new (multi-) resistant mutant pathogens.

ITM is fighting this global threat through several research projects. One of these is the EDCTP-funded and ITM-led **SIMBLE project**, which aims to introduce a simplified, cheap and robust blood culture system. 'Bactinsight' can withstand tropical conditions such as dust, humidity and unreliable power supplies. It enables the diagnosis of bloodstream infections in low-resource settings, resulting in improved treatment and a reduction in the misuse of antibiotics. The system, which will be evaluated in Burkina Faso and Benin, is also affordable and easy to use. The project involves seven international partners in Europe and Africa.

Additionally, there is an increasing need for alternatives to antibiotics to prevent the transmission of sexually transmitted infections such as gonorrhoea, chlamydia and syphilis. In the FWO-funded **Preventing Resistance in Gonorrhoea (PReGo)** study researchers aim to better understand why resistance usually emerges in core-groups (populations with high rates of partner change) and develop new modalities to prevent the emergence of resistance. They developed a number of alternatives to antibiotics to treat and prevent a *Neisseria gonorrhoeae* infection, including bacteriophages and chlorhexidine mouthwash. In a paper published in 2021 in *The Lancet Infectious Diseases*, ITM researchers concluded that mouthwash cannot be used to treat and prevent pharyngeal gonorrhoea. The research work is ongoing to find bacteriophages and bacteriocins that can eradicate *N. gonorrhoeae*.

Tackling AMR requires an interdisciplinary approach. The institute develops new diagnostic tools and treatment strategies, promotes responsible antibiotic stewardship and investigates human, social and cultural factors.



Antimicrobial resistance

Innovate and evaluate to detect antimicrobial resistance in tuberculosis

Accurate and timely detection of antimicrobial resistance (AMR) is key to patient management. Rifampicin is one of the key anti-tuberculosis (TB) drugs, but current routine diagnostics fail to detect a small percentage of rifampicin-resistant TB strains. Consequently, patients are not adequately treated, have low chances of being cured and are likely to continue transmitting the disease. In a collaborative study, ITM researchers applied a non-commercial method, Thin Layer Agar (TLA), to detect

rifampicin-resistant strains. TLA, which was previously extensively evaluated at ITM, is an affordable method that provides accurate test results, detecting also resistant strains missed by the other methods. Importantly, clinical samples require very limited manipulation, eliminating the need for high-level biohazard containment.

The TLA method is now under evaluation for its performance on the detection of bedaquiline resistance. Bedaquiline is a novel antibiotic, used in the treatment of multidrug-resistant TB, that significantly shortens the treatment duration.

Ardizzoni et al. 2021 *Antimicrob Agents Chemother*



Antimicrobial resistance

Using cutting edge gene sequencing technologies in the fight against drug-resistant malaria

Malaria is a mosquito-borne infectious disease caused by single-celled microorganisms of the *Plasmodium* group. Of the five species infecting humans, *P. vivax* is the predominant species outside of Africa, causing millions of cases. A major challenge to achieve malaria elimination by 2030 is the parasite's resistance against chloroquine. While the first cases of *P. vivax* chloroquine resistance (PvCQR) were reported in 1989, the markers and mechanism of chloroquine resistance (CQR) remain unknown, hampering molecular surveillance and accurate diagnosis.

In order to address PvCQR, ITM researchers will capitalise on a large collection of existing *P. vivax* clinical samples to pioneer in the application of cutting-edge RNA sequencing technologies. They will unravel the network of genes underlying PvCQR, and the impact of parasite stage and infection complexity in treatment outcome. The results of the study will directly benefit *P. vivax* patients and drug resistance surveillance, while advancing



research with new protocols, tools, datasets and transgenic lines to investigate *P. vivax* biology.

Partner institutions for the study include the Royal Veterinary College (UK), National Institute of Malariology, Parasitology and Entomology (Vietnam), the Institute of Medical Research (Papua New Guinea) and the Universidad Peruana Cayetano Heredia (Peru).

Antimicrobial resistance

Community pharmacies can play a large role in combatting AMR

Antimicrobial resistance (AMR) is a major threat to public health worldwide. Particularly in low-income countries that have high rates of infectious diseases and where people often receive antibiotics without prescription from local pharmacies. The CABU-EICO project, coordinated by ITM, aims to improve antibiotic use and hygiene practices, to ultimately reduce antimicrobial resistance. Starting from 2022, the research team will develop and evaluate a one-year behavioural intervention for communities and community pharmacy staff in Burkina Faso and the DRC.

The project, one of the new JPIAMR 13th transnational call projects, receives financial support from FWO, the Medical Research Council in the UK, ANRS | Emerging Infectious Diseases in France and the Swedish International Development Cooperation Agency. The consortium includes Institut de Recherche en Science de la Santé (Burkina Faso), Institut Médical Evangélique de Kimpese (DRC), University of Antwerp (Belgium), Institut Pasteur (France), University of Cambridge (UK) and University of Oxford (UK).



Antimicrobial resistance

Journal highlights

Sexually Transmitted Infections

An alarming high prevalence of resistance-associated mutations to macrolides and fluoroquinolones in *Mycoplasma genitalium* in Belgium: results from samples collected between 2015 and 2018
Irith De Baetselier et al.



EUROPEAN RESPIRATORY journal

Deep amplicon sequencing for culture-free prediction of susceptibility or resistance to 13 anti-tuberculous drugs
Agathe Jouet et al.





(VUB) and the University of Antwerp (UA) with ITM as additional host institute. Three projects will also involve international partners; namely Stellenbosch University (South Africa), University of London (UK) and the Rwanda Biomedical Center (Rwanda).

ITM submitted 17 research projects to FWO's call for fundamental research projects in 2021 and **five senior research projects** were awarded. A multidisciplinary project studying the drivers of monkeypox outbreaks in DRC will be in close collaboration with the University of Antwerp's ecology team, the Robert Koch Institute (Germany) and ITM's institutional partner INRB in DRC. A project on omics data to predict TB-resistance is in collaboration with the University of Antwerp, Harvard University and the University of Colorado (USA), University of Bradford (UK) and Maastricht University (NL). ITM scientists are also involved in two projects led by the University of Antwerp; one will study the ecology of *Borrelia* infections in wild birds, the other will investigate the causality between onchocerciasis and epilepsy. The fifth project will study the innate immune response that is triggered by a trypanosome-infected tsetse fly.

Lastly, the **Scientific Research Network** on tuberculosis, awarded for 2022-2026, will join and strengthen the collaboration between internationally recognised scientific experts from Belgium, the Netherlands and the UK that perform qualitative outstanding research on TB or non-TB mycobacterial disease with complementary research topics.

Partnerships

FWO awards funding for ITM's collaborative research

The Research Foundation of Flanders (FWO) has awarded five PhD projects, five collaborative research projects and one scientific network to ITM in 2021. The research topics, aligning with ITM's research priorities, include modelling of pathogen spread and field research on pathogen spill-over to human populations; antimicrobial resistance in tuberculosis (TB) and malaria; and new strategies to accelerate elimination of leishmaniasis and onchocerciasis.

The PhD scholarships were awarded to candidates from the Vrije Universiteit Brussel

Partnerships

Seed funding inspires three new cross-organisational research projects

In the framework of the second edition of the Joint Pump Priming Programme (JPPP), ITM researchers submitted joint applications with outside researchers who are willing to co-invest in the development of a new research idea.

Three joint projects were awarded in 2021 and include two collaborations with the University of Antwerp, one on health governance in challenging urban environments and one on *Leishmania* parasites. For the third project, ITM is teaming up with the Department of Microbiology, Immunology and Parasitology at the Universidade Federal de São Paulo to study epigenetic regulation of *P. knowlesi* (malaria-causing parasite) phenotypes.

Education

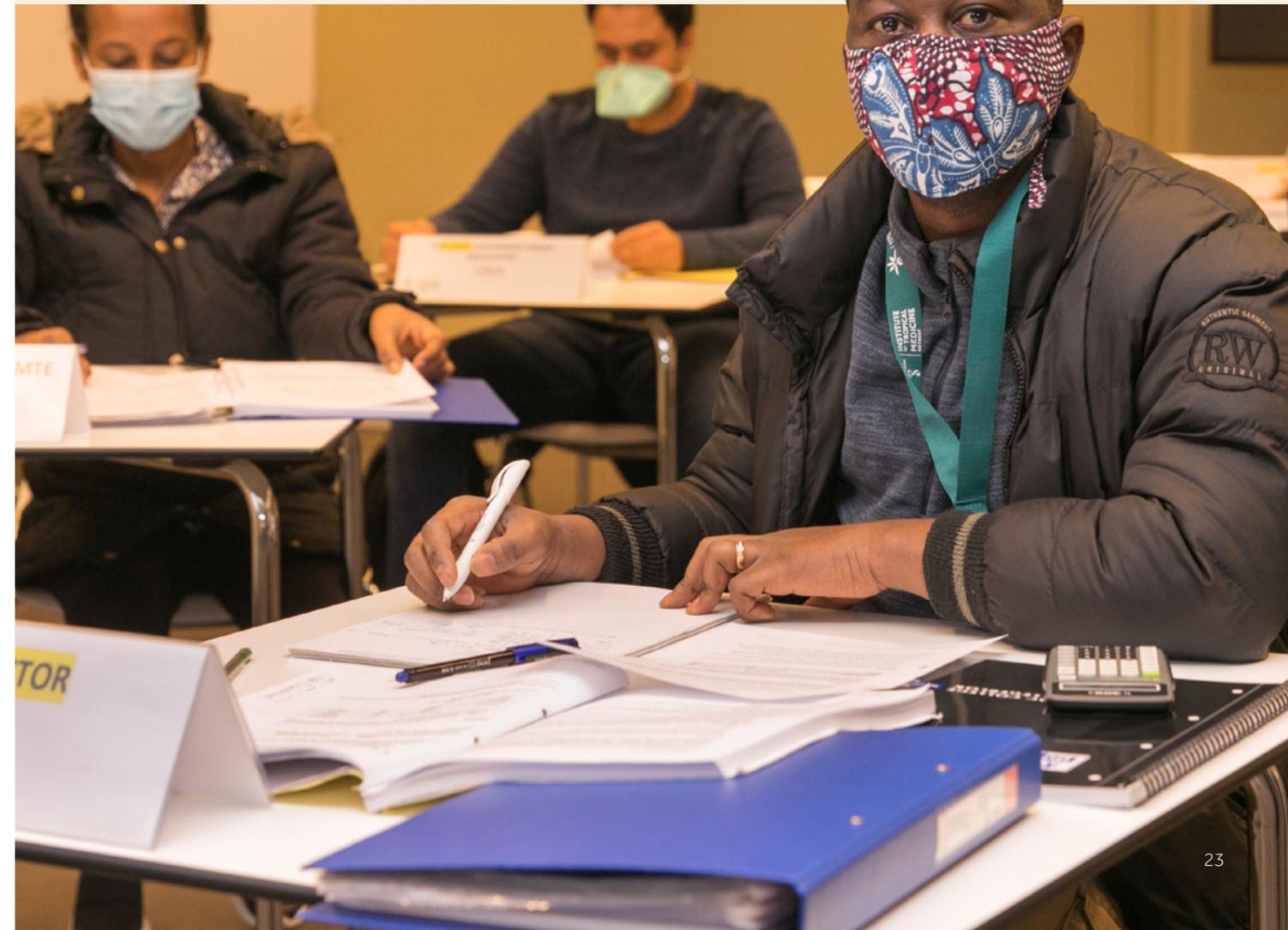
Every year more than 500 students and PhD researchers further their education at ITM, in expert short and postgraduate certificate courses, advanced master's courses and doctoral programmes. ITM thrives in being a vibrant, global open campus that offers science-driven and socially relevant postgraduate training, in the field of tropical medicine, international public health and tropical animal health. Flexible and blended learning, international mobility and tailored student support are at the heart of ITM's educational vision.

With reference to our master's programmes, the first cohort of the new MSc in Tropical Medicine (MTM) has graduated in August 2021, with 17 students. This new course responds to the students' requests for more specialisation in the biomedical and clinical sciences research fields. The flexible, modular structure of the MSc in Public Health programme now offers 15 elective courses, all open to non-degree students. In 2021, "Data for Action in Disease Control" and "Achieving Universal Health Coverage by 2030: The Health Financing and Social Protection Challenges" were developed to

cover rising demand. You can read more about our third master's, the MSc in Global One Health in this section.

In 2021, a mid-term evaluation was conducted in the context of our 4th Framework Programme with the DGD. The report gave valuable insights into the impact of ITM's education activities and scholarship programmes. Based on the findings, recommendations have been formulated for further action, among others to ensure the continuation of the scholarship programme as a way to enhance diversity in the student population, a crucial factor in facilitating capacity development.

Another highlight of last year was having our alumni elect their new representative to ITM's General Council for the 2022-2026 term. MTM-alumna Elizabeth Tabitha Abbew from Ghana was the chosen candidate, and she started her mandate on 1 January 2022.



The Master of Science in Global One Health is born

In 2021 the Flemish Government approved the title change of the Master of Science in Tropical Animal Health (MScTAH) to “Master of Science in Global One Health: Diseases at the Human-Animal Interface” (MScGOH). This new name better fits the curriculum and the scope of the 60 ECTS programme. While the term “Global One Health” is used internationally by other higher education institutes, it is unique in Flanders.

Following an integrated One Health approach, the programme focuses on diseases and zoonoses that have a global impact, and emphasises the socio-economic and health impact of interactions between humans and animals. Herewith the programme explicitly targets a more diverse student population, as the participation of a more multidisciplinary audience promotes transdisciplinary collaboration and communication. The MScGOH of ITM is at this moment also evolving from a collaborative to a full joint degree with the University of Pretoria, South Africa.



EDUbox Pandemics: global citizenship education for secondary school students

In collaboration with the Flemish broadcaster VRT NWS, imec, VIB (the Flemish Institute for Biotechnology), Health House and Brightlab, ITM launched the EDUbox ‘Pandemics’ in May 2021, the first educational package on global health for secondary school pupils.

COVID-19 demonstrated that a pandemic is a complex problem that requires a multidisciplinary approach at the intersection of science, technology, human behaviour and good communication. The Flemish research centres have been fighting the pandemic with innovative research to enable the development of new medicines, vaccines or rapid



tests, and by making their knowledge available to increase the scientific literacy of young people. By means of educational packages that can be used by secondary school teachers, ITM is increasing youth awareness of the health and research topics the institute and its partners conduct, encouraging them to think critically about the interconnections between global and local challenges.

Continuous professional development for Belgian healthcare workers

In the context of providing continuing professional education for a local audience, ITM has further fine-tuned and delivered three Dutch-speaking courses in 2021.

The travel medicine course “Reisgeneeskunde-bijtscholing voor huisartsen” targets general practitioners (GPs) and aims to familiarise them with the most important aspects of counselling for travellers. Through the series of seminars, GPs get acquainted with the major health risks to be expected in tropical regions and will be able to recommend the most needed preventive measures

before travel. During the training entitled “HIV: care and prevention, a multidisciplinary approach” (Hiv: zorg en preventie) Belgian frontline doctors, nurses, midwives and medical students of HIV treatment and prevention are updated on the most recent state-of-the-art aspects of the Belgian guidelines.

The course known as ‘Soa-kwartet’, on sexually transmitted infections, provides an update on the new specific guidelines of the Belgian Healthcare Knowledge Centre (KCE) to GPs with a practical case-discussion approach on these diseases.

Brand new short course on pharmaceutical policies

Coherent and integrated pharmaceutical systems are essential to provide equitable, affordable access to essential medical products. A few years ago, our partners at the University of Western Cape (UWC) started a one-week course on pharmaceutical policies. Building on that collaboration, in 2021 ITM launched a three-week short course on “Pharmaceutical Policies in Health Systems”. It attracted eighteen participants from four continents, with a variety of backgrounds (academia, regulation,

pharmacovigilance, supply, health insurance, international NGOs and development cooperation) that allowed rich mutual learning.

Thanks to our broad pharmaceutical network, the expertise of ITM staff was complemented by a group of amazing external lecturers, including well-known “access” veterans, the lead author of the Lancet Commission Report on Essential Medicines, the former head of the Sudan Regulatory Authority, the WHO Medicines and Health Products Pricing and Affordability Team, and representatives of the Infectious Diseases Data Observatory and Sciensano.





© Photo by Thomas Geuens, Province of Antwerp

Student body

101 PhDs

67 master's

180 Belgian students

75 EU students

288 non-EU students



217 short courses

108 postgraduates

50 interns



ITM alumni win prize for global research of the province of Antwerp

Four former ITM master's students, graduates of our MSc in Public Health, MSc in Tropical Medicine and MSc in Tropical Animal Health (2020-2021) have been awarded the 2021 Prize for Global Research of the Province of Antwerp. Through this award, honouring people since 1996, the Province of Antwerp looks to stimulate research relating to low- and middle-income countries.

The prize is awarded yearly to 'master-after-master'-students of ITM and the Institute of Development Policy (IOB) - University of Antwerp, whose master's thesis focuses on topics such as economy, politics, society, culture, environment, (public) health or medicine (human and animal). Development relevance, quality and originality of the master's theses and graduation projects are central in the selection criteria.

The four ITM winners were John De Maesschalck (Belgium), Tatiana Prudence Nti Mvilongo (Cameroon), Jahan Mallick (Germany) and Hendrik Swane-poel (South Africa).



Worldwide impact

International cooperation

2021 was the final year of ITM's 2017-2021 multi-year grant from the Directorate-General for Development Cooperation and Humanitarian Aid (DGD). Together with partners from 10 countries we worked on capacity strengthening initiatives in research and education. ITM partners range from universities and public health institutes to hospitals and disease control programmes. In addition, students from over 30 low- and middle-income countries (LMICs) participated in education at ITM through DGD scholarships.

2021 was also a year to catch up after the pandemic slowed down activities in 2020. Projects advanced and the majority of the intended programmes were finished. In particular ITM and partners did a fantastic job in delivering on the CREDO programme in the DRC, where an additional four million euro of DGD funds were spent to reinforce response to emerging and re-emerging diseases. ITM's policy support was called upon frequently by the Belgian government during the pandemic. Our scientists

and policy advisors contributed their expertise on malaria, access to quality medicines and most of all on questions concerning COVID-19 and vaccines.

Since the 2017-2021 multi-year grant was ending, a lot of time was invested in drafting a new five-year programme for support from the Belgian government. This programme was submitted at the end of 2021 and approved by the Minister of Development Cooperation in early 2022. For 2022-2026, a new grant of 70 million euro was awarded, in which two new countries will join as partners: Nepal and Rwanda. New mechanisms were also created to allow for co-creation on research and capacity, leveraging funds and networking.

ITM continues its technical support to the Instituto Nacional de Saude in Mozambique with the support of the Flemish government. The focus remains on antimicrobial resistance and capacity strengthening on both research and overall institutional management.

Latin America

- Bolivia ●
- Cuba ●●
- Ecuador ●
- Peru ●●

Legend

- Institutional capacity building supported by DGD
- Institutional capacity building supported by Flanders
- Alliance for Education in International Public Health and Tropical Medicine

Africa

- Benin ●●
- Burkina Faso ●●
- DRC ●●
- Ethiopia ●●
- Guinea ●●
- Morocco ●
- Mozambique ●●
- South Africa ●●
- Uganda ●

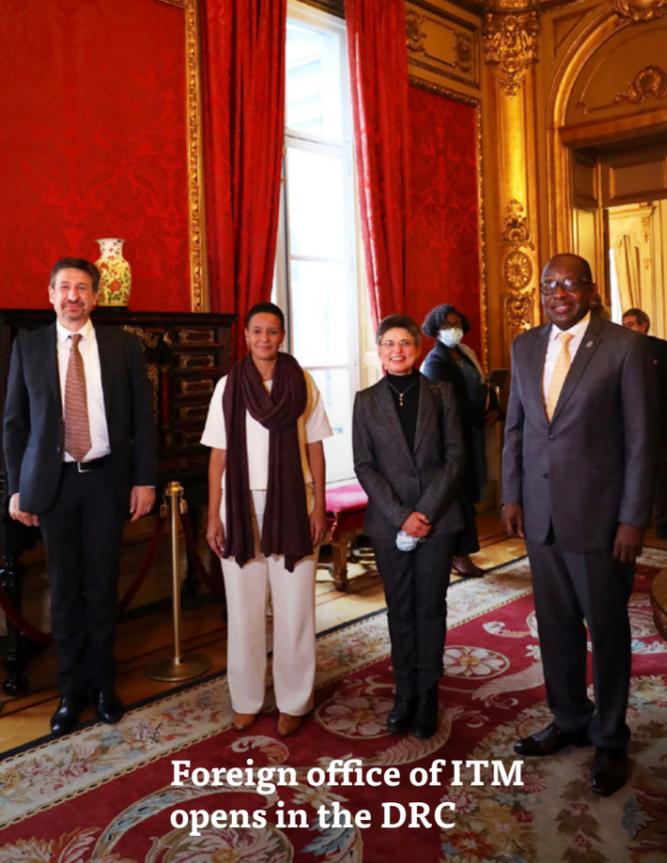
Asia

- Cambodia ●●
- India ●
- Indonesia ●
- Nepal ●
- Vietnam ●●



Scan the QR-code for the interactive map.

For a full list of our partner organisations, please refer to page 43.



Foreign office of ITM opens in the DRC

For over 50 years, ITM has been working closely with many Congolese partners to build capacity in education, scientific research and disease control in the DRC, contributing to fighting Ebola, sleeping sickness and other emerging and neglected diseases.

To further strengthen these and other productive collaborations, the Congolese Deputy Prime Minister Christophe Lutundula, and the Chair of ITM's Board of Governors, Cathy Berx signed a seat agreement in the fall of 2021. The agreement is an official sign of recognition by the Congolese government of ITM's achievements in their country. It confirms the benefits of ITM's activities for the Congolese population and gives ITM the permission to continue its work.

Thanks to the seat agreement ITM is officially allowed to open a foreign office in the DRC, in Kinshasa. The agreement also provides a framework to address administrative, logistical and financial challenges in the DRC more efficiently and to promote the local cooperation. Establishing a physical office in DRC is another step to improve cooperation and to reduce the impact of emerging diseases on the Congolese population and prevent global infections.

The DGD-funded CREDO project formed a major boost in the process to get to the official recognition of a local office in the DRC. The project aims to improve the health of the Congolese population by building capacity for research in emerging and re-emerging diseases and by investing in local researchers and institutes.

Partner institute in Burkina Faso at the forefront of research into a new malaria vaccine

Malaria parasites undergo several stages in their complex lifecycle. To achieve reductions in both the individual disease burden and malaria transmission within communities, a malaria vaccine with high efficacy is needed.

The Institute of Research in Health Sciences (IRSS) - Clinical Research Unit of Nanoro (CRUN) in Burkina Faso has been an ITM partner for over a decade. For a few years they have been working on a phase II/b trial of a new malaria vaccine candidate called "R21/Matrix-M", within a Multi Stage Malaria Vaccine Consortium (MMVC). The results of a phase II trial reported in 2021 showed a vaccine efficacy of 77% over one year follow up in children aged 5-17 months; considerably higher than the recently

approved RTS,S vaccine with an efficacy in a phase III trial of 56%. The phase III trial of R21/Matrix-M with 4800 participants in four endemic countries is currently ongoing, and it is coordinated in Nanoro by CRUN researchers. By testing in four different countries they want to assess vaccine efficacy in different epidemiological profiles. The research project of the R21 vaccine is supported by over a dozen partners worldwide and is coordinated by the University of Oxford.

CRUN began its research activities in 2008 with ten staff members. They now have over 300. ITM has supported CRUN through its capacity building programme with DGD and believes that CRUN with its best practices can have a lot of impact on other health clinics in its region.



A decade of Emerging Voices

Through an innovative, catalysing blended training programme, the Emerging Voices for Global Health (EV4GH) initiative gives a voice to young researchers and activists from the low- and middle-income countries. EV4GH celebrated its 10th anniversary in 2020 and has trained close to 300 participants from 66 countries. It is linked to the Health Systems Global (HSG) biennial health systems research symposium (HSRS), where participants immediately apply their new presentation and networking skills.

2021 began with an externally commissioned evaluation reflecting on the past ten years, which produced a number of recommendations, aimed at continuing to leap forward while also making the

programme financially sustainable. In late 2021, the Mohammed Bin Rashid School of Government in Dubai was a very generous host of the delayed face-to-face venture for the EV 2020 cohort. In 2021, EV4GH also renewed its Thematic Working Group status within HSG for the coming five years allowing it to maintain its position and for emerging voices to continue to be heard at this renowned conference.

Besides DGD, various partner institutes and donors have supported EV4GH throughout the years. These include: HSG, WHO's Alliance for HPSR, USAID's HRH2030, IPH Bangalore, Peking University, University of Western Cape, University of Cape Town, Liverpool School of Tropical Medicine, Mohammed Bin Rashid School of Government, and most recently the new EV4GH secretariat, the African Population and Health Research Center.



International cooperation in numbers

11 partner countries



institutional partners **19**

Journalist-in-Residence Programme celebrates its 8th edition

Since 2014, ITM has welcomed journalists from Africa, Asia and Latin America to immerse themselves in tropical medicine and public health. In 2021, due to the COVID-19 crisis, the residency ran online. The four talented journalists were Chibuikwe Alagboso from Nigeria, Beth Karuana Mwai from Kenya, Samik Kharel from Nepal and Lungelo Ndhlovu from Zimbabwe.

Karuana Mwai focused on COVID-19 disruptions on the burden of malaria, especially in maternal and child health. Samik wrote about vaccine access for marginalised communities and the 62nd ITM Colloquium. Lungelo delved into how the COVID-19 pandemic threatened the fight against tuberculosis in Africa, and Chibuikwe put three of our female scientists in the spotlight.

Since its launch, 17 journalists participated in this DGD-funded programme; welcoming ten women and seven men; with ten having been African, six Asian and one Latin American.



First edition of AIM course organised in Peru

Antimicrobial resistance (AMR) is a rising public health threat worldwide. Countries must ensure development of robust national action plans to tackle AMR, improving surveillance and control

and strengthening AMR programmes. The course "Containment of antimicrobial resistance and infection control", the Peruvian version of ITM's AIM course ("Hospital-based interventions to contain antibiotic resistance in low-resource settings"), was organised from 10-26 August for the first time by ITM's long-time partner, the Instituto de Medicina Tropical Alexander von Humboldt (IMTAvH) in Peru, in close collaboration with ITM.

Sixty-one participants completed the course; they represented healthcare professionals from 38 different hospitals of 15 Peruvian regions. The distance learning course focused on three key areas: antimicrobial stewardship, microbiology surveillance, and infection prevention and control. Lectures were facilitated by Peruvian teaching staff from IMTAvH, colleagues from other Latin American countries and ITM experts. The course was supported by the Alliance for Education in Tropical Medicine and International Public Health.

IMTAvH is an exemplary institution in the field of AMR and microbiological surveillance. Their researchers are leading experts involved in the human AMR component of the National AMR Action Plan of Peru.



Staff community

Arrivals and departures



Kreppel, Kielmann, Adriaensen



Büscher



Criel



Dorny

2021 marked the appointments of several new professors. We wish them the greatest of success moving forward:

Wim Adriaensen became Head of the new Unit of Clinical Immunology. Wim and his team, now of six, will work together with the Unit of Experimental Immunology, they will share and collaborate in the immunology laboratory now under renovation.

Katharina Kreppel is the new Head of the Unit of Emerging Infectious Diseases in the Department of Public Health. She is looking forward to working with her team on arboviruses and rodent-borne diseases using a One Health approach.

Karina Kielmann has become Professor and Head of the Unit of Equity & Health, taking over from Prof Em Bart Criel. Her team will work closely with the Unit of Complexity and Health and the Unit of Health Policy to promote stronger cohesion and synergies across the field of health policy and systems research.

We also send a warm appreciation to retiring professors. Having all started in the late 80s early 90s, they have collectively spent 92 years at the institute. ITM extends its gratitude for all that they have accomplished over these years. Happily, they will continue contributing their expertise to ITM teams and to teaching:

Pierre Dorny retired from his professorship in Veterinary Helminthology. He now volunteers for the same department working in research projects, reference activities, PhD and MSc student supervision.

Philippe Büscher was heading the Unit of Diagnostic Parasitology. After his retirement he was offered a contract by the Unit of Mycobacterial Diseases and NTDs.

Bart Criel retired from being Professor and Head of the Unit of Equity and Health. He remains actively involved in many ITM initiatives including conferences, coaching PhD students and working on development cooperation in Africa.



Heads of Department say goodbye

The heads of the Biomedical and Clinical Sciences Departments, respectively Jean-Claude Dujardin and Lut Lynen, finished their tenures in 2021, following mandates of 10 years each. ITM would like to thank them for their marked contributions to the institute during their tenures and wishes them best of luck in their further ITM careers!

Lut Lynen: "I remember with pride a few key events that were very rewarding as they showed the strengths of the Department of Clinical Sciences and of ITM."

In 2015 we committed many talented people across several units of the department towards a clinical trial in West Africa on the use of convalescent plasma in Ebola patients. This was a strategically important study for ITM. In 2020 I was very happy that we received accreditation for the Master's in Tropical Medicine, which offers an opportunity for scientists at ITM and elsewhere to work together with students on exciting research projects. In the same year, with the start of the COVID-19 pandemic, we were ready to not only conduct research but also to provide emergency medical assistance to the Antwerp University Hospital. From 2011 to 2020, the number of academic units and research lines increased from four to ten in our department. Not an easy feat, but it was made possible with the support of many members of the department, a fantastic departmental manager, and continuous finetuning of our policy plans.

At the end of 2020, I felt the need to seek a new challenge and field experience. ITM's DRC Office was looking for a senior scientist, and I found a very good new head of department, who was willing to take over the leadership. Thanks go to Johan van Griensven and our departmental manager

Filip De Keulenaer. And of course, to the rest of the department."

Jean-Claude Dujardin: "During my tenure, I tried to put science, excellence and relevance in the centre of our 'business' of the Department of Biomedical Sciences. I am proud of the research achievements of all units, with a personal crush on (post-) genomic investigation that has flourished during my mandate, particularly the idea of going from gene to ecosystem - combining molecular biology with clinical and ecological insight. This is also the approach that comes through in our new Master's in Tropical Medicine - an excellent example of our inter-departmental collaboration that was cause for celebration towards the end of my tenure."

In order to achieve these feats, participative management was important for me, paying particular attention to the wellbeing of my colleagues, as well as taking tough decisions alone on some occasions. I really valued my excellent collaboration with the department manager, Nadine Van Peer. We formed a true 'binome'. Secondly, I treasured the complicity and friendship of Lut and the late Marleen Boelaert.

Last but not least, I would like to thank the members of my research unit, Molecular Parasitology. My colleagues supported me in my departmental endeavor and kept the unit moving and growing in my absence. Now, the show must go on and I am happy to pass on the flame of department head: may the force be with you, Kevin."

We welcome our new leaders:



"ITM has a strong triad: public health, biomedical and clinical sciences. Together with the other department heads, we will continue to strengthen each other and work towards realising the institute's ambitions."

Johan van Griensven stepped in as interim head of department in 2021, and in 2022 his 5-year mandate begins as Head of Department of Clinical Sciences.



"Innovation is the key to remain relevant. We are working on state-of-the-art biosafety labs level 3, but I'm already dreaming of level 4."

Kevin Ariën will lead the Department of Biomedical Sciences from 2022.

Four distinguished academics granted honorary titles

ITM works with scientists and academics from institutes all around the world, people who demonstrate clear, substantive and ongoing commitments to our institute's mission and vision. In addition to our institutional collaborations, we also wish to recognise individual academics and scientists, thus increasing the visibility of valued collaborations and further supporting current and future ones. In order to endorse partnerships that include an external (inter)national scientist or academic, our institute awards honorary appointments.

The honorary titles are granted for a period of three years, with a possibility for one extension. This recognition of excellence also contributes to ITM's ambition to be a vibrant open global campus. In 2021, we were pleased to grant the following titles:

Honorary Professor:



Halidou Tinto
Institute of Research in Health Sciences, IRSS (Burkina Faso)

Honorary Fellow:



Larissa Otero
Universidad Peruana Cayetano Heredia (Peru)



Por Ir
National Institute of Public Health (Cambodia)



Erika Vlieghe
Antwerp University Hospital (Belgium)

Our staff



54% 46%

Executive academic, scientific & medical staff



36% 64%

Academic, scientific & medical staff



29% 71%

Administrative & technical staff

Event highlights

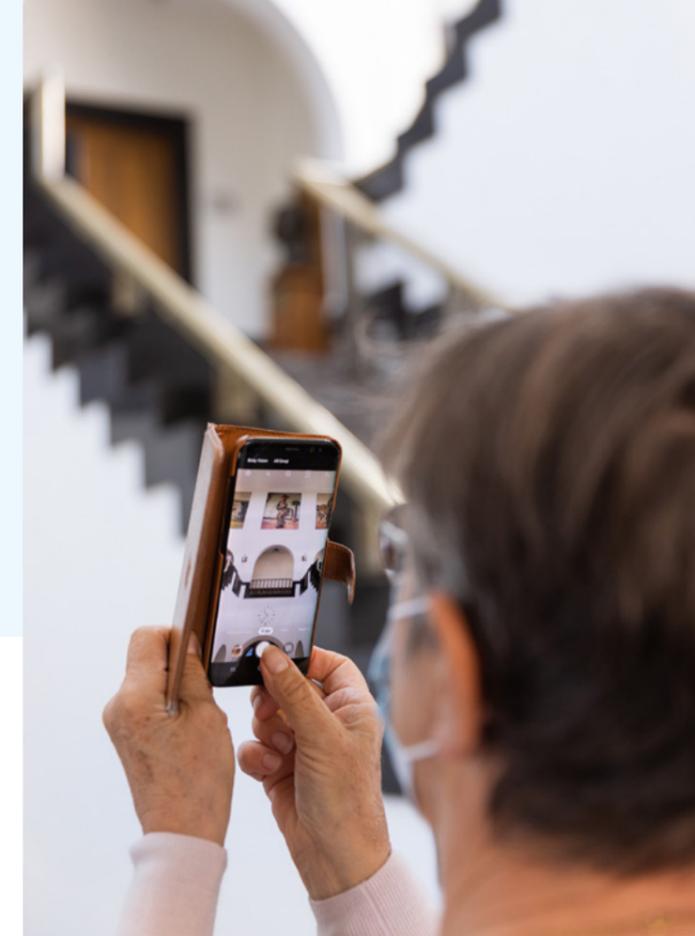


24 February

Minister of Development Cooperation and Major Cities Policy, Meryame Kitir, paid a visit to ITM to get acquainted with the institute. She was provided with an overview of the research and development cooperation activities carried out by ITM, with an emphasis on innovative research with a broader social impact including sleeping sickness.

12 September

ITM welcomed 1400 visitors for Heritage Day Flanders (Open Monumentendag). The theme of the 2021 edition was 'diversity and inclusion', which provided the ideal moment for reflection about the colonial past. Based on testimonies of employees, (former) students and outsiders, visitors were given an idea of the activities of ITM and how our colonial heritage is approached today. The exhibition was designed with the help of ITM's Commission on Decolonisation.



22 October

During the 'Night of Happiness' (De Nacht van het Geluk), ITM Director Marc-Alain Widdowson proudly accepted an award on behalf of ITM, conferred by the National Lottery for exceptional contributions and work in the previous year. ITM received this award for its contribution in the fight against COVID-19.



2-3 December

ITM and its partner institution, the Department of Veterinary Tropical Diseases of the University of Pretoria, South Africa, organised the 62nd ITM Virtual Colloquium. The Colloquium covered emerging and re-emerging epidemics, with a special focus on neglected tropical and zoonotic diseases. The event brought together more than 500 experts from 60 countries.



A new webinar series

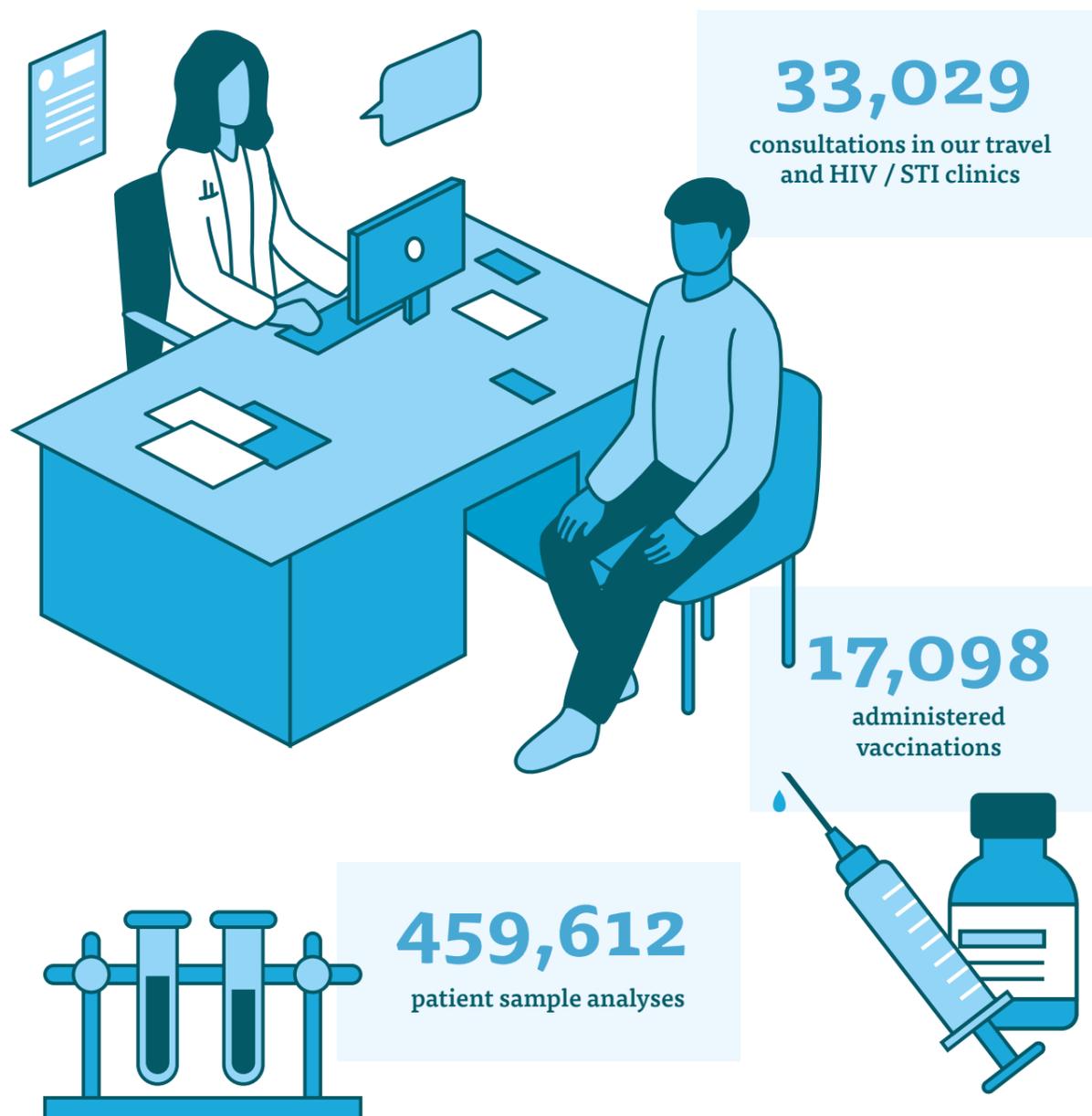
ITM's EcoHealth webinar series covers EcoHealth concepts and whole systems approaches to global health challenges. They focus on the dynamic interactions between human, social, biological, ecological and political systems and how these affect the health of people. In 2021 the topics ranged from the state of child health to approaches to reduce malnutrition in Bangladesh and research trends and challenges.



Medical services

The polyclinic, the side of ITM the Belgian public knows best, is part of our Department of Clinical Sciences. It is ITM's ambition to provide world class medical care and laboratory services in the domain of tropical infectious diseases.

By conducting clinical and laboratory research, the medical services are nationally and internationally recognised for their expertise and are uniquely placed to advise national and international health authorities and organisations.



Profit & loss account

	2021	2020	2019
Operating income (+)	62,513,794	52,331,241	55,151,368
Turnover	15,778,176	16,328,828	18,048,071
Work and services in progress (additions +, withdrawals -)	16,996,229	5,828,446	8,773,473
Member fees, funds, legacies and subsidies	22,360,649	23,187,787	14,615,889
Other operating income	7,378,740	6,986,180	13,713,934
Operating expenses (-)	60,529,527	50,317,409	54,552,689
(Cost of) goods for resale & raw materials	9,318,518	6,454,373	7,333,046
(Cost of) goods and services	15,417,966	11,783,594	15,633,428
Personnel expenses	34,556,026	31,889,450	30,999,280
Depreciation and impairments on fixed assets	1,252,901	1,218,758	1,314,963
Impairments on current assets and provisions for liabilities and charges (additions +, withdrawals -)	-111,941	-1,265,154	-728,180
Other operating expenses	96,057	236,388	152
Operating profit (loss)	1,984,267	2,013,832	598,680
Financial income (+)	144,431	122,375	103,391
Revenue from current assets	1,781	1,216	3,378
Other financial revenue	142,650	121,159	100,013
Financial expenses (-)	357,851	329,423	346,759
Costs of debts	263,538	286,080	307,798
Other financial costs	94,313	43,343	38,961
Profit (loss) from regular company activities	1,770,847	1,806,784	355,312
Exceptional income (+)	20	0	11,864
Write-back of amortisations and depreciations on fixed assets	0	0	11,864
Other exceptional income	20	0	0
Exceptional expenses (-)	7,455	159,519	15,325
Exceptional amortisations and depreciations on fixed assets	0	0	15,325
Other exceptional expenses	7,455	159,519	0
Profit (loss) of the financial year	1,763,412	1,647,265	351,851

Balance sheet

Assets	2021	2020	2019
Fixed assets	28,396,435	29,365,282	29,919,454
<i>Intangible fixed assets</i>	0	0	0
Tangible fixed assets	28,396,435	29,365,282	29,919,454
Land and buildings	27,254,290	27,780,984	28,500,113
Plants, machinery and equipment	20,749	21,638	66,396
Furniture and motor vehicles	864,288	1,158,434	849,129
Leasing	0	0	0
Assets in course of construction and payments on account	257,108	404,226	503,816
Financial fixed assets	0	0	0
Current assets	37,266,442	35,195,301	30,322,319
Stock and orders-in-progress	2,050,254	1,580,511	2,009,329
Stock	52,550	334,259	424,547
Orders in progress (projects in progress)	1,997,704	1,246,252	1,584,782
Debtors due in one year or less	4,980,089	2,474,229	2,561,885
Trade receivables	3,213,713	2,366,953	2,498,309
Other debtors	1,766,376	107,276	63,577
Investments	2,480,371	2,480,371	2,480,371
Cash and bank balances	26,588,798	26,748,907	21,390,700
Prepayments an accrued income	1,166,930	1,911,283	1,880,034
Total assets	65,662,877	64,560,583	60,241,774

Liabilities

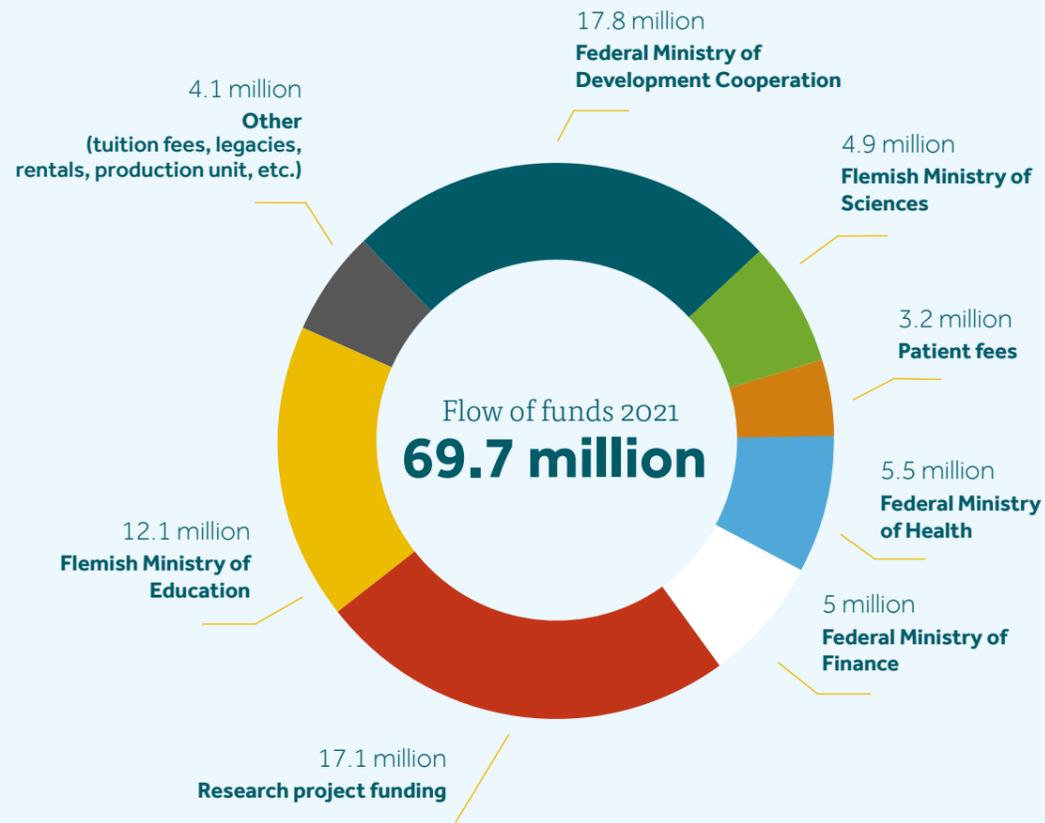
Capital and reserves	30,636,875	28,964,857	27,408,986
Funds of the foundation	345,712	345,712	345,712
Revaluation surpluses	11,891,000	11,891,000	11,891,000
Earmarked funds	6,137,497	6,223,548	8,118,675
Profit (loss) brought forward	11,131,763	9,282,301	5,739,908
Capital grant	1,130,903	1,222,296	1,313,691
Provisions	286,503	387,467	1,472,621
Provisions for liabilities and charges	286,503	387,467	1,472,621
Provisions for pensions and similar obligations	28,051	103,025	1,099,169
Other provisions	258,452	284,442	373,452
Debts	34,739,499	35,208,259	31,360,167
Creditors due in over one year	7,426,845	8,192,185	8,956,097
Financial debts	7,426,845	8,192,185	8,956,097
Creditors due in one year or less	25,157,775	25,228,926	20,450,841
Creditors becoming due within one year	765,340	763,911	740,884



Trade payables	3,240,702	2,650,432	2,565,898
Received advanced payments (project funding)	17,069,499	17,924,805	13,392,752
Debts in reference to taxes, salaries and social contributions	3,871,496	3,751,586	3,714,339
Various debts	210,738	138,192	36,968
Accruals and deferred income	2,154,879	1,787,148	1,953,229
Total liabilities	65,662,877	64,560,583	60,241,774

Our financials

All financial figures are in euro.



The difference between the total income in the profit & loss account and in our flow of funds is due to advances received for (multi-annual) projects and to transfers to partners not being included in the profit & loss account. The flow of funds diagram gives an indication of receipts from the different revenues, financing and funding channels.



Please find the signed auditors letter confirming these results online.

Our institutional partners and global alliances

- Institutional capacity building supported by DGD
- Institutional capacity building supported by Flanders
- Alliance for Education in International Public Health and Tropical Medicine

Latin America

1. Post-Graduate Medical School, Universidad Mayor de San Simon (UMSS), Cochabamba, **Bolivia** ○
2. Instituto Nacional de Higiene, Epidemiología y Microbiología (INHEM), Havana, **Cuba** ○ ●
3. Instituto Pedro Kourí (IPK), Havana, **Cuba** ○ ●
4. Institute of Public Health, Pontificia Universidad Católica del Ecuador (PUCE), Quito, **Ecuador** ○
5. Instituto de Medicina Tropical "Alexander von Humboldt" (IMTAvH), Universidad Cayetano Heredia, Lima, **Peru** ○ ●

Africa

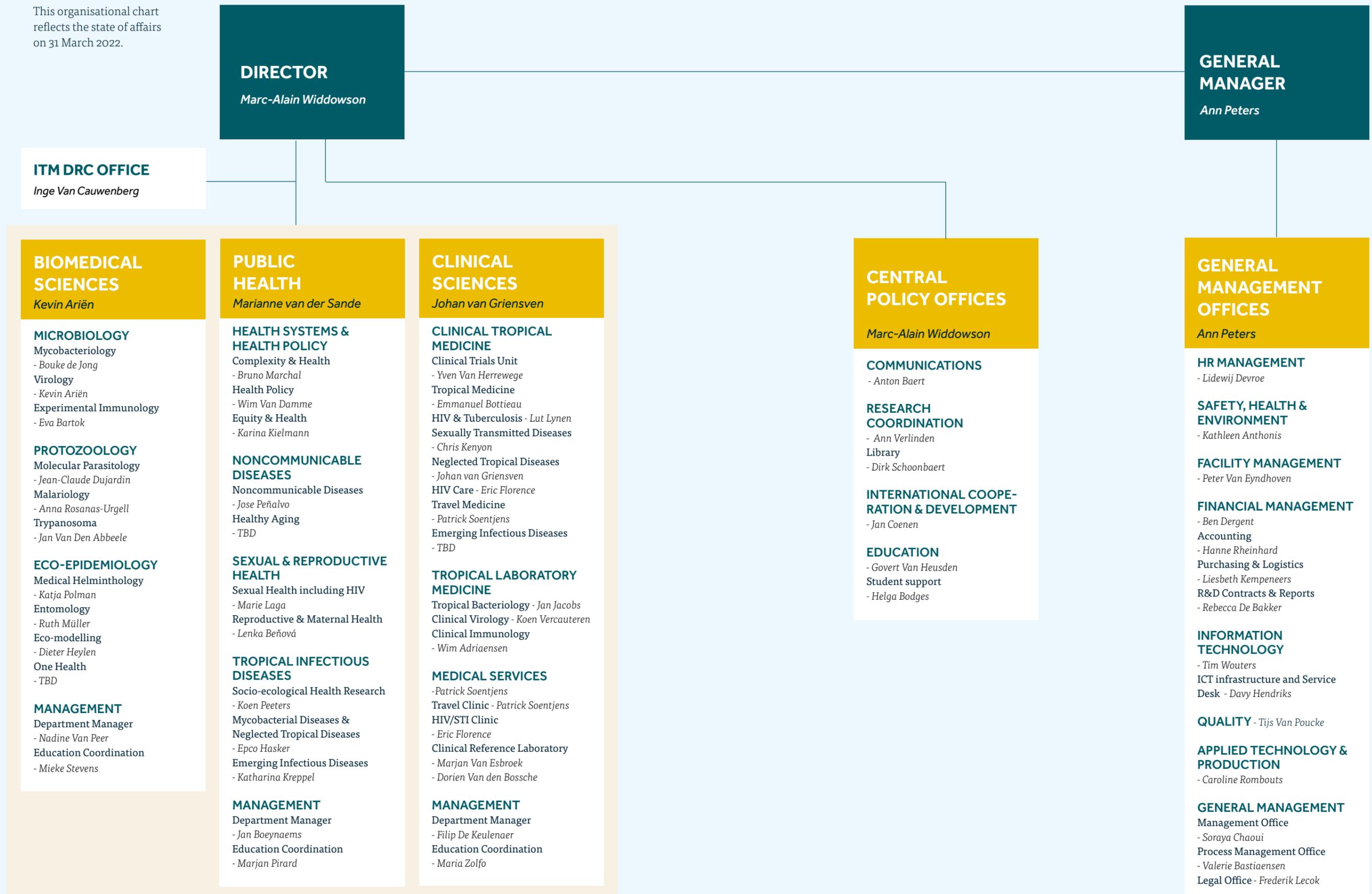
6. Laboratoire de Référence des Mycobactéries (LRM), Cotonou, **Benin** ○ ●
7. Clinical Research Unit of Nanoro (CRUN), including Centre Muraz, **Burkina Faso** ○ ●
8. Institut National de Recherche Biomédicale (INRB), Ministère de la Santé Publique, Kinshasa, **DRC** ○ ●
9. Programme National de Lutte contre la Trypanosomiase Humaine (PNLTHA), Kinshasa, **DRC** ○ ●
10. École de Santé Publique (ESP), Université de Lubumbashi, Lubumbashi, **DRC** ○ ●
11. Centre de Recherche Sanitaire de Kimpese (CRSK), Kimpese, **DRC** ○ ●
12. College of Medicine and Health Sciences, University of Gondar, Gondar, **Ethiopia** ○ ●
13. Centre National de Formation et Recherche de Maferinyah, **Guinea** ○ ●
14. École Nationale de Santé Publique (ENSP) Rabat, **Morocco** ○
15. Instituto Nacional de Saúde (INS), Maputo, **Mozambique** ○ ●
16. School of Public Health, University of Western Cape (UWC), Cape Town, **South Africa** ○ ●
17. Department of Veterinary Tropical Diseases (DVRD), University of Pretoria (DVTD), Pretoria, **South Africa** ○ ●
18. School of Public Health (SPH - MUCHS), Makerere University College of Health Sciences, Kampala, **Uganda** ○

Asia

19. Sihanouk Hospital Center of HOPE (SHCH), Phnom Penh, **Cambodia** ○ ●
20. National Centre for HIV/Aids, Dermatology and STD's (NCHADS), Phnom Penh, **Cambodia** ○ ●
21. National Centre for Parasitology, Entomology and Malaria Control (NMC), Phnom Penh, **Cambodia** ○ ●
22. National Institute of Public Health (NIPH), Phnom Penh, **Cambodia** ○ ●
23. Institute of Public Health (IPH), Bangalore, **India** ○
24. Center for Tropical Medicine, Faculty of Medicine, Gadjah Mada University, Yogyakarta, **Indonesia** ○
25. B.P. Koirala Institute of Health Sciences (BPKIHS), Dharan, **Nepal** ○
26. National Institute of Malariaology, Parasitology and Entomology (NIMPE), Hanoi, **Vietnam** ○ ●

Organogram

This organisational chart reflects the state of affairs on 31 March 2022.



Guaranteeing high quality analyses in our 13 reference laboratories

ITM laboratories are highly regarded as scientific centres of reference on tropical diseases both nationally and internationally. They also work to improve services for patient care locally. In our high-security biosafety level 3+ (BSL3+) labs we have the infrastructure to safely research dangerous pathogens such as tuberculosis and the Ebola virus.

Several of our research and diagnostic laboratories are recognised as reference laboratories by the national governments and various international

organisations such as the World Health Organization. As such, ITM's laboratories are of the highest quality standards and our scientists are often called upon as expert advisors locally and worldwide.

In 2021, ITM successfully applied for extra funding through the ambitious 'Vlaamse Veerkracht' investment call of the Flemish Government and received 1 million euro. ITM will use the grant to renovate our immunology labs.

- 01. National Reference Centre for Arboviruses**
- 02. National Reference Centre for Sexually Transmitted Diseases**
(*Treponema pallidum*, *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Mycoplasma genitalium*)
- 03. National Reference Centre for Rickettsia and Anaplasma**
(consortium with Koningin Astrid Militair Hospitaal - Queen Astrid Military Hospital)
- 04. National Reference Centre for Coxiella burnetii and Bartonella**
(consortium with UCL Saint-Luc et CODA)
- 05. National AIDS Reference Laboratory**
- 06. WHO Testing Laboratory**
- 07. WHO Collaborating Centre for HIV/AIDS Diagnostics and Laboratory Support**
- 08. National Reference Laboratory for Infectious and Tropical Diseases**
- 09. BCCM/ITM Mycobacteria Collection**
- 10. WHO TB Supranational Reference Laboratory - Coordinating Center**
- 11. OIE Reference Laboratory for Surra**
- 12. WHO Collaborating Centre for Research and Training in Human African Trypanosomiasis Diagnostics**
- 13. National Reference Laboratory for Parasites**
(*Trichinella*, *Echinococcus* and *Anisakis*)

Our figures

	2021	2020	2019
ITM in the world			
Institutional partners	19	19	19
Reference laboratories	13	14	14
Diagnostic tests sent across the world*	2,215,841	2,098,004	2,364,546
Staff at ITM			
Academic, scientific and medical staff	488	447	431
Administrative and technical staff	194	166	166
Male/female (M/F) ratio (%)	294	281	265
M/F ratio executive academic, scientific and medical staff (%)	35/65	33/67	33/67
M/F ratio academic, scientific and medical staff (%)	54/46	57/43	59/41
M/F ratio administrative and technical staff (%)	36/64	33/67	32/68
M/F ratio administrative and technical staff (%)	29/71	29/71	29/71
Research			
Scientific excellence and impact			
Papers in scientific journals	422	387	311
New international research projects	41	61	31
International research consortia led by ITM	7	9	7
Innovative research projects running with the support of Flanders	23	20	12
Clinical trials coordinated by ITM**	29 (16+6+7)	12	11
Education			
Master			
Master students	67	62	62
Master students Public Health	43	43	39
Master students Topical Medicine	18		
Master students Tropical Animal Health	19	19	23
Nationalities			
Belgian	2	4	1
Other EU countries	1	2	2
Non-EU countries	64	56	59
Postgraduate			
Postgraduate students	108	45	117
Postgraduate Tropical Medicine for Bachelors in Nursing and Midwifery	75	0	59
Postgraduate Certificate in Tropical Medicine and International Health	33	45	58
Nationalities			
Belgian	75	36	73
Other EU countries	32	7	27
Non-EU countries	1	2	17

* Due to the presence of a new Scientific Head in the Unit of Applied Technology & Production, the way of calculating the numbers changed in 2021.

** From 2021 onwards we combine the clinical (16), interventional (6) and observational (7) studies in our reporting*.

	2021	2020	2019
Short courses			
Short course students	217	121	196
Nationalities			
Belgian	44	17	1
Other EU countries	15	11	2
Non-EU countries	158	93	59
PhD students			
Ongoing PhD's at ITM (31/12/2020)	101	80	83
Nationalities			
Belgian	21	18	20
Other EU countries	20	9	8
Non-EU countries	60	53	55
PhD dissertations in 2020	5	16	19
Interns and master thesis students			
Interns	50	109	117
Nationalities			
Belgian	38	37	44
Other EU countries	7	14	17
Non-EU countries	5	58	56
Master thesis students*	16	10	17
Nationalities			
Belgian	9	5	9
Other EU countries	2	3	3
Non-EU countries	5	2	5

* University students who have written their master thesis at ITM

	2021	2020	2019
Medical services			
Consultations			
Consultations in 2020	33,029	28,864	42,398
HIV (%)	20%	14%	14%
PrEP (%)	13%	9%	7%
STD (%)	11%	10%	7%
Pre-travel (%)	34%	21%	51%
Helpcenter (%)	6%	8%	8%
Post-travel, pediatrics (%)	10%	13%	14%
Nurses	7%		
COVID-19 (%)		17%	
By phone (%)		9%	
Patient samples			
Analyses*	459,612 analyses for 38,627 patient contacts	472,470 analyses for 41,093 patient contacts	589,391 analyses for 43,480 patient contacts
Analyses as National Reference Centre for the Diagnosis of Infectious and Tropical Diseases (KRL)	86,263	78,039	121,047
Newly diagnosed HIV infections in the National HIV/STD Reference Laboratory	270	272	313
Travel medicine			
Visitors and patients for travel advice and vaccinations	11,008	6,159	21,563
Administered vaccinations	17,098	15,031	48,751
Top 5 diseases for which visitors got vaccinated (%)	1. Yellow fever 26% 2. Hepatitis A 17% 3. Polio 12% 4. Diphtheria 10% 5. Tetanus 10%	1. Yellow fever 30% 2. Hepatitis A 22% 3. Tetanus & diphtheria 17% 4. Polio & pertussis 14% 5. Rabies 7%	1. Yellow fever 53% 2. Hepatitis A 43% 3. Tetanus & diphtheria 26% 4. Polio & pertussis 26% 5. Rabies 21%
People returning from the South who came to our clinic with medical symptoms	3,670	3,694	5,835
The most common diseases	1. Malaria: 13,5% 2. Diarrhea (acute/chronic): 11,7% 3. Schistosomiasis: 10,9% 4. Skin/soft tissue infection: 6,9% 5. Scabies: 6,5% 6. NB: COVID-19: 2,6%	1. COVID-19: 21,57% 2. Diarrhea (acute/chronic): 10,78% 3. Schistosomiasis: 9,8% 4. Malaria: 4,9% 5. Skin/soft tissue infection: 4,9%	1. Diarrhoea (all types): 26.52% 2. Malaria (all types): 9.58% 3. Skin/soft tissue infection/rash/abscess: 8.83% 4. Animal bites/rabies PEP: 4.7% 5. Arboviral infections: 3.45%
Page views on Wanda - Travel in good health (website)	263,514	487,136	421,434
New users in Wanda - Travel in good health (app)	9,436	19,856	
User engagement in Wanda - Travel in good health (app)	92,981	120,606	

*In 2021 we refined our counting methods which give more accurate results.

	2021	2020	2019
Infectious Diseases ward at UZA			
Patients admitted in the Infectious Diseases Ward	348	486, predominantly COVID-19	347
Acquired HIV infections			
<i>HIV reference center</i>			
Patients in follow-up	3,113	3,008	3,054
Average age	49	48	48
Nationality (%)	Europe & North America 67% Asia 4% Africa 22% Latin America 5% Unknown 2%	Europe & North America 67% Asia 4% Africa 22% Latin America 5% Unknown 2%	Europe & North America 68% Asia 4% Africa 22% Latin America 4% Unknown 2%
Gender ratio (M/F %)	75/25	75/25	75/25
Number of newly registered HIV patients	127	148	163
<i>Helpcenter - Low-threshold centre</i>			
Visitors	1,760	1,496	2,459
Priority target groups	MSM: 637 Migrants (outside Europe): 352 Commercial sex workers (CSW): 30 Clients of CSW: 92 High risk: IVDU (intravenous drug users), Persons with occasional sexual contacts, Group sex: 1614	MSM: 401 Migrants (outside Europe): 607 Commercial sex workers (CSW): 23 Clients of CSW: 93 IVDU (intravenous drug users): 9 Persons with occasional sexual contacts: 1,216 Group sex: 764	MSM: 1,048 Migrants (outside Europe): 619 Commercial sex workers (CSW): 54 Clients of CSW: 276 IVDU (intravenous drug users): 20 Persons with occasional sexual contacts: 1,370 Group sex: 547
HIV tests performed	1,063	381	1,724
Newly diagnosed HIV infections	11	6	16
<i>Swab2Know programme</i>			
Collected oral fluid tests	369	417	906
Newly diagnosed HIV infections. 2021: reactive samples	5	2	4



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