INSTITUTE OF TROPICAL MEDICINE ANTWERP

2023 ANNUAL REPORT

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2023

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SCOPE OF THE ANNUAL REPORT

The focus of this annual report is administrative reporting to the various governments, with the focus is on quantitative and qualitative reporting as a function of the objectives of the ITM policy plan 2020 - 2024 and in line with the provisions in the management agreement between ITM and the Flemish government, and the EWI covenant. The activity-specific reports and/or annual reports referred to in the text of this report are available on ITM via intranet and can be requested if required.

This report is available in Dutch and English.
For the many (inter)national stakeholders,
a short video will present the highlights
of explained the past operating year.
All annual reports are available at www.itg.be.

INSTITUTE OF TROPICAL MEDICINE ANTWERP

Introduction

The Institute of Tropical Medicine (ITM) is a leading international institute in teaching, research, scientific and medical services. ITM is recognised worldwide for its commitment to improving health, especially in places with limited resources and for vulnerable populations, wherever they are. Our objective as set out in our constitution is:

To conduct and promote scientific research, professional and academic education as well as scientific and social services in the field of tropical diseases and global health, with a particular focus on low- and middle-income countries.

With regard to its patrimony, ITM wishes to anchor its activities in Antwerp, and strives for a performing and sustainable use of its current building patrimony. This objective is also set out in the articles of association:

Given its valuable patrimony, the Institute also aims to preserve and valorise its buildings and surrounding garden located at 155 Nationalestraat and 43 Sint- Rochusstraat in Antwerp, which are directly materially and effectively used for its social purpose.

Our **vision** is to be a global centre of excellence in the fields of tropical medicine and international public health.

ITM's **motto** is "global science for a healthier world" or "Global Science for Health Worldwide".

We **value**:

- Excellence & relevance: We strive to be among the international leaders in our science domains and go for the highest quality in research, teaching and service with the ultimate goal of solving pressing health problems.
- Integrity: we aim to comply with international ethical standards and strive for critical insight, honesty and transparency in all our activities.
- Fairness: We value equality, diversity, solidarity and well-being of our students and staff and in our partnerships.
- Sustainability: We strive for long-term progress without compromising the potential of future generations.

Strategic objectives ITM

1

1. Strategic objectives ITM

a. Policy priorities ITM 2020-2024

Responsible service = Director and General Manager

The Institute of Tropical Medicine (ITM) in Antwerp, Belgium, strives for continuous advancement of science and health, focusing on innovative research, cutting-edge teaching, professional services and sharing capabilities with our partner institutions in Africa, Asia and Latin America.

For the policy period 2020-2024, the following strategic objectives were defined at an institutional level:

SO1 - Build on our reputation and expertise to expand into new health challenges using new approaches to collaboration and scientific research.

SO2 - Strive to create an open and global campus for students, faculty, alumni, professionals and researchers with a flexible teaching approach.

SO3 - Forge and strengthen synergistic partnerships that increase the impact of our unique expertise and knowledge, further enhancing our academic reputation

SO4 - Strengthen the overall coherence, efficiency and effectiveness of ITM's policy, support and decision-making processes.

In 2023, ITM again achieved all the proposed KPIs of the management agreement and the EWI covenant.

SO1 – Reputation and expertise

ITM reinforced its top position as an international reference centre on global health.

ITM scientists published 322 papers, of which as many as 20% (65 publications) were published in journals with an impact factor of 10 or higher, and 43% in journals with an impact factor above 5, and 23% of our publications achieve a normalised citation index of more than 1.5 (target is 20%). The most cited publications deal with the 4 priority areas through which we confirm our reputation in emerging (viral) infections, antimicrobial resistance, disease elimination and sustainable health systems.

ITM is successful in obtaining competitive FWO mandates (21 ongoing mandates) and competitively acquired research projects (50 ongoing projects FWO, Horizon Europe, Wellcome, etc.) and the Clinical Trial Unit coordinated 27 clinical trials.

Our increasing focus on social and economic valorisation resulted in 1 patent application and 21 health policy contributions based on ITM research results.

Our expertise in global health and pandemic preparedness was also called upon by the Flemish and Federal governments in preparations for the Belgian EU presidency.

With Flemish funding, ITM invested in a state-of-the-art insectarium. In 2023, the next phase was completed with the establishment of a high-security insectarium (Arthropod Containment Level-3 (ACL-3)). This infrastructure allows us to experimentally infect exotic mosquitoes to

“Our vision is equal opportunities for healthy living for all.”

conduct vector competence studies and study behaviour. We aim to create a major research hub at ITM on the field of insect-borne diseases, which is not only known for excellent research, but also accessible, to other Belgian institutions and international researchers.

The insectarium is an important asset of ITM and led to 16 new research projects studying host-vector-pathogen interactions in 2023 alone. ITM and the Belgian public health institute Sciensano have successfully engaged citizens in reporting tiger mosquitoes through the new MosquitoSurveillance.be website. By 2023, the tiger mosquito has been identified at 25 sites, 16 new locations were identified with the help of citizens.

For the first time, ITM researchers were able to show that the tiger mosquito overwinters in Belgium. Moreover, we showed that the common mosquito in Belgium is resistant to common insecticides. This may pose a problem for the transmission of West Nile virus, which is present in several European countries is on the rise. ITM is therefore using the insectarium to conduct climate and biodiversity studies in the hope of designing ecologically sound control measures against infections transmitted via mosquitoes and other vectors. This kind of research is fully in line with our priority theme of emerging infections due to climate warming.

The Outbreak Research Team (ORT) has also provided scientific advice to the European Centre for Disease Control (ECDC) and the European Food Safety Agency (EFSA) on vectors and vector- borne diseases and was involved in the risk assessment "Findings of overwintering Aedes albopictus (asian tiger mosquito) populations in Belgium, 2023" organised by the RAG (Risk Assessment Group, Belgium). The ORT has been part of the Belgian Pandemic Intelligence Network (BE-PIN) since 2023, which brings together academic policy actors in infectious disease prevention and control in Belgium.

In the theme of disease control and elimination, ITM together with Senegalese research partners (IRESSEF) have discovered in a proof-of-concept study that an antimalarial combination therapy, artesunate-mefloquine, is also effective against schistosomiasis, another major neglected parasitic disease in sub-Saharan Africa. In a study involving 718 school-age children in northern Senegal, the combination proved safe and as effective as praziquantel, the current (but unique) standard treatment. The study (funded by EWI and supported by the Clinical Trial Unit of ITM) also showed that additional courses of artesunate-mefloquine (at 6-week intervals) significantly increased the cure rate, with only a marginal increase in side effects. This opens up perspectives for further large-scale studies evaluating artesunate mefloquine as an integrated seasonal chemoprevention against both malaria and schistosomiasis. These findings were published in Nature Medicine in December 2023.

Groundbreaking results were also laid down for another neglected disease, leishmaniasis. The deadly Leishmania parasite is notorious for adapting to drugs through mutations and drug resistance. Molecular parasitologists at ITM discovered a second way to circumvent drugs: tolerance to drugs, by the parasite going into a dormant phase. The research results were published in the renowned journal Frontiers in Cellular and Infection Microbiology.

Researchers from the Eco-epidemiology unit developed a digital board game for disease prevention and control under a senior FWO grant. The games were presented at the 17th European Conference on Games Based Learning (Enschede, the Netherlands) on 5 & 6 October 2023. The Vicious Worm Boardgame was the winner of the Fully Developed Non-Digital Games at the 11th International Educational Games Competition.

In the field of antimicrobial resistance, the EDCTP-funded SIMBLE project has laid down a feat of reverse innovation. The project combines the development of a field-adapted reading system

for blood culture bottles and the installation of a local bacteriological culture media factory (Bactinsight). By 2023, Bactinsight has been successfully implemented at our institutional partners in Cotonou, Benin, and in Ouagadougou, Burkina Faso.

In the sustainable health systems theme, the results of the PROMISE study, a large-scale PREP study led by ITM and UA were explained. They described barriers to accessibility of PREP especially among MSM from migrant backgrounds. Their recommendations for a more flexible model of care, which would include GPs and organisations in addition to HIV reference centres who care about the specific target group were included in the National HIV Plan.

In 2023, the Social-Ecological Health Research (SEHR) unit pioneered materials and methods to study biases in AI-generated images by categorising text-to-image. In the process, it demonstrated how AI systematic Africa exoticises, care and HIV status links with blackness, and whiteness associates with providing care. The study was published in the Lancet Global Health and picked up by several news media such as National Public Radio, where the story quickly reached more than 500,000 readers.

In 2023, we were allowed to include development minister Caroline Gennez, welcoming DRC ambassador Roxane de Bilderling, Eurocommissioner Jutte Urpilainen and Education Minister Ben Weyts to ITM.

SO2 – Open and global campus

In 2023, ITM professors framed 497 students, including 97 doctoral students and 79 master's students. Among the group of PhD students, the 'Global Campus' is well reflected with 34% PhD students from the African continent, 12.3% from Asia, 7% from Latin America, 20% from Europe (excluding Belgium), 21.6% from Belgium and 5.1% from elsewhere.

Master's students also come from 66 different countries (Africa 30 countries, Europe 15, Asia 13, North America 3 and South America 5).

Of the ITM professors in 2023, 54% have Belgian nationality, 42% are from the EEA (excluding Belgium) and 4% from outside Europe. 51% percent of postdoctoral researchers have Belgian nationality, 24.5% are from the EEA (non-Belgium) and 24.5% from outside the EEA. 59% per cent of junior researchers have Belgian nationality, 12.8% are from the EEA (non-Belgium) and 28.2% from outside Europe.

In the coming years, we want to further focus on the attractiveness and visibility of ITM as a 'Global Campus' to attract excellent researchers through the Marie Curie programmes and ERC, among others.

During the academic year 2022-2023, a total of 159 national and international guest lecturers were invited in the master's and postgraduate programmes as well as in the specialised short courses. Of these 159, 25 international guest lecturers were from EEA countries (15.72%) and 68 from non-EEA countries (42.76%), including 56 alumni. This is an increase compared to 2022, where 39% international guest lecturers were from non-EEA countries.

The Marleen Boelaert student fund campaign was launched in January 2023. Various internal and external media channels were used to promote the donation programme for LMIC (Low or Middle- Income) students. Sufficient funding was raised in 2023 to offer the first Marleen Boelaert scholarship to a short-course student in 2024.

Several alumni meetings were organised and 28 travel grants awarded to alumni to attend lifelong learning conferences. They aim to contribute to alumni's capacity to act as 'agents of change'.

As part of the Alliance strategy 2022-2026, the 2023 call to support the 'internationalisation' of education initiatives in FA5 country programmes and networks was launched in January 2023. This annual call funds mobility of ITM staff, alumni and staff from partner institutions to teach courses at ITM and Alliance partner institutions.

A total of 16 inward and outward staff mobility initiatives were supported under this call. By 2023, 50% of mobility grants were awarded to women.

By 2023, we have reformed postgraduate programmes by bringing together students from medical, biomedical, nursing and social science backgrounds to explore health challenges in vulnerable settings around the world. These include the effects of the climate crisis on public health and health systems, the health problems of migrants and refugees, the impact of pandemics such as Covid-19 or Ebola, the unequal access to quality healthcare of people in vulnerable situations.

In 2023, ITM also submitted a self-assessment report to the VLUHR for the re-accreditation of the 3 master's programmes, MSc Public Health, MSc Tropical Medicine and MSc Global One Health, by the NVAO. The international panel evaluated the programmes in spring 2024.

In 2023, the Erasmus+ HITIHE project in Indonesia and Cambodia was successfully completed, with the launch of the Wikitropica platform, the Wikipedia for tropical diseases, as one of its major achievements. This realisation based on our expertise and that of our partners will be a useful information and training resource for today's infectiologists.

In October 2023, we launched the brand new science podcast series 'Transmission', which addresses key international health topics. In it, we feature the stories of ITM researchers and their colleagues at partner institutions in their fight for global health. With this English-language podcast, we aim to reach an international audience of students, partners and future employees.

In 2023, ITM participated in the Nerdland Festival (20,000 visitors), in Erfgoeddag i.c.w. City of Antwerp and co-organised the 'Children of Care' exhibition with the Maagdenhuis Museum and the University of Antwerp. During this exhibition, 1,574 people visited ITM, including 24 schools with 658 pupils. The exhibition was a unique opportunity to expose an underexposed piece of Antwerp history and highlight the contemporary functioning of ITM. It was very well received both internally and externally.

From 21 to 23 November 2023, the 64th ITM Colloquium took place in Nepal with the topic 'Understanding the Global Landscape of Disease Burden in the Context of Climate Change'. We organised the colloquium together with our Nepalese partner the Nepal Health Research Council (NHRC). There were lectures by 40 researchers, 12 session chairs, 8 keynote speakers and 21 oral presentations. More than 300 registered participants from 37 countries physically participated in the colloquium and 138 online.

SO3 – Partnerships

ITM aims to strengthen and expand its international partnerships. ITM mostly collaborates with top European research institutions with complementary expertise in the framework of joint competitive research projects such as London School of Hygiene & Tropical Medicine, Karolinksa Institute, Utrecht University, University of Oxford and Institut National de la Santé et de la Recherche Médicale (INSERM). There are also intensive collaborations with top international health organisations such as the World Health Organisation and Médecins Sans Frontières, which testify to the structural link between ITM research and the health situation on the ground. Our expert role under Global Health EDCTP3 also enabled us to support the entry of some partner countries in SSA into the EDCTP association.

The Institute of Public Health Bengaluru (IPH) and ITM (Department of Public Health) have been collaborating in the field of health policy and systems (research) under joint research and capacity development projects for over 10 years. With a view to strengthening ITM courses on health systems and health policy, a long-term collaboration between the two institutes came into being in 2023 that includes mobility of external guest lecturers and joint development of course materials.

ITM has a long history of combating gambiense human African trypanosomiasis (gHAT or sleeping sickness) in the DRC. This intervention contributes to Belgium's international commitment to help eradicate sleeping sickness by 2030, in collaboration with the Bill & Melinda Gates Foundation (BMGF). In October 2023, the Belgian government renewed the agreement with the Bill and Melinda Gates Foundation. This renewal is in recognition of the results submitted so far, by ITM, the national sleeping sickness programme (PNLTHA) and our partner institution Institut National de Recherche Biomédicale (INRB).

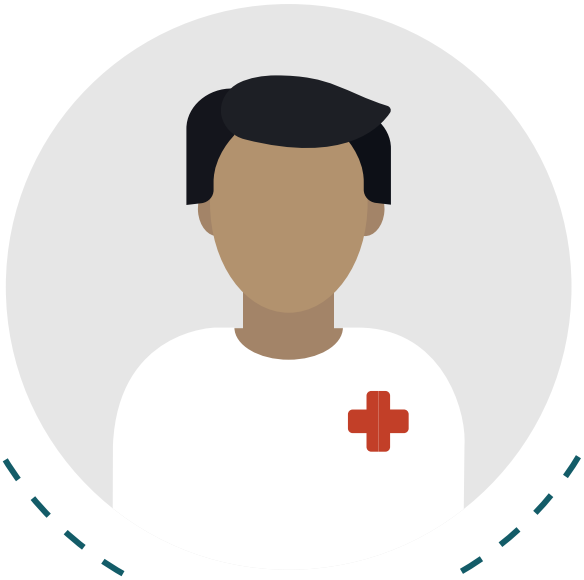
Not only internationally, but also domestically, new collaborations were established. As an associate member of the VLIR, ITM can join various consultation forums with representatives of Flemish universities with expertise within (the part of) the policy domain in which the respective consultation forums are set up. The exchange with colleagues in various fields, contributes to a stronger connection to the Flemish academic landscape. In 2023, ITM renewed the institutional framework agreement with the University of Antwerp, and agreements with KULeuven, UHasselt, VIB and UGent were prepared. A call for Joint Pump Priming Projects was also launched again in 2023 with the University of Antwerp.

INTERNATIONAL COOPERATION

26

institutional partners

Patients



Populations

MEDICAL SERVICES

46,107

patient consultations

EDU

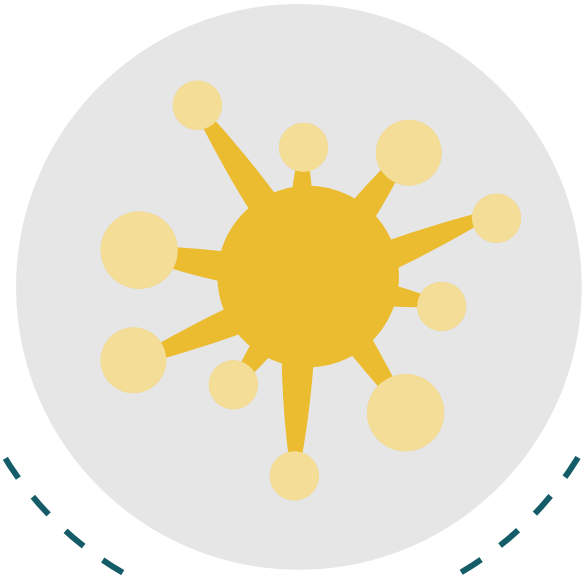
4

RESEARCH

322

scientific publications

Pathogens



UCATION

98

students

SO4 – Coherence, efficiency and effectiveness

Management: There was a change of directors in early 2023, with Marc-Alain Widdowson replaced by Lut Lynen, as interim director. In 2023, the process was launched to recruit a new director. The department head of public health (Marianne van der Sande) retired and was replaced by Raffaella Ravinetto.

The articles of association were amended under the new legislation on foundations.

The administrative organisation was clarified with a clear mandate for the General Council, Board of Directors and Executive Board.

In 2023, the medical services went through an important transition process to build a new, stronger clinic structure. After all, the proper functioning of our clinic is not only necessary for quality and efficient patient care but also provides opportunities for scientific research and education. In this way, the entire ITM will reap the benefits of this thorough reform, which has now been successfully completed.

Process-wise, huge strides were made in 2023. These included implementing a new procurement module, upgrading the ERP system and launching ITM's new education platform, Archie.

In close consultation with staff representatives, the new pay policy went into effect in January 2023, an important milestone for staff and management after years of negotiating the transition to a modern HR policy. Not only the result, but certainly also the process towards it happened in an open and transparent manner between management and staff. ITM will now also fall under the scope of the new expat regime, enabling ITM to be an attractive employer for foreign researchers. From HR, the migration to the new social secretariat (Acerta) was also prepared.

The Energy Working Group together with the management follow up on energy-saving measures. Thanks to these measures, such as maintaining 19°C and replacing energy wasters, 10% less energy was consumed in 2023 than in 2022. This decrease is largely due to less natural gas consumption for heating, but for the first time, 4% less electricity was also structurally consumed, which is also the most expensive energy component. Here, some measures were implemented in autumn 2023, so the positive effects will only become visible in 2024. Co-financing was requested and granted from a number of guardian ministers in 2023.

A building master plan project manager was appointed and helps ensure the incorporation of energy-saving measures in the short and medium term. Also in 2023, our heritage management plan of the "monument" Institute of Tropical Medicine was approved by the Immovable Heritage Agency.

To ensure our operation and continue to innovate, we need to plan ahead. We do this in the Buildings Master Plan for ITM, in which we address 3 major challenges: (1) a future building heritage that meets current activities and future ambitions; (2) a sustainable building heritage and (3) a building heritage that respects heritage. The master plan sets the outlines for ITM of the future and examines what infrastructure we need to fulfil our ambitions.

b. Strategic Indicators

Responsible service = General Manager and Quality

Global science for health worldwide

The core objectives of ITM are scientific progress and the right to good health for all through innovative research, continuing education, professional services and capacity building of our partner institutions in the South.

Our operations can be summarised in hard figures by presenting our income and expenditure, with linked direct impact on scientific publications, number of degrees awarded and figures concerning our services. For ITM, however, direct impact does not stand alone and is linked to its social responsibility and impact of our activities on the environment. Direct impact, social dimension and environment form a triangle in which ITM strives to balance these three elements. Each dimension only comes into its own when all three are fully integrated into the day- to-day operations of ITM.

Figure 1. Presentation of the 'Direct Impact', 'Social Impact' and 'Environmental Impact' of ITM's activities in 2023.

ENVIRONMENTAL IMPACT

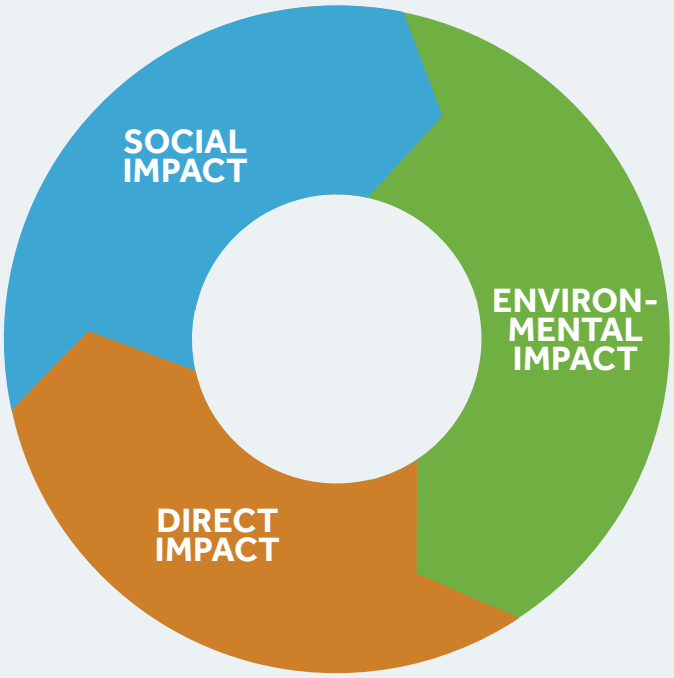
- CO2 emission: 3939 tons
- Energy use: 4,389 MWh
- Commuting: 90% public transport/bike/foot, 10% by car
- Correct processing of 150 tons of waste (domestic, chemical and biological)
- Laboratories: high-security laboratories and insectary

SOCIAL IMPACT

- 502 employees (66% women, 34% men)
- Active contribution in fighting mpox pandemic
- Guidance from CTU in 27 studies
- Contribution to 'health on the move' via app WANDA
- Worldwide alumni network

DIRECT IMPACT

- 67.8 million EUR in / 69.4 million EUR out
- 498 students
- 322 publications, of which 140 with JIF ≥ 5
- 50 research projects with competitive external funding
- 26 institutional partners in 19 countries
- 46,000 consultations in the clinic
- 2.5 million diagnostic tests produced



Education

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2. Education

a. Education policy priorities 2020- 2024

Responsible service = Education Office

SD1 - Expand and strengthen educational offerings in tropical medicine and international public health in line with evolving needs and scientific advances.
SD2 - To provide ITM's international staff, students and alumni with the most interesting and meaningful teaching and learning experiences
SD3 - strengthen the position of ITM education nationally and internationally.

The strategic goals for education in the 2020-2024 policy plan focus on offer development, the qualitative experience of students, teachers and alumni, and (inter)national anchoring and cooperation. A number of indicators (KPIs) were established to monitor these strategic goals.

1. Education and digitalisation

One of the objectives in the policy plan is a progressive increase in the number of 'blended' short courses. The COVID-19 pandemic accelerated the process of digitalisation within ITM and an update of the teaching strategy, endorsed by the Board of Governors in March 2022, resulted. Although ITM wants to remain primarily a campus where students meet physically for the purpose of joint learning (peer-learning), a number of important benefits resulting from digitalisation were further implemented: students can from now on, in case of force majeure, participate in courses online; the structural use of hybrid teaching (with simultaneously physically present and online students) will be tested in the 2022-2023 academic year to assess what resources would be needed if it were to be organised more in the future. As a function of this, an analysis of the additional audiovisual infrastructure needed to further develop the classrooms in order to permanently develop online and hybrid teaching was carried out. In addition, in the context of digitization, a working group on AI was developed.

This working group aimed to develop guidelines for students regarding the use of AI, and is continuing to work for the time being to track the opportunities - and risks - of using AI for both students, and researchers.

2. Growth in credit certificates (KPI: 10% over 3 years)

After a drop in the number of credit certificates in 2020 because of the COVID-19 crisis, the figures for 2021 were again representative (165) of a normal academic year as in this pandemic year, education switched completely to a hybrid or online modality. For the 2021-2022 academic year, we saw another - albeit minimal - increase, with 169 credit certificates issued. In the 2022-2023 academic year, 179 credit certificates were issued. We note that a growth of 8.5% was achieved over the past three academic years.

3. Student satisfaction

ITM student satisfaction remains high to very high. This is reflected in course evaluations, student feedback during the semester-long "participation consultations" with representatives from the various courses and ITM management, and in the results of the mid-term analysis of the education and scholarship programme under the framework agreement (2017-2021) between ITM and the Directorate-General for Development Cooperation (DGD). Based on the course evaluations, we can state that the vast majority of students evaluate the course followed as good to very good, and this for the various facets (content, work formats, framework). However, for the postgraduate certificate courses, we received signals that the objectives and set-up of the course were in need of revision. These signals led to a thorough reform of the postgraduate certificate programme that started in September 2023, to make the course offering more responsive to changing student learning needs and a changing landscape in international health.

4. Student and faculty diversity (KPI: 30% international and no more than 75% from the same continent in masters programmes)

Diversity among students in master's programmes (and the same applies to short courses), after the assessment of admission criteria, is monitored through the selection process and through the allocation of scholarships. For DGD fellows (large majority of international students) the funder expects at least 50% of grantees to be of sub-Saharan origin making African students always the majority. In the MSc in Public Health (MPH), the highest percentage of students from the same continent (Africa) is 60%. For the MSc in Tropical Medicine (MTM), the percentage is 47% and for the MSc in Global One Health (MScGOH) this is at 65%. For the three master's programmes combined, the percentage of African students is 58%. The percentage of European students is 22% and Asian students make up 14% of the master's student population. From the perspective of diversity across campus, this is a positive sign. The KPI was achieved.

In the staff of ITM, and more specifically the lecturers (this category includes not only lecturers and senior lecturers but also (ordinary) professors, scientific experts, researchers, specialists, teaching coordinators), 36.5% are of foreign origin. Of this 36.5%, 65.75% are from EEA countries and 34.25% from non-EEA countries. The latter figure is a slight increase compared to 2021, where 33.5% were from non-EEA countries.

During the academic year 2022-2023, a total of 159 national and international guest lecturers were invited in the master and postgraduate programmes as well as in the specialised short courses. Of these 159, 25 international guest lecturers were from EEA countries (15.72%) and 68 from non-EEA countries (42.76%). This is an increase compared to 2022, where 39% international guest lecturers were from non-EEA countries.

In line with previous years, an effort was made to involve more alumni in teaching (out of 159 guest lecturers, a total of 56 were alumni, i.e. 35.22%). Compared to 2022, this is a similar number of alumni who have taught courses. So we cannot speak of a significant increase this year of the number of alumni. This is due to the fact that TMED took place only in French and not in English. Indeed, in the past, both postgraduate courses invited a significant number of external lecturers. Of the total number of alumni who taught, 32 (57.14%) were from EEA and non-EEA countries. This is a very small decrease compared to the number of international alumni invited as guest lecturers last year. Furthermore, alumni and staff from partner institutions also participated as judges of the master's defences (in total, there were 18 external jury members including 12 international alumni from non-EEA countries). This is an increase compared to 2022. The possibility of online participation was again an enabling factor in this regard this year.

5. Cooperation agreements and joint certification

ITM has cooperation agreements with Flemish universities, an agreement with the University of Pretoria (including in the context of developing the renewed curriculum in "Global One Health") and with tropEd network for credit mobility (increasingly under the form of virtual mobility) between network members. TropEd unites universities worldwide in a learning network for education in international and global health. Through the renewed cooperation agreements, guest lecturers are exchanged, PhD students are jointly supervised and trainees supervised in the framework of their master's project. ITM has participated in the inter-university certificate in clinical infectiology and medical microbiology (in collaboration with KULeuven, UA, VUB and UGent) since 2022.

6. Projecten met partners (KPI: 3 nieuwe samenwerkingsprojecten onderwijs /3j)

In 2023, the Erasmus+ HITIHE project in Indonesia and Cambodia ended successfully, with the launch of the Wikitropica platform, the Wikipedia for tropical diseases, as one of its major achievements. A total of 16 e-cases on seven themes were developed based on real clinical scenarios in Indonesia and 21 e-panoramas on various symptoms. These e-panoramas serve as diagnostic and pedagogical tools. They are online on the Wikitropika platform and are used in teaching at ITM and partner institutions. The Institute of Public Health Bengaluru (IPH) and ITM (Department of Public Health) have been collaborating for more than 10 years on health policy and -systems (research) under joint research and capacity development projects. With a view to strengthening ITM courses on health systems and health policy, a long-term collaboration between the two institutes emerged in 2023 established that includes the mobility of external guest lecturers and the joint development of course materials.

Collaboration also took place with WHO and TDR as part of the training SORT IT (Structured Operational Research and Training IniTiative), and more specifically around communicating the results of recent research on neglected tropical diseases (GRIPP).

7. Erasmus+

The Erasmus+ pilot funding awarded to ITM for Individual Learning Mobility 2022 (KA131), was further rolled out in 2023. In a first phase, the evaluation procedure and criteria, application process and internal and external communication strategy to announce the student and staff mobility opportunities available for the academic years 2022-2023 and 2023-2024 developed and rolled out. Due to a small pilot project with a limited number of mobility grants, it was initially opted to make them available only for MSc students. This choice and the nature of the type of master's programmes and mobilities helped result in no scholarships being awarded in the first half of 2023. Hence, in autumn 2023, it was decided to revise the selection criteria for student mobility and make it possible for ITM PhD students as well. As these students are on a 4-year PhD path, they have more opportunities to engage in long-term physical mobility in the context of studies or internships. They can also claim (virtual) short-term PhD mobility. Thus, a specific call was launched at the beginning of this academic year to announce the 2023-2024 student mobility, including PhD mobility. The deadline for mobilities from the E+ Call 2022 is 31 July 2024.

b. Indicators education

1. Education input indicators

Table 1. Summary of input indicator results for education (students per programme) for academic years 2018-19, 2019-20, 2020-21, 2021-2022 and 2022-23.

Students by programme	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24 (target figure)
Post-initial courses (masters)						**Min. 50**
Master of Sc. in Public Health (all majors)	39	42	29	35	42	
Master of Sc. in Tropical Animal	23	19	25	24	20	
Master of Sc. in Tropical Medicine (all majors)*			18	15	17	
Postgraduate courses						**Min. 100**
Tropical Medicine and International Health (30c)	52	45	33	32	27	
Tropical Medicine for Bachelors in Nursing and Midwifery (20c)	59	0	75	61	27	
Specific training						**Min. 100**
Specialised short courses (5-6c)**	116	121	169	171	187	
Short continuing education courses*** (incl. individual students and trainees)	78	35	105	84	149	
PhD courses	**2019**	**2020**	**2021**	**2022**	**2023**	**Min.8**
Starting PhDs	17	18	28	18	22	
Total number of ongoing PhD tracks	81	80	101	102	97	

** New master's programme started in September 2020*
***Short courses leading to academic credit certificate.*
****These short courses do not lead to a credit certificate.*

2. Notes on training programmes

Master's programmes and postgraduate certificates follow the decree provisions from the Codex for Flemish Higher Education. The accreditations of the master's programmes are valid until 30 September 2024.

Master's programmes are MaNaMas (60 credits) aimed at mid-career health professionals and scientists. The modal age range for students in MaNaMas is 30- 34 years. Exceptional admission to a MaNaMa is possible for holders of a bachelor's degree based on professional experience and relevant professional responsibilities. In 2022-2023, in the Master in Public Health, 5 undergraduate students were admitted through this procedure.

Master's programmes offer the opportunity to study part-time. In the MScGOH, all students are part-time and take two years or more over the 60 credits. MScGOH students start on 1 January and follow the academic calendar of South Africa and the University of Pretoria. The output table (see below) includes all graduating MScGOH students, including cohorts who were still starting in the Master in Tropical Animal Health. For MPH, 10 part-time students enrolled in 2022-2023, for MTM, seven students for both orientations together. Part-time students who enrolled earlier and graduated in 2022-2023 were included in the output table (see below).

The attractiveness of the MaNaMa programmes (see table) allows for a selection ratio below one to two. For the three master's programmes combined, the selection rate for the 2022- 2023 cohorts was 21%.

Table 2. Attractiveness master's programmes: number of students admitted vs applications, 2018-19 to 2022-23..

Candidates and admitted students by programme (masters)		2018-19	2019-20	2020-21	2021-22	2022-23
Master of Sc. in Public Health (all majors)	Number of candidates	360	224	174	193	162
	Number of students admitted	39	42	29	35	42
	Percentage of students admitted	11%	19%	17%	18%	26%
Master of Sc. in Tropical Animal Health/ Global One Health	Number of candidates	110	61	121	113	154
	Number of students admitted	23	19	25	24	20
	Percentage of students admitted	21%	31%	21%	21%	13%
Master of Sc. in Tropical Medicine (all majors)	Number of candidates			90	77	58
	Number of students admitted			18	15	17
	Percentage of students admitted			20%	19%	29%

NB. exceptionally, after academic admission, and for various reasons, a student will still fail the programme

3. Educational offer 2022-2023

a. Origin students masters and short courses.

In 2022-2023, students came from 66 (up from 53 in 2021-2022) different countries (Africa 30 countries, Europe 15, Asia 13, North America 3 and South America 5). See table for the number of students by continent.

Table 3. Origin of students academic year 2022-23.

Oorsprong studenten academiejaar 2022-23	Europe	Africa	N-America	S-America	Oceania	Asia	Total
Post-initial courses (masters)							
Master of Sc. in Public Health	11	25	0	2	0	4	42
Master of Sc. in Tropical Animal Health/Global One Health	2	13	0	0	0	5	20
Master of Sc. in Tropical Medicine (all majors)	4	8	1	2	0	2	17
Postgraduate courses							
Tropical Medicine and International Health (30c)	27	0	0	0	0	0	27
Tropical Medicine for Bachelors in Nursing and Midwifery (20c)	27	0	0	0	0	0	27
Specific training							
Specialised short courses (5-6c)	37	95	2	8	0	45	187

The programme components of the masters are offered as specialised short courses (see lower an exhaustive list of short courses).

b. Gender and age of students

Table 4. Student numbers academic year 2022-2023; distribution by age group and gender.

	M	V	X	20-29	30-34	35-39	40-44	45 en <
Post-initial courses (masters)								
Master of Sc. in Public Health	23	19	0	7	20	9	4	2
Master of Sc. in Tropical Animal Health/Global One Health	11	9	0	6	7	5	2	0
Master of Sc. in Tropical Medicine (all orientations)	10	7	0	8	6	1	1	1
Postgraduate courses								
Tropical Medicine and International Health (30c)	10	17	0	18	7	2	0	0
Tropical Medicine for Bachelors in Nursing and Midwifery (20c)	4	23	0	14	10	1	2	0
Specific training								
Specialised short courses (5-6c)	93	93	1	33	53	54	30	17

c. Overview of educational offerings including specialised short courses leading to credit attestation

Table 5. Annotated overview of educational offerings 2022-2023

Educational offer 2022-2023 Title	Credits
Post-initial courses (masters)	
Master of Science in Public Health - orientation Health Systems and Disease Control	60
Master of Science in Tropical Medicine - orientation Biomedical Sciences	60
Master of Science in Tropical Medicine - orientation Clinical Sciences	60
MSc in Global One Health: diseases at the human-animal interface	60
Postgraduate courses	
Postgraduate Certificate in Tropical Medicine and International Health	30
Tropical Medicine for Bachelors in Nursing and Midwifery	20
Médecine Tropicale pour Bachelors en Soins Infirmiers et Sages-femmes	20
Specific training (specialised short courses)	
Achieving Universal Health Coverage by 2030: The Health Financing and Social Protection Challenges	5
Applied Epidemiology	4
Clinical Decision-Making for Drug-Resistant Tuberculosis	5
Data for Action	5
Design & Evaluation of Health Programmes	5
Global Health in times of crises	5
Health Policy & Governance	5
Health Policy and Systems Research Methodology	5
Health Systems Performance Analysis	5
Health Systems Strengthening	5
Hospital-based Interventions to Contain Antibiotic Resistance in Low-resource Settings	5
Introduction to International Health	20
Molecular Data for Infectious Diseases	5
Multivariable Analysis	5
Non-communicable Diseases	5
Outbreak Investigations and Research	5
Pharmaceutical policies in health systems	5
Qualitative and Mixed Methods in International Health Research	8
Sexual & Reproductive Health and HIV: beyond Silos	5
Short Course in Clinical Research and Evidence-Based Medicine	9
Sustainable Approaches to Infectious Disease Control and Elimination	5
Tropical Medicine and Clinical Decision Making	10

d. Overview of courses that do not lead to a credit certificate

Continuing education offerings for health professionals are explained below.

Table 6. Annotated overview of continuous formations at ITM in 2022-2023.

Continuing education offer	Duration	Number of participants	Target audience
Travel advice for pharmacists (in collaboration with IPSA)	2 evenings	29 (evening 1) 22 (evening 2)	Pharmacists
Travel advice for general practitioners	7 evenings (including exam)	20	Belgian general practitioners, general practitioners in training and other health professionals
Online module 'Travel medicine-case: On an adventure in Thailand'	30 minutes	151	Belgian general practitioners, general practitioners in training and other health professionals
Good Clinical Practice certificate (GCP)	1 week	10	Belgian and international researchers and health professionals
Under a collaboration with WHO-TDR: SORT IT AMR and SORT IT NTDs (Ethiopia)	3x1week coaching over 1 year - ITM staff participation in modules 1, 3 & 4	12 participants per module	Young researchers, international
Demographic and Health Survey (DHS) data on reproductive and child health (paper writing), offered as a short course	Hybrid course over 13 weeks	11	Young researchers, international

Table 7. Individual training contracts and internships: origins and numbers of students (2022-2023).

	Europe	Africa	N-America	S-America	Oceania	Asia	Total
Individual students	6	31	3	7	0	8	55
Trainees	62	3	0	0	0	2	67
Pre-doctorate	0	2	1	0	0	0	3

The internship at ITM was used by 14 out of 67 interns for a master's project including master's thesis.

e. Explanation of tuition fees and DGD scholarship programme

In 2021-2022, tuition fees to ITM remained unchanged. Tuition fees distinguish between registration fees and credit fees on the one hand and between EU/EEA nationals and non- EU/non-EEA nationals on the other. The new fees were applied to formal course offerings from September 2020. The registration fee for short specialised courses (residence under 3 months) is also lower for non-EU/EEA nationals than for masters courses.

The registration cost is 300 and 900 euros (600 for short courses) for EU/EEA and non-EU/non-EEA nationals, respectively. The cost per credit is 86 and 260 euros, respectively. For the MSTAH, in collaboration with the University of Pretoria, a cost per credit of 172 euros was set. Staff or ITM PhD students pay only the credit cost and at the EU/EEA rate. For students from low- and middle-income countries, ITM on DGD scholarships.

In academic year 2022-2023, a structure for tuition fees for continuing education was established where, by analogy with formal course offerings, a distinction is made between registration fee (100 euros) and cost per hour of teaching (20 euros). This tuition fee is

the minimum price charged, based on 20 participants per course.

In December 2023, the Board of Governors agreed not to index tuition fees for academic year 2024-2025.

f. Education output indicators

Table 8. Summary of education output indicators (degrees and certificates) for academic years 2018- 19, 2019-20, 2020-21, 2021-22 and 2022-23.

Diplomas and certificates	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24 (target figure)
Diplomas post-initial education						**Min. 50**
Master of Sc. in Public Health (all majors)	38	43	31	32	31	
Master of Sc. in Tropical Animal Health/ Global One Health	17	19	14	17	7	
Master of Sc. in Tropical Medicine (all majors)			12	11	18	
Tropical Medicine and International Health (30c)	52	45	33	33	27	
Tropical Medicine for Bachelors in Nursing and Midwifery (20c)	59	0	75	60	27	
Postgraduate education/ specific courses						
Credit certificates issued	111	104	165	169	179	
PhD preparation	**2019**	**2020**	**2021**	**2022**	**2023**	
Number of promotions (on 31/12)	21	16	5	13	21	

Note: pass rates are high, mainly thanks to a rigorous selection procedure prior to admission to the programme. The number of defended doctorates in 2023, with 21 defended doctorates, is again higher than the previous year's level, after a decrease in 2021 that can be explained by the emirate of some professors and the appointment of new professors, who in turn need time to build a team of PhD students. By 2023, the decline seems to be fully made up.

4. Education impact indicators

Table 9. Summary of education impact indicators (alumni impact) for the years 2018, 2019, 2020,

Alumni network	2018	2019	2020	2021	2022	2023
Total number of members (11/12/2022)	3513	3783	4006	4306	4647	4926
New members (new students)						
Postgraduate courses	123	103	67	108	93	54
Post-initial courses (masters)	40	50	53	64	69	66
Specific courses	98	92	89	26	126	154
PhD	16	10	7	1	3	5

The table above shows, by programme type, the number of new members joining the network/ alumni database in 2023. Since alumni regularly rejoin ITM to further specialise, the number of new members is lower than the number of students. Of the 320 students who took a master's, postgraduate or short course during the 2022-2023 academic year, 279 (87%) were first-time students studying at ITM ('new' students).

5. 2023: an active year for the ITM Alumni Network

In the year 2023, in addition to virtual alumni activities, four physical alumni meetings also took place.

A total of 28 travel grants were awarded to ITM alumni to participate in four international scientific conferences: The Union World Conference on Lung Health (15-18 November 2023, Paris, France), the European Congress of Tropical Medicine and International Health (ECTMIH, 17-21 November 2023, Utrecht, the Netherlands), the ITM Colloquium (21-23 November 2023, Kathmandu, Nepal) and the International Conference on AIDS and STIs

in Africa (ICASA, 4-9 December 2023, Harare, Zimbabwe). These travel fellowships act as opportunities for lifelong learning, networking and scholarly exchange. They aim to contribute to alumni's capacity to act as 'agents of change'.

As part of these four conferences, a total of four physical alumni meetings were organised: two thematic alumni meetings and two social networking events.

On the margins of the ITM Colloquium, an ITM thematic alumni meeting was organised in Kathmandu on 21 November 2023, attended by some 40 national and international ITM alumni and staff members participated. During this meeting, 'Voices from the field: the experience from ITM alumni', alumni shared their experiences regarding various topics: DR-TB management; innovations for disease surveillance at the time of COVID-19 challenges in Nepal; lessons learned from interventions and research on Ebola and COVID-19 in Guinea; climate change adaptation and mitigation measures through health facility standards and confidence building in the Philippines; tobacco control in India in its historical, cultural and political context. The sessions were moderated by ITM staff members Bouke de Jong, Grace Ku, Epco Hasker and Wim van Damme.

As part of the ICASA Conference, the thematic alumni meeting 'Sustaining the HIV response: from financing to chronic care' was organised on 3 December 2023 in Harare, Zimbabwe.

In the presence of more than 30 ITM alumni from Zimbabwe and other African countries, ITM alumni shared several experiences on the topic of the meeting. The sessions were moderated by ITM alumnus Richard Makurumidze (University of Zimbabwe) and ITM staff Bernadette Hensen and Maria Zolfo. A renewed collaboration between ITM and alumni from Zimbabwe was also presented and discussed. This will focus on exchange of lecturers and content experts for mutual strengthening of educational programmes.

Both meetings also probed alumni needs, challenges and expectations in the context of ITM alumni networking. Developing national/regional alumni chapters has support. This will be further pursued in the future.

Alumni networking events were also organised as part of ECTMIH 2023 and the Union World Conference on Lung Health. As part of ECTMIH 2023 in Utrecht, more than 80 ITM alumni, staff, students and staff from partner institutions attended to network, exchange experiences and views. An alumni dinner was organised as part of the Union Conference in Paris, where mainly DRTB alumni and ITM teaching staff shared professional experiences.

A total of 8 alumni webinars were organised in 2023. Four of these webinars were organised in the context of specific International (Health) Days (e.g. International Women's Day, World Malaria Day). There were also four alumni webinars highlighting the ITM laureates of the Province of Antwerp's Prize for Global Research 2023. In total, these webinars were attended by a broad international audience of mainly ITM alumni, students and ITM staff (500 people in total).

Furthermore, alumni also continued to teach (through both physical and virtual mobility) as external guest lecturers in ITM courses (cfr point 4. Student and faculty diversity).

The virtual alumni platform, "ITM ALUMNI CONNECT", was continuously fed with academic information, lifelong learning activities and news about alumni, ITM and partner institutions, among others.

In figures:

- 249 new members have registered on the platform (2362 members in total compared to 2113 members in 2022)
- 175 vacancies were published
- 99 events (including webinars, conferences, trainings) announced
- 223 news and email campaigns published

Furthermore, a private group was established on ITM ALUMNI CONNECT on the platform with members of the FA5 Thematic Network on Climate Change and Health, consisting of ITM alumni, students, staff and partner institutions. This group acts as a Community of Practice (COP) where relevant info on the theme is shared among members. This is pulled by an MPH alumnus and ITM staff.

The year 2023 was again marked by a balanced approach in organising both virtual and face-to- face networking opportunities and alumni activities. This is essential for a global network such as the ITM Alumni Network.

6. 2023: the Alliance for Education

Also in 2023, the Alliance continued to focus on individual and institutional capacity building of alumni and staff of partner institutions (including ITM), respectively, through initiatives focused on continuous professional development and lifelong learning as well as the joint development of education initiatives with partners in and outside country programmes. As part of the Alliance strategy 2022-2026, the 2023 call to support the 'internationalisation' of education initiatives in FA5 country programmes and networks was launched in January 2023. This annual call funds mobility of ITM staff, alumni and staff from partner institutions to teach courses at ITM and Alliance partner institutions.

A total of 16 virtual inward and outward staff mobility initiatives were supported under this call. By 2023, 50% of mobility grants were awarded to women.

Joint Alliance initiatives were also further developed and organised:

- Joint course development projects in collaboration with Alliance partners (e.g. a long- term collaboration between the Institute of Public Health, Bengaluru and ITM that includes mobility of external guest lecturers and joint development of course materials under the ITM courses on health systems and health policy);
- Technology Enhanced Learning -education initiatives (e.g. an inter-regional workshop on e-learning and Moodle in collaboration with CERRHUD and two African partners (the INRB in DRC and the Centre National de Formation et Recherche de Maferinyah (CNFRSR), Guinea); the launch of the Wikitropica platform (under the Erasmus+ funded HITIHE project in Indonesia and Cambodia) including e-panoramas and e-cases for problem-based learning in health education);
- Alliance joint educational professionalisation and support workshops (e.g. three online workshops on the quality of feedback to students to promote successful learning were organised (by and for Alliance partners).

7. Education impact evaluation: follow-up actions management response

The management response to the recommendations made by Syspons under the FA4 mid-term evaluation "Social, developmental and professional impact of ITM's educational activities and scholarship programme" was approved and published on the ITM website in March 2022. Regarding the follow-up of this management response, a series of actions were initiated and/or further followed up. For instance, the working group worked on a longitudinal survey consisting of 4 survey moments of the students/alumni (at the start of the studies, just after the completion of the studies, 1 year after the studies and 4 years after).

C. Education policy and organisation

1. Education regulations

In addition to course-specific agreements shared with students through the learning platform (ITM Moodle), teaching is mainly regulated through the following 4 documents:

- Education regulations and the NL version
- Examination regulations and NL version
- Exhibition regulations and NL version
- PhD regulations

1. Quality assurance (Codex HO - art. II. 122)

ITM's master's programmes are NVAO-accredited until 30 September 2024.
The MSc in Tropical Medicine (MTM) gained accreditation as a new programme with accreditation until 30 September 2023 as the programme will be fully completed for the first time in 2020-2021. Meanwhile, the MTM applied for an extension of its accreditation as a new programme until September 2024. This extension was approved, ensuring that the three master's degree programmes go through the same external evaluation cycle. This new cycle was launched in late 2022, in collaboration with the Flemish Universities and Colleges Council (VLUHR).
ITM submitted the self-evaluation report of the MSc Public Health for this purpose at the end of 2023, MSc Tropical Medicine and MSc Global One Health. The international panel evaluated the courses in spring 2024.

2. Educational organisation and role Education Office

The role of the Education Office was formally included in the education regulations back in January 2018. This role has since been further concretised. In 2019-2020, it was examined whether ITM's education organisation could be further optimised. Since 2021, the Student Support is part of the Education Office. The education secretariats of the three departments are now formally managed by the departmental education coordinators (previously by the departmental administrators), with the exception of one education secretary who takes up education administration duties under the Education Office in function of the three departments. Since 2021-2022, the formal function of registrar was also included within the Education Office.

ITM decided to develop its own new student information system. A project group was set up and the new information system, Archie, which contributes to even more efficient cooperation between education coordination, administration and policy, was delivered in April 2022. Archie harmonises student administration, from registration to graduation, and ensures greater transparency in educational processes. Meanwhile, work has also been carried out on the development of a high-performance data warehouse that should enable efficient and more transparent reporting of student and education data. The data presented in this annual administrative report are the result.

3. Quality assurance for education and students (Study guidance, student facilities, etc.

A harmonised quality assurance tool for course evaluation at ITM was adopted and implemented within ITM. Although other surveys are currently largely still being organised on an ad hoc basis, the use of a harmonised longitudinal (pre-study and post-study) survey was launched in spring 2022 to allow the impact of courses to be measured. ITM is thus striving here for a fully harmonised cycle of surveys on the quality of education. This system will now be rolled out in stages since 2023.

4. Student legal status scheme

Students, and alumni, are represented in the General Council of ITM. A "participation meeting" that generally takes place twice a year is a consultation opportunity between student representatives, the director, the chairs of the Academic Council and the Education Policy Committee, and Education Office. The student representatives in the General Council are co- invited. The purpose of these meetings is to get feedback from students on studying at ITM and discuss policy decisions.

5. Policy decisions

Within the education portfolio, the new postgraduate certificates were introduced in the 2023-2024 academic year. This reform was implemented to meet a changing demand from the labour market, to allow more multidisciplinarity in the programmes, and to respond to new health challenges and global transitions (following climate change, demographics)

The "Master of Science in Tropical Animal Health" received approval from the Flemish government in April 2021 to change its name to "Master of Science in Global One Health. diseases at the human-animal interface". This master's programme, organised in collaboration with the University of Pretoria (UP) in South Africa, was further developed during the 2022-2023 academic year.

After a thorough assessment of the impact of the discontinuation of the French-language version of the Master of Science in Public Health, the Board of Governors gave its approval in December 2022 to perpetuate this decision: ITM has adequately invested in language support for students, continues to attract students from French-speaking countries, and has demonstrated that these students do not perform significantly less than other students.

The board gave her the green light not to index the registration fees

With the replacement of the Education Office head of service, it was also decided to revisit the position of student ombudsperson in 2023. The function of ombudsperson will now be taken up jointly by the head of Education Office and the head of Research Office, for anything related to education and examination-related matters. For non-academic related issues, students can contact a confidential advisor from academic year 2023-2024.

Finally, ITM remains committed to educational digitisation, with the explicit emphasis that ITM remains a campus that physically receives students, the further diversification of the student population, the development of partnerships on education; the specification of expectations on educational responsibilities to the different categories of staff and the development of one of a marketing strategy for education.

Research

3

3. Research

a. Policy priorities Research 2020-2024

Responsible service = Research Office

The institutional policy plan 2020-2024 defined four strategic objectives.

SO1 - EPursuing excellence and relevance in ITM research [IDEAS]
This means pushing the boundaries of knowledge and its applications by developing new ideas of original research and deepening existing lines of research.

SO2 - Attract and nurture excellent researchers [PEOPLE]
This means researchers from around the world with a proven or potential track record in excellent, relevant research, specialised in an ITM area of expertise and who share ITM's values.

SO3 - Forging and strengthening synergetic partnerships [CONNECTION].
This means maximising synergies within ITM and consolidating and expanding partnerships and networks with partners in research and industry in Flanders, Belgium, Europe and worldwide.

SO4 - Doing research in an 'open culture' [OPENNESS]
This means that ITM supports 'open science': open access publications and open data within the boundaries of ethical, legal, contractual obligations and intellectual property.

In the covenant 2020-2024 between the Flemish Region and ITM, SO3 and SO4 were merged into the strategic objective (SO) 'Connection': to stimulate synergies and cooperation within ITM, in Flanders, Belgium, Europe and worldwide, including actively supporting open science, open access and open data.

The Strategic Objectives were translated into Operational Objectives (OOs) measured by Key Performance Indicators (KPIs):

SO IDEAS

OO1. Departmental and institutional research plans and follow-up systems are operational and result in scientific and societal impact. (KPI 1, 2, 3, 4, 5, 6)

OO2. The grant of the Department of Economy, Science and Innovation (EWI) realises leverage to increase external competitiveness and attract external research funding. (KPI 7)

SO PEOPLE

OO3. Investment is made in attracting, circulating and fostering talent. (KPI 8)

SO CONNECTION

OO4. Investment is made in establishing synergies between Flemish, Belgian, European and international partners. (KPI 9)

OO5. Efforts will be made to share scientific data widely, within the research community, with stakeholders and with the general public, in an open and transparent manner, within the rules of confidentiality, intellectual property protection according to the principle of 'as open as possible, as closed as necessary'. Monitoring and reporting will be done through FRIS. ITM will actively participate in (the working groups of) the Flemish Open Science Board (FOSB).

The achievement of the objectives is measured by a number of Key Performance Indicators (KPIs). The KPIs are linked with the entire ITM research, not just the part of the research funded by the EWI grant. Table 10 shows that in 2023, the set targets were met albeit with some nuance for KPI 7. The summary tables supporting the value of the KPIs in 2023, can be found in annex.

In 2021, the Flemish government decided to structurally allocate 1 million euros above the annual EWI subsidy of 3,946,00 euros to ITM to invest in research professors on the one hand and in a 'Global Population Data Sciences Hub' on the other. The addendum to the covenant between the Flemish Community and ITM agreed to increase the Key Performance Indicators (specifically, KPI 1 to 85, KPI 4 to 20, KP 6 to 12 and KPI 8 to 18).

Reporting on the increased KPIs and the additional 'qualitative' indicators, is expected from 2023 onwards. The increased targets for the relevant KPIs were met in 2023.

Table 10. Summary of key performance indicators, 2020-2023

SO 1			IDEAS					
	OD	KPI		Value	Value 2020	Value 2021	Value 2022	Value 2023
	1	1	ISI publications with JIF>=5	Base 2020: 60, increasing annually by at least 2 to 75 (85)	74	149	167	140
		2	Fraction of peer-reviewed publications that are 1.5 x more cited than the world average of all publications of the same type, published in the same year and within the same research domain 1	Minimum 20%	12,1%	20,6%	20,0%	23.4%
SO 1			IDEAS					
		3	Number of clinical trials coordinated by ITM - CTU*	Base 2020: 13, increasing annually by at least 1 to 18	26 (12+8+6)	29 (16+6 + 7)	32 (18+6+8)	27 (18+2+7)
		4	Number of ongoing competitively awarded research projects, incl. FWO, H2020, Horizon Europe, NIH, ... (cumulative)	Base 2020: 12, increasing by at least 1 every 2 years up to 15 (20)	59	51	54	50

1 This KPI is based on the determination of the 'Category Normalised Citation Impact' (CNCI), an indicator developed by Clarivate Analytics that can be consulted for any publication indexed in Web of Science through Clarivate Services. The CNCI is a neutral indicator that allows to measure the scientific impact of a publication in the year of publication and is normalised by discipline and document type

		5	Number of ongoing ORT studies	Base 2020: 8, every 2 years at least by 1 boosting up to 10	28	32	30	37
		6	Number of publicly accessible policy documents, guidelines and recommendations based on ITM research and expertise	Base 2020: 8, every 2 years minimum by 1 increasing to 10 (12)	14	17	14	22
	2	7	EWI grant (excluding investments) as lever: EWI budget ratio relative to total annual research budget	Base 2020: at least 85% non-EWI - funding (for research) increasing to 90% average by end of covenant	9%	12,9%	13,8%	13,1%
SO2			**PEOPLE**					
	3	8	Number of ongoing (cumulative) ITM FWO aspirants and mandates, MSCA (personal grants), HSFP, EMBO or ERC grants, seal of excellence, ...**	Base 2020: 12, increasing every 2 years by at least 1 to 15 (18)	20	23	21	21
SO3			**CONNECTION**					
	4	9	Number of productive (>10 joint publications per year) collaborations with international partners	Base 2020: 15, increasing annually to 17	19	21	21	21

JIF: Journal Impact Factor
**Clinical trials further divided as: clinical studies - interventional studies - observational studies*
***Minimum 50% active in ITM*

Summarised in light of the strategic objectives:

(SO1) [IDEAS] Pursuing excellence and relevance in ITM research

In 2023, ITM researchers published 322 papers, a decrease of 19% compared to 2022. As many as 43% (140) of the peer-reviewed output in 2023 was published in journals with an impact factor of 5 or higher, this is similar to 2022. However, it should be mentioned that journal impact factors within the broad discipline of 'infectious diseases' and 'medical sciences' generally increased significantly due to the anomalous publication activity during the COVID pandemic. This year, we comfortably met the target for KPI-2, with 23% of publications having a normalised citation index > 1.5 (target =20%).

The number of ongoing competitively awarded research projects in 2023 was 50 (well above target). ITM research and expertise resulted in 22 publicly accessible policy documents, guidelines and recommendations in 2023..

(SO2) [PEOPLE] Attracting and nurturing excellent researchers

In 2023, ITM had a total of 21 ongoing competitive mandates. Two new FWO PhD Fellows started their PhD research with ITM as an additional host institution and the University of Antwerp as the main host institution. A third candidate was also selected for an FWO PhD fellowship, but was offered a PhD opportunity elsewhere. One candidate started her PhD with a VLAIO-Baekeland mandate.

Three new FWO postdocs started, two of them with ITM as main host institution (Gabriel H. Negreira, M, Brazil and Christophe Van Dijck, M, Belgium) and one with ITM as additional host institution at University of Antwerp (Elise Daems, F, Belgium). At the same time, it was also possible to carry out the EWI-People programme (see below) to recruit a 'high potential' postdoctoral researcher (Peter Macharia, M, Kenya).

Furthermore, ITM welcomed the new research professor 'Experimental immunology' Maria Luísa Simões (she/her) in 2023.

(SO3) [COMMITMENT] Stimulating synergies and cooperation within ITM: Flemish, National, European and internationally, including by actively supporting open science, open access and open data

ITM aims to strengthen and expand its international partnerships. KPI-9 shows that by 2023, we will again have had productive collaborations (>10 joint publications per year) with more than 20 institutions. These are mainly top European research institutions with complementary expertise. ITM mostly collaborates with these institutions in joint competitive research projects such as the London School of Hygiene & Tropical Medicine, Université de Montpellier, Utrecht University, the University of Oxford, and Institut National de la Sante et de la Recherche Medicale (INSERM). It is remarkable that for 2023, new collaborations with US partners are now visible in KPI-9, with CDC as a partner in emerging infectious research. In addition, KPI-9 also shows the intensive collaboration with public health institutions and international health organisations such as Sciensano on the national level and the World Health Organisation on the international level, which testify to the structural connection between ITM research and the health situation in the field. And finally, KPI-9 also shows that long-standing (>10 years) structural collaborations in the context of capacity strengthening do not always lead to productive research collaborations, with Universidad Peruana Cayetana Heredia in Peru, Université de Kinshasha and Institut National de Recherche Biomédical in DRC in the KPI-9 list in 2023.

b. Indicators research

1. Input indicators

Table 11. Summary of input indicator results for 2020-2023

Researchers	2020	2021	2022	2023	2024 (target)
Number of ZAP2 2	26	28	26	26	30
Number of postdoctoral researchers	28	33	33	41	/
Number of junior researchers	27	34	31	39	/
ATP lab technicians	75	72	76	76	/
PhD courses					
- starting PhDs	18	23	18	23	/
- total number of ongoing PhD tracks	80	101	102	97	/
Number of ongoing (cumulative) individual mandates from: FWO (pre- and postdoc); MSCA; HSFP; EMBO; ERC; Seal of Excellence, ...	20	23	21	21	Minimum 15 (18)

2. Brief explanation of the various statutes of the investigators

The ZAP (professor) category includes the various ranks of the academic track. Eleven of the 26 ZAPs in 2023 are women (42.3%).

In the postdoctoral researcher category, the job description 'doctor assistant' (not recruited in 2023), 'researcher' (N=28, of which 14 are women, 50%) and 'senior researcher' (N=13, of which 7 are F, 54%) are included (i.e. only the academic track and the expert track 'research'). The junior researcher category includes both the 'junior researcher' post and the 'academic assistant' post(not recruited in 2023). In 2023, there were 39 junior researchers, of whom 29 were women (74%). These are staff members only: PhD students who are not ITM staff are not included in these figures. There is a partial overlap between the categories of junior researchers and doctoral students ('total number of ongoing PhD tracks), namely junior researchers (payroll ITM) who are also simultaneously enrolled as PhD students at ITM.

The ATP category includes all ITM lab technologists 1 and 2. 74% of the 76 lab technicians are women.

3. Time-to-degree for PhD students (target is < 4.5 years);

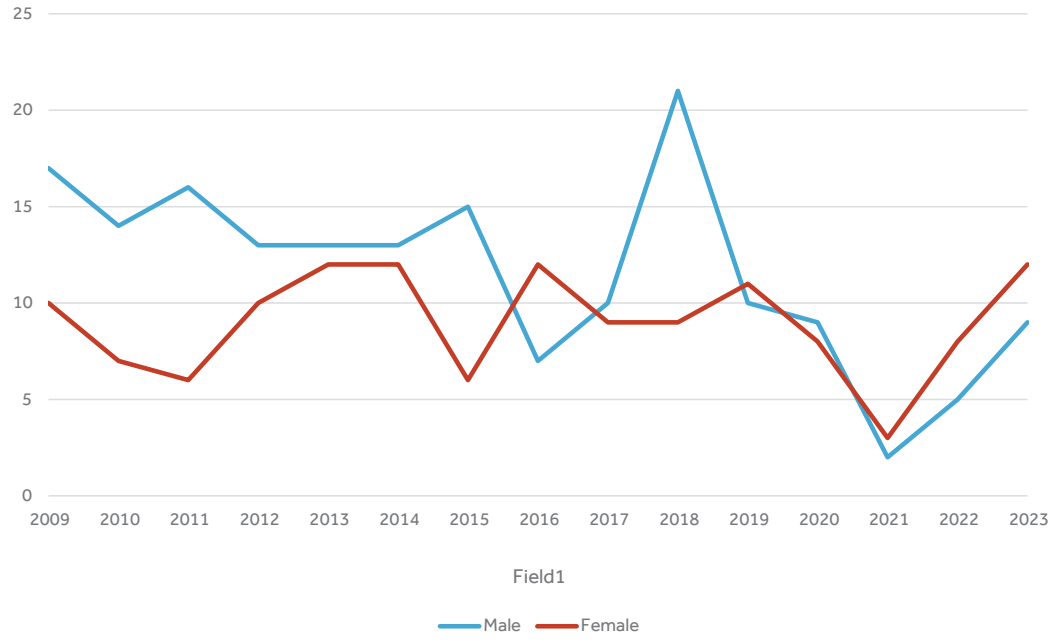
After the sharp drop in the number of PhDs in 2021 to 5[3], an upward trend has resumed since 2022, with 13 PhD defences in 2022 and 21 in 2023. An overview of doctoral defences can be found on ITM website under 'events'.

2 For ZAPs, postdoctoral researchers, junior researchers, invited researchers, ATP lab technicians situation on reference date 31/12 (as in the sections on personnel, see below). The figures in the 2023 report for the years 2020, 2021 and 2022 differ slightly from those of previous reports because the specific reference date 31/12 was not systematically taken. This was corrected in the current 2023 reporting

3 For explanatory factors, see 2021 report: professors not taking on new PhD students in light of their emeritus status, delayed replacement of retired professors and new professors needing time to build a team. COVID may also have played a role.

The average time to the defence was 4 years for the 2023 defences, although there is a lot of variation with some candidates taking longer than 4 years and candidates who obtain a PhD via an abbreviated route. The median was 40 months. A slight majority of PhD students (52%) had the Belgian/EU nationality. The number of newly started PhD students in 2023 was 23, well above the target of 8 mentioned in the management agreement.

Figure 2. Number of PhD defences 2009-2023 according to M/F distribution.



4. Critical mass formation, specific niches, international positions;

ITM's specific research fields are located in the four research priorities set for the period 2020-2024: (1) emerging diseases and outbreaks, (2) antimicrobial resistance, (3) disease elimination, (4) sustainable health systems and strategies..

5. HR-policy: personnel policy and communication (at the start of the agreements) with regard to the expected career path of doctoral students and postdoc staff;

For the HR policy, we refer to chapter 7 of this report. ITM does not have a 'career centre' like Flemish universities have. The Research Office advises PhD students and postdocs on career paths within and outside ITM (and corresponding funding opportunities). Every February, the Research Office, together with colleagues from other services and departments, organises the 'Transferable Skills programme'. This programme is open to PhD students, junior researchers, postdocs, ZAPs and the wider ITM research community.

Table 12. Overview of revenue for research for the years 2019-2023

Revenue for Research *	2019	2020	2021	2022	2023	2024 Target grade [4]
Section A						
Basic allowance Flemish Ministry of Education (33.33%)	3,663,00	3,686,745	3,742,784	3,930,439	4,134,623	N/A
Section D						
Defiscalisation funds & NSSO ristorno	4,659,158	4,735,605	4,998,329	5,610,787	6,505,212	N/A
Flemish government science policy (EWI)	3,103,785	3,026,202	4,783,500	5,246,400	4,888,800	N/A
Section E						
Diagnostic tests	1,684,334	1,508,662	1,571,130	1,416,825	1,061,637	2.000.000
Section F						
Valorisation medical service provision (20%)	967,672	942,916	970,340	1,117,435	1,175,970	N/A
Section G						
DGD programme (20%)	3,192,735	3,257,303	3,568,625	2,800,000	2,800,000	N/A
Section H						
Research projects & operating funds	9,358,722	16,595,968	17,432,626	17,931,822	16,875,776	22,578,858
TOTAL	26,629,706	33,753,402	37,067,334	38,053,707	37,442,019	

** Revenues: incl. overheads and partners for Unit A, D-EWI, G & H*

The ratio of the EWI budget to the total annual research budget 2023 was calculated by relating EWI 2023 revenue to the total research budget in 2023. The EWI budget does not include the grant under the Open Science policy, FOSB. The 10% balance of the 2022 EWI subsidy that is paid only after reporting was already reported in 2022 (and therefore not in 2023). The ratio is thus 13.1% in 2023. It is important to note that the 'externally acquired' FWO fellows and FWO postdocs are not contained in Unit H because they are not on ITM payroll and these are not recorded as 'revenue' (see below). The KPI target of achieving at least 90% non-EWI funding on average by the end of the covenant is unrealistically high, given the calculation of the research budget. One-third of the basic funding (grant) from the Flemish Ministry of Education was allocated to research (equal distribution across the academic triad: teaching, research and service).

20% of the DGD scientific capacity building programme was allocated to budget research (i.e. the PhD sandwich doctoral programme and the scientific capacity building in the framework of the country programmes). In the light of the research valorisation of medical services, 20% of RIZIV is also taken into account for ITM's 'research budget'.

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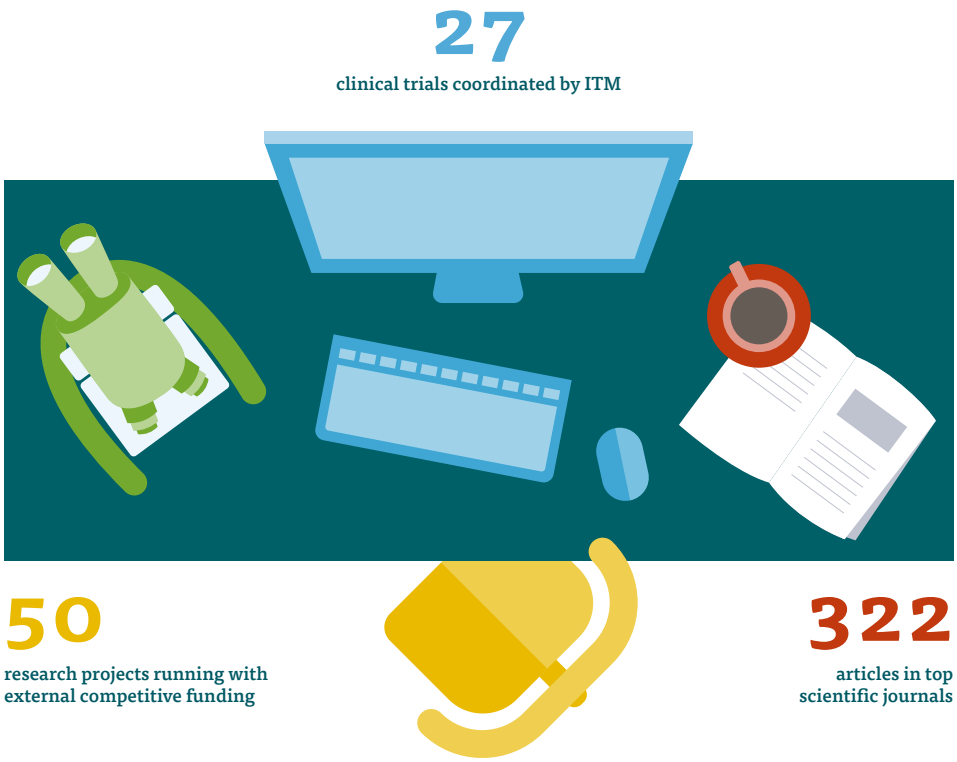
4 The projected targets 2024 are no longer applicable as ITM received additional funds to absorb additional expenditure from energy and wage indexations

Section E relates to the income from CATT tests (Card Agglutination Test for Trypanosomiasis/ diagnostic tests for sleeping sickness) which can be counted as valorisation income under research income.

Table 13. Number of research projects by type for 2020-2023 along with the target for 2024.

Research projects (detailed description, cf. PURE/FRIS)	2020	2021	2022	2023	2024 (target)
Number of ongoing, competitively acquired research projects, incl. FWO, H2020, HorizonEurope, NIH, ... (cumulative)	59	51	54	50	Base 2020: 12, increasing every 2 years by at least 1 to 15
Number of current ORT -studies	28	32	30	37	Base 2020: 8, increasing by at least 1 every 2 years up to 10
SOFI projects*	7 (2 + 5)	12 (2+5+5)	10 (5+5)	16 (5 + 5 +6)	/
PPP*	12	11 (2+7)	10 (8+2)	8 (1+7)	/

** A list of the SOFI projects and PPP projects can be found under the 'use EWI grant' section.*



6. Short explanation on research funding and projects (balance of fundamental, translational, clinical and applied research);

Table 14 shows a breakdown of research spending by flow of funds in the period 2019-2023. The figures for the 2nd money stream5 do not include FWO mandates (aspirants and postdocs). In 2023, there were 13 FWO aspirants and 7 FWO postdocs. This represents an amount of 1 739 250 euros: for the aspirants calculated at the salary of a junior researcher with an average of 2 years' seniority (77 250 euros) and for the FWO postdocs calculated at the salary of a postdoc with an average of 4 years' seniority

Table 14. Research spending by funding stream, 2019-2023.

Total expenditure		2019	2020	2021	2022	2023
Government contribution to basic fundamental research	2nd flow of funds	397.642	841.997	1.590.645	1.369.464	1.860.571
Government contributions to applied scientific research	3rd flow of funds	5.750.712	7.557.105	6.291.316	7.179.954	5.850.070
Contract research with the private sector and scientific services	4th flow of funds	8.048.658	7.311.133	6.178.275	7.732.967	8.577.537
Other revenues linked to education, research and services	Other revenues linked to education, research and services	1.504.497	1.221.958	825.897	837.710	1.169.891
Total		15.701.509	16.932.193	14.886.133	17.120.095	17.458.069

7. Cooperation with Flemish universities and research institutions with a view to valorisation (economic - social)

The ITM policy plan 2020-2024 expresses a commitment to actively seek further synergies and complementarity with Flemish actors. Specifically, ITM aspires to (i) expand vaccination research within Belgium and Europe together with university vaccination centres, (ii) innovate medicines and diagnostics with Flemish biotech and pharma companies, (iii) engage digital technologies and AI together with strategic research centres for predicting disease outbreaks and developing faster, more accurate medical interventions.

A cooperation agreement with the University of Antwerp was signed in 2023. Also in 2023, a call for Joint Pump Priming Projects was again launched with the University of Antwerp (see below). In 2023, talks with UGent and UHasselt continued and those with KU Leuven reached a final stage.

5 *FWO SBO and TBM are placed by Flemish universities under the 3rd flow of funds. As we have placed both funding channels under the 2nd flow of funds since 2020, we will also do so in 2023 for the sake of comparability. The list of current FWO projects can be found in annex (KPI-4).

8. Short explanation on services in the broad sense: training, consultancy, lab services, expertise, etc. See chapter 4 Services

Output indicators

Table 15. Overview of research output indicators (number of publications and projects) for 2020- 2023 together with the target for 2024.

Publications & projects	2020	2021	2022	2023	2024 (target figure)
Total number of publications	406	422	397	322	/
Share of Open Access publications	333 (82%)	355 (84,1%)	341 (85,9%)	285 (88.5%)	
Number of clinical studies coordinated by ITM-CTU	26	29	32	27	Minimum 18
Number of productive international collaborations per year measured through joint publications (> 10/year)	19	21	21	24	Base 2020: 15, increase annually to 17
Number of new patent applications	1	0	0	1	/6

Impact indicatores

Table 16. Overview of research impact indicators (number of publications and projects) in 2020- 2023 along with the target figure for 2024.

Publications & projects	2020	2021	2022	2023	2024 (target figure)
ISI publications with JIF ≥ 5	74	149	167	140	Base 2020: 60, to be increased annually by at least 2 to 75 (85)
Share of publications in CSS class 3 and 4 (class with highest citations	ECOOM via EWI	ECOOM via EWI	ECOOM via EWI	ECOOM via EWI	
Fraction of peer-reviewed publications cited 1.5x more than the world average of all publications by same type, published in the same year and with the same research discipline	12,1%	20,6%	20,0%	23.4%	Minimum 20%

6 A target number of patents has not yet been defined. However, ITM is committed to strengthening its valorisation potential, including economic valorisation and patents.

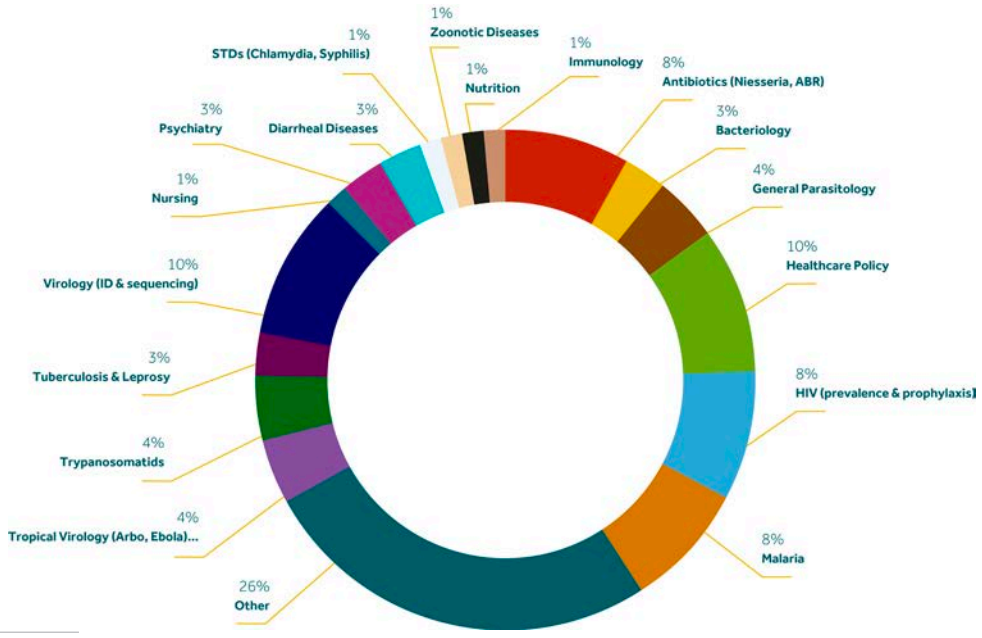
Publications & projects	2020	2021	2022	2023	2024 (target figure)
Number of publicly accessible policy documents, guidelines, recommendations, ... based on ITM research and expertise	14	17	14	22	Base 2020: 8, increasing by at least 1 every 2 years to 10 (12)
EWI grant as leverage funding: ratio of EWI budget to total research budget	9%	12,9%	13,8%	13,1%	Base 2020: at least 85% non-EWI funding (for research) increasing to 90% average by end of covenant

8. Quality, relevance and impact of international exchanges & impact stories

Scientific Impact: In 2023, ITM researchers published 322 peer-reviewed publications, a decrease compared to previous years that seems to be related to the disappearing COVID effect. This output consists of 84% original research articles, with the remaining 16% being reviews, editorials and letters; a similar ratio to 2022. As many as 20% or 65 publications were published in journals with an impact factor of 10 or higher, and in total, there were 43% published in journals with impact factors higher than 5. It is difficult to compare these figures with previous years given that the journal impact factors within the 'infectious diseases' and 'medical sciences' disciplines generally increased significantly due to anomalous publication activity during the COVID pandemic.

However, the scientific impact of 2023 publications is unambiguously reflected in the citation index, with more than 1 in 5 publications achieving an above-average number of citations (CNCI > 1.5, KPI-2) by the cut-off date of 15 March 2024. Web of Science has labelled five 2023 ITM publications as 'Highly Cited' (15/03/2024)[7]

Figure 3. Research topic of publications with high scientific impact 2023 (KPI-2, n=73). Publications were categorised based on the Web of Science meso citation topic categories. (https://clarivate.com/blog/introducing-citation-topics/)



7 Five publications labelled as 'Highly Cited' in Web of Science on 15/03/2024: Coppens J. et al. In J Clin Viro- mpox molecular detection, Vanbaelen T. et al. in STDs - AMR in Neisseria gonorrhoeae, Huerga H. et al. in Lancet Global Health- TB detection in HIV, Bartholomeeusen K. et al. in Nature Reviews - Chikungunya, Angelo K. et al. in Lancet Infectious Diseases - mpox in Geosentinel.

Furthermore, Figure 2 also shows that ITM scores high on scientific impact with the research topics that were put forward as priorities in the ITM research policy plan 2020-2024 *'Global Science for a Healthier World'*:

1. (Re-)emerging viral diseases and the emergence of associated vectors among the impact of climate change (14%) This research fits under research priority 1.
2. Drivers and biological basis of antibiotic resistance and treatment failure in bacterial and mycobacterial infections (14%) These fall under research priority 2.
3. Research on protozoa and the diseases caused by these pathogens remains a unique strength of ITM in which the three departments are active (16%), a cross-cutting objective of this research is to better understand the pathogens and disease and thus accelerate their intended elimination. Research priority 3.
4. Research into how health systems can be better informed and designed, with HIV research remaining strong with research into prevention medication (PREP) in Flanders and now also in low-income countries, but also fast-growing new research lines in (i) maternity care in low-income countries and (ii) prevention and management of non-communicable diseases (21%) All in line with research priority 4.

Societal impact: KPI-6 indicates that ITM research continued to contribute significantly to the creation of policies at national and international levels in 2023. Researchers from the Department of Clinical Sciences provided expert advice to national and international bodies on COVID-19, antibiotic resistance and mpox. The Department of Biomedical Sciences was again cited internationally in 2023 for advice on public guidelines on tuberculosis control and insect vectors that can transmit diseases. Public health researchers in 2023 contributed to publications that had an impact on maternal health policy. This societal impact of ITM research largely stems from the research priorities set for 2020-2024: (1) emerging diseases and outbreaks (7 papers), (2) antimicrobial resistance (3 papers), (3) sustainable health systems and strategies (12 papers). Further details on the nature and content of the contribution is described in annex (KPI-6).

In addition to the 22 publicly available documents prepared on behalf of governments or international organisations reported under KPI-6, ITM researchers also regularly contributed to discussion forums by and with policymakers, unpublished opinions for the Federal Ministry of Foreign Affairs (through policy support for the Directorate General for Development Cooperation) and to several policy recommendations published by non-public third parties.

9. Success, attraction and visibility of the 'Global Campus'

54% of the ITM professors in 2023 have Belgian nationality, 42% are from the EEA (excluding Belgium) and 4% are from outside Europe. 51% of postdoctoral researchers have the Belgian nationality, 24.5% are from the EEA (non-Belgium) and 24.5% from outside the EEA. 59% per cent of junior researchers have the Belgian nationality, 12.8% are from the EEA (non-Belgium) and 28.2% from outside Europe.

Among the group of doctoral students, the 'Global Campus' is most evident with 34% doctoral students from the African continent, 12.3% from Asia, 7% from Latin America, 20% from Europe (excluding Belgium), 21.6% from Belgium and 5.1% from elsewhere.

In the coming years, we want to further focus on the attractiveness and visibility of ITM as a 'Global Campus' to attract excellent researchers through the Marie Curie programmes and ERC, among others. In 2023, 4 Marie Curie postdoctoral individual fellowships were submitted with

ITM as host institution (and co-funding through the EWI grant in case of award) and 2 ERC applications (Bouke de Jong/Advanced Grant & Maria Luísa Simões/ Consolidators Grant). Unfortunately, the ERC Advanced Grant was not awarded. The results of the other submissions are expected in 2024. FWO's new funding channel 'credit for a scientific stay in Flanders' also offers opportunities to strengthen and further internationalise ITM research. The instrument investment grant also offers opportunities to attract international researchers (see below).

c. Research policy and organisation

In March 2018, the institutional 'Research Office' (RO) started with 2 FTE senior staff (Ann Verlinden & Saskia Decuypere) and 0.5 FTE management assistant support (Nathalie Brouwers). Following up on the 2019 EWI recommendations to strengthen the RO, the RO reinforced in 2022with an FTE junior staff member whose main tasks are: DGD FA5 Synergy Programme, follow-up ITM Research Information system (PURE) and data delivery to FRIS, the organisation of the Transferable Skills programme and workshops/trainings/seminars. The coordination role for Belgium in the framework of the Global Health EDCTP3 Joint Undertaking is taken up by Saskia Decuypere who has also been the lead for 'innovation & impact' since mid-2023. Since November 2023, Saskia Decuypere's 'Strategic research funding and bibliometrics' duties were taken over by new staff member Hideko Matsuo. Beyond the tasks already mentioned, the RO supports institutional research policy, monitors the EWI instruments and the research fund, advises on strategic partnerships and institutional cooperation agreements, and monitors academic access to the predoc/PhD/postdoc programme. The ROs 'multivalence matrix' indicating the specific tasks is available on request. The division of tasks can also be consulted by ITM researchers on the internal 'Tropbox' page. Since 2022, the library has also been placed under the Research Office in the organisational chart and in 2023 the new librarian Eva Nijs was recruited. The RO further works closely with the 3 departments including the departmental research managers appointed in 2021, with the Education Office, Development Office, Quality Assurance, 'Contract & Reports office', human resources, IT and the Communications service.

d. Financial report

The following is the financial overview for the spending period 01/01/2022-31/12/2023 of the (i) structural EWI grant as allocated in the 2020-2024 agreement including the increased grant since 2021 as regulated in the addendum to the 2020-2024 agreement and (ii) the investment grant insectary. The detail of the spending is available upon request. According to Article 14 §3 in the Covenant, a maximum of 10% per year of the subsidy granted in a given year may be carried forward as reserves to a subsequent operating year. Total accumulated reserves may not exceed 50% of the annual grant. The overview shows that we remain within the agreed spending percentages.

Table 17. Structural EWI grant agreement 2020-2024 including increased grant since 2021/addendum agreement 2020-2024, spending period 01/01/2023-31/12/2023.

Sum of Sum of AmountLedger	Column Lables													
	SOFI	**CTU 2023**	**ORT 2023**	**PPP**	**Bio-bank**	**Bio Infor-matics**	**OA-Pub**	**People Pro-gram**	**S/M scale research infra-structure**	**GP Data Hub/ Research ZAPs**	**IDEAS Work-shops**	**Valori-sation**	**Research Com-pliance**	**Expenditure 01/01-31/12/2023**
Row Labels														
1 - Staff costs	1,138,541,31	779,145,45	470,683,82	72,376,11	47,580,31	355,921,03		172,403,77		828,075,49		28,529,35	49,977,68	3,943,234,32
2 - Operating costs	589,537,34	17,997,33	73,228,73	110,800,00			60,529,60	20,967,23	468,346,11	174,194,86	31,218,07	1,848,21		1,548,667,48
02417								1,972,60						1,972,60
03791									58,413,13					58,413,13
NA	589,537,34	17,997,33	73,228,73	110,800,00			60,529,60	18,994,63	409,932,98	174,194,86	31,218,07	1,848,21		1,488,281,75
3 - Partner contracts	57,502,90													57,502,90
NA	57,502,90													57,502,90
Expenditure 01/01-31/12/2023	**1,785,581,55**	**797,142,78**	**543,912,55**	**183,176,11**	**47,580,31**	**355,921,03**	**60,529,60**	**193,371,00**	**468,346,11**	**1,002,270,35**	**31,218,07**	**30.377,56**	**49,977,68**	**5,549,404,70**
4 - Organisational costs														
Overhead current year (10%)	178,558,16	79,714,28	54,391,26	18,317,61	4,758,03	35,592,10	6,052,96	19,337,10	46,834,61	100,227,04	3,121,81	3,037,76	4,997,77	554,940,47
TOTAL EXPENDITURE	**1,964,139,71**	**876,857,06**	**598,303,81**	**201,493,72**	**52,338,34**	**391,513,13**	**66,582,56**	**212,708,10**	**515,180,72**	**1,102,497,39**	**34,339,88**	**33,415,32**	**54,975,45**	**6,104,345,17**
Budget 2023 (OH inclusive)														5,443,000,00
Remaining balance 2022														1,462,029,39
Total budget 2023														6,905,029,39
BALANCE BUDGET 2023														-661,345,17
BALANCE (including transfer 2022)														800,684,22
% EXPENDITURE 2023 (excluding transfer)														
% EXPENDITURE 2023 (including transfer)														112,15%
														88,40%

Table 18. Investment subsidy insectary, spending period 01/01/2023-31/12/2023.

	Insectary	Expenditure 01/01-1/12/2023
1 - Operation expenses		
600000	13.389,59	13.389,59
600009	146,73	146,73
600200	54.411,93	54.411,93
610009	-853,52	-853,52
610100	218,58	218,58
610120	491,49	491,49
610180	25.104,19	25.104,19
610190	22,66	22,66
611170	1.412,99	1.412,99
612110	39.523,97	39.523,97
612230	5,37	5,37
612380	1.119,24	1.119,24
612510	2.098,11	2.098,11
612511	1.734,51	1.734,51
612512	2.403,39	2.403,39
613000	567,09	567,09
613010	2.605,98	2.605,98
613120	1.095,32	1.095,32
615100	645,00	645,00
657000	45,23	45,23
Expenditure 01/01-31/12/2023	146.187,85	146.187,85
2 - Organisational costs		
Overhead current year (10%)	14.618,79	14.618,79
TOTAL EXPENDITURE	160.806,64	160.806,64

Budget 2020-2024 (OH inclusief)	1.000.000,00
spending in 2019	169.040,01
expenditure in 2020	331.852,72
expenditure in 2021	47.981,73
expenditure in 2022	209.596,57
expenditure in 2023	160.806,64
BALANCE OF BUDGET 2020-2024	80.722,34
% EXPENDITURE 2023 (excluding expenditure 2019-2022)	16,08%
% EXPENDITURE 2023 (including expenditure 2019-2022)	91,93%

e. Use of EWI grant

1. (i) Use of structural EWI grant as allocated in the 2020- 2024 agreement

The grant from the Flemish Community in 2023 was used to fund the (i) activities of the Clinical Trials Unit (CTU) and (ii) the Outbreak Research Team (ORT), (iii) innovative research at ITM (SOFI), (iv) 'pump priming projects' (PPP), (v) People programme, (vi) small and medium-sized research infrastructure, (vii) supporting Open Access publications, (viii) organisation of an IDEAS workshops and (IX) the support under 'Research compliance' external funders, (X) Biobanking support, (XI) Bioinformatics support (human capital), (XII) Valorisation, Innovation & Impact, (XIV), Research Professors, (XV) Research starting grant,
(XVI) Pulse funding.

2. Clinical Trials Unit (CTU)

ITM established an interdepartmental and interdisciplinary "Clinical Trials Unit" with support from the Flemish Community on 1 July 2004. Its objective was to ensure coordination, quality assurance, efficiency, compliance and technical support for clinical trials of new drugs, vaccines, diagnostics and/or pesticides against human diseases in developing countries, with a focus on malaria, tuberculosis and HIV.

Since 2007, ITM obtained the legal status of "Sponsor" of non-commercial clinical trials, as published in the Official Gazette of 17 January 2007.

Until June 2011, the CTU was an interdepartmental unit guided by a steering committee with representatives from the then participating departments of Parasitology, Microbiology, Public Health and Clinical Sciences, with the head of the CTU responsible for the administration of the Steering Committee. Since July 2011, the CTU has been part of the Department of Clinical Sciences.

The Clinical Trials Unit enables ITM to conduct clinical trials according to the rules of the art and in-house. This capacity is increasingly vital to maintain independent clinical and epidemiological research; both deontologically and regulatively, we must be able to apply the same standards around the world as in Europe. In this sense, it is also important not only to be active in the South in supporting studies but also to maintain the necessary expertise within Belgium/Europe regarding regulations and implementation of guidelines for 'Good Clinical Practice' (ICH-GCP).

Since 2017, the CTU not only supports studies in the South but also studies in Belgium/Europe, initiated by (or in collaboration with) ITM researchers and with potential relevance for the South.

In late 2020, ITM was invited to participate in a COVID vaccination study organised by Johnson & Johnson (Janssen Pharmaceutica)., Johnson & Johnson's COVID vaccination study was just one of several clinical trials in which ITM was asked to actively participate as a clinical site for the recruitment and follow-up of study participants. Until recently, however, no dedicated infrastructure was available within the ITM buildings and studies were therefore organised in a temporary setting: a part of ITM's cafeteria was transformed with a modular system into a site for clinical studies. Thanks to the Flemish Government's 'Flemish Resilience' initiative, the necessary subsidies were obtained to carry out the necessary infrastructure works whereby (part of) the cafeteria was renovated into a fully-fledged clinical site. The Clinical Trial Site (CTS), was officially opened in September 2022 and, together with the CTU, forms the Clinical Trial Centre (CTC).

The CTU focuses on all trial management activities (clinical project management & monitoring, data management, statistics) of academic clinical trials. The CTS, on the other hand, focuses on trial operational activities, i.e. the recruitment and medical follow-up of study participants throughout the study. The CTS team consists of study nurses and study physicians who, together with a study coordinator and the ITM principal investigators, ensure the smooth running of the clinical studies, in consultation with academic and life sciences partners who act as sponsors and provide the necessary funding. The salary costs of the CTS staff are borne entirely by the CTS itself, based on the income it receives from working with these partners. A large part of the CTU staff's fixed salary costs and limited general operating costs are financed by the EWI grant. Part of the salary costs, the operating budgets for the clinical studies themselves, the costs of the participating departments, the support of the South partners and most of the CTU's project-specific operating costs are paid through other budgets (ITM, DGD Framework Agreement, external project funds including EDCTP, Horizon 2020).

As of 31 December 2023, the CTU team consisted of 14 employees (11.3 FTE):

- Yven Van Herrewege, Head of Service (100% FTE);
- Els Genbrugge, Biostatistician (50%)
- Achilleas Tsoumanis, Biostatistician (40%);
- Bart Karl Jacobs, Biostatistician (50%)
- Annelies De Hondt, Clinical Trials Scientist (80%);
- Natascha Herssens, Clinical Trials Scientist (80%);
- Carolien Hoof, Clinical Trials Scientist (100%);
- Lindsay Poppe, Clinical Trials Scientist (100%)
- Gaetan Van Aelst, Clinical Trials Scientist (100%)
- Harry van Loen, Clinical Data Manager (100%);
- Diana Arango, Clinical Data Reviewer (80%);
- Christophe Burm, Clinical Data Manager (50%);
- Hanne Landuyt, Clinical Data Reviewer (100%)
- Elke Verlodt, Clinical Data Manager (100%)

The CTU provides support to ITM researchers in organising, supporting and coordinating both (1) clinical trials and (2) other interventional studies in humans, as well as support for (3) observational studies.

For clinical studies, the ICH-GCP definition is used:

"Any study in human subjects intended to determine or confirm the clinical, pharmacological and/or other pharmacodynamic effects of one or more investigational medicinal product(s), and/or to determine any adverse effects of one or more investigational medicinal product(s), and/or to study the resorption, distribution, metabolism and excretion of one or more investigational medicinal product(s) with a view to establishing the safety and/or efficacy of the investigational medicinal product(s)."

Thus, according to this definition, a clinical trial is a study in which a 'drug' (medicine) is administered and evaluated. Studies in which there is no intervention with a drug are not clinical trials per ICH-GCP definition.

However, if there is some form of intervention (e.g. with a health product not recognised as a 'medicine', with a diagnostic test or other additional procedures that are not part of a standard routine examination), these are interventional studies.

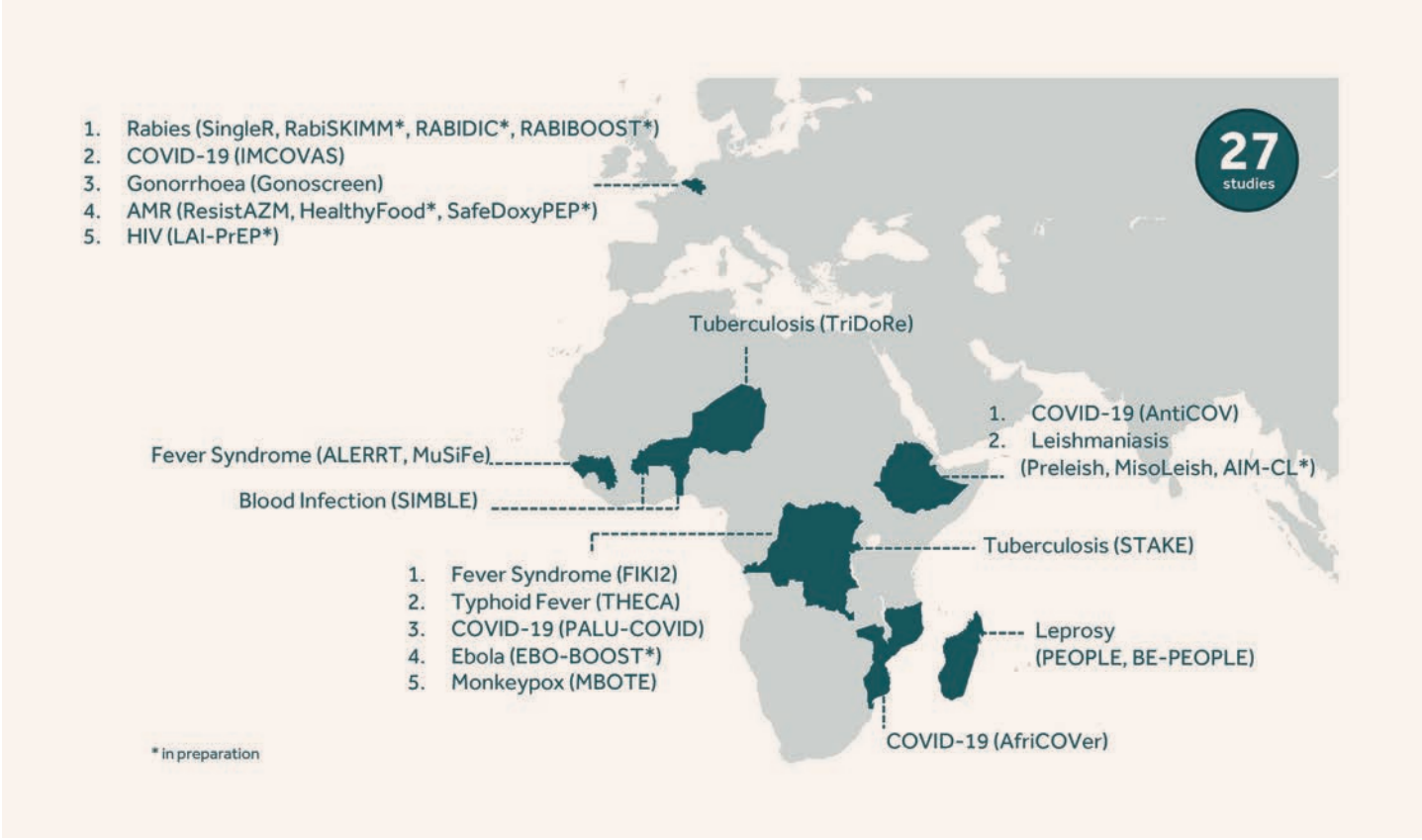
In addition to these interventional (clinical) studies, the CTU also supports observational studies. These are studies in humans in which there is only observation; there is no intervention as a result of a study protocol and study participants are only followed up based on their routine treatment.

In 2023, the CTU provided support to 27 studies, broken down as follows (see also list KPI-3 in annex):

a. Clinical Studies (i.e. 'Clinical Trials' according to ICH-GCP definition): 18
b. Interventional studies: 2
c. Observational studies: 7

A more comprehensive report on the specific studies and activities of the CTU is available upon request. The figure below shows the 27 studies that CTU supported in 2023:

Figure 4. Overview of CTU-supported studies in 2023.



3. Outbreak Research Team (ORT)

ITM has long held a leading role in research on disease outbreaks in the tropics. To maintain this international leadership role, and to further develop its own epidemic research with partners in Europe, Africa, Asia and South America, ITM initiated the establishment of an Outbreak Research Team (ORT) in 2017 with support from the Flemish Community. The overall scientific objective of the ORT *is to generate new knowledge that allows to improve the prevention, detection and control of infectious disease outbreaks*. In 2017, ORT's two-part mission was formulated as follows:

I. Inter-epidemic research activities

The ORT works on interdisciplinary lines of research leading to

a. new knowledge on the driving forces behind epidemics, thus generating insights on how best to prevent and control outbreaks

b. new, innovative tools, methods and procedures for diagnosis, case management, prevention and control.

The ORT focuses on **three types of outbreaks** that on the one hand are rep ntative of all possible infectious disease outbreaks, and on the other hand fall within the ITM's specific thematic and disciplinary research fields:

a. Viral infections transmitted by mosquitoes (arboviral infections), this group of diseases includes dengue, chikungunya, Zika and yellow fever and typically occur as seasonal outbreaks;

b. Infectious disease outbreaks frequent in emergency settings, this group includes measles, cholera, meningitis, malaria; but also outbreaks of viral haemorrhagic fevers and influenza in low-resource settings, and outbreaks in the context of elimination programmes;

c. Antibiotic resistance spread, globally recognised as one of the biggest public health threats with a disproportionate impact on the healthcare systems of low- and middle-income countrie

Furthermore, within the inter-epidemic component, the ORT should also build a research network with relevant actors in the South and the North to immediately set up collaborations in a timely and efficient manner in the event of an outbreak.

II. Epidemic survey response

The ORT is always ready to deploy to places where acute epidemics take place and ensure a timely interdisciplinary investigative response on site. The team formulates ad hoc research questions relevant to the acute epidemic in question. These will be congruent with inter-epidemic research lines; amongst other things, this can include validation/implementation of developed methods, tools, procedures..

By 2023, there were a total of 37 ongoing ORT projects (KPI-5, list in annex). Several outbreaks in Europe were investigated: the outbreak of mpox throughout Europe and scabies in Belgium. The ORT also provided scientific advice to ECDC and EFSA on vectors and vector-borne diseases and was involved in risk analysis "Findings of overwintering Aedes albopictus (asian tiger mosquito) populations in Belgium, 2023" organised by the RAG (Risk Assessment Group, Belgium). Since 2023, the ORT has been part of the Belgian Pandemic Intelligence Network (BE-PIN), which brings together academic policy actors in infectious disease prevention and control in Belgium. Outside of Europe, the ORT conducted research on cholera in south-western Cameroon, mpox in DRC, Rift Valley fever in Rwanda and Burundi, an outbreak of skin ulcers in Burundi and viral haemorrhagic fever in Guinea, and on the cause of acute fevers in the Amazon rainforest. It is important that ITM creates a favourable environment for research in emergency situations, thanks, for example, to the Institutional Review Board (IRB) that ensures rapid review (4 working days) of research protocols for outbreaks, and to the rapid support provided when needed by the Data Protection Officer (DPO).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Since 2022, an iterative process tried to clarify the governance model for the ORT. In the context of departmental autonomy and accountability, it was decided in 2023 that the budget for ORT provided on the EWI grant (600K staff + 50K operating funds) would be shared equally among the departments. It was also decided not to replace the previously appointed administrative coordinator but to follow the usual departemental management processes and, when exceptional circumstances require specific coordination, to organise ad hoc interdepartmental coordination by the department/management committee.

The departments spent the allocated ORT budget on the ORT objectives and more specifically on: (i) salaries of 2-3 core ORT members, (ii) salary cost of additional staff working on outbreak research according to the needs and expertise required (flexible deployment), (iii) limited operating budget.

The 2023 EWI grant for the ORT was largely used to fund permanent ORT members (see list below). In addition, the funding was used to a limited extent for operating costs and to provide specific staff support for (i) research on arbovirus infection rates of Aedes mosquitoes in Cambodia whose results were can be used in future outbreaks and ii) research in the context of a cysticercosis outbreak in Lier.

Permanent ORT team composition:

- Epidemiologist - Soledad Colombe from the Department of Public Health
- Entomologist - Wim Van Bortel from the Department of Biomedical Sciences
- Epidemiologist - Elise De Vos from the Department of Clinical Sciences
- Laboratory expert - Eugene Bangwen from the Department of Clinical Sciences
- Clinical researcher One Health - Isabel Brosius from the Department of Clinical Sciences
- Molecular Biologist - Philippe Selhorst from the Department of Biomedical Sciences
- Social scientist - Marie Meudec from the Department of Public Health

4. SOFI

A total of 16 SOFI projects were supported in 2023. SOFI projects are innovative research projects that aspire to push the boundaries of knowledge and its applications. In 2023, five projects from the 2018 round, five projects from the 2021 round and six projects from the 2023 round were supported.

A list of SOFI projects supported in 2023 is presented below. Full activity reports will be kept available upon request. For the 2023 projects, cooperating FA5 DGD partners could - if the requirements were met - apply for up to EUR 80,000 per project in 'DGD-FA5 Synergy Funds' to finance research capacity-building activities that were deemed essential to optimally implement the proposed SOFI research. Of the six approved projects, three are with FA5- DGD- Synergy funding.

The SOFI procedure requires a mid-term review halfway through the project period by the panel of external experts that will recommend whether to continue or discontinue the project, or make recommendations. The management committee makes the final decision on whether or not to continue the projects. The mid-term review of the SOFI-2021 projects took place in 2023. Four of the five projects received positive recommendations. For the 'SNA LEP' project, the panel advised that the project should continue but with the recommendation to submit a clear plan for the rest of the project. The executive committee confirmed the panel's advice and decided to continue the projects, for the SNA LEP project 'Improving leprosy prevention strategies by integrating social

network analysis with spatial and molecular epidemiology data of Mycobacterium leprae in the Comoros' with the condition that the PI and team submit a plan for the rest of the project to the department head.

SOFI 2018 ZCL Morocco
A systemic insecticide to control zoonotic cutaneous leishmaniasis in Errachidia province - Southeastern Morocco: an intervention trial for an innovative vector control tool
(Epco Hasker)
846.485€ | 1/11/2018-30/10/2022 + no-cost extensie tot 31/12/2023

SOFI 2018 SchistoSAM
A proof-of-concept trial to evaluate artesunate/mefloquine as a novel alternative treatment for schistosomiasis in African children
(Manu Bottieau, Katja Polman)
798.609€ | 1/10/2018-30/9/2022 + no-cost extensie tot 31/12/2024

SOFI 2018 CHARHAT-DRC
Cryptic human and animal reservoirs compromise the sustained elimination of gambiense-human African trypanosomiasis in the Democratic Republic of the Congo
(Philippe Büscher, Epco Hasker)
983.673€ | 1/12/2018-30/11/2023 + no-cost extensie tot 31/5/2024

SOFI 2018 MAD-LEI
Aneuploidy and mosaicism: a strategy for early adaptation to drug pressure in Leishmania
(JC Dujardin, Malgorzata Anna Domagalska)
999.814,00€ | 1/10/2018-30/9/2023
SOFI 2018 TriDoRe

Novel high-dose tuberculosis retreatment regimens: how to overcome resistance without creating more
(Lut Lynen, Bouke de Jong)
996.039€ | 1/10/2018-30/9/2024
SOFI 2021 InnoR3TB

Innovate to reduce rifampicin-resistant tuberculosis in Rwanda and beyond-InnoR3TB
(Bouke de Jong, Leen Rigouts, Mazarati, JP)
€599,343.00 | 1/1/2021-31/12/2024

SOFI 2021 VIVAX RES
Mechanisms of P. vivax chloroquine resistance: a transcriptomic/transgenic approach
(Anna Rosanas-Urgell, Eline Kattenberg, Malgorzata Domagalska, Pieter Monsieurs)
€599.226 | 1/1/2021-31/12/2024

SOFI 2021 Metatropics
Clinical research platform for untargeted RNA virus detection in tropical fever patient populations: construction and application.
(Koen Vercauteren, Philippe Selhorst, Kevin Ariën, Marjan Van Esbroeck)
€599.983 | 1/1/2021-31/12/2024

SOFI 2021 PRESTIP
PReventing the Emergence of untreatable STIs via radical Prevention
(Chris Kenyon, Tania Crucitti, Irith De Baetselier, Eric Florence, Patrick Soentjens, Sheeba S Basil)
€527.953 | 1/1/2021-31/12/2024

SOFI 2021 SNA_Leprosy
Improving leprosy prevention strategies by integrating social network analysis with spatial and molecular epidemiology data of Mycobacterium leprae in the Comoros
(Koen Peeters, Epco Hasker, Bouke de Jong)
€ 590.752 | 1/1/2021-31/12/2024

SOFI 2023 TRYPTACKLE
Tackling the livestock parasite *Trypanosoma congolense* by targeting invariant surface proteins.
(Jan Van Den Abbeele, Pieter Monsieurs)
€ 600.000 | 1/1/2023-31/12/2026

SOFI 2023 CLIMB
The impact of rapid CLIMate change on the Biodiversity- health interface
(Ruth Müller, Kevin Ariën, Marco Brustolin)
€ 599.908 | 1/1/2023-31/12/2026

SOFI 2023 PrEP roll-out female sex workers
How to optimize the PrEP roll-out and HIV prevention among female sex workers in Burkina Faso?
(Bernadette Hensen, Bea Vuylsteke, Christiana Nöstlinger)
€599.993 | 1/1/2023-31/12/2026

SOFI 2023 AIM-CL
Antimicrobial adjuvants to revert the Imbalance of skin Microbiotafor improved outcomes of Cutaneous Leishmaniasis treatment in Ethiopia
(Johan van Griensven, Pieter Monsieurs, Myrthe Pareyn)
€599.982 | 1/1/2023-31/12/2026

SOFI 2023 RABISKIMM
Skin imprinting in intradermal rabies vaccination: a prioritized outcome in vaccine trials?
(Wim Adriaensen)
€599.998 | 1/1/2023-31/12/2026

SOFI 2023 Prevention strategies of epidemic spread
Improving disease prevention strategies of epidemic spread by integrating socio-spatial characterization of human mobility, environmental typology and mathematical modelling in an urban system of Cuba
Veerle Vanlerberghe, Maria Eugenia Toledo (CU), Katharina Kreppel, Claudia Nieto, Dennis Perez (CU)
€600.000 | 1/1/2023-31/12/2026

5. PPP

PPPs are designed to investigate and provide proof of concept for new scientific hypotheses. Ideally, the project results in preliminary findings that can be used to develop a project proposal for submission to external funders (max budget is €25,000). Joint PPPs or joint PPPs are PPPs between ITM and other research institutions where ITM and the partner each contribute 50% financially to the project.

In 2023, 1 more jPPPs ran under the 2022 'standing mechanism': this is for projects that were submitted to external funders and were not awarded there despite good review scores. The award of the jPPP is intended to increase the chances of being awarded when resubmitted.

The (j)PPP-2023 call projects also started on 1/1/2023, four of them with UAntwerpen also participating in the call. The projects run for 9 months, with a 'default' no-cost extension of 3 months. Of the 7 projects awarded, there was also 1 jPPP project with DGD-FA5 synergy funding for FA5 partner CRUN ('Introducing a Malaria Vaccine into a Vaccine-Hesitant World').
For most projects, it is too early to report on follow-up projects.

In 2023, the management committee decided to reserve the competitive joint Pump Priming Calls from now on to calls in collaboration with UAntwerpen or other universities that contribute institutional co-funding to the call. The standing call mechanism is retained, but has been extended to an 'upfront' mechanism where the PI(s) identify an external funding call and make a 'case' for a (j)PPP. PI(s) must be admissible as a proposer for the identified call. The following principles apply:

Duration: maximum 12 months. End date of the (j)PPP is deadline submission of full proposal to external funder.

Budget: maximum 20K. Higher amount is possible subject to argument. In case of jPPP, partner contributes same amount (written confirmation, in child contribution allowed). In case of jPPP with FA5 partner, same amount can be requested from FA5-Synergy Fund.

Review: Research Office, with the guiding principle for a positive opinion being the 'fit' of the proposal with the jPPP concept. In case of jPPP Synergy additional advice from the Development Office required. In case of request increased budget, the application is also sent to an external reviewer from the resident SOFI expert panel.

Decision: Executive committee

In 2023, a joint 2024 Pump Priming call was launched together with the University of Antwerp with a reduced budget per project (15K ITM + 15K UAntwerpen). There were 3 projects submitted, of which 1 was ineligible. Two other projects were awarded with start date 15/2/2024.

Table 19. (j)PPPs running in 2023.

Title	Duration	PI ITM	Partner institute (PI)	Status of full proposal submission to external funder
Standing jPPP 'Urban health systems, shocks and resilience: what can we learn from COVID-19?	1/5/2022-31/1/2023	Bruno Marchal	**UAntwerpen** (Josefien Van Olmen)	FWO fundamental research project 2023 submitted, not awarded. Will be resubmitted in 2024 round.
jPPP 2023 Identification of the T-cell receptor (TCR) repertoire present in patients with long-term joint pain during chronic chikungunya virus disease.	1/1/2023-30/9/2023	PI: Dr. Koen Bartholomeeusen CI: Prof. Dr. Kevin Ariën	**University of Antwerp :** PI: Prof. Dr. Benson Ogunjimi CI: Prof. Dr. Kris Laukens CI: Dr. Pieter Meysman	
jPPP 2023 The adaptation of instruments to Assessing the influence of social networks on chronic disease management (CIM) among non-EU migrants in Belgium: A pre-test study in Antwerp	1/1/2023-30/9/2023	Joris Michielsen	**UAntwerpen** PI: Josefien van Olmen	
jPPP 2023 Mapping rodent viruses across a biodiversity gradient in Morogoro, Tanzania	1/1/2023-30/9/2023	Philippe Selhorst (PI) Kevin Ariën (co-PI)	**UAntwerpen** Herwig Leirs (PI UAntwerp) Joachim Mariën (co-PI UAntwerp)	

jPPP 2023 The diagnostic potential of CD8 T cells in the context of historical infection	1/1/2023-30/9/2023	Koen Vercauteren Co-PI: Wim Adriaensen	**UAntwerpen** PI: Kris Laukens Co-PI: Pieter Meysman Co-PI: Benson Ogunjimi	
jPPP 2023 Elucidation of the molecular basis of host receptor recognition by recombinantly obtained Plasmodium vivax tryptophan-rich antigens (RecTRAgs)	1/1/2023-30/9/2023	Anna Rosanas-Urgell	**UAntwerpen** Yann Sterckx	FWO 2023 fundamental project round
jPPP 2023 Dengue in the coastal areas of Tanzania - a ticking time bomb	1/1/2023-30/9/2023	Katharina Kreppel	**Nelson Mandela African Institute of Science and Technology (NM-AIST), Tanzania:** Dr. Elingarami Sauli Nkya (MD, PhD)	
jPPP 2023 Introducing a Malaria Vaccine into a Vaccine-Hesitant World	1/1/2023-30/9/2023	Koen Peeters	**CRUN, Burkina Faso** Halidou Tinto	FWO 2023 fundamental project round

6. People programme

The People programme supported in 2023:

(i) Support policy competitive mandates: award of an incentive bonus (bench fee, available until 31/10/2024 foreseen end of FWO mandate) to Sara Van Belle, FWO senior postdoctoral researcher, to Lenka Benova, FWO senior postdoctoral researcher and Christophe Van Dijck, FWO junior postdoctoral researcher.

(ii) 'high potential'/People-receiving mandate was awarded to: (i) Dr Malgorzata Domagalska, leading Leishmania expert in the Molecular Parasitology Unit to bridge a funding gap towards future external funding opportunities/ a permanent position as an academic leader, (ii) Postdoc trainee Rornald Muhumuza Kananura who was invited to interview in the 2023-FWO postdoc round but was not awarded the FWO postdoc. The postdoctoral training grant should allow him to resubmit in the 2024-FWO postdoctoral round, (iii) (1/8/2022-30/7/2023) Saleh Aljadeeah on condition that he would apply for a postdoctoral follow-up mandate on external funding. He was successful in obtaining a springboard grant from the King Baudouin Fund 'Fund Maurange' (= 'Springboard grant to help talented postdoctoral researchers in applied research in primary care to launch their research career') and on 1/12/2022, he submitted an FWO junior postdoctoral application

(unsuccessful); (iv) Peter Macharia, 12 months, starting April 2023 on condition that he submits an FWO postdoc application (submitted 2023 FWO postdoc round, in process).

7. Small and medium-sized research infrastructure

In 2021, ITM launched a call for 'Small to medium-sized research infrastructure', this is research infrastructure with a total funding cost of a minimum of €50,000 and a maximum of 500 000 euros. The ITM departments submitted priority needs for research infrastructure to the ITM Steering Committee. The funding percentage charged on the EWI grant was 80% (20% co- funding by the relevant department). In case more than 1 department can use the research infrastructure, the percentage could be increased to 100%. Under the call, the following infrastructure was funded in 2023:

(i) Residual Amount Update Research Infrastructure Genome Platform. The 'Genome Platform' is a cluster of shared laboratory spaces for molecular biology work within the Department of Biomedical Sciences.

(ii) Residual amount nCounter (expenditure 2022, Virology, Entomology, Experimental & Clinical Immunology). The nCounter® analysis system enables the profiling of hundreds of mRNAs, microRNAs, SNVs, CNVs or proteins on a single platform with high sensitivity and precision. This platform is useful for all biomedical and clinical research units with studies on pathogens (viruses, bacteria and parasites), host response, (innate) immune responses, metabolic pathways, immune depletion, inflammasome, pathogenesis, etc.

In 2023, the renewal of autoclaves in our high-security labs Virology and Mycobacteriology was funded by EWI funding. Autoclaves are used to sterilise used material and disinfect waste from our labs so that it is safe to dispose of conduct.

Also in 2023, calibration costs were subsidised with the EWI grant.

The second call for 'Small to medium research infrastructure' was launched in 2023. The spending of the selected proposals spans 2023 & 2024. In 2023, these were:

(i) Investment in 'Geospatial capacity' (hardware, software, data) : 'Putting ITM on the map - Consolidating and expanding geospatial capacity across departments to competitively establish ITM in the world of spatial epidemiology';

(ii) Ultrasonic humidifiers for the Applied Technology and Manufacturing (TT&P) animalarium & freezing device for TT&P's cryo biology bench;

(iii) Series of magnets (1x EasyEights for purification, 6x EasySep 50 for PBMC isolation) & LUNA-FX (including 2-year warranty, IQ/OQ/IPV, QC and validation package).

8. Supporting Open Access publications

Under SO1 and SO3, Open Access publication costs can be paid with the EWI grant if the following criteria are met: (i) original research paper resulting from a SOFI/PPP project after the SOFI funding has ended; resulting from (ii) original research paper resulting from an externally funded project whose funding has ended and published in a Q1 journal as assessed in the *Clarivate Science Citation Index Expended* (SCIE). Q1, short for first quartile, is the top 25% of journals in the subject category in which the journal is classified.

In 2023, it involved:

Out of sight, out of mind? Evidence from cross-sectional surveys on hidden caesarean sections among women with stillbirths in Ghana, 2007 and 2017
Zethof, S; Christou, A; (...); van den Akker, T
Jun 2023 BMJ Global Health 8 (6)
https://gh.bmj.com/content/8/6/e011591

Facilitators and barriers of implementation of routine postnatal care guidelines for women: A systematic scoping review using critical interpretive synthesis
Benová, L; Semaan, A; (...); Duclos, D
2023 Journal of Global Health 13
https://jogh.org/2023/jogh-13-04176

Wealth-based inequality in the continuum of maternal health service utilisation in 16 sub-Saharan African countries
Asefa, A; Gebremedhin, S; (...); Benová, L
Oct 2 2023 International Journal for Equity in Health (22) 1
https://equityhealthj.biomedcentral.com/articles/10.1186/s12939-023-02015-0

Neonatal and perinatal mortality in the urban continuum: a geospatial analysis of the household survey, satellite imagery and travel time data in Tanzania
Macharia, PM; Benová, L; (...); Hanson, C
Apr 2023 BMJ Global Health 8 (4)
https://gh.bmj.com/content/8/4/e011253

Exploring the urban gradient in population health: insights from satellite-derived urbanicity classes across multiple countries and years in sub-Saharan Africa
Macharia, PM; Pinchoff, J; (...); Benova, L
Oct 2023 BMJ Global Health 8 (10)
https://gh.bmj.com/content/8/10/e013471

Stillbirth rates and their determinants in a national maternity hospital in Phnom Penh, Cambodia in 2017-2020: a cross-sectional assessment with a nested case-control study
Christou, A; Mbishi, J; (...); Delvaux, T
Oct 21 2023 Reproductive Health 20 (1)
https://reproductive-health-journal.biomedcentral.com/articles/10.1186/s12978-023-01703-y

No Varicella Zoster Virus Infection among Mpox Cases in Antwerp, Belgium
Coppens, J; Liesenborghs, L; (...); Van Dijck, C
Dec 2023 American Journal of Tropical Medicine & Hygiene, 109 (6) , pp.1282-1283
https://www.ajtmh.org/view/journals/tpmd/109/6/article-p1282.xml

Presymptomatic viral shedding in high-risk mpox contacts: A prospective cohort study
Brosius, I; Van Dijck, C; (...); Liesenborghs, L
May 2023 Journal of Medical Virology 95 (5)
https://doi.org/10.1002/jmv.28769

Using the multiple streams model to elicit an initial programme theory: from policy dialogues to a roadmap for scaling up integrated care
Martens, M; van Olmen, J; (...); Van Belle, S
Sep 2023 BMJ Global Health 8 (9)
https://doi.org/10.1136/bmjgh-2023-012637

Malaria Molecular Surveillance in the Peruvian Amazon with a Novel Highly Multiplexed Plasmodium falciparum AmpliSeq Assay
Kattenberg, JH; Fernandez-Miñope, C; (...); Rosanas-Urgell, A
Apr 13 2023 Microbiology Spectrum 11 (2)
https://doi.org/10.1128/spectrum.00960-22

Geostatistical analysis of active human cysticercosis: Results of a large-scale study in 60 villages in Burkina Faso
Dermauw, V; Van De Vijver, E; (...); Carabin, H
Jul 2023 PLOS Neglected Tropical Diseases 17 (7)
https://doi.org/10.1371/journal.pntd.0011437

Diagnosing Viral Infections Through T-Cell Receptor Sequencing of Activated CD8+ T Cells
Vujkovic, A; Ha, M; (...); Vercauteren, K
Feb 14 2024 Journal of Infectious Diseases 229 (2) , pp.507-516
https://doi.org/10.1093/infdis/jiad430

Conditions for health system resilience in the response to the COVID-19 pandemic in Mauritania
Kirsten Accoe ; (...) ; Marchal, Bruno
Volume 8, Issue 12, BMJ Global Health
https://doi.org/10.1136/bmjgh-2023-013943

9. Organisation of a IDEAS workshop

The EWI grant is also used to organise 'IDEAS workshops'. There are 2 types: 1. workshop/ conference to identify new research projects; 2. workshop to design a research application for a specific research call.

Were supported in 2023:

IDEAS workshop Type 1: support ITM Colloquium 2023 '"Understanding the global landscape of disease burden in the context of climate change", https://www.itg.be/en/events/itm-colloquium-2023

IDEAS workshop Type 2 'Developing a Dengue Research Project in Tanzania for the FWO Research Project Call 2024' (Prof Katharina Kreppel)

10. Support Research Compliance

In late 2022, a staff member was recruited in the Quality Department to provide support in the context of 'research compliance' from external funders (e.g. NIH). This staff member was also funded on the EWI grant in 2023.

11. Support Biobanking

40% salary support for ITM biobank manager

12. Bioinformatics support (human capital)

To strengthen 'human capital' in bioinformatics: Salary cost of bioinformaticians in Department of Biomedical and Clinical Sciences.

13. Support valorisation, innovation & impact

From 1/7/2023, 50% of Saskia Decuypere's salary cost was paid for the purpose of valorisation, innovation & impact (HI4A).

14. Research professors

The research position '(Re-)Emerging Infectious Diseases' has been filled by Prof Laurens Liesenborghs, former postdoctoral researcher of the ITM Outbreak Research Team, since August 2022. His research interests mainly concern mpox. Furthermore, ITM in 2023 the new research professor 'Experimental Immunology' Maria Luísa Simões (she/her). The original proposed research ZAP 'One Health' was reoriented to a research ZAP 'Emerging Viruses' with a primary focus on the biomedical aspects of newly emerging viruses, such as the ecology of viruses with zoonotic potential (with a strong field component) or the development of new biomedical strategies in the fight against vector-borne viruses (such as new concepts for vaccination and interference with the pathogen in the vector). This additional research ZAP in the domain of the virology, should better arm us in the response to new epidemics caused by viruses. The recruitment process ran through 2023 and the position will be filled from February 2024 by Joachim Mariën, also a former postdoctoral researcher in the ITM Outbreak Research Team..

15. Research starting grant

The 'Research starting grant' is awarded to newly recruited professors to strengthen a research line and/or build a research team. The starting grant is expressed as the equivalent for a postdoc salary for 2 years (€190,000). For research professors, the research start-up grant is covered by the EWI grant. For regular professors, the start-up grant is half funded by the EWI grant (95,000€) and half by the department (95,000€).

Christophe Van Dijck started in 2023 as a postdoctoral researcher in Laurens Liesenborghs' unit on his Research Starting Grant. Van Dijck also submitted an FWO junior postdoctoral application in 2022 (submission date 1/12/2022/) and was successful. His FWO postdoc mandate started on 1/11/2023.

Professor Wim Adriaensen, appointed in 2021, used his 'Research Starting Grant' in 2023 to pay the salary of junior researcher Janne Wouters. Wouters will submit an FWO aspirant application in the 2024 FWO round.

On the 'Research Starting Grant' of professors Kathy Kreppel and Karina Kielmann, recruited in 2021, and professor Bernadette Hensen, recruited in 2022, started in 2023 were postdoctoral researcher Mattew Watts, postdoctoral researcher Mohammed Limbada and junior researcher

Sawah Engy. Watts and Limbada submitted a junior FWO postdoctoral application at the 1/12/2023 deadline.

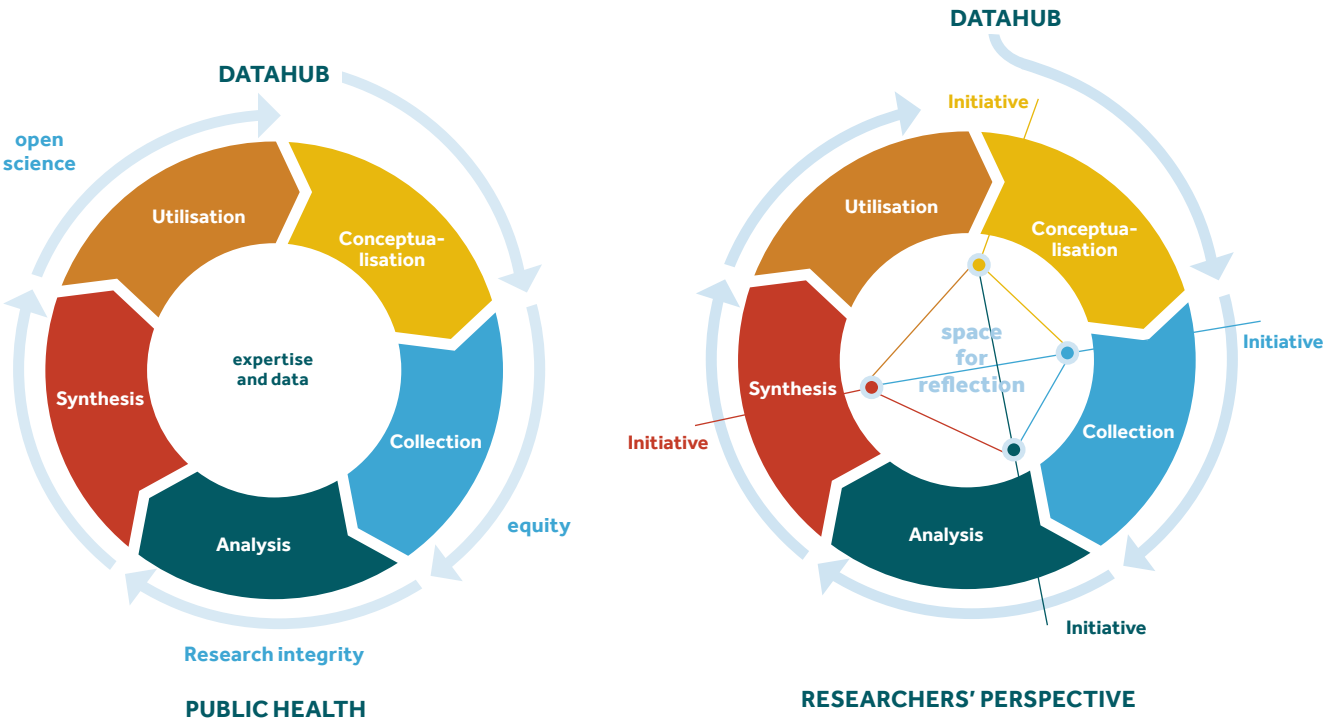
16. Impulse research infrastructure insectarium

In 2020, ITM was awarded an investment grant of €1,000,000 by the Flemish Ministry of Economy, Science and Innovation for the development of an insectarium (see below). In 2023, the insectarium invested in the purchase of additional fluorescence microscopes..

17. Datahub

The data hub aims to support researchers and valorise expertise in terms of collecting, exchanging, analysing, integrating, and using data. Thematically, the focus is on how populations in various contexts are affected by and cope with health challenges. The data hub has the ambition to go beyond storing and making available ready-made datasets and aims to screen critical points in the chain of data-related processes and transform them where necessary.

Figure 5. Visualisation of data hub operation.



The data hub activities are initiated from the perspective of researchers in the fields of public health and global health. Seven initiatives were launched in 2022 that continue into 2023, and 3 new initiatives were launched in 2023 (see list below). A summary of each of these initiatives is available on the datahub website. [Website update is pending].

1. Development and sharing methods that facilitate interdisciplinary research. Contact: Claudia Nieto. Started in 2022. Developed into long-term core theme "interdisciplinarity".
2. Conduct a literature review (systematic search and critical analysis) and formulate guidelines on health research and data on racial groups. Contact person: Marie Meudec; started in 2022.
3. Provision of R code for disease frequency estimates using Bayesian hierarchical spatial approaches. Contact person: Tine Verdonck. Developed into long-term core statistical topic.
4. Making quantitative survey data available for secondary use. Contact person: Lenka Benova. Started 2022.
5. Contribute to a paper on ethical considerations for sharing qualitative data. Contact person: Mira Schneider. Started 2022.
6. Write vignettes to share statistical experiences that do not make it into traditional research papers. Contact: Tom Smekens. Started in 2022. Developed into long-term core statistical topic.
7. Collection of primary data for quantitative social network analysis using digital tools. Contact: Claudia Nieto. Started in 2022. Developed into long-term core theme "interdisciplinarity".
8. Host of one round of the BRIDGE mentoring programme to promote research integrity and fairness in epidemiological studies in global health. Contact person: Tine Verdonck. Started 2023
9. Development of a DHIS 2-based data management system, to be tested for leprosy programmes. Contact person: Epco Hasker. Started in 2023.
10. Map data for urban health: on processes that shape decisions on producing and using data for *evidence-informed* policy-making, and on aggregating, linking and interpreting data into multidisciplinary *evidence*. Contact person: Joris Michielsen. Started 2023.

Below is an overview of the 2023 'products' by initiative.

Table 20. Initiatives and output data hub.

Initiative	Type	Year	Availability
1. Interdisciplinarity	Report [document]	2023	On request; presented in Public Health (PH) seminar
2. Data and racialised groups	Peer-reviewed publication of review protocol [document]	2023	https://pubmed.ncbi.nlm.nih.gov/38434645/
2. Data and racialised groups	Website including interesting reads [website and hyperlinks to bibliography], Zenodo Community, ResearchGate Lab	2023	https://linktr.ee/record_itm and https://zenodo.org/communities/record-project/records?q=&l=list&p=1&s=10&sort=newest and https://www.researchgate.net/lab/Race-Conscious-Research-and-Data-RECoRD-Marie-Meudec
3. Software code	Try out one chapter [document including software code]	2023	Available on request
4. Quantitative data	Reflection [document]	2023	https://zenodo.org/records/7966418
6. Statistics	Synthesis [ppt presentation]	2023	On request; presented in PH seminar
7. Social network analysis	Peer-reviewed publication of review protocol [document]	2022 - 2023	https://pubmed.ncbi.nlm.nih.gov/37456573/
8. BRIDGE mentorship	Blueprint [document]	2023	https://zenodo.org/communities/bridge_mentoring/records?q=&l=list&p=1&s=10&sort=newest
9. Data management for programmes	Initiative proposal [document]	2023	Available on request
10. Map data for urban health	Initiative proposal [document]	2023	Available on request
11. Assessment of datasets on medicines for migrants	Initiative proposal [document]	2023	Available on request
12. Experience with data sharing platforms	Conference presentation [video]	2023	https://youtu.be/ZfBinVxkgcc?si=abiJwb6az_Ywt0jy

The data hub consists of a core team (n=4) and researchers (n=12) involved in the various initiatives. The core team is shown in the table below.

Table 21. Core team members involved in data hub initiatives.

Name	Background expertise	Role in the datahub
Tine Verdonck	MD, epidemiologist, statistician (senior researcher)	Overall coordination
Claudia Nieto	Social scientist (senior researcher)	In charge of the theme "interdisciplinarity"; involved in two specific initiatives
Tom Smekens	Social science statistician (predoc)	In charge of the theme "statistics"; link with statistics (software) training for staff and students; involved in three specific initiatives
Stefanie Dens	Architect, expert in urban development (predoc)	In charge of the content of the website and visualisation of datahub activities in general; involved in two specific initiatives

Team members of the data hub are attached to regular units within the Department of Public Health. They are also involved in central or cross-departmental committees and teams, namely the Data Access Committee, Institutional Review Board, Stats Group and Open Science Group.

f. Use of insectarium investment subsidy

The insect-vector-pathogen-host-environment interaction is still greatly understudied. The insectarium enables pioneering interdisciplinary research to address new global health challenges caused by vector-borne diseases. The core group using the insectarium brings together expertise from basic ecology across virology and parasitology to immunology. Its members are Prof Ruth Müller (Entomology Unit), Prof Anna Rosanas (Malariology Unit), Prof Kevin Ariën (Virology Unit), Prof Jan Van Den Abbeele (Trypanosoma Unit), Prof Jean-Claude Dujardin (Molecular Parasitology Unit), and Prof Maria-Luisa Simoes (Experimental Immunology Unit).

A detailed report (in English) is available upon request. For a virtual insectarium tour, please refer to the video at https://www.itg.be/E/itm-insectary .

1. Progress of infrastructure works:

- Module 1, including the extension of a third chamber with a large cage and a state-of-the-art video recording system to study the swarming behaviour of anopheles vectors, is 100% complete. The second chamber of module 1a has been completed, doubling the working space and allowing multiple lines of research to be carried out simultaneously without compromising research quality and biosafety standards. The SOPs for biosafety, mosquito breeding and experimental infections have been completed and are now being reviewed for the second time. Module one is equipped with a Zeiss SteREO Discovery.V12, a fluorescence stereomicroscope. With this equipment, transgenic mosquitoes expressing fluorescence markers can be imaged and analysed. A 'capillary puller' (Sutter Instruments) was purchased that can be used to create borosilicate and quartz capillaries for microinjection of adult mosquitoes and embryos. This equipment meets the needs of all three modules. In addition, a Nanoject III (Drummond Scientific) is now available for microinjection into this module.
- Module 2 for experimental infections of tsetse flies, sand flies and Anopheles mosquitoes is now 100% complete. Infection studies with tsetse flies are regularly carried out in this insect module. In addition, a first experimental infection of sand flies by Leishmania has been successfully conducted in the ACL2 insectarium and the SOPs have been completed and reviewed by the biosafety experts. However, with the advent of the new ZAP Experimental Immunology in 2023, the need arose to expand Module 2 to include genetic modification of Anopheles mosquitoes and respective experimental mosquito infection with the Plasmodium parasite, for which departmental and EWI funding for infrastructure has been used. The development of SOPs for these activities has progressed significantly.
- Module 3 is now 100% complete. This ACL3 insectarium is equipped with 2 climate cabinets, a class II biosafety cabinet, a Daniovision system to realise behavioural studies with infected mosquitoes, an Olympus stereo microscope with software to assess morphometric properties of insects, an Echo Revolve fluorescence microscope and two different feeding systems for experimental infections (Hemoteck and glass-jacketed feeding system). A total of six experimental infections were carried out in the new ACL3 insectarium in 2023 (4x Chikungunya virus; 2x Mayaro virus). A Nanoject III (Drummond Scientific) is now available for microinjection into this module. SOPs for experimental infection have been finalised and new revision is underway. By 2023, one postdoc and one technical officer have been trained in working with infected specimens. Training activity is planned to continue in the coming years to increase our capacity in experimental arbovirology. By further training staff in infection studies in ACL3's insectarium, we are contributing to outbreak preparedness in Belgium.

In 2023, the insectarium's work focused on the awarded projects CLIMB (SOFI project), SWARM (Human Frontiers Science Programme), DIMOC (EU BiodivERsA programme), MEMO2+ (NEHAP), Leish-ILIAD (PPP, EWI). In total, the Department of Biomedical Sciences submitted 34 proposals for new research projects focusing on target insect-borne diseases by 2023, of which 16 have been positively assessed (52% success rate) and five are still pending (see details in table below).

2. Impact

We can already report strong interest in the insectarium from the public community, students and researchers. This infrastructure is considered one of the hotspots for research at ITM and can help increase the acceptance of science by public, especially at the forefront of health and biodiversity research. ITM research activities related to the insectarium were picked up more than 100 times by traditional media (press and online) and social media by 2023.

Modules 1-3 are fully established and Module 2 is currently being expanded. The senior researcher in Vector Biology successfully led the establishment of module 3 of the insect infrastructure, crossing joint research activities and promoting scientific exchange between units. As such, the senior researcher plays an essential role in creating of synergistic transdisciplinary research lines between researchers working on vector-borne diseases at ITM and beyond. In 2024, we plan to spend the remaining investment grant to add additional equipment, e.g. an olfactometer and a clean air delivery system to study olfactory interactions between host and vector and between plants and mosquitoes. We made the infrastructure available to other Belgian institutions and international researchers. We plan to offer more training, through the co-promotion of BSc, MSc and PhD students, and to intensify our joint research collaborations. We will train the scientific and technical staff of ITM but also of our partner institutions, e.g. for implementing microinjection techniques to create genetically modified mosquitoes and experimental infection studies (arboviruses, Plasmodium spec., Trypanosoma spec, Leishmania spec.) to be carried out. In addition, we will expand the mosquito repository to meet the needs of all research lines by adding laboratory and field strains, with a special focus on Aedes albopictus from Belgium.

We have collected large datasets in the insect modules, which are currently being prepared for scientific publication. Several research ideas have been developed/submitted and a significant number of new projects have been awarded. The insect infrastructure plays also plays a vital role in the development of research activities programmed in the FA5 programmes (Nepal, DRC, Peru).

We will further discuss the path to increase our impact and perception as a world-class research hub in the field of vector-borne diseases. We aim to create at ITM a major research hub in the field of insect-borne diseases that is not only known for excellent research but also accessible.
The availability to collaborate in a state-of-the-art insectarium at ITM facilitates excellence in high-quality science, relevance, innovation and impact at ITM. The state-of- the-art insectarium will increase critical mass and mutual further enhance scientific exchange on different transmission models of pathogen- vector-host environment. This new biomedical collaboration will also enable cross-fertilisation of techniques from different fields.

Table 22. Proposals in 2023 that rely at least partially on the insectarium.

ITM Promotor/PI	Unit	Funding organisation	Call	Submission year	Proposal type
Kevin Ariën	Virology	VLAIO	VLAIO O&O	2023	Research Project
Jean-Claude Dujardin	Molecular Parasitology	Dioraphte Foundation	Dioraphte call 2023 for research proposals on skin-related neglected tropical diseases	2023	Research Project
Malgorzata Anna Domagalska	Molecular Parasitology	Koninklijke Academie voor geneeskunde van België	Prijs Dubois-Brigué voor tropische pathologie	2023	Research Project
Ruth Müller	Entomology	Koninklijke Academie voor geneeskunde van België	Beurs Dubois-Briqué voor tropische pathologie	2023	Research Project
Ruth Müller	Entomology	EWI	DGD pre-doc grants	2023	Research Project
Jan Van den Abbeele	Trypanosoma Unit	EWI	DGD pre-doc grants	2023	Research Project
Wim Van Bortel	Entomology	FWO	FWO PhD Fellowship Fundamental Research	2023	Research Project
Kevin Ariën	Virology	FWO	FWO PhD Fellowship Strategic Basic Research	2023	Research Project
Kevin Ariën	Virology	FWO	FWO PhD Fellowship Strategic Basic Research	2023	Research Project
Anna Rosanas	Malariology	FWO	FWO PhD Fellowship Strategic Basic Research	2023	Research Project
Anna Rosanas	Malariology	FWO	FWO PhD Fellowship Fundamental Research	2023	Research Project
Jean-Claude Dujardin	Molecular Parasitology	FWO	FWO PhD Fellowship Fundamental Research	2023	Research Project
Kevin Ariën	Virology	FWO	FWO senior research project	2023	Research Project
Anna Rosanas	Malariology	FWO	FWO senior research project	2023	Research Project
Kevin Ariën	Virology	EC	HORIZON-HLTH-2023-DISEASE-03-04: Pandemic preparedness and response: broad spectrum anti-viral therapeutics for infectious dieases with epidemic potential	2023	Research Project
Ruth Müller	Entomology	The Wellcome Trust	Climate impact awards: unlocking urgent climate action by making the health effects of climate change visible	2023	Research Project
Wim Van Bortel	Entomology	FWO	Bilateral research cooperation Québec	2023	Research Project
Jan Van den Abbeele	Trypanosoma Unit	Koning Boudewijnstichting	Grant Fund Poelmans-Van Meulder	2023	Research Project
Kevin Ariën	Virology	Koning Boudewijnstichting	Grant Fund Poelmans-Van Meulder	2023	Research Project
Jean-Claude Dujardin	Molecular Parasitology	Koning Boudewijnstichting	Grant Fund Poelmans-Van Meulder	2023	Research Project
Anna Rosanas	Malariology	EC	HORIZON-JU-GH-EDCTP3-2023-01-01: Global Health EDCTP3 Training networks - clinical research fellowships	2023	Training Network
Kevin Ariën	Virology	EC	HORIZON-JU-GH-EDCTP3-2023-02-02: Advancing point-of-care diagnostics to the market	2023	Research Project
Anna Rosanas	Malariology	FWO	FWO senior postdoc fellowship	2023	Research Project
Anna Rosanas	Malariology	FWO	FWO junior postdoc fellowship	2023	Research Project
Kevin Ariën	Virology	DGD	Individual Sandwich PhD scholarship call ITM-DGD	2023	Research Project
Jan Van den Abbeele	Trypanosoma Unit	DGD	Individual Sandwich PhD scholarship call ITM-DGD	2023	Research Project
Kevin Ariën	Virology	DGD	Individual Sandwich PhD scholarship call ITM-DGD	2023	Research Project
Anna Rosanas	Malariology	DGD	Individual Sandwich PhD scholarship call ITM-DGD	2023	Research Project
Maria Luisa Simoes	Experimental Immunology	EC	ERC Consolidator Grant	2023	Research Project
Kevin Ariën	Virology	KCE	KCE Trials 2023 Investigator-led call	2023	Clinical trial
Ruth Müller	Entomology	Vlaamse Overheid	OMG_VPO_2023_opdrachtBW_044	2023	Service delivery
Anna Rosanas	Malariology	BMGF		2023	Service delivery
Jean-Claude Dujardin	Molecular Parasitology	Horizon Europe	HORIZON-MSCA-2023-DN-01	2023	Training Network
Ruth Müller	Entomology	DGD	DGD pre-doc grants	2023	Research Project
Kevin Ariën	Virology	EWI	jPPP ITM/UA call 2024	2023	Research Project
Anna Rosanas	Malariology	La Caixa	CaixaResearch Health 2024	2023	Research Project

Proposal Title	Stage	Approved
Research towards a prophylactic and therapeutic solution with triple mechanism of action for Dengue	full proposal	yes
Parasite and host determinants of treatment outcome of local therapies for cutaneous leishmaniasis (PAHTROL-CL)	full proposal	no
Understanding the biology and adaptive skills of Leishmania donovani	full proposal	no
Influence of biodiversity and climate change on mosquito-borne disease risk in Europe	full proposal	yes
Godfrey Katusi - Assessing the impact of maize pollen, a locally available mosquito larval food on the fitness parameters of major malaria vectors in rural Tanzania	full proposal	yes
Peter Odhiambo - Integrative approach towards the understanding of the role of tsetse fly saliva-derived miRNA in mammalian host-parasite interaction at the bite site	full proposal	yes
Tine Cooremans: Zoonotic arboviruses: how anthropogenic habitat disturbance impacts the prevalence and diversity.	full proposal	no
Martina Ceconi: Development of virus-specific anti-NS1 antibodies for use in neurotropic flavivirus NS1 antigen capture-based diagnostics	full proposal	no
Hannah Op de Beeck: A novel plasmonic nanoparticle amplified photoelectrochemical detection platform for dengue diagnosis (DeNPec)	full proposal	yes
Dalia Díaz: Determining the role of tryptophan-rich antigens during P. vivax reticuloctye invasion using a functional transgenic P knowlesi model and P. vivax ex vivo assays	full proposal	yes
Anna Escoda Suarez: Identifying the impact of host environmental immunological and metabolic factors on the sexual conversion of Plasmodium falciparum parasites and their transmission	full proposal	no
Orlagh Fennelly: Probing the molecular drivers and cellular features of quiescence in Leishmania donovani .	full proposal	yes
Resubmission: The role of chikungunya virus non-structural protien 3 (nsP3) in modulating cellular pathways in human and mosquito	full proposal	no
Elucidation of the structure-function relationship of reticulocyte binding Plasmodium vivax tryptophan-rich antigens.	full proposal	no
e-FabRIC: Enhanced manufacturing of broadly potent equine polyclonal Fab with a rational immunization strategy against Coronaviruses	full proposal	yes
CLIDEN: Dengue at its invasion front - strengthening the resilience and adaptive capacity to climate-induced impact of dengue disease in Asia, Africa and Europe	full proposal	no
Investigating and defining neglected Bartonella quintana infection and ectoparasitosis among populations experiencing houselessness (ID-BQI)	full proposal	yes
Molecular surveillance of Trypanosoma brucei gambiense using high-throughput sequencing	full proposal	no
Enabling next-generation sequencing diagnostics for acute undifferentiated fevers in the tropics through optimizing host depletion and target enrichment strategies	full proposal	no
Sleeping parasites: a role in the clinical diversity of cutaneous leishmaniasis in Ethiopia?	full proposal	no
Genomic surveillance network in Africa for malaria (GENETAM): Building capacities for public health impact	full proposal	no
TABONO: Tracking African vector borne diseases through point of care diagnostics and a One Healt approach	1st stage	yes
Pieter Moris: Enabling the genomic surveillance of malaria through travelers	full proposal	pending
Katlijn De Meulenaere: A single-cell sequencing approach to understand epigenetic regulation of the P. vivax multigene families	full proposal	pending
Junior Bulabula-Penge: Viral etiologies of patients discharged as non-Ebola virus disease oubreaks in eastern DRC	full proposal	no
Peter Odhiambo: Exploring the non-coding RNA in tsetse fly saliva and its effect on the host innate immune response and trypanosome development at the host skin bite site.	full proposal	yes
Ane De Souza Novaes: Developing, evaluating, and deploying a wet and dry laboratory pipeline for monitoring and characterizing arboviral pathogens using virus-enrichtd metagenomic sequencing	full proposal	yes
Arlette Umugwaneza	full proposal	yes
lowTRANS: Exploiting parasite infection overdispersion in the vector mosquito to control malaria transmission	full proposal	pending
VOCVAC: Level of neutralizing antibodies against the SARS-CoV-2 variant(s) of conern (VOC) targeted by the vaccination after vaccination versus placebo: a randomised multicentric non-inferiority tril in vulnerable and non-vulnerable populations	1st stage	no
Ontwikkeling en berekening van de omgevingsindicator "het voorkomen van exotische muggen in Vlaanderen" om de gezondheidsimpact van de klimaatverandering te monitoren	full proposal	yes
Monitoring the threat of malaria resistance against artemisinin-based combination therapy in sub-Saharan Africa	1st stage	no
PACT: Parasite adaptive skills and how counter them	full proposal	pending
Diana Leyva (UPCH)	full proposal	yes
Development of virus-specific anti-NS1 antibodies and expression system for flavivirus recombinant NS1 for use in neurotropic diagnostic, therapeutics, and vaccination development	full proposal	yes
EpigEpid: Malaria epigenetic epidemiology: a novel approach to investigate natural malaria infections	full proposal	pending

Table legend: red: submitted, confirmation ongoing | green: approved project | grey: rejected project

Services

4

4. Services

4.1 Scientific services

a. Reference and accredited laboratories

Responsible service = Quality

ITM houses reference laboratories on the one hand and accredited laboratories on the other. The reference laboratories are recognised both nationally (government, Sciensano,...) and internationally (WHO, FAO,. . .) and are directly linked to scientific research and expertise in tropical medicine. These laboratories aim to provide both local and international healthcare.

The analyses performed in our laboratories meet the highest quality requirements and our organisation is appreciated both locally and internationally for scientific expertise and advice.

ITM strives to maintain these recognitions in line with our strategic objectives.

Table 23. Overview of the different ITM reference laboratories together with the coordinator and the authority recognising the laboratory as a reference centre.

Reference laboratories	Coordinator:	By:
BCCM/ITM mycobacteria collection.	Leen Rigouts	BCCM
TB Supranational Reference Laboratory - Coordination centre	Bouke De Jong	WGO
Reference laboratory for SURRA	Nick Van Reet en Caroline Rombouts	OIE
Collaborative Centre for Research on and Training in Diagnosis of African Trypanosomiasis	Jan Van den Abbeele	WGO
National Reference Centre for Parasites (Trichinellosis, Echinococcosis and Anisakiasis)	Famke Jansen	FAVV
Reference centre for Animal Trypanosomiasis and its Vectors	Jan Van den Abbeele	FAO
National Reference Centre (NRC) for Arboviruses	Marjan Van Esbroeck	Sciensano
National Reference Centre (NRC) for Sexually Transmitted Diseases (Treponema pallidum, Chlamydia trachomatis, Neisseria gonorrhoeae, Mycoplasma genitalium)	Irith De Baetselier en Dorien Van den Bossche	Sciensano
National Reference Centre (NRC) for Rickettsia and Anaplasma (Consortium with Queen Astrid Military Hospital)	Marjan Van Esbroeck	Sciensano
National Reference Centre (NRC) for Coxiella burnetii and Bartonella (Consortium with ULC-Saint Luc and CODA)	Marjan Van Esbroeck	Sciensano
National AIDS Reference Laboratory	Dorien Van den Bossche	By Royal decree
WHO Collaborating Centre for Diagnostic and Laboratory Support of HIV/AIDS	Kevin Ariën Dorien Van den Bossche	WGO
WHO Test laboratory	Dorien Van den Bossche	WGO
National Reference Centre (NRC) for Tropical and Infectious Diseases	Marjan Van Esbroeck	By Royal decree

Clinical laboratories perform many of the analyses under accreditation. This accreditation is granted by BELAC. In 2022, the first follow-up audit of the 5-year accreditation cycle (2021 to 2026) took place. An overview of the number of analyses accredited according to the various ISO standards is given below. The accreditation certificate for ISO15189 applies to analyses on patient samples. The certificate for ISO17025 applies to evaluation of HIV/SOA diagnostic tests and analyses on animal samples (SURRA and Trichinae). The certificate for the ISO17043 standard applies to the organisation of ring tests for determination of Trichin commissioned by the FASFC.

Table 24. Overview of the number of accredited tests for the various accreditation certificates from 2018 to 2023.

Accredited tests	2019	2020	2021	2022	2023	Accreditated by
ISO15189 (certificate 147-MED)	131	135	135	135	135	BELAC
ISO17025 (certificate 147-TEST)	7	7	7	7	7	BELAC
ISO17043 (certificate 147-PT)	1	1	1	1	1	BELAC

ITM aims to maintain accreditation of testing in line with its strategic objectives.

b. Diagnostics

Responsible service = TTP - Quality

ITM produces diagnostics for neglected diseases, more specifically for detecting Trypanosomiasis or sleeping sickness (CATT T.b Gambiense and evansi and VSG production) and Leishmaniosis (DAT/VL production).

The causative agent of sleeping sickness is Trypanosoma b. gambiense, a parasite transmitted by the tsetse fly. The key to controlling sleeping sickness is early detection. This can be done with

the CATT (Card Agglutination Test), a test developed by ITM in the late 1970s and used massively to detect sleeping sickness in West and Central Africa. Another CATT test can detect infection in animals of Trypanosoma evansi, the causative agent of SURRA.

Because CATT production is labour-intensive and of little commercial interest, there is little or no interest worldwide in developing and producing these diagnostics and availability is dependent on the production of this test at ITM. A total of 908,955 tests for CATT T.b. gambiense and 39,268 tests for CATT T. evansi were produced in 2023.

A summary of VSG and CATT production numbers over the different years is given below.

Table 25. Summary of the number of diagnostic tests produced at ITM from 2019 to 2023

Product	2019	2020	2021	2022	2023
VSG (mg): Litat 1.3 Freeze Dried	0	0	0	0	0
VSG (mg): Litat 1.5 Freeze Dried	0	0	0	0	0
VSG (mg): Litat 1.3 Not Freeze Dried	1,600	939	618	959	1,168
VSG (mg): Litat 1.5 Not Freeze Dried	1524	986	546	1,031	1,486
CATT T.b Gambiense (number of tests)	2,837,807	2,410,168	2,436,756	1,755,597	908,955
CATT T. Evansi (number of tests)	107,853	100,535	95,081	123,260	39,268
DAT/VL (number of bottles)	1,938	5,035	6,177	2,835	0

10 planned productions of CATT T.b. gambiense between April and August 2023 were cancelled based on information given by the Department of Health in Q1 2023. They indicated that the stock in DRC was still sufficient, so the number of tests produced in 2023 was much lower than in previous years. From 2024, the offtake is expected to increase again. VSG (Variant Surface Glycoprotein) is used as the basis for the production of the diagnostic CATT tests. VSG is currently produced only in non-freeze-dried form. The main customers of VSG are Coris and Standard Diagnostics (SD). SD did not purchase VSG in 2022 - 2023, but is expected to purchase again in 2024. The main customer of CATT T.b. Gambiense are the ITM sleeping sickness programme (dep. Public Health), WHO, FIND and DNDi.

There were no productions of DAT/VL in 2023, as there was still plenty of stock. This is because a key customer had reduced its order of 3,200 vials to 1,000 DAT/VL vials in 2022, due to the economic crisis, which means there are still many DAT/VL vials in stock. Shelf life of DAT/ VL antigen is 5 years, so there is no risk of expiry of lots for the time being.

c. Biobank

Responsible service = TTP - Quality

1. ITM-Biobank

The ITM Biobank consists of human, animal material and isolates (bacteria, viruses etc).

Linked to this biobank is a digital Central Register (SLIMS) in which all information linked to the samples is recorded. The management of the ITM Biobank complies with applicable legal provisions and has been registered with the FAMHP since 2019 under number BB190041.
In 2023, a 2- year report was submitted and approved by the Ethical Committee of the UZA.

Human body material used as part of scientific research at ITM should be registered in the ITM Biobank for human samples according to the legal provisions and can only be used for research after a formal approval procedure.

In 2023, the electronic registration system in the software SLIMS was further rolled out and the inventory of non-human material was started. This inventory will continue until 2024. Work was carried out on the digitisation and inventory of the samples and data of Prof. Van Marcke's collection. When this is fully completed, we will review with the biobanks exit committee how we might best make this collection public for in-house and external researchers.

In 2023, work was carried out on an extension of the ITM Biobank policy plan, specifically on the financial part and the practicalities of the exit committee. This is ready to be submitted to the Executive Committee for approval in early 2024.

From 2023, a general description of our static sample collections (residual material clinic) was made public via the directory of BBMRI-ERIC.

Cooperation with those responsible for the biobank of the parasitology unit of the INRB (Kinshasa, DRC) for the implementation of a digital biobanking system continues. A new contact was established with the biobank of ITM partner CRUN (Nanoro, Burkina Faso). As part of this, budget was requested within the FA5 project to provide IT training to local partners to further develop and secure the biobank database.

2. BCCM-collectiom

ITM is part of the consortium of The Belgian Culture Collection of Microorganisms (BCCM). The BCCM consortium was established by the federal government in 1983 to coordinate collections of microorganisms in Belgian institutions.

The BCCM/ITM collection in the secure ITM laboratories contains some 400 strains of non-tuberculosis mycobacteria, but the strength lies mainly in the diversity of >600 tuberculosis (TB) strains, representative of a global diversity of TB variants and TB strains with (a combination of) resistance to common and new antibiotics. In 2013, the World Health Organisation (WHO) transferred management of the largest public research collection of TB strains to BCCM/ITM, quite a scientific honour for ITM. Resistance of TB to antibiotics is a major problem worldwide, helping to ensure that TB remains the number one deadly infectious disease. This collection enables scientists around the world to better understand the disease, help discover new drugs and develop diagnostic tests.

BCCM's operations are ISO9001 certified.

In the period 2020-2023, the collection was expanded with 222 new strains, TB strains showing resistance to the new antibiotics such as bedaquiline, linezolid, delanamid and pretonamid. These include clinical isolates as well as in vitro selected or experimentally mutated strains originating from different continents. To further improve the management of the BCCM collections, the configuration of a new laboratory information management system (LIMS) and making a renewed website more user-friendly was started in 2022. Combined with the further completion of crucial data such as type of mutations, phenotypic resistance, history of BCCM/ITM strains, and accurate migration of data to the new LIMS in early 2023, the data quality of the collections and storage of biological material was raised to a higher level. Scientists will thus have an easier time accessing the variety of strains the collections have to offer through the online BCCM catalogue, and their search for the necessary biological material can refine. Between 2020 and 2023, we distributed 1132 cultures or derivatives to more than 50 external customers from Europe, the Americas and Africa.

d. Institutional Review Board (IRB)

Responsible service Quality

Good research should have both scientific and social value and requires an institutional and personal culture of research ethics, research integrity and fair practices in research collaboration.

ITM is committed to the highest ethical standards for medical and non-medical research involving human participants, human data and human biological samples. The ITM Ethics Committee (IRB ITM) reviews all non-commercial research protocols involving ITM researchers to ensure compliance with appropriate ethical principles and requirements. The IRB strives to avoid unnecessary formalism, towards constructive critical assessment of research aims, context and implications, and through open dialogue with ITM researchers and partner institutions. The IRB also aims to contribute to shaping ethically informed behaviour among PhD and master students, through tailored education and individual counselling and through an ongoing dialogue with Department of Education coordinators and the research office.

As ITM is mainly involved in joint research projects with partner institutions in low- and middle-income countries, the IRB also monitors researchers' compliance with local regulations and ethical rules, and is particularly careful about emerging topics in research ethics, such as data and sample sharing in international research, fair research partnerships and engagement with local communities.

ITM and all its researchers subscribe to the Declaration of Helsinki, the CIOMS Ethical Guidelines for Health-Related Research with Human Subjects and the TRUST Global Code of Conduct for Research in Resource-Poor settings. Moreover, the IRB checks that research complies with applicable regulations, such as the European General Data Protection Regulation (GDPR) and the Belgian Human Body Materials (Biobank) Act. In 2023, the IRB maintained excellent cooperation with the Data Protection Officer and the biobank coordinator, making a concerted effort to improve compliance, the streamline procedures and minimise duplication and unnecessary administrative burdens for researchers. The IRB also launched a new mechanism for accelerated assessment of low- risk studies conducted on retrospective, anonymised clinical data.

Although the IRB operates according to regularly revised and internally approved standard operating procedures, it is not a legally accredited ethics committee as stipulated by Belgian law (RD 4 April 2014). If approval by an accredited ethics committee is legally required, the IRB conducts its review before seeking approval by an accredited ethics committee.

The IRB is chaired by Raffaella Ravinetto and co-chaired by Wim Pinxten, bioethicist at Hasselt University, and Jan Van den Abbeele. By the end of 2023, the IRB will have 12 members, with three experienced female researchers, Tine Verdonck, Tanyth de Gooyer and Grace Marie Ku, who were welcomed as new members during the year. There is a good balance in the representation of ITM's three scientific departments and a precise gender balance.

In 2023, the IRB received and reviewed 142 applications, including 90 new protocols and 52 amendments. Most reviews were conducted during scheduled monthly meetings, but about 22% were accepted for expedited reviews conducted between meetings, for projects related to outbreaks and other public health emergencies and, in some cases, for master's students.

A brief description of how the IRB works and contact details are publicly available on the ITM website (https://www.itg.be/E/institutional-review-board).

Table 26. Summary of the initial assessment results of the different IRB files in 2023.

Protocols	142 (90 new files and 52 amendments)
Approval / conditional approval	85 (59%)
Minor comments	41 (30%)
Substantive comments	14 (8,5%)
Exempt from IRB review	2 (2,5%)

4.2 Medical reference care for, and prevention of, tropical infectious diseases and import pathology (national and/or international)

a. Policy priorities medical services 2020-2024

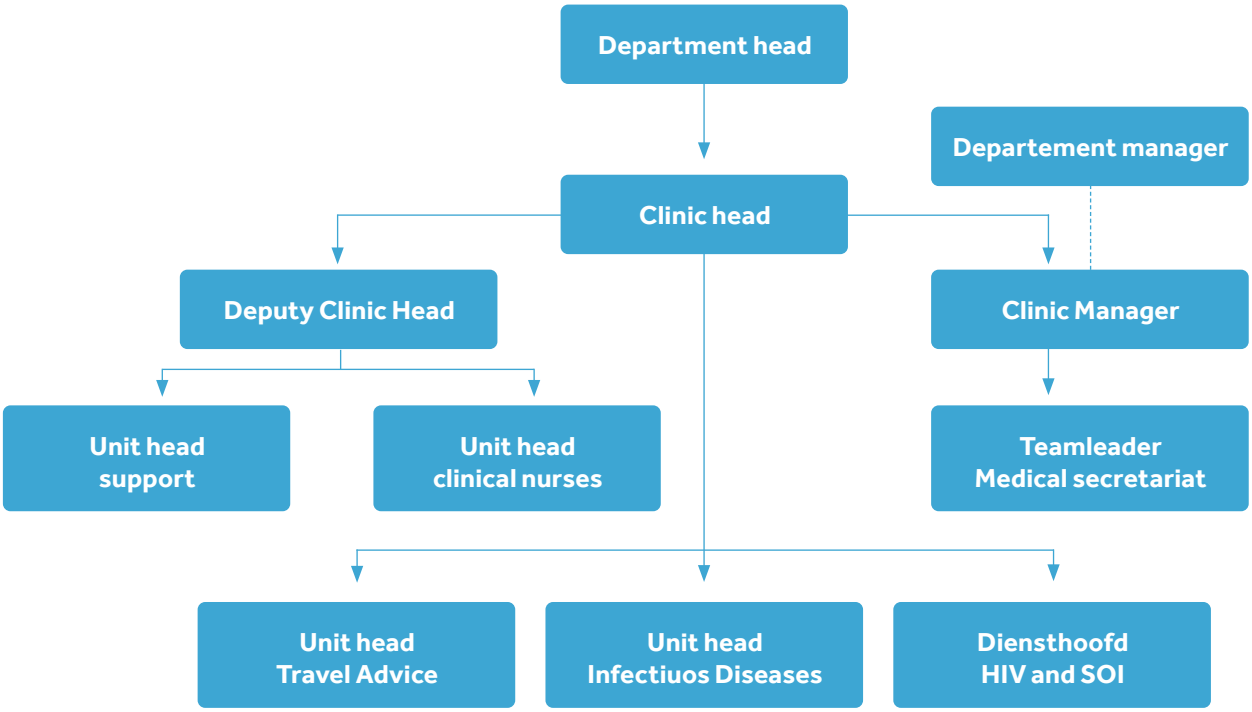
Responsible service = DKW

MS-SO1 - Provide excellent care and services to patients in Belgium
MS-SO2 - Academic valorisation of medical services
MS-SO3 - The specific situation/needs of medical services in ITM is recognised

The main achievement of 2023 is the elaboration and implementation of a new outpatient clinic organisational model. Under the guidance of an external coach and with input from various stakeholders, a new clinic structure was approved with the following key principles:

1. We are evolving from two clinics (travel clinic and HIV/soak clinic) to one clinic given the high intertwining of activities and people.
2. We are looking for a better balance around leadership including achievable size of groups.
3. We retain the clinic within the Department of Clinical Sciences to ensure existing synergy with the academic units.
4. We are establishing a strong structure with sufficient positions of responsibility to meet the future challenges in medical services.
5. We assume equal groups that are all essential to fulfil the missions.
6. We maintain and strengthen specific expertise in our niche areas (travel advice, tropical infectious diseases and HIV/std).

Figure 6. New polyclinic organisational model



Meanwhile, all positions within the new organisational chart have been filled and we are confident that a strong structure is in place that is ready for the challenges of the future.

1. Outpatient realisations

- The main realisation is that we had another normal activity year. During and after covid, the number of travel consultations was significantly lower, but this trend has been broken. By providing additional vaccinators and further developing nurse-based vaccination, we were able to meet the high demand from travellers and thus recorded the highest number of consultations ever.
- Successful continuation of RIZIV covenant as HIV reference centre.
- Through this covenant, we provide multidisciplinary care to our cohort of more than 3 000 HIV patients. This year also marked an extension for reimbursement of uninsured patients.
- We underwent an audit by RIZIV around the Help Centre, our low-threshold HIV screening centre. Conclusions on this are expected in 2024.
- Through evening seminars, healthcare providers were taught topics around travel medicine.
- Several clinical studies were ongoing, including on mpox and HIV & autism. The HIV clinic is participating in a European project on the implementation of injectable medication in the treatment of HIV infection.
- A new successful campaign was launched to fight the stigma surrounding HIV ("love my safe space").

2. Realisations clinical reference lab

- In terms of analysis, the many travel-related consultations also meant another normal year of activity for the KRL.
- The renewal audit for accreditation of clinical trials by BELAC was successfully completed. The number of tests under accreditation was maintained.
- Successful continuation of RIZIV covenants as tropical reference lab and HIV reference lab.
- Diagnostic support or (co-)lead on numerous scientific research projects on HIV/SOA, covid or tropical diseases. The laboratory is also involved in several capacity-building programmes in the tropics.

3. Realisations E-platforms for medical services

- The current Electronic Patient Record will no longer be supported within a few years.
- We have therefore s tarted preparations for a new EHR, a project that will run
- at cruising speed in 2024 and 2025 and will require commitment from many stakeholders.
- Together with ICT colleagues, we had a new test environment set up to better manage
- the risk around continuity for our critical applications Healthone (EPD) and LAB400 (LIMS).
- We have revived the patient satisfaction survey and will relaunch as of 2024

4. Realisations regarding the specific status of our polyclinic

Through affiliation to Zorgnet-Icuro, the Flemish network of healthcare organisations, we have access to information on legal obligations and developments in the sector and can call on specific advice. Zorgnet-Icuro remains an important point of reference for clinic management.

Discussions with the Public Health Cabinet and NIHDI management are ongoing around the specific status of our clinic. With the current status, we often fall outside the applicable guidelines that either t arget GPs or hospitals. Our question is whether a specific statute exists or can be created for ITM that meets our needs and allows us to access basic funding for our medical services. In addition, we also have around savings in clinical biology addressed ITM's specific situation, which will also lead to a solution here.

b. Indicators medical services

1. Input indicators

Table 27. Overview of budgets for medical activities in 2019-2023 together with the 2024 target

Budgets for medical activities	2019	2020	2021	2022	2023	2024 (target figure)
Section F (euro)						
NIHDI	4,838 362	4,714,579	4,748,815	5,587,174	5,879,851	5,200,000
Flemish Care & Health Agency	98,037	82,309	90,324	131,777	101,433	94,000
UZA	119,883	134,778	432,000	184,000	184,000	184,000
Sciensano	274,975	172,305	110,000	155,050	278,284	200,000
Nomenclature and other	4,448,235	3,030,922	3,14,150	3,807,679	4,765,397	4,500,000

2. Output indicators

Table 28. Summary of output indicators for medical services in 2019-2023 together with the 2024 target.

	2019	2020	2021	2022	2023	2024 (target figure)
Number of consultations	42,398	28,864	33,029	40,252	46,107	40,000
Number of vaccines administered	48,751	15,031	17,098	33,106	45,273	50,000
Number of lab requests	43,518	41,093	38,211	37,865	41,587	45,000
Number of lab analyses	594,801	449,244	480,439	507,644	530,995	600,000
Number of incoming phones	44,599	53,760	28,627	48,577	53,446	/
Number of page views website	421,434	487,136	263,514	743,334	1,156,349	500,000
Number of user interactions Wanda app	16,271	120,606	92,981	130,326	62,422*	150,000
Number of new users Wanda app	11 ,183	19,856	9,436	15,576	9,154	25,000

**Because of an issue with an app update, there was a problem with tracking for a long time. This problem persisted from mid-April to the end of November 2023.*

3. Impact indicators / quality indicators

Table 29. Summary of quality indicators for medical services in 2019-2023 along with the 2024 target.

	2019	2020	2021	2022	2023	2024 (target figure)
Satisfaction surveys	2	0	0	0	0	2
Number of complaints	9	8	11	9	11	Monitoring KPI
% accredited specialists	73%	85%	81%	83%	86%	90%

We started preparing the satisfaction survey again in 2023 to conduct it in 2024. The number of complaints formulated by outpatients remains constant (low) over the different years.

Complaints are handled independently by the ITM ombudsperson. The percentage of accredited specialists has remained stable. All specialists in the outpatient clinic who perform consultations on a regular basis meet the conditions for accreditation and thus together perform more than 90% of the specialist consultations. In other words, the three non-accredited internists see few patients.

4. Specific KPIs from the strategic policy plan

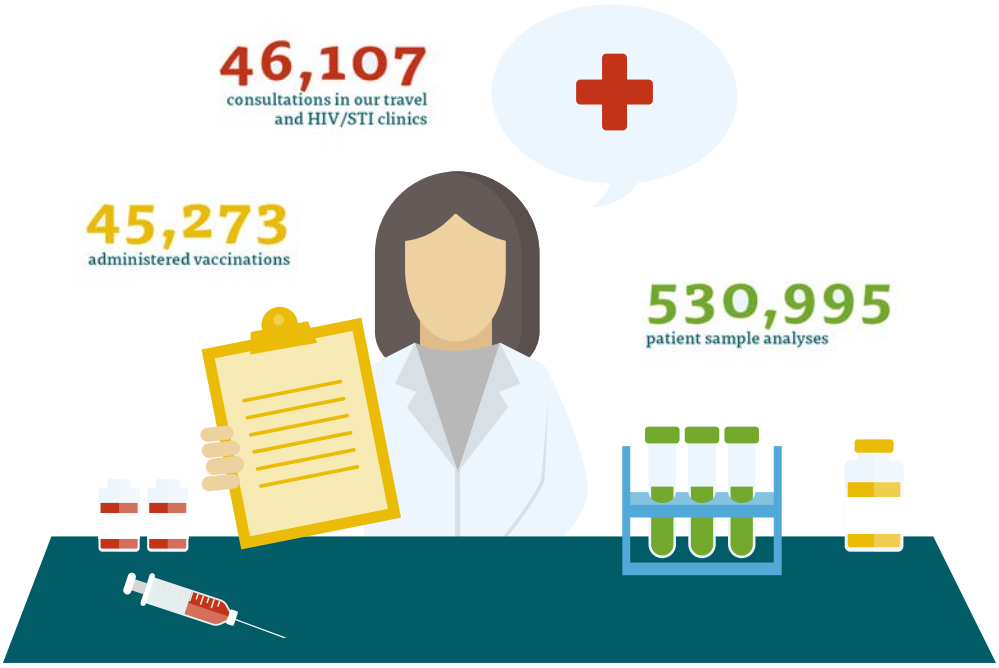
Table 30. Summary of KPI results in 2019-2023 for medical services from The 2020-2024 strategic policy plan.

	2019	2020	2021	2022	2023	2024 (target figure)
MS-KPI-1: Number of consultations	42 398	28 864	33 029	40 252	46 107	> 40.000/ year
MS-KPI-2: Number of nurse-based vaccinations	No data - mode of operation was not yet active	Did not go ahead because of covid impact on clinic (very little travel vaccinations)	Did not go ahead because of covid impact on clinic (very little travel vaccinations)	1 022	1 442	Increase of 20% per year
MS-KPI-3:% of consultations done/ supervised by specialists	KPI was not measured	>50%	> 50%	>50%	>50%	> 50%
MS-KPI-4: Number of visits to the website	421,434	487,136	263,514	743,334	1,156,349	> 500.000 per annum
MS-KPI-5: number of accredited specialists	73%	85%	81%	83%	86%	> 90%

	2019	2020	2021	2022	2023	2024 (target figure)
MS-KPI-6: A fair remuneration system for clinical specialists is in place	Not yet active	Under develop-ment - no data yet	New pay policy envisaged from 2023	New wage policy in force	New wage policy in force	Present
MS-KPI-7: Electronic Medical File is used by 100% of medical providers	New system	100%	100%	100%	100%	100%
MS-KPI-8: All medical staff attend at least 25 continuous professional education sessions	KPI was not measured	> 25	> 25	>25	> 25	25
MS-KPI-9: Patient satisfaction survey is conducted twice a year	2	0 because of COVID-pandemic	0 because of COVID-pandemic	0	0	2 / year
MS-KPI-10: At least 2 national or international guidelines per year are updated under our leadership	KPI was not measured	> 2 / year	> 2 / year	> 2 / year	> 2 / year	> 2 / year
MS-KPI-11: BELAC audit (Belgian accreditation organization) successfully completed for the Clinical Reference Laboratory	OK	OK	OK	OK	OK	Accreditation status has been maintained
MS-KPI-12: Successful renewal of the main Federal and Flemish health subsidies	-	OK	Renewal and enhance-ment	OK	OK	Successful renewal
MS-KPI-13: ZAP succession plan is implemented: (+2 in 2020, +1 in 2021)	2	0 well launched, effective start in 2021	2	0 (+1 en -1)	-1 (this ZAP is now ITM director, replacement in 2024)	Successful implemen-tation
MS-KPI-14: At least 2 ongoing clinical studies in patients attending the outpatient clinic	KPI was not measured	> 2 / year	> 2 / year	> 2 / year	> 2 / year	> 2 / year
MS-KPI-15: At least 2 diagnostic test evaluations (WHO, Industry, ...) conducted per year	KPI was not measured	> 2 / year	> 2 / year	> 2 / year	> 2 / year	> 2 / year

	2019	2020	2021	2022	2023	2024 (target figure)
MS-KPI-16: at least 2 ongoing PhD projects and 2 master student projects embedded in the medical services per year	KPI was not measured	> 2 / year	> 2 / year	> 2 / year	> 2 / year	> 2 / year
MS-KPI-17: Case discussions and CME are recycled in educational tools and archived in an accessible way	KPI was not measured	OK	OK	OK	OK	OK
MS-KPI-18: The% of unpaid invoices is reduced to less than 3% of total patients' payments	KPI was not measured	1,9%	1,2%	0,5%	0,4%	< 3%
MS-KPI-19: Compliance with e-health requirements is 100%	KPI was not measured	100%	100%	100%	100%	100% compliance
MS-KPI-20: At least 3 new IT projects are fully implemented over the next 5 years (registration kiosk, OrderIT, ...)	KPI was not measured	On schedule 1 system implemented, 2 implementations are ongoing	On schedule 2 systems implemented tarred, 1 implementation is ongoing	3	On schedule	> 3 / 5 years

Where possible, available results of the 2019 KPIs were shown. Operational KPIs were actively measured from 2020. For most KPIs, the results are in line with the targets set for the policy period 2020 - 2024.



4.3 International focus: fighting diseases and strengthening healthcare in low- and middle-income countries

a. Policy priorities capacity building 2020-2024

D-SO1 - Pursue excellence and relevance of ITM's international cooperation and development programme

D-SO2 - Stimulate international networking and exploit opportunities for cooperation in the field of education and research

D-SO3 - Promote outstanding long-term institutional partnerships with a perspective of international cooperation and development "beyond aid" and towards "growing together by doing"

1. Indicators ITM capacity-building activities

The activities on international cooperation and development within ITM fall mainly under two programmes: a five-year programme concluded with DGD (2022-2026), and a five-year intervention extended by 1 year with the support of the Global Challenges Division of the Flemish Department of Chancellery and Foreign Affairs (2018-2023). Reporting on the specific programmes is done in accordance with the guidelines of the relevant agreements.

Annual DGD reporting

We report annually to DGD (Directorate General for Development Cooperation and Humanitarian Aid). The report consists of a narrative and a financial section.

The narrative component consists of annual reporting using performance scores and l essons learned. The performance scores were elaborated with a tool by DGD, offering five OECD DAC criteria (efficiency, effectiveness, relevance, sustainability and coherence) for evaluation, complemented by the cross-cutting themes of gender and environment.

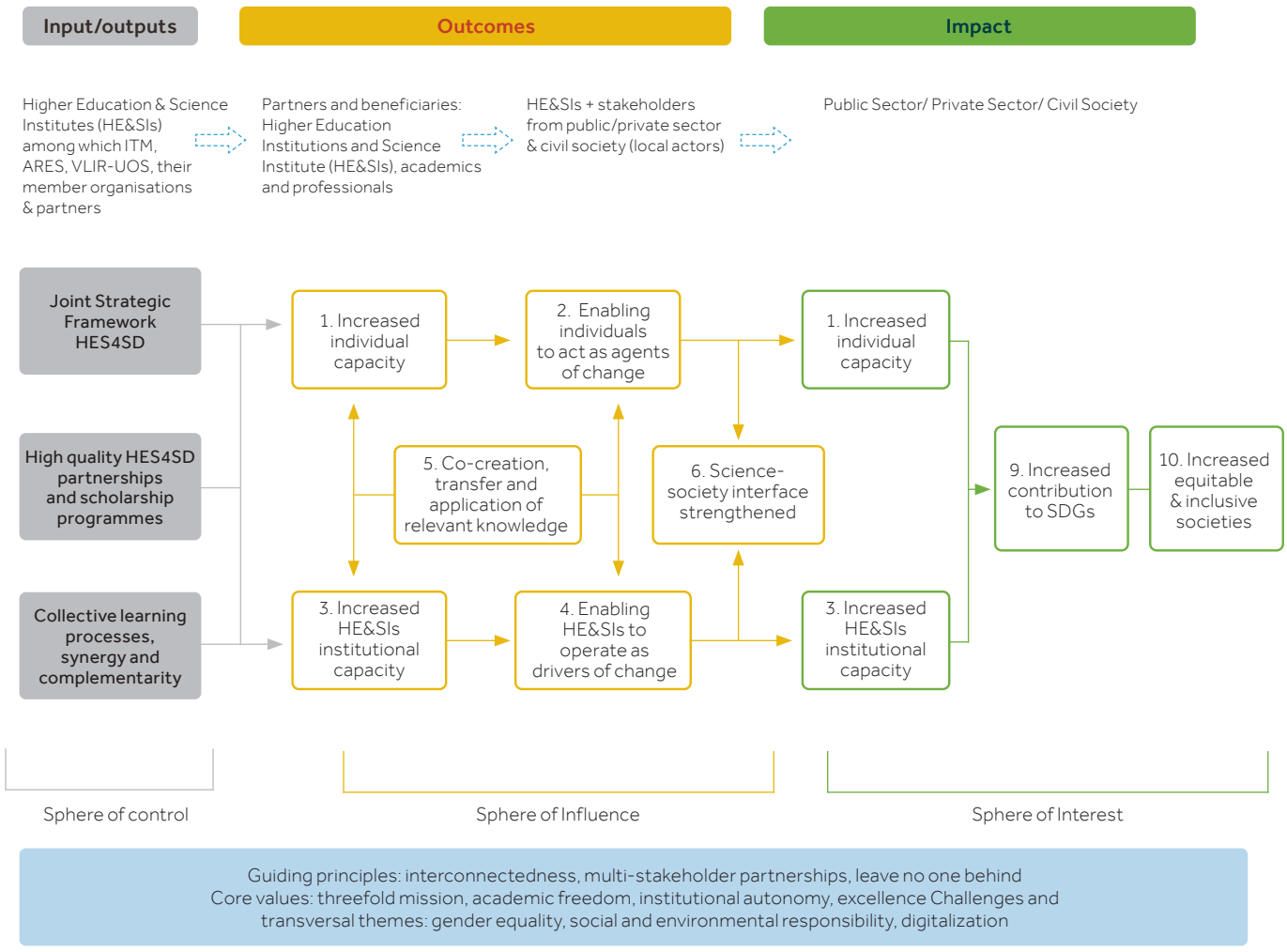
On all the dimensions listed above, ITM should give a score per outcome (= the specific objective we wish to achieve in a particular country or within a thematic approach) of A to D, with A being the best, and D being the least score. We provide these scores exclusively to DGD. Since the deadline for reporting to DGD is only 30 June, we do not have conclusive figures on reporting this year. However, after the 2022 start-up year, most programmes took off well. So we anticipate reporting mainly A and B scores.

Lessons learned is a document of no more than two pages noting per country the most pertinent lessons learned in the past programme year. These lessons may be both operational and strategic. They have the finality of promoting learning within the Belgian Development Cooperation sector. We share them on DGD's extranet with VLIR-UOS and Ares, the actors with whom we developed the Common Strategic Framework (JSF) Higher Education and Science for Sustainable Development (JSF HES4SD) launched. This GSK defines overarching objectives we wish to achieve as academic actors within Belgian development cooperation.

This collaboration with the other academic institutions is new since the current five-year programme. By establishing common objective with VLIR-UOS and Ares, we hope to make GSK more relevant to the academics involved. An assumption here is that lessons learned are more based on shared issues and that more coordination between academic actors will lead to more exchanges including on scholarships.

In this thematic GSK, we aim to achieve 6 strategic goals - shown in yellow in the figure at the bottom. All outcomes within the new five-year programme contribute to these goals.

Figure 7. Common Strategic Framework (CSF) with targets for academic actors within Belgian development cooperation.



Half-time reporting indicators and mandatory evaluation

In terms of monitoring and evaluation, DGD imposes additional obligations in year three (2024) and five (2026). In these years, ITM is required to include in IATI (International Aid Transparency Index) the reflect progress on a number of predefined indicators. These data are publicly accessible via d- portal.org and serve to create greater transparency internationally on funding for international cooperation and aid effectiveness. In addition, ITM is legally obliged to conduct a mid-term and final evaluation of the five-year programme conduct.

For the mid-term evaluation, ITM chose to focus on the theme 'Getting Research Into Policy and Practice'. We use a peer-to-peer methodology for this evaluation, in which partners dialogue with each other about their approach to the theme, 'evaluate' each other's approach and learn from each other. In addition, we evaluate the personal competences of the participants in the trajectory through interim surveys on the increase of their knowledge about 'GRIPP'.

This participatory, learning approach is in line with ITM's vision of monitoring and evaluation in which the learning aspect is at the forefront. The evaluation process runs over 2.5 years. We started in Q4 2022 and will conclude in October 2024. Capacity Development International is supervising this trajectory as external expert.

Cooperation with Mozambique, funded by FDFA

The third phase of the BICMINS (Building Institutional Capacity In Mozambique, INS) programme ended in December 2023. We completed this programme with a spending rate of 98.3% on the ITM budget. Some highlights of the collaboration include a highly successful SORT-IT course, 2 promising pre-doctoral students who followed a track at ITM and 2 INS staff who graduated as Masters in Public Health. We also collaborated in laying the foundations for solid AMR surveillance.

In 2023, together with colleagues at INS, we designed a fourth phase for the project. We divided the budget of 2 million made available by the Flemish government between the two parties. ITM manages 697,400 euros of the budget. Priorities under the new programme are strengthening INS staff including through a sandwich-PhD, but also through targeted training for IRB and data specialists. In addition, INS requires institutional strengthening and support around 'Getting Research Into Policy and Practice'. We are also making the link with the Flanders-funded Health System Strengthening programme in Tete province under this new programme .

This HSS programme has a budget of €750,000 from June 2022 to December 2024. Currently, the implementation of the programme is very slow. Around this, there is frequent dialogue with FDFA representatives who are aware of the implementation hurdles.

2. Specific KPIs from the strategic policy plan

Table 31. Summary of KPI results in 2020 to 2023 for Capacity Building from the Strategic Policy Plan 2020-2024.

	2020	2021	2022	2023	2024 (target figure)
D-KPI-1: Number of international cooperation and development programmes implemented on schedule	69% (11/16)	94% (15/16)	67% (12/18)	72% (13/18)	90%
D-KPI-2: Number of international cooperation and development partners with special focus on fragile and conflict-affected countries with weak public health systems	82% (9/11)	82% (9/11)	79% (11/14)	85% (11/13)	80%

D-KPI-3: Availability of a regular quality assurance mechanism to ensure learning/ evaluation	Present: DGD-certificate evaluation system	Present	Present	Present	Present
D-KPI-4: Number of experts participating in development-relevant international fora and conferences	No information	No information	No information	No information	N/A
D-KPI-5: Number of contributions to policy-related issues	54	21	36	*	25
D-KPI-6: Number of awareness and information activities (debates, documentary, newsletter...)	130	96	86	132	95
D-KPI-7: Number of long-term exchanges (>21 days) for PhD students between ITM & partners	8	9	N/A - no separate information available since 2022	N/A - no separate information available since 2022	15
D-KPI-8: Number of long-term (>21 days) academic exchanges between ITM and partners (excluding courses)	10	8	39	13	10
D-KPI-9: Number of relevant networks with active ITM participation or coordination	4	4	6	9	5
D-KPI-10: Number of relevant partnerships with development actors (academic, industry, NGO, non-academic institutions)	22	22	30	30	25
D-KPI-11: Number of inventoried synergy initiatives in development programmes	18	18	31	*	20
D-KPI-12: Number of countries involved in by ITM supported networking initiatives	18	18	19	19	18
D-KPI-13: Number of capacity-building partner institutes recognised at national, regional and/or international level for their scientific or academic excellence	1	1	1	1	1
D-KPI-14: Realised technology transfers (e.g. PCR platform installed and used, ...)	N/A	N/A	N/A	N/A	N/A
D-KPI-15: Percentage of ITM publications with first/last author from LMIC	27,8%	37%	39,7%	45%	40%
D-KPI-16: Number of doctorates realised (from LMIC)	8	4	8	10	6
D-KPI-17: Number of participants from LMIC to masters/short courses at ITM	68	Masters: 53 KC: 127	206	209	175
D-KPI-18: Level of funding from various sources for ITM's international cooperation and development programmes	3	3	3	3	4

Reporting around the above indicators links ITM to reporting to our donors where possible. For a number of indicators, this is not possible or relevant. Therefore, for a number of indicators we do not have sufficient information to report correctly. As the KPIs are included in this report, we will continue to report on them, but lack of information may result in certain indicators being permanently at N/A.

Because DGD moved the deadline for reporting to 30 June in the current multi-year programme, we do not currently have information available for the indicators where we noted '*'.

b. ITM policy capacity strengthening

In its institutional policy plan 'Global Science for a Healthier World', ITM reflects its vision and ambitions in terms of international cooperation:

ITM's raison d'être is based on scientific excellence, societal relevance and embeddedness in and commitment to LMICs through long-standing collaborations. International Cooperation and Development within ITM is an important part of the academic triad of research, training and service delivery. ITM's overall aim in International Cooperation and Development is to strengthen the rational basis and the country ownership of health care systems, programs and policies in LMICs and to improve the health status of the populations, thereby contributing to the reduction of poverty and inequity. ITM's development actions contribute to the improvement of health for all, based on the provision of evidence and translating evidence into policy5.

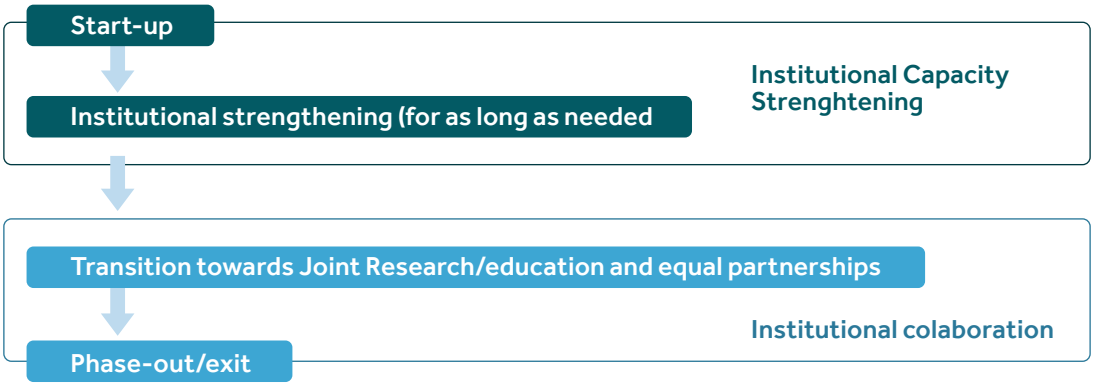
On partnerships, the policy plan states the following:

ITM is gradually reorienting long-standing partnerships in LMIC from "North-South" capacity building to equal partnerships aiming for a shared scientific progress and conducting collaborative excellent science on priority health issues. During a transition period, ITM will diversify its development actions to respond to existing needs for capacity building of partners as well as develop new approaches of equal scientific partnerships.

To gradually transform long-term partnerships from capacity support to equivalent scientific cooperation, as indicated in the policy plan (1.3.1), the Development Cooperation Committee (COS) in 2021, following a recommendation from an external evaluation (FA3 - 2020), elaborated a pathway for partnerships that we are still using. The COS made an analysis of the existing partnerships and placed them on a curve from need for capacity-building support to full-fledged scientific cooperation. For this, the COS members used criteria such as the duration of the cooperation, whether or not the country had a DGD priority, where the country stands on the fragile state index, etc. These criteria are in line with the objective in the policy plan.

We incorporated this approach to partnerships as a 'trajectory' in the development of the ongoing framework agreement (FA5 2022-2026) with DGD.

Figure 8. Partner trajectory (Source: Development Committee proposal for FA5).



In the figure above, we illustrate the partnership pathway. Within this trajectory, partnerships gradually evolve from an initial phase focusing on institutional capacity building to a second phase focusing on institutional, academic (research and teaching) collaboration. As indicated in the figure at the bottom of the page, this trajectory should not be seen as a linear model with clearly delineated phases, but rather as a sliding scale in which we incorporate both elements of institutional capacity building and cooperation with certain partners.

The trajectory also implies that cooperation funding should gradually evolve from funds with a development cooperation finality, to more research-oriented funding. In this way, we free up funds for international cooperation that we invest in new partners or partner countries where the demand for capacity building is higher. In the new five-year programme, for example, we added new partners in Rwanda and Nepal.

Through our institutional capacity building, we support our partners to become active drivers of change and have a real impact on society. Under institutional cooperation, this role anchors itself even more strongly, through co-creation, transfer and application of relevant knowledge and/or through science-society exchange.

Figure 9. Partner trajectory - gradual scale (Source: Development Cooperation Committee proposal for FA5).

ITM partnerships

5

5. ITM partnerships

The overview below is limited to formal collaborations at ITM level. In addition, ITM researchers and professors have established national and international collaborations within the scope of their expertise. For example, ITM provides expert advice to national and international organisations, such as the World Health Organisation (WHO), the 'World Organisation for Animal Health (OIE), Sciensano, Risk Assessment Group (RAG), and the Federal Agency for Medicines and Health Products (FAGG). There are also intense educational and research collaborations between the ITM researchers and their (inter)national peers.

a. with partners in Flanders / Belgium

Responsible department = General Management

- Associate member Flemish Interuniversity Council (VLIR): as an associate member of the VLIR, ITM can join various consultation forums with representatives of the Flemish universities with expertise within (the part of) the policy domain in which the respective consultation forums are established . A VLIR consultation forum formulates opinions and proposals. The exchange with colleagues in various domains, contributes to a stronger connection to the Flemish academic landscape.

- ITM has an institutional framework agreement with universities in Flanders:
  - University of Antwerp (renewed in 2023)
  - KU Leuven (renewed in 2023)
  - Free University of Brussels
  - Ghent University (renewal initiated)
  - Hasselt University (in preparation).

- Cooperation with research institutes in Flanders/Belgium:
  - Flemish Institute of Biotechnology (started)

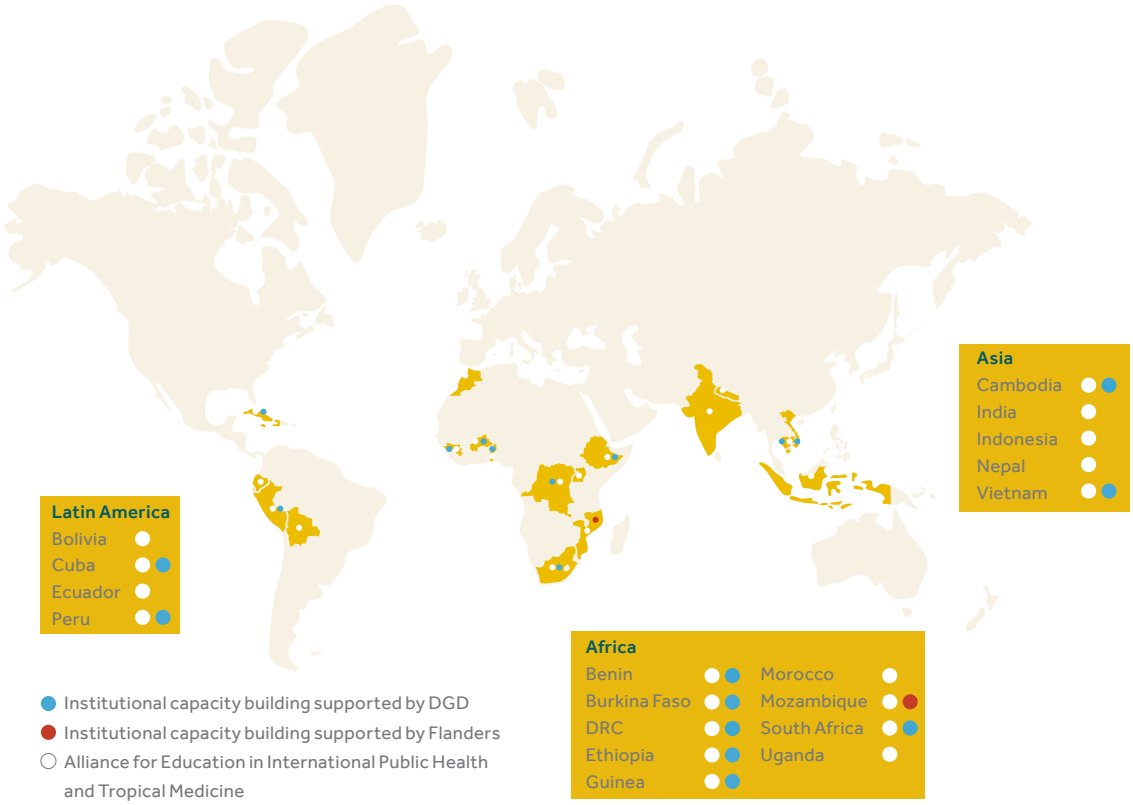
- Collaboration with partners in medical sector:
  - Member of Zorgnet Icuro: Through membership of Zorgnet-Icuro, the Flemish network of healthcare organisation, ITM has access to information on legal obligations and evolutions in the sector and can call on specific advice. Especially with regard to the rapidly and frequently changing COVID guidelines, they were an important guide for clinic management in 2020 and 2021.
  - Cooperation agreement with Antwerp University Hospital (UZA): The medical services and laboratories fall under the Department of Clinical Sciences. The hospitalisation department has been scientifically and administratively under the management of the UZA since 2018. (renewed in 2022)
  - In 2022, ITM also entered into a partnership with ZNA Stuivenberg in which HIV patients are further monitored and treated.

- Cooperation with partners in development cooperation sector:
  - Memisa
  - Renewal of agreement with ENABEL

b. international partners

Responsible department = General Management and International Cooperation and Development

Figure 10. Map of development cooperation partner institutions (FA5/DGD and Flanders).



International partners under the DGD programme:

Latin-America

- Post-Graduate Medical School, Universidad Mayor de San Simon (UMSS), Cochabamba, Bolivia
- Instituto Nacional de Higiene, Epidemiologia y Microbiologia (INHEM), Havana, Cuba
- Instituto Pedro Kourí (IPK), Havana, Cuba
- Institute of Public Health, Pontificia Universidad Católica del Ecuador (PUCE), Quito, Ecuador
- Instituto de Medicina Tropical "Alexander von Humboldt" (IMTAvH), Universidad Cayetano Herredia, Lima, Peru

Africa

- Laboratoire de Référence des Mycobactéries (LRM), Cotonou, Benin
- Centre de Recherche en Reproduction Humaine et en Démographie's (CERRHUD), Cotonou, Benin
- Clinical Research Unit of Nanoro (CRUN), including Centre Muraz, Burkina Faso
- Institut National de Recherche Biomédicale (INRB), Ministère de la Santé Publique, Kinshasa, DRC
- Programme National de Lutte contre la Trypanosomiase Humaine (PNLTHA), Kinshasa, DRC
- École de Santé Publique (ESP), Université de Lubumbashi, Lubumbashi, DRC

- Centre de Recherche Sanitaire de Kimpese (CRSK), Kimpese, DRC
- College of Medicine and Health Sciences, University of Gondar, Gondar, Ethiopia
- Jimma University, Jimma, Ethiopia
- Armauer Hansen Research Institute (AHRI), Addis Abeba, Ethiopia
- Ethiopian Institute for Public Health (EPHI), Addis Abeba, Ethiopia
- Centre National de Formation et Recherche de Maferinyah, Guinea
- Centre d'excellence africain pour la prévention et le contrôle des maladies transmissibles (CEA-PCMT), Conakry, Guinea
- École Nationale de Santé Publique (ENSP) Rabat, Morocco
- Instituto Nacional de Saúde (INS), Maputo, Mozambique
- Serviço Provincial de Saúde de Tete (SPS), Tete, Mozambique
- Rwanda Biomedical Centre (RBC), Kigali, Rwanda
- Centre Hospitalier Universitaire de Kigali, University of Rwanda (UR/CHUK), Kigali, Rwanda
- School of Public Health, University of Western Cape (UWC), Cape Town, South Africa
- Department of Veterinary Tropical Diseases (DVRD), University of Pretoria (DVTD), Pretoria, South Africa
- School of Public Health (SPH - MUCHS), Makerere University College of Health Sciences, Kampala, Uganda

Asia

- National Institute of Public Health (NIPH), Phnom Penh, Cambodia
- Institute of Public Health (IPH), Bangalore, India
- Center for Tropical Medicine, Faculty of Medicine, Gadjah Mada University, Yogyakarta, Indonesia
- National Health Research Council (NHRC), Kathmandu, Nepal
- B.P. Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal
- National Institute of Malariology, Parasitology and Entomology (NIMPE), Hanoi, Vietnam

In the new five-year programme, we started working with new partners in Rwanda (RBC and CHUK- University of Rwanda) and Nepal (BPKIHS and NHRC).

In Mozambique, we started a new partnership with Flemish funding with the SPS (Servico Provincial de Saude) of Tete province in July 2022.

26

institutional partners

19

partner countries

Research Groups

6

1. Scientific departements

a. Department of Public Health

Responsible service = DVG

SO1 - Improving understanding of biological, environmental, sociocultural and systemic determinants of population health

SO2 - Develop, test and implement interventions that support and strengthen population health.

SO3 - Create knowledge and capacity to prevent, detect and address local and global health threats.

1. General

- The non-communicable diseases unit was closed with the departure of Prof. José Penalvo.
- Two new units were created: Eco-epidemiology and Medicines and Public Health.
- The department is now structured into 4 research groups (Health Systems and Health Policy, Sexual and Reproductive Health, Tropical Infectious Diseases, Eco-health), a management unit and a teaching unit.
- Prof Marianne van der Sande retired as head of the department and was replaced by Prof. Raffaella Ravinetto.

2. Highlights SO1:

Since April 2023, a new unit has joined the Department of Public Health, the Eco-epidemiology Unit (former Helminthology Unit of the Department of Biomedical Sciences). Together with the Complexity and Health Unit and the Social-Ecological Health Research Unit, within the Department of Public Health, they form the Eco-Health Group. This group brings together researchers from different backgrounds and disciplines and recognises the need for systemic approaches to address current health challenges that arise at the interface between humans, animals and their wider natural and social environments. In 2023, the Eco-Health researchers began investigating the relationship between urban green space and the resilience of the elderly.

The Sexual and Reproductive Health group adapted educational offerings to provide relevant continue to target key populations and expanded the number of staff/PhD students in the unit, as well as the breadth of expertise. They also launched a population-based STI prevalence study with partners in Zambia during 2023.

Working with partners, further insight was created on how countries can scale up care for people with chronic conditions such as diabetes and hypertension (SCUBY project, led by the Health Policy Department).

The Equality and Health Unit has consolidated a strong focus on social and structural determinants of (dis)equality in access to health services and priority interventions, for groups that are underserved in the context of outbreaks, epidemics and humanitarian response.

3. Highlights SO2:

For the Mycobacterial Diseases and Neglected Tropical Diseases unit, the analysis of the first clinical trial of post-exposure prophylaxis of leprosy with a single dose of rifampicin conducted in Comoros and Madagascar was completed. The results were presented at the Leprosy Research Initiative spring meeting in the Netherlands and COR-NTD in Chicago, and the manuscript has been accepted for publication in the Lancet Global Health. A new clinical trial of post-exposure prophylaxis for leprosy in Comoros, based on a combination of bedaquiline and rifampicin, started in March, following successful completion of a preliminary phase 2 safety study. In DRC, another clinical trial started to assess the impact on the transmission of human African trypanosomiasis examines the treatment of anyone who tested positive on a serological screening test with a new single-dose oral treatment, acoziborole.

The Emerging Infectious Diseases unit gained advanced insights into rodent-borne diseases, AMR and the emergence of arboviruses in Africa and into the epidemiology of Dengue in Cuba.

Researchers from the Eco-Health Group conducted two studies in Belgium on the response of frontline zones to the COVID-19 pandemic and launched a project on the use of data and equity in urban health decision-making in Antwerp and Lima.

A consortium of ITM colleagues from different departments, including the Eco- epidemiology unit, and Senegalese research partners discovered that the antimalarial combination therapy artesunate-mefloquine is effective against schistosomiasis: in a study with schoolchildren in northern Senegal, the combination proved safe and as effective as praziquantel.

Researchers from the Eco-epidemiology unit developed a digital board game for disease prevention and control under a senior FWO grant. The games were presented at the 17th European Conference on Games Based Learning (Enschede, the Netherlands) on 5 & 6 October 2023. The Vicious Worm Boardgame was the winner of the Fully Developed Non-Digital Games at the 11th International Educational Games Competition.

Research on optimising the delivery and implementation of injectable and oral PrEP in Belgium and Burkina Faso respectively has been initiated; evaluations of community-led HIV responses in Europe are also ongoing at the HIV and Sexual Health Unit.

4. Highlights SO3:

The weekly International Health Policies (IHP) newsletters, a long-standing initiative of the Health Policy Unit, were regularly distributed to alumni and other interested parties. They summarise and frame recent relevant developments in health and health policy, as well as scientific articles.

Newsletters are also regularly distributed from the Pharmaceutical Public Health Unit, covering pharmaceutical policy and ethical issues.

The communication platform of the Climate Change, Urbanisation and Health Thematic Working Group was launched during the ITM colloquium and ECTMIH conference, connecting colleagues from all partner countries.

The Department of Public Health has developed a short course on Sustainable Approaches to Infectious Disease Control and Elimination (SUSTAIN). In this course, we highlight key challenges and discuss sustainable approaches to the control and elimination of malaria, tuberculosis,

HIV/AIDS and Neglected Tropical Diseases, focusing not only on technical and programmatic factors that can affect sustainability, but also on context and environmental impacts. Alternative paradigms to current global infectious disease control strategies are discussed, with emphasis on systemic approaches to build and sustain more resilient and sustainable programmes, health systems and communities to address infectious disease threats.

New institutional collaborations were launched with partners in Mozambique, Tanzania and Zambia through the networks of recently launched ZAPs. In Zambia, these collaborations include capacity building for STI diagnosis.

The Medicines and Health unit was established in July 2023, building on the results of the policy support component of the ITM-DGD Framework Agreement in the area of pharmaceutical policy. In 2023, the unit strengthened its research lines on access to medicines, with a focus on vulnerable

health systems and environments, and actively supported DGD in preparing policy content for the Belgian Presidency of the Council of the EU. It also successfully organised the third edition of its short course on pharmaceutical policy in health systems and strengthened its institutional partnership with the School of Public Health at the University of the Western Cape in South Africa to extend it from teaching to research and capacity building.

The Equality and Health Unit provides social science input on communities' adaptive practices on health-seeking and infection prevention in the context of outbreaks and epidemic response.

In 2023, the Social Ecological Health Research (SEHR) unit pioneered materials and methods to study biases in AI-generated images by text-to-image categorisation. In the process, it demonstrated how AI systematicly exoticises Africa, links care and HIV status with blackness, and whiteness associates with providing care. The study was published in the Lancet Global Health and picked up by several news media such as NPR, where the story quickly reached more than 500,000 readers.

By 2023, we have reformed postgraduate programmes by bringing together students from medical, biomedical, nursing and social work backgrounds to explore health challenges in vulnerable settings around the world. These include the effects of the climate crisis on public health and health systems, the health problems of migrants and refugees, the impact of pandemics such as Covid-19 or Ebola, the unequal access to quality healthcare of people in vulnerable situations.

5. Key ambitions and challenges

The main ambitions of the various units and research groups are as follows:

- The Mycobacterial Diseases and Neglected Tropical Diseases Unit will continue clinical trials in Comoros and DRC, expand leishmania projects in Nepal and initiate new research on leprosy transmission in low endemic countries (Suriname and Pakistan);
- Together with partners and staff, the Emerging Infectious Diseases Unit will Strengthen research capabilities and continue to contribute scientific knowledge on arboviruses and rodent-borne diseases in the tropics and in Belgium;
- Following the successful launch of urban maternal health projects in Guinea and the DRC under DGD's FA5 programme in 2023 and the award of a four-year FWO project starting in January 2024, the Sexual Reproductive Health Unit will conduct research to understand the nature of the dynamics of the elucidate urban maternal health and inform context-specific action on how urban healthcare systems and living environments can be adapted to most effectively improve maternal and perinatal survival and well-being;
- The Eco-health group, comprising the Complexity and Health Unit and the Social-Ecological Health Research Unit, will be developed and consolidated. Current topics include climate change, urbanisation and health, sustainable disease control and elimination, and innovations in research methodology. The group plans to develop joint research proposals and courses, organise seminars and write papers on these topics;
- The Medicines and Public Health Unit will consolidate the research and capacity building portfolio by expanding it to include pharmacovigilance and monitoring of pharmaceutical research and development, and by strengthening skills in collecting and managing data from vulnerable groups;
- The Equality and Health Unit aims to develop and secure funding for projects that explore health and healthcare systems in response to the needs of migrants, minority and mobile populations in both the Global North and South;
- SEHR further explored the relationship between human health and socio-ecological factors and the health of the planet, e.g. on malaria in Ethiopia and leprosy on Comoros. By 2024, we aim to strengthen our research portfolio in the area of socio-environmental health.
- The teaching unit will work to consolidate postgraduate programme reform and address (some of) the MPH-related challenges faced in mentioned in the self-assessment report and/or formulated by the review panel.

Table 32. Overview of the different services and departments (Dutch-language and English-language denomination) and the designated heads of service in the Department of Public Health.

Department Public Health		
English name	**Dutch Name**	**Head of Service / ZAP**
Research group : Health systems & Health policy		
Health Policy	Gezondheidsbeleid	Wim VAN DAMME
Equity and Health	Gelijkwaardigheid en Gezondheid	Karina KIELMANN
Pharmaceutical Public Health	Geneesmiddelen en Gezondheid	Raffaella RAVINETTO
Research group : Sexual & Reproductive Health		
Sexual Health, including HIV	Seksuele Gezondheid, incl HIV	BERNADETTE HENSEN
Reproductive and maternal health	Reproductieve en Maternale Gezondheid	Lenka BENOVA
Research group : Tropical Infectious Diseases		
Emerging Infectious Diseases	Opkomende Infectieziekten	Kathy KREPPEL
Mycobacterial diseases and NTDs	Mycobacteriële ziektes en Verwaarloosde Tropische Ziektes	Epco HASKER
Research group : Eco-Health		
Socio-Ecological Health Research	Sociaal-Ecologisch Gezondheidsonderzoek	Koen PEETERS
Eco-epidemiology	Eco-epidemiologie	Katja POLMAN
Complexity and Health	Complexiteit en Gezondheid	Bruno MARCHAL
Department Public Health		
Head of Department	Departementshoofd	Raffaella RAVINETTO
Management Public Health	Beheer Volksgezondheid	Jan BOEYNAEMS
Education Coordination	Onderwijscoördinatie	Marjan PIRARD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INSTITUTE OF TROPICAL MEDICINE
INSTITUTE OF TROPICAL MEDICINE

b. Department of Biomedical Sciences

Responsible service = DBW

SO1 - As a collective target, we want to tackle some of the most important and neglected pathogens, and their possible vectors of spread, by creating better scientific understanding of pathogens and the diseases they cause, as well as by developing and evaluating innovative tools to improve diagnosis, surveillance, prevention, treatment and control.

SO2 - We aim to better understand the patterns and underlying biomedical factors that drive the adaptation of pathogens and vectors to changing environments, such as drug pressure, immune evasion, co-infection and colonisation of new hosts; we also study the influence of these factors on pathogen heterogeneity within and between hosts, as well as the impact on transmission and on pathogen virulence.

SO3 - To achieve our objectives, we combine field-based epidemiological and ecological research with experimental biomedical research using state-of-the-art research and analytical methods within the fields of molecular and cellular biology, immunology, entomology, bioinformatics, biostatistics and epidemiological modelling.

(SO1 – SO2)

- In the Department of Biomedical Sciences, 11 new projects started in 2023, including 1 EC project, 2 VLAIO projects, 1 NIH-funded pilot study, 1 FWO research project and 1 project funded by the International Society of Travel Medicine:
  - European Commission - Enhanced manufacturing of broadly potent equine polyclonal Fab with a Rational Immunization strategy against Coronaviruses (e-FabRIC)
  - VLAIO:
    - » Baekeland mandate - Peptide-based diagnostics for re-emerging flaviviruses of significant public health concern
    - » Use of multimodel omics technologies to study Dengue host response markers (R&D DENMARK)
  - NIH - Next-generation sequencing diagnostics to identify etiologies of acute undifferentiated fever in the Peruvian Amazon (CREID)
  - FWO - Host immune and metabolic determinants of sexual conversion in Plasmodium parasites (IMMETASEX)
  - International Society of Travel Medicine - Surveillance of Molecular epidemiology of Malaria in travellers (SUMMIT)

Trypanosoma

- The Trypanosoma service continued to build its expertise in diagnostic research for sleeping sickness (HAT). In 2023, the unit began (funded by the Bill & Melinda Gates Foundation) to build out a regional lab in Mbuji-Mayi (DRC) for HAT diagnostics, in support of the ongoing ITM sleeping sickness elimination programmes. In addition, the service developed a diagnostic trypanolysis assay using fluorescent animal trypanosomes that enables an objective and automated reading of parasite lysis.
- The team remains at the top internationally for research in i) tsetse-trypanosome-host interactions and (ii) the molecular diagnostics of T. brucei gambiense.

- The service published a leading paper in 2023 on a dominant invariant protein on the surface of the metacyclic trypanosome, the infectious stage injected into the mammalian host by the tsetse fly.

Malariology

- Travel clinic and imported malaria: The Malariology service collaborates with the travel clinic and the National Reference Laboratory for Malaria at ITM to monitor treatment failure in returning travellers with malaria. Cfr our 2019 report (PMID: 31678453), we describe the association of resistant markers with treatment failure in two travellers returning from East Africa, and highlight the need for systematic genomic surveillance of resistance in travellers (PMID: 38157311). In the context of imported malaria, the service contributed to the investigation of a airport-associated cluster of falciparum malaria in Frankfurt, Germany, using innovative machine learning tools to predict the parasite's origin (PMID: 38304950).

Molecular parasitology:

- Through its activities in different regions of the world (Peru, Brazil, Ethiopia, Morocco, Nepal), the service further demonstrated the importance of genomic leishmaniasis surveillance. Direct sequencing methods in host tissue were optimised and included in the service's training portfolio, together with corresponding bioinformatics applications.
- Senne Heeren, PhD student at ITM, UAntwerpen and KULeuven, discovered in Peru that an endosymbiont of Leishmania (Leishmania RNA virus, LRV) was transmitted from one parasite to another through sexual recombination of the parasite. Thus, LRV causes a sexually transmitted infection in the parasite. This may have an impact on treatment efficacy.
- Frederik Van den Broeck, evolutionary biologist, completed his FWO postdoctoral fellowship on the genomic diversity and ecology of Leishmania in the New World.
- Marlene Jara completed her FWO postdoctoral fellowship and discovered that Leishmania exploits quiescence - a temporary and reversible decrease in metabolism - to survive exposure to drugs without developing resistance. This line of research could open up alternative R&D pathways for new drugs against leishmaniases and is now being taken forward in Allison Aroni's PhD project.
- Gabriel Negreira defended his PhD "Investigating aneuploidy and mosaicism as a mechanism for survival and adaptation of Leishmania" with brio and obtained a postdoctoral-FWO grant to continue his research.

Virology

- The Virology Department continued to work around SARS-CoV-2 with a focus mainly on studying the hybrid immune response after infection and vaccination in different vulnerable populations. This resulted in 39 publications since the start of the pandemic in 2020, about half of which appeared in leading scientific journals.
- Thanks to its accumulated expertise on humoral immunity against SARS-CoV-2, the Virology Department was able to attract substantial new research funding from Horizon Europe (e-FabRIC) to develop, together with European partners, a new antibody-based treatment for the group of sarbecoviruses, which includes SARS-CoV-2 but also several coronaviruses that could potentially threaten us in the future.
- The service also further strengthened work on arboviruses, with new projects on improved arbovirus diagnostics, identification of prognostic biomarkers for severe dengue infection and nanobodies as a new therapeutic application for dengue.
- The Virology Department, together with the Entomology Department, inaugurated the new Arthropod Containment Level 3 (ALC3) facility, as the final capstone of the unique insectarium platform. This infrastructure allows us to experimentally infect exotic

mosquitoes to perform vector competence studies and study behaviour. We achieved the first hopeful results with a new innovative strategy in which we aim to use double-stranded RNA to activate the mosquito's innate immune system to respond very specifically to certain viruses. We will further develop this technology together with colleagues in the Entomology Department as a new vector control method.

- With our partners in Peru and the support of Janssen Pharmaceutica and the Belgian Cooperative for Development Cooperation (DGD), a comprehensive study was launched in the Amazon region of Peru to better predict the onset of severe dengue infections using predictive biomarkers and to use innovative metagenomics sequence analysis to map the fever-causing pathogens circulating in addition to the already known arboviruses such as dengue, zika, yellow fever and chikungunya.

Mycobacteriology

- he PEOPLE study of post-exposure prophylaxis (PEP) of leprosy with 1200 mg of rifampicin was completed and showed both individual protection and impact on leprosy incidence at the population level (in press, Lancet Global Health).
- The BE-PEOPLE phase 2 study of bedaquiline-enhanced PEP for leprosy was presented at the 1st WHO- skinNTD meeting in Geneva, while phase 3 has since started.
- Phenotypic susceptibility determination (DST) was further developed by applying a printer method to fill plates with specific concentrations of antibiotics and further modifications of the inoculum. This method allows rapid determination of the level of resistance (MIC value), including for new drugs, and addresses some teething problems of the new EUCAST reference standard. In addition, a field- friendly version of DST was optimised in collaboration with colleagues in Rwanda, where sputum is inoculated directly onto antibiotic-containing medium, without the need for an intermediate step of positive culture. Since the plates are sealed, the complete test including interpretation can be performed at biosafety-2 level. An agreement in principle has been signed between the national TB programmes in DRC and Rwanda, allowing diagnostic services for patients in South Kivu to take place in Kigali.
- The results of the EndTB clinical trial were presented to a standing ovation at the Union of Tuberculosis and Lung Diseases (IUATLD) conference in November 2023. The results show that different combinations of new and existing TB drugs can safely cure rifampicin-resistant TB. The FWO-funded deepMTB study builds on the study in which we compared direct and indirect sequence analyses for the detection of the earliest signs of (acquired) resistance.
- Using extensive bioinformatics analysis and 3D modelling, we were able to map some TB virulence markers, and better predict phenotypic resistance to bedaquiline from DNA sequences.

Entomology

- The Entomology Service launched the SOFI project CLIMB, in which it is investigating the impact of rapid climate change on the biodiversity-health interface ('The impact of rapid CLIMate change on the Biodiversity-health interface). The service also continued its research in the very prestigious SWARM project (Human Frontier Science Programme).
- The Entomology team's work was awarded in 2023 through various channels:
    - Adwine Vanslembrouck - Erasmus+ mobility award; Dubois-Brigué scholarship Royal Academy of Medicine
    - Isabelle Kramer - Best presentation at the 64th ITM colloquium
    - Marco Brustolin - FWO travel grant, Abilitazione Scientifica Nazionale (IT): 07/H3 -Malattie infettive e parassitarie degli animali (Associate professor level)
    - Ruth Müller - part-time appointment at the University of Antwerp
- The Entomology Service organised several scientific events in 2023:
    - Symposium SWARM project (Human Science Frontiers Programme)
    - European Congress of Entomology 2023 (Presidium). 5 contributors gave a presentation, contributing not only to the dissemination of the research results but also ITG's pioneering role regarding Vector-Borne Disease research at the European level highlighted
    - The Service was responsible for the scientific coordination of the 64th ITM colloquium "Understanding the Global Landscape of Disease Burden in the Context of Climate Change"

Zoonoses

- In April 2023, Veronique Dermauw was appointed head of service ad interim, following the transfer of Katja Polman, professor of Medical Helminthology, to the Department of Public Health. The service was renamed Zoonoses.
- Veronique Dermauw was awarded a grant (FWO long stay abroad) for a research stay at the University of Pretoria, South Africa (October 2023-February 2024).
- The service was involved in follow-up and sample analyses in the context of an outbreak of neurocysticercosis in a school in Lier, Belgium.
- Veronique Dermauw was appointed ITM representative to the Belgian Preventing Zoonotic Disease Emergence (PREZODE) Expert Group and became a voting ITM member of the International Alliance against Health Risks in Wildlife Trade.
- In DRC, a sampling was organised on the occurrence of Echinococcus and Taenia species in dogs and pigs, and owners were questioned about their knowledge of these parasites as well as possible risky practices that could prevent the spread of these parasites. It also collaborated on sampling in South Africa around Fasciola in cattle and sheep. Projects within the framework agreement agreements for capacity building of the Vietnamese National Institute of Malariology,
- Parasitology and Entomology and from JImma University, Ethiopia were further prepared.
- The service was consulted for the molecular confirmation of several rare parasitic infections.
- The service committed to installing and refining PCR techniques for the detection of food-borne trematodes in snails.
- MSc Adina Asim, supervised by Veronique Dermauw, in collaboration with Steven Abrams (UHasselt) and Brecht Devleesschauwer (Sciensano/UGent) obtained her MSc in Statistics. For her thesis, she developed a mathematical transmission model for fascioliasis, an essential link in our FWO- NAFOSTED project.

Experimental Immunology

- Maria Luísa Simões started as Research Professor at ITM in May 2023. In the short period from May to December 2023, there are already several highlights to report:
    - Prof. Simões' work was published in Nature (https://www.nature.com/articles/d41586- 023-02051-4)
    - The Service was granted a budget of EUR 60,000 for the "Malaria Transmission @ ITM" project.
    - Prof. Simões was elected to serve on the Executive Council of the American Committee of Medical Entomology.
    - She presented her research at the American Society of Tropical Medicine and Hygiene Annual Meeting (Chicago, IL, USA, Oct) and at the Entomological Society of America Annual Meeting (National Harbor, MD, USA, November).
    - The Service received a very strong response to an initial postdoc position vacancy and selected a candidate starting in February 2024.
    - All biosafety dossiers for the service's planned work were prepared, submitted and approved.

(SO3)

- The Entomology Service conducted entomological field studies in Belgium, Germany, Nepal, DRC, Burundi and Peru (active surveillance) and was responsible for following up Aedes albopictus notifications in Belgium (via Sciensano), as part of passive surveillance.
- In the ACL3 insectarium, the first experimental infection studies were carried out (4x Chikungunya virus; 2x Mayaro virus). The SWARM lab was commissioned and the ACL2 insectarium was further equipped for Prof Maria-Luísa Simões' research.
- Renovation works on the lab infrastructure for immunological research started in 2023 and will be completed in early 2024. After commissioning and validation, the laboratories will be commissioned in mid-2024.
- The Malariology service applies innovative omic technologies to gain knowledge about the biology of Plasmodium. In 2023, using novel PacBio low impute technology, we built a P. vivax reference genome for South America with high resolution in highly complex telomeric regions. (PMID: 37821878); we validated nanopore adaptive sampling in P. falciparum isolates (PMID: 38054750), and we generated first data on single-cell transcriptomics using an innovative HIVE system.
- The department published its research in respected scientific journals, including:
    - Simões ML. (2023) Transgenic approaches in medical entomology: 2022 highlights. Journal of Medical Entomology Volume 60, Issue 6, November 2023, Pages 1262–1268, https://doi.org/10.1093/jme/tjad105
    - Bartholomeeusen et al. (2023) Chikungunya fever. Nat Rev Dis Primers. 2023 Apr 6;9(1):17.
    - Rezende et al. (2023) Validation of a Reporter Cell Line for Flavivirus Inhibition Assays. Microbiol Spectr. 2023 Feb 14;11(2):e0502722.
    - Selhorst et al. (2023)Phylogeographic analysis of dengue virus serotype 1 and cosmopolitan serotype 2 in Africa. Int J Infect Dis. 2023 Aug;133:46-52.
    - Van Den Broucke, et al. (2023) Juvenile *Fasciola gigantica* emerging through the skin in a returning traveller, Journal of Travel Medicine, vol. 30, no. 6, taad033. https://doi.

org/10.1093/jtm/taad033

- Dermauw, et al. (2023) Geostatistical analysis of active human cysticercosis: results of a large-scale study in 60 villages in Burkina Faso, PLoS Neglected Tropical Diseases, vol. 17, no. 7, e0011437. https://doi.org/10.1371/journal.pntd.0011437
- Casas-Sanchez et al. (2023) The Trypanosoma brucei MISP family of invariant proteins is co-expressed with BARP as triple helical bundle structures on the surface of salivary gland forms, but is dispensable for parasite development within the tsetse vector. Plos Pathogens 19(3):e1011269.
- Müller, R. et al. (2023) RNA interference to combat the Asian tiger mosquito in Europe: a pathway from design of an innovative vector control tool to its application. Biotechnology Advances 66, 108167
- Manzambi, E.Z. et al. (2023) Behavior of Adult Aedes aegypti and Aedes albopictus in Kinshasa, DRC, and the Implications for Control. Tropical Medicine and Infectious Disease, 8(4), p.207.
- Kramer, I. M. et al. (2023) Genomic profiling of climate adaptation in Aedes aegypti along an altitudinal gradient in Nepal indicates nongradual expansion of the disease vector. Molecular Ecology, 32, 350–368.
- Heeren S et al. (2023) Diversity and dissemination of viruses in pathogenic protozoa. Nat Commun. 2023 Dec 15;14(1):8343.
- Negreira GH et al. (2023) The adaptive roles of aneuploidy and polyclonality in Leishmania in response to environmental stress. EMBO Rep. 2023 Sep 6;24(9):e57413.
- Lempens P et al. (2023) Borderline rpoB mutations transmit at the same rate as common rpoB mutations in a tuberculosis cohort in Bangladesh. Microb Genom. 2023 Sep;9(9):001109. doi: 10.1099/mgen.0.001109.
- Jouet A et al. (2023) Hi-plex deep amplicon sequencing for identification, high-resolution genotyping and multidrug resistance prediction of Mycobacterium leprae directly from patient biopsies by using Deeplex Myc-Lep. EBioMedicine. 2023 Jul;93:104649. doi: 10.1016/j.ebiom.2023.104649. Epub 2023 Jun 14

1. Educational achievements

- Within the Master Course in Global One Health, the elective modules were transferred to Moodle and reworked with interactive tools. Furthermore, Moodle was extended with a functionality that allows students to receive technical and academic support via Teams in addition to the discussion forums. The programme of the induction week was completely reworked with a research project on the animal-wildlife interface and with an outreach in One Health with local schoolchildren. We received a record number of applications for 2023 (300+). The selection process was adapted to handle this large number. A colleague from the University of Pretoria visited the Zoonoses service with an Alliance mobility grant, to further develop the Applied Helminthology module and also to organise it alternately at ITM (Antwerp) and in Pretoria.
- Within the Master in Tropical Medicine - Biomedical Sciences, preparations were initiated to merge the orientations of Clinical and Biomedical Sciences from 2024-2025. The IIH was reformed into CIH and is now modular with research methods in September allowing biomedical students from January can start in the lab. The graduation moment now coincides with the Master in Public Health.

- The department identified new opportunities for future Short Courses:
    - (Bioinformatics (Malariology Service)
    - Mosquito ID (Entomology Service)
- The Entomology Service organised several scientific training courses:
    - FA5 Nepal: taxonomy of mosquitoes, molecular barcoding, bioinformatics
    - FA5 DRC: Insectarium + field tomology; data analysis - Tresor Iluku
    - FA5 Peru: Theoretical and practical training in vector biology at ITM for students at Universidad Peruana Cayetano Heredia; Regional Workshop on vector biology at Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas in Chachapoyas.
    - SWARM Bioinformatics training for students from Burkina Faso
    - DGD predoc: Insectarium + biochemical training for a student from Tanzania BiodivERsA DiMoC training workshop in Hamburg (Germany)

2. Service delivery achievements

- The Malariology Service remains strongly committed to capacity building and human capital development in malaria molecular surveillance (MMS) in endemic areas. In 2023, we published manuscripts on the development and roll-out of MMS (PMID: 38177851, PMID: 37626131, PMID: 36908639, PMID: 36864926, PMID: 36840586) and organised a 2-week hands-on workshop on using AmpliSeq technology for MMS for laboratory technologists and PhD students from CRUN, Burkina Faso. Moreover, we launched a hybrid (online) and F2F training that combines 3 weeks of lab training with 2 weeks of bioinformatics data analysis for MMS.
- Thanks to its expertise, the department remains a valuable partner for industry. It also contributed to several studies in collaboration with industry in 2023 from which new opportunities for research emerged.
- The department houses 5 (inter)national reference centres; several services provide ad hoc expert advice to international institutions such as WHO and locally such as to the FAMHP.
- Veronique Dermauw and Pierre Dorny participated as experts in the WHO focus group discussion on food-borne trematodes in December 2023, in the context of the GAP Assessment Tool, a qualitative method for monitoring programmatic Progress towards the 2030 targets proposed in the Neglected Tropical Diseases roadmap.
- As part of the cooperation agreement with Brussels Environment for wildlife disease surveillance in the Brussels Capital Region, 34 foxes have already been screened for Echinococcus, fortunately all with a negative result.
- The Zoonoses Service organised a training in DRC on safe handling of dog faeces samples on 28 September 2023.
- The Zoonoses Department participated in Heritage Day on 23 April 2023, with the theme ‘Beastly’. A public lecture was given on how helminths can be transmitted from animals to humans, and what the health consequences of such an infection can be.

3. Organisation of the department:

- The year 2023, with the establishment of the departmental research priorities in the draft policy plan, was entirely dominated by the transition to the new policy period 2025-2029. The department continues to work on filling its faculty cadre with the start of Maria Luísa Simões as Professor of Experimental Immunology on 1 May 2023, the recruitment of Joachim Mariën as Research Professor of Virus Ecology (start February 2024) and the opening of the position Professor of Helminthology at the end of 2023 (start date scheduled for mid-2024). In April 2023, Katja Polman (Professor of Medical Helminthology) transferred to the Department of Public Health as planned.
- The Department of Biomedical Sciences invested heavily in a more robust recruitment process for strategic positions (ZAP), laying the foundation for the reworking and extension of the selection procedure for ZAP at institutional level.
- After more than 10 years, the department reformed its consultation structure in 2023 to strengthen the advisory role and participation of department heads in policy, promote internal communication and foster a sense of community. The expansion of the departmental office and the launch of the departmental newsletter brought a new impetus.

4. Ambitions and challenges

- Sustainable balance between opportunity/need-driven research and the strategic focus on neglected diseases.
- Strengthen critical mass for research and teaching.
- Guarantee a balanced framework for all departmental services within a defined staff budget and with sharply increased wage costs.
- Strengthening our capacity to attract external funding, including through the further strengthening/digitisation of the preliminary process and collaboration with the institutional fundraiser.
- Infrastructure:
    - Housing the entire department 'under 1 roof' in state-of-the-art research infrastructure - ensuring business continuity pending implementation of the building master plan.
    - Further investment in cooperation with other research institutes and universities at home and abroad.
    - Urgent need for investment funds to achieve a healthy investment rhythm for basic laboratory infrastructure.
- Strengthening institutional support for valorisation and technology transfer.
- Biobanking : efficient management of samples.
- Need to reform/expand support processes:
- HR:
    - Expert support in international recruitment and mobility
    - Exponentially increased labour costs versus committed envelopes
- Purchase:
    - Compliance of purchasing processes combined with efficiency and smoothness (evolution towards online purchasing)


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Table 33. Overview of the various services and departments (Dutch-language and English-language denomination) and the designated heads of department in the Department of Biomedical Sciences. (status 31.12.2023)

Department Biomedical Sciences / Departement Biomedische Wetenschappen		
English name	**Dutch name**	**Head of Service / ZAP**
Mycobacteriology	Mycobacteriologie	Bouke DE JONG
Virology	Virologie	Kevin ARIËN
Experimental Immunology	Experimentele Immunologie	Maria Luísa SIMÕES
Molecular Parasitology	Moleculaire Parasitologie	Jean-Claude DUJARDIN
Malariology	Malariologie	Anna ROSANAS-URGELL
Trypanosoma	Trypanosoma	Jan VAN DEN ABBEELE
Zoonoses	Zoönoses	Véronique Dermauw**
Entomology	Entomologie	Ruth MÜLLER
Virus Ecology	Virus Ecologie	Vacant*

Department Biomedical Sciences		
Head of Department	Departementshoofd	Kevin ARIEN
Management Biomedical Sciences	Beheer Biomedische Wetenschappen	Nadine VAN PEER
Education Coordination	Onderwijscoördinatie	Mieke STEVENS

** Joachim Mariën starts on 1 February 2024*

*** Head of Service ad interim. Selection of a 'ZAP Helminthology' is planned during 2nd quarter 2024*

c. Department of Clinical Sciences

Responsible service = DKW

SO1 - Conduct outstanding clinical and laboratory research on HIV, tuberculosis, STI, tropical infectious diseases, including vaccine-preventable diseases, in order to answer questions on the best prevention, diagnosis and treatment practices to reduce individual suffering due to infectious diseases;

SO2 - Contribute to improved patient management by strengthening capacities for research, education and reference services in LMICs;

SO3 - Provide scientific and medical services for the benefit of patients in Belgium (Europe), in support of global health security and outbreak preparedness, and national and international health organisations.

In 2023, we went through an important transition process to build a new, stronger clinic structure. After all, the proper functioning of our clinic is not only necessary for high-quality and efficient patient care. A well-functioning clinic also means space and opportunities for scientific research and education. In this way, the entire department will reap the benefits of this thorough reform, which has been successfully completed in the meantime

1. Achievements regarding SO1

- No new ZAP recruitments in 2023, but in view of the new policy plan work was done to update the ZAP plan. For instance, it was decided to commit to ZAP replacements for the Tropical Bacteriology and HIV & Tuberculosis units by 2024.
- Several, competitive external funds were acquired within the niche domains and activities of the department both in Belgium and the South. These funds were obtained in a wide range of national and international competitive grant programmes (HorizonEurope, EDCTP, FWO, KCE, Vlaio, etc) on various topics such as alternative testing strategies, bacterial infections, antibiotic resistance, tuberculosis and neglected tropical diseases, etc.

2. SO2 realisations

- The main achievement is the launch of WikiTropica as an open-access platform on tropical infectious diseases, providing e-learning tools and information that can be used worldwide by students, staff and healthcare professionals. The ambition to launch this platform dates back ten years, and it is the result of a large-scale international project funded by Erasmus+.
- The new master's in Tropical Medicine runs jointly with colleagues in the Department of Biomedical Sciences. The third group of students graduated last year.
- Activities around capacity building in DRC were significantly strengthened with a clinical component in close cooperation with the DRC office. Collaboration with the other partner institutions is also continuing to achieve the objectives within FA5.

3. SO3 realisations

SO3 deals on the one hand with 'Medical reference care' mainly implemented by the Department of Clinical Sciences. These realisations are explained in detail under 4.2. ITM remains the national reference institution in Belgium in tropical treatment & diagnostics and is among the major national reference centres and laboratories in HIV & STI.

4. Ambitions and challenges 2024

- Addressing key concerns within the medical services, such as further shaping the new structure, providing continuity within the various disciplines, further integrating activities & processes and responding to new policy developments. The medical services are the core of the department and proper functioning within clinic and KRL is the basis for further shaping research and teaching.
- Recruit the new ZAP according to the ZAP plan and embed them within the existing research lines in the department and across ITM to generate more critical mass academically.
- Building on the clinical trial site. Now that the new infrastructure has been delivered and an established study team has been built out, we want to commit to further development, including by involving multiple promoters within ITM, facilitating new academic studies and attracting additional commercial studies.
- Coordinate the entire Master in Tropical Medicine, including the biomedical track that will be administratively transferred to KW. Taking further steps in the digitalisation strategy within the education system and commit to opportunities around new short courses or evening seminars, or WHO initiatives under the SORT-IT.

- Further sustainable anchoring of clinical activities under the new FA5 framework agreement.
- Maintain or further develop the reference role to our various partners, such as UZA, RIZIV and WHO.

Table 34. Overview of the different services and departments (Dutch-language and English- language denomination) and the designated heads of service in the Department of Clinical Sciences.

Department Clinical Sciences / Departement Klinische Wetenschappen		
English name	**Dutch name**	**Head of Service / ZAP**
Research group : Klinische Tropische Geneeskunde/ Clinical tropical medicine		
Clinical Trials Unit	Clinical Trials Unit	Yven VAN HERREWEGE
Tropical Diseases	Tropische Geneeskunde	Emmanuel BOTTIEAU
HIV & Tuberculosis	HIV & Tuberculose	Tom DECROO a.i.
Sexually Transmitted Diseases	Seksueel Overdraagbare Infecties	Chris KENYON
Neglected Tropical Diseases	Verwaarloosde Tropische Ziekten	Johan VAN GRIENSVEN
Travel Medicine	Reisgeneeskunde	Patrick SOENTJENS
Emerging Infectious Diseases	Opkomende Infectiezieken	Laurens LIESENBORGHS
Research group : Tropische Laboratoriumgeneeskunde/ Tropical laboratory medicine		
Tropical Bacteriology	Tropische Bacteriologie	Jan JACOBS
Clinical Virology	Klinische Virologie	Koen VERCAUTEREN
Clinical Immunology	Klinische Immunologie	Wim ADRIAENSEN
Medical Services/Medische diensten		
Clinical Reference Laboratory	Klinische Referentielaboratorium	Marjan VAN ESBROECK / Dorien VAN DEN BOSSCHE
Polyclinic	Polikliniek	Patrick SOENTJENS
Department Clinical Sciences		
Head of Department	Departementshoofd	Johan VAN GRIENSVEN
Management Clinical Sciences	Beheer Klinische Wetenschappen	Filip DE KEULENAER
Education Coordination	Onderwijscoördinatie	Maria ZOLFO

Policy and management of ITM

7

7. Policy and management of ITM

a. Policy organisation

Responsible department = General Management

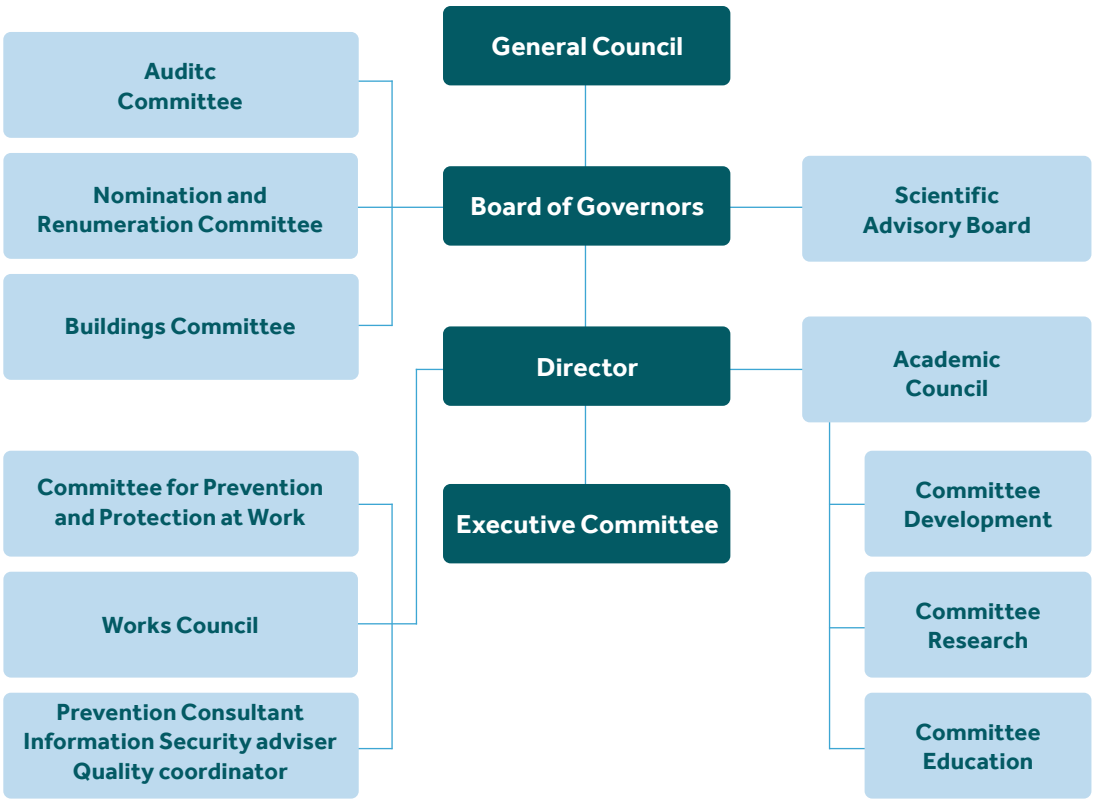
1. Charter of good governance

ITM lays down decision-making principles and methods in a Charter of Good Governance. The Charter aims to ensure effective, sustainable and transparent compliance, safeguard the mission, mandate and core values of ITM, in the full confidence of its stakeholders and society at large. The Charter ensures that decision-making and governance actions are transparent, accessible and verifiable at every level. Based on the private-law status of a foundation, the Charter also safeguards the scientific freedom and participatory policy-making characteristic of an academic institute. In doing so, ITM complies with the recommendations for Good Governance in Flemish Universities. The Charter is published on the ITM website and is accessible to all stakeholders and other interested parties.

2. Overview of consultative bodies

The diagram below charts ITM's policy and advisory bodies as set out in the Statutes, as well as the statutory consultation structures and functions that report to the Executive Board (being the Director). For the sake of completeness, this chart also includes academic consultative bodies that provide advice to the Executive Board or Director. As well as the functions reporting to the director in accordance with statutory provisions.

Figure 11. Presentation of ITM's various policy and advisory bodies.



General Council

The General Council is a statutory body that ensures that policies, governance and management of ITM are consistent with its purpose, identity and integrity. The Council consists of various stakeholders with voting rights, specifically the various granting authorities, local authorities, universities, staff, alumni, students and additional members co-opted by the General Council (such as partners). Members of the Executive Board and the Government Commissioner are non-voting members. A list of the current members of the General Council can be found on our website.

The General Council oversees an independent Board of Governors and can appoint and dismiss its members, with the exception of the director (who is appointed and dismissed by the Board of Governors). It evaluates annually the quality of the work delivered by the Board of Governors. In case of serious deficiencies, he may suspend or dismiss one or more directors with a reasoned decision.

The General Council meets at least twice a year, but may organise additional sessions. More information on the General Council can be found in the statutes.

Board of Governors

ITM is managed by a Board of Governors, which delegates day-to-day management to the Director. The Director is accountable to the Board of Governors for all managerial actions. The Board of Governors has full powers, even though some powers require the prior opinion of the General Council.

The Board of Governors is composed of a minimum of three and a maximum of 12 members, appointed by the General Council, excluding the director. The mandate of the members of the Board of Governors lasts for four years and is renewable. The director is an ex-officio member of the Board of Governors, but cannot be chairman or vice-chairman. A list of the current members of the Board of Governors can be found on our website.

The Board of Governors meets at least four times a year and as often as the interests of ITM require. More information on the Board of Governors can be found in the articles of association.

The Board of Governors is supported by three advisory committees, namely the Audit Committee (with advisory powers on finance and risk management), the Nomination and Remuneration Committee (with advisory powers on executive appointments, salary policy and selection of directors), and the Buildings Committee (with advisory powers on ITM's building assets).

Charters were drawn up for these three advisory bodies, regulating their mission, composition and operation.

Executive Committee

The Governance Committee assists the director in the day-to-day management of ITM. The composition, functioning and powers of the committee are laid down in the Executive Regulations. In principle, the members of the Executive Committee meet fortnightly.

Academic Council

The Academic Council is a consultative body outside the hierarchical line in which ideas are exchanged on academic matters across unit boundaries and departments and concrete opinions are formulated. Members decide autonomously on the agenda and opinions are given independently of the hierarchical line. These opinions are not binding, but do provide direction. The Council meets monthly.

Works council

The Works Council is a consultative body in which the head of the company informs and consults employee representatives. For some matters the Council can take decisions, for others it has supervisory powers. The powers of the Council are in the areas of employment and work organisation, working conditions and remuneration, private life and new technologies, events or decisions that could change the organisation of work and working conditions and supervisory powers. The Works Council meets monthly, with the exception of July and August.

Committee for Prevention and Protection at Work

The Prevention and Protection at Work Committee is a statutory consultative body composed of appointed employer representatives, elected employee representatives as members of the Safety, Welfare and Environment Department (VWM). The Committee has advisory powers and its main mission is to formulate proposals that promote the safety and welfare of workers in the performance of their work as well as to promote the activities of the VWM service and monitor its operation. The Committee meets monthly, with the exception of July and August.

Table 35. Overview of various meetings and consultative bodies (2019 -2023)

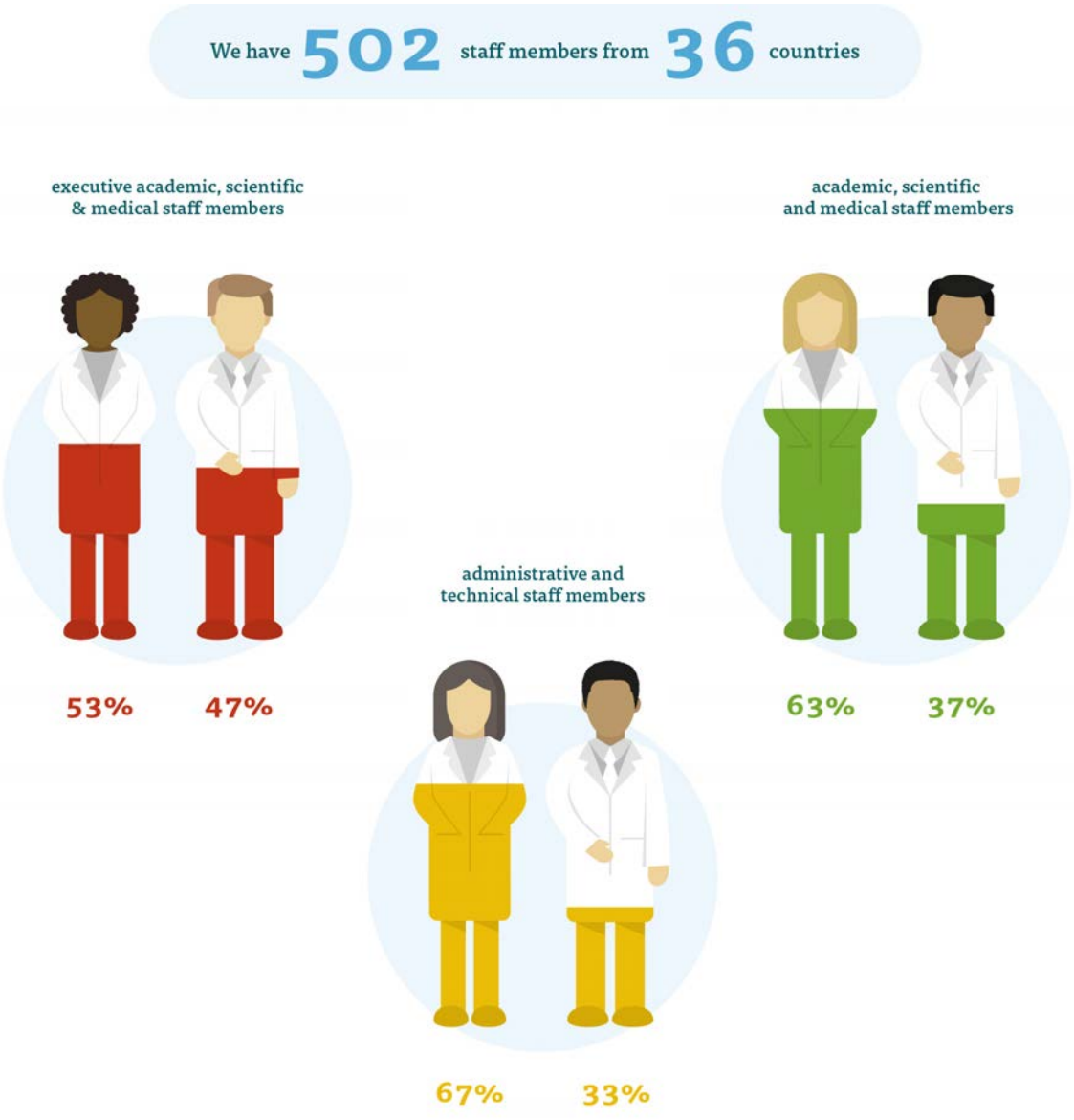
Meetings of consultative bodies	2019	2020	2021	2022	2023
General Council	4	2	2	2	2
Board of Directors	7	7	7	6	8
Executive Committee	24	23	23	21	20
Audit Committee	2	3	6	4	6
Nomination and Remuneration Committee	3	4	4	6	5
Buildings Committee	4	2	4	3	4
Works Council	10	10	10	10	11
Academic Council	12	10	11	10	8
Comité voor Preventie en Bescherming op het Werk	9	10	9	9	10

3. Overview of ITM organisational structure

The diagram below shows which departments and services ITM has, and in which hierarchical relationship the departments and services are related to each other. The Designation department is henceforth reserved for the clustering of scientific services as well as the management and administrative departmental services.

Central support for the operation of ITM is organised into central policy services reporting to the director on the one hand, and general management services reporting to the general manager on the other. Support in the departments is organised by department into departmental management services.

Since late 2020, ITM has had a central service in DRC. The 'ITM-DRC Service' or 'ITM-DRC Office' is headed by the ITM-DRC representative and coordinates the operation of ITM activities in DRC. This service monitors both policy and management aspects of ITM in DRC.
The ITM- DRC team aims to carry out close project management in the DRC and thus allowing the programme to be managed more flexibly, because more adapted to the local context.
A new statute (Accord de Siège) in the DRC was signed in November 2021.



DIRECTOR
Lut Lynen

CENTRAL POLICY OFFICES

COMMUNICATIONS
Anton Baert

RESEARCH COORDINATION
Ann Verlinden

- Library
  Eva Nijs

INTERNATIONAL COOPERATION
Jan Coenen

EDUCATION
Bruno Broucker
- Student support
  Helga Bodges

PUBLIC HEALTH
Raffaella Ravinetto

HEALTH SYSTEMS AND POLICY
- Complexity and Health
  Bruno Marchal
- Health Policy
  Wim VanDamme
- Equity and Health
  Karina Kielmann
- Pharmaceutical Public Health
  (Raffaella Ravinetto)

SEXUAL AND REPRODUCTIVE HEALTH
- Sexual Health
  including HIV
  Bernadette Hensen
- Reproductive and Maternal Health
  Lenka Beňová

TROPICAL INFECTIOUS DISEASES
- Socio-Ecological Health Research
  Koen Peeters
- Mycobacterial Diseases and Neglected Tropical Diseasesn
  Epco Hasker
- Emerging Infectious Diseases
  Katharina Kreppel
- Medical Helminthology
  (Katja Polman)

MANAGEMENT PUBLIC HEALTH
- Departement Manager
  Jan Boeynaems
- Education coordination Public Health
  Marjan Pirard

BIOMEDICAL SCIENCES
Kevin Ariën

MICROBIOLOGY
- Mycobacteriology
  Bouke de Jong
- Virology
  Kevin Ariën
- Experimental Immunology
  Maria Luisa Simões

PROTOZOOLOGY
- Molecular Parasitology
  Jean-Claude Dujardin
- Malariology
  Anna Rosanas Urgell
- Trypanosoma
  Jan Van Den Abbeele

ECO-EPIDEMIOLOGY
- Entomology
  Ruth Müller
- Zoonoses
  Véronique Dermauw a.i.

MANAGEMENT BIOMEDICAL SCIENCES
- Departement Manager
  Nadine Van Peer
- Departement Labaratory Coordinator
  Evi Pockelé
- Education coordination Biomedical Sciences
  Mieke Stevens

ITM-organogram | 31.12.2023

Figure 12. Presentation of the ITG organisational structure.

GENERAL MANAGER
Ann Peters

ITM-DRC OFFICE
Inge Van Cauwenberg

CLINICAL SCIENCES
Johan van Griensven

CLINICAL TROPICAL MEDICINE
- Clinical Trial Centre
  Yven Van Herrewege
- Tropical Medicine
  Emmanuel Bottieau
- HIV and Tuberculosis
  Tom Decroo a.i.
- Sexually Transmitted Diseases
  Chris Kenyon
- Neglected Tropical Diseases
  Johan van Griensven
- HIV Care
- Travel Medicine
  Patrick Soentjens
- Clinical Emerging Infectious Diseases
  Laurens Liesenborghs

TROPICAL LABORATORY MEDICINE
- Tropical Bacteriology
  Jan Jacobs
- Clinical Virology
  Koen Vercauteren
- Clinical Immunology
  Wim Adriaensen

MEDICAL SERVICES
Patrick Soentjens
- Travel Clinic
  Patrick Soentjens
- HIV/STI Clinic
  Vincent Barvaux
- Clinical Reference Laboratory
  Marjan Van Esbroeck &
  Dorien Van den Bossche

MANAGEMENT CLINICAL SCIENCES
- Departement Manager
  Filip De Keulenaer
- Education coordination Clinical Sciences
  Maria Zolfo

GENERAL MANAGEMENT OFFICE
Ann Peters

HR MANAGEMENT
Nick Cuyvers

SAFETY, HEALTH & ENVIRONMENT
Liesbet De Graef

FACILITY MANAGEMENT
Peter Van Eyndhoven

FINANCIAL MANAGEMENT
Ben Dergent
- Accounting
  Hanne Rheinhard
- Purchasing and Logistics
  Hugo Geeraert
- R&D Contracts and Reports
  Rebecca De Backer

INFORMATION TECHNOLOGY
Tim Wouters
- ICT Infrastructure and Service
  Davy Hendriks

QUALITY
Tijs Van Poucke

APPLIED TECHNOLOGY AND PRODUCTON
Caroline Rombouts

GENERAL MANAGEMENT
- Process Management Office
  Valerie Bastiaensen
- Legal Office
  Frederik Lecok
- Management Office

b. Regulatory framework

Responsible department = General Management

The main legal missions of ITM are contained in:

- Codex Higher Education;
- Decree of 30 April 2009 on the organisation and financing of science and innovation policy;
- Ministerial decree of 31 August 1998 on the recognition of the Prince Leopold Institute of Tropical Medicine as a reference laboratory for the diagnosis and
- treatment of tropical and infectious diseases;
- Law of 19 March 2013 on Belgian Development Cooperation;
- Royal Decree of 11 September 2016 on non-governmental cooperation
- Royal Decree of 11 September 2016 on the number of common strategic frameworks of non-governmental cooperation and their geographical or thematic coverage.

Academic recognition and funding by the Flemish Ministry of Education is the basis on which ITM is established. ITM has several public mandates and funding, laid down in a considerable number of agreements with Flemish and federal authorities:

- Management agreement with the Flemish Department of Education as a Foundation of Public Utility for post-initial training, research and services;
- Covenant with the Flemish Department of Economics, Sciences and Innovation for its research programme ('Structural Research Fund');
- Ministerial recognition of ITM as an Institutional Actor by the Minister for Development Cooperation (1/1/2017-31/12/2026) (letter dated 7 October 2016);
- Federal Ministerial Decision of 21 February 2017 on awarding the grant for the implementation of the 2017-2021 Multi-Year Programme to ITM as an approved organisation (Institutional Actor - IA);
- Project partner "Mozambique", Flemish Department of Foreign Affairs (Global Challenges Division);
- Approvals and multi-year agreements with the NIHDI (Public Health and Social Affairs) as reference centres or laboratories for tropical and infectious diseases, HIV/AIDS;
- Recognition as a Scientific Institution for tax and parafiscal deductions to promote research and development by the Federal Government;
- Project partner of the Flemish Department of Welfare.

In addition to the above legal mandates and approvals, ITM must comply with general laws and regulations on welfare, environment, heritage, etc. The (bio-)safety, welfare and environmental legislation (incl. ADR, IATA, Dual Use,...) can have a significant impact and must be respected in order to be allowed and able to perform our core tasks. In addition, the various activities at ITM must comply, often legally, with certain ISO standards, Good Clinical (Laboratory) Practices (GC(L)P), Nagoya protocol, ...

c. Staff policy and report

Responsible service = HR, input VWM for Welfare

The total number of employees at ITM in 2023 (situation on 31 December) is 502.
This is an increase compared to 2022. The number of interim employments increases on average from 3.1 interim workers in 2022 to 3.9 in 20231. The table below shows the total number of employees, the distribution of the number of employees by staff category and the gender ratio over the last five years.

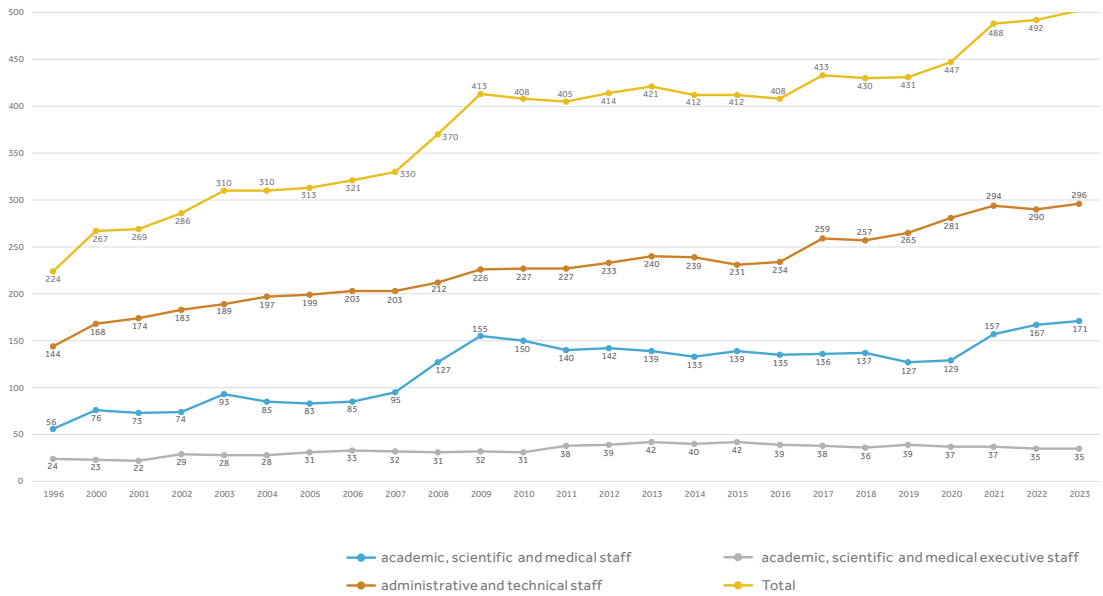
Table 36. Representation of staff numbers (total ITM and by staff category) along with gender ratios (total and by staff category) from 2019 to 2023.

Employees at ITM (situation on 31 December)	2019	2020	2021	2022	2023
Total number of employees	**431**	**447**	**488**	**492**	**502**
Academic, scientific and medical managerial staff	39	37	37	35	35
Academic, scientific and medical staff	127	129	157	167	171
Administrative and technical staff	265	281	294	290	296

Male/female (M/F) ratio (%)	33/67	33/67	35/65	32/68	34/66
M/F ratio academic, science mental and medical staff (%)	59/41	57/43	54/46	51/49	47/53
M/F ratio academic, scientific and medical staff (%)	32/68	33/67	36/64	34/66	37/63
M/F ratio administrative and technical staff (%)	29/71	29/71	29/71	29/71	33/67

Taking the above data from recent years, the trend of increase in the workforce is clearly visible. Except for the Academic, Scientific and Medical Staff category, all categories of staff increase.

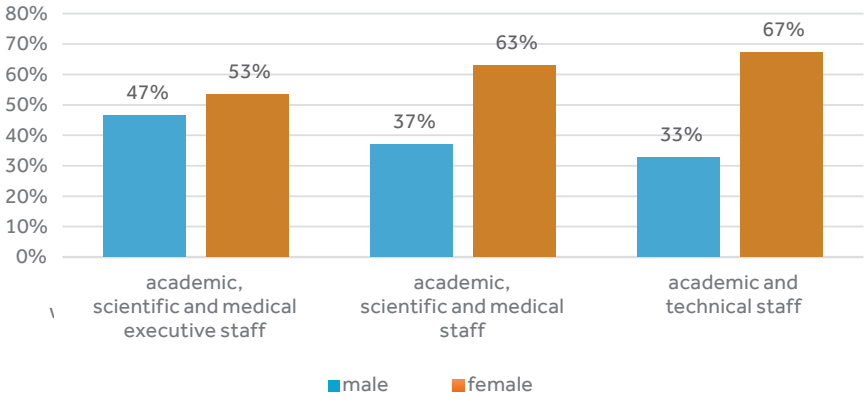
Figure 13. Evolution of the number of staff (total and per staff category) from 1996 until 2023.



The ratio of full-time to part-time employees is 71% full-time and 29% part-time. Compared to last year, more employees are therefore working full-time. Indeed, last year 68% of employees worked full-time.

Gender ratios across staff categories are shown below. The data clearly indicate that more women are employed than men in each category.

Figure 14. Graphical representation of gender ratios in 2023 by staff category on 31/12/2023.



Over 81% of ITM employees have Belgian nationality. 9.56% are from the Netherlands, France, Spain, Germany and Italy. In addition, almost 9% of the workforce represents a wide range of nationalities (36), which is a direct translation of ITM's international character.

Figure 15. Presentation of the distribution of different nationalities among ITM staff on 31/12/2023.

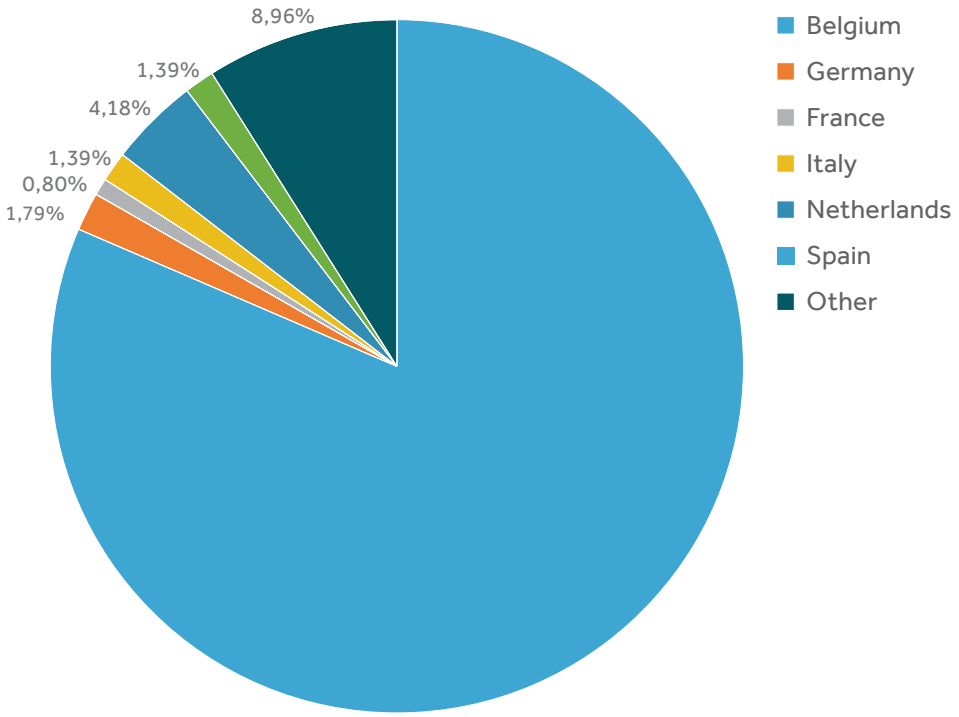
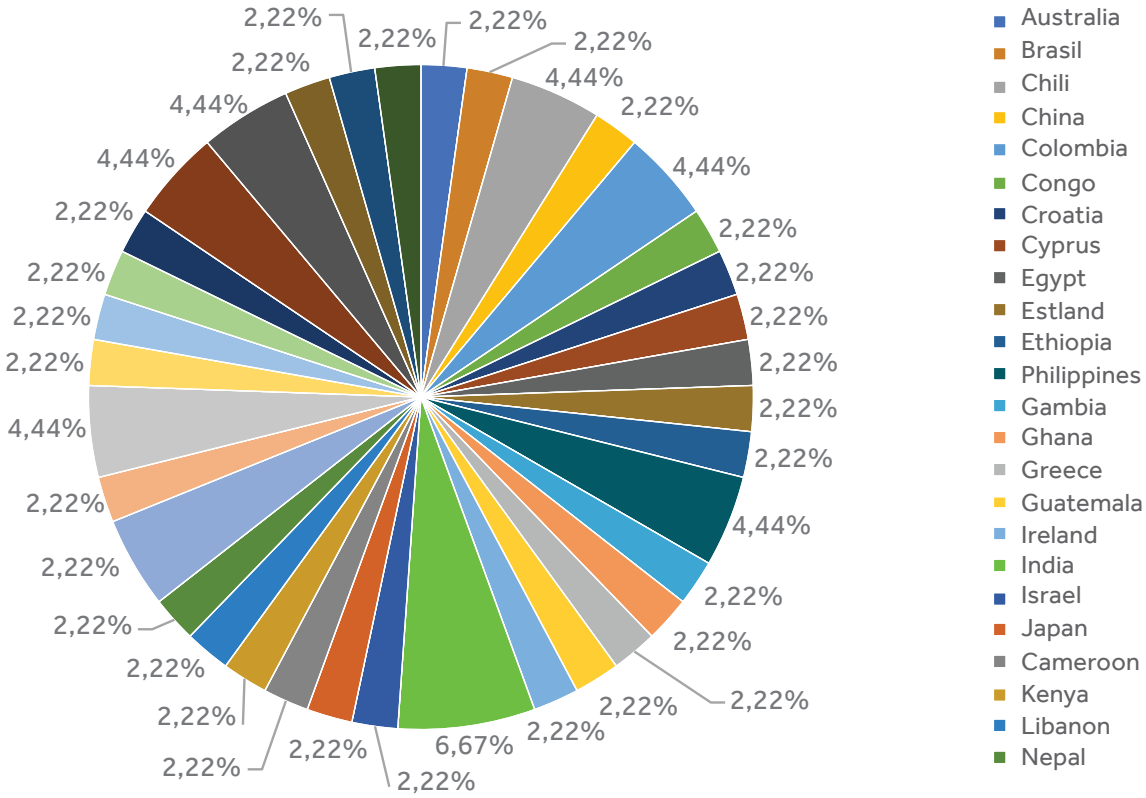
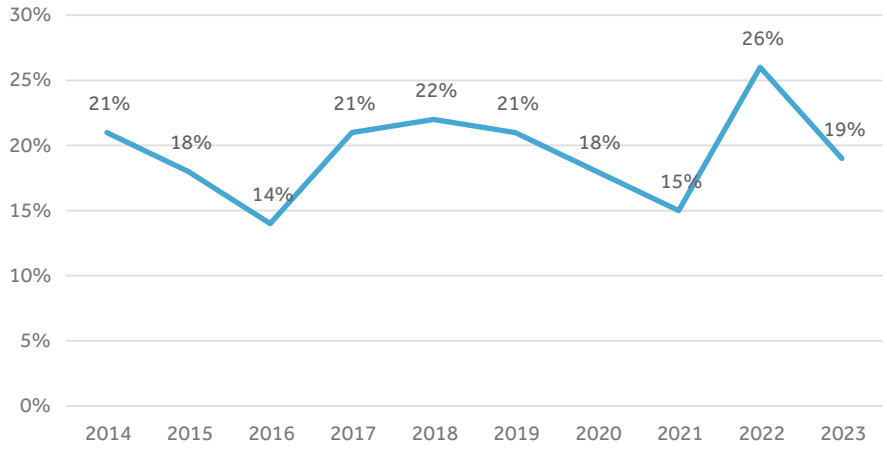


Figure 16. Presentation of the distribution of nationalities of almost 9% of ITM staff on 31/12/2023.



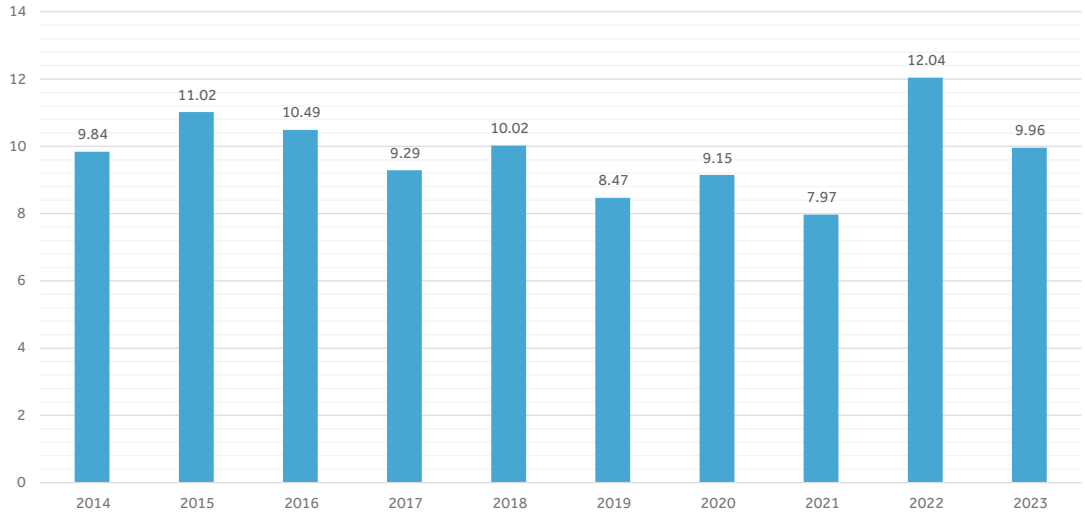
Staff turnover fell back in contrast to last year. Compared to the modest peak of 26% in 2022, this fell to 19% in 2023. In 2023, 104 new people were enrolled and 94 people were deregistered.

Figure 17. Percentage of employees leaving per year compared to the total average number of employees in that year.



Since 2018, training effort has been measured by the average number of training days per full- time equivalent (FTE) per year. When we convert the number of training hours (formal, informal and initial vocational training) into full-time days and divide this by the average FTE, then this falls to 9.96 days in 2023. The legal standard of 5 days is still comfortably met.

Figure 18. Overview of the average number of training days per full-time equivalent (FTE) since 2014 (Source: social balances).



Welfare

Well-being concerns the mental and physical health of ITM employees which is monitored through:

Medical examinations:

The occupational physician (Mensura) reports annually to the Committee for Prevention and Protection at Work through an annual report and consults with the Department of Safety, Welfare and Environment (VWM) on a regular basis.

Table 37. Overview of medical examinations in 2023.

Medical examinations	Number of investigations among subject employees	Number of investigations of non-subject employees
Recruitment	9	/
Periodic health assessment	182	/
Interim supplementary medical procedures	65	/
Maternity protection	20	/
Research prior to work resumption	2	9
Research on resumption of work	7	13
Spontaneous consultation	97	35

In 2023, 4 occupational diseases were declared to Fedris.

Well-being and ergonomics:

An annual report on psychosocial well-being is also drawn up and discussed at the CPBW by the PSY team. Before 2023, 7 informal and 0 formal files were started with the prevention advisor psychosocial aspects of Mensura and 9 informal interventions were carried out by the confidential counsellors.

In 2022, ITM organised a well-being survey involving work organisation, relations, content, terms and conditions are surveyed among employees. An action plan was developed in 2023 based on the results of this well-being survey. Important themes that ITM immediately started working on in 2023 were the clarification of ITM's vision and mission, the need for a full-fledged leadership programme for all members of the hierarchy and a learning management tool.

Throughout the year, ITM undertakes several initiatives on wellbeing, including the stress-permits, two bicycle repair days, an exercise challenge, a 'Well@ Work' week (with a breakfast, massage@work, ergonomic workplace analyses, first aid & self-defence workshop, plant exchange, cubbing tournament, and others), yoga and mindfulness sessions, Easter action, Saint action, soup action, a New Year party, compliments day and others.

The SHE Service supports colleagues in carrying out an ergonomic analysis of the workplace and offers extensive information on this on the intranet. This year, this information page was further expanded to include tips&tricks on working ergonomically in the lab. In 2023, a total of 30 ergonomic workplace analyses took place within the organisation. In addition, an in- depth study was carried out by an external ergonomist around the duties of the logistics department.

Medical social team:

The MST met 3 times in 2023 to follow up the 32 long-term absentees under the attendance and reintegration policy (2022: 34).

Check-ups:

11 employees invoked the comprehensive health survey under CLA104 'employment plan for older workers'.

d. Financial report

Responsible department = Financial Management

The full annual accounts were submitted to the Flemish Government on 29 March 2024.

The asset amounts to EUR 67.2 million at the end of 2023. This means quasi status quo or a very slight decrease of around €152,000 (-0.23%) compared to 2022 (€67.3 million). On the assets side, the limited variation is mainly due to a gradual decrease in tangible fixed assets by EUR

0.7 million (because of depreciation vs. investments, idem last year), combined with an increase in current assets by EUR 0.5 million, and, more specifically, an increase in orders in progress of €1 million (projects in progress debit balances, more costs than receipts, counterpart of the account 46 'prepayments received' for credit balances projects). Other internal fluctuations can also be noted. Among other things, there is a reduction in trade receivables (€0.4 million in 2023) from €4.8 million in 2022 to €4.4 million in 2023. These are mainly receivables outstanding against funders ('fund claims' of research projects), mutual funds and various sales invoices. There is also an increase in bank balances of 2.3 million euros to 29.7 million euros as at 31/12/2023 compared to 27.4 million euros as at 31/12/2022, in combined with, on the one hand, a decrease in other receivables amounting to -1.4 million euro in 2023 (due to payment balance of previous DGD Framework Agreement 4) and, on the other hand, the contraction of accruals by 0.9 million euro from 1.5 million euro at the end of 2022 to 0.6 million euro at 31/12/2023 (due to still high energy compensation in acquired revenues in 2022 amounting to €0.4 million, transferring some large invoices in 2023 (€0.2 million) and, finally, a shift to the 'invoices to be received' account (€0.4 million) due to different processing by switching to Medius software).

The liabilities at the end of 2023 amount to 67.2 million euros. This represents quasi status quo or a very slight decrease of 152,000 euros (-0.23%) compared to 2022 (67.3 million euros). On the liabilities side, the limited variation is due to many different fluctuations. First, there is a significant decrease in equity (-1.7 million euro) including specifically the contraction of earmarked funds (utilisation -0.6 million euro) and retained earnings (loss -1 million euro). There is also the release of the provision for co-financing (-251,000 euros). Then again, there is a 1.8 million euro increase in liabilities due to the combination of the decrease in non-current liabilities (-0.7 million euro due to repayment of capital loans) and an increase in current liabilities (+2.8 million euro). The latter is due, on the one hand, to the increase in trade payables of 0.5 million euro (invoices payable as at 31/12) and, on the other hand, the increase in advance payments received on projects (+€2.9 million, mainly by DGD). Finally, there is a decrease of accruals, in particular the income to be carried forward due to the alignment of the ARC agreement (€210,000).

The result for the financial year 2023 is a loss of -1.6 million euros and is deteriorated by 2.1 million euros in 2023 compared to 2022. The 'operating loss' (terminology as per template government commissioner) also in the amount of -1.6 million euro drops sharply by 1.9 million euro, and is slightly reduced by a financial status quo of -25,000 euro in 2023. As a reminder, the positive financial result in 2022 came from the sale of dollars and the valuation USD account at 31/12 (totalling about 350,000 euros). The 2023 'result' without earmarked funds (t.b.v. decrease of ca. €600,000 support funds and R&I fund) is less heavily negative and thus amounts to € -1 million, which is lower than budgeted € -0.7 million, but which is slightly better than the 2023 forecast of € -1.1 million (which was made at budget 2024 in September 2023). Among other things, many movements due to better financial result, more overhead, the release of the provision, but on the other hand some more operating expenses, slightly lower result production, higher defiscalisation receipts, etc. compared to forecast 2023.

On the one hand, there is an increase in operating income of EUR 4.3 million compared to last year (e.g. increase in operating benefits due to the index, increase in defiscalisation funds, income from polyclinics, increase in matching 71 projects mainly due to EWI (and cf. infra DGD operating cost), but also decrease in subsidies projects and other revenues e.g. TT&P CATT and energy compensation).

On the other hand, we also see a very sharp increase in operating expenses of €6.2 million. This is 1.9 million more than the increase in operating income, which explains the fall in operating profit. There is a status quo in goods (60), but an increase in services (61) of €1.4 million and personnel costs (62) of €5.1 million. Explanations at services & miscellaneous are mainly many pluses and minuses, mostly also project-related at EWI, DGD (a.o. an operating cost DGD 1.1 million matched with the 71 account is the biggest explanation here) and H, and related to consumption at production and medical services. As for ITM, on the one hand less maintenance & repairs, lower energy costs (-550,000 euro), on the other hand increased costs for insurance, interims, training, representation, software & licences, and consultants. The explanation at remuneration are the full reckoning of the indexations from 2022, the introduction of the new pay policy personnel cost (both approx. 10%) together with the increasing evolution personnel framework: the increases are almost evenly spread over ITM, EWI, medical services and DGD and external projects together. The personnel evolution consists of +1.7 million euros on personnel envelopes, +1.1 on medical services, and a higher personnel allocation cost research projects of +2.3 million euros.

Finally, relevant to mention:

- Liquidity ratio 2023 dropped: 1.21 (is greater than 1) compared to 1.34 in 2022 and 2021, but status quo vs budgeted 1.20.
- Spending investment budget 2023: €527 000 or 54%/46% vs. budgeted €975 000/ forecast
- €1.16 million. This mainly due to a shift to 2024 due to late invoice for 100,000 euro (replacement of nodes and wifi points), allocation on project money (ELN to EWI) instead of co-financing from ITM (80 000 euro), project Acerta payment to 2024 and project Planon on operation (together 95 000 euro), and finally 'lagging' of own contribution on Flemish Resilience (50 000 euro instead of 300,000 euro).
- The 2023 profit appropriation: withdrawal of earmarked funds 607 718 euros (R&I fund and support funds), with decrease in retained earnings -1 024 323 euros to total retained earnings of 10 063 846 euros.
- ESA 2023: total revenue/expenditure 68 561k EUR, and final state with result carried forward total revenue/expenditure 85 285k EUR.

Last but not least, it is important to note that the file in relation to the 'foregone' funds from the past for the group insurance 'purpose to be achieved' (alignment statute with universities, but without funding) still remains topical, pending possible intervention from the Flemish Fund for Lastendelging.

The notes to the annual accounts in National Bank format will be updated with a review by the auditor, including the notes to the pension plans, a mention of a recent bequest received in 2024, and a mention of a communication from the NIHDI regarding proposals for regularisations of previous years regarding the ARC agreement. An annual report was also drawn up in accordance with the model WVV.

A more detailed explanation is prepared in the financial commentary for the benefit of the Government Commissioner in implementation of the Education Management Agreement and may be delivered later for information.

An evolution of recognised revenues over the different years is shown below.

Figure 19. Evolution of the different funding streams (additional revenues) of ITM from 1995 to 2023 (k €).

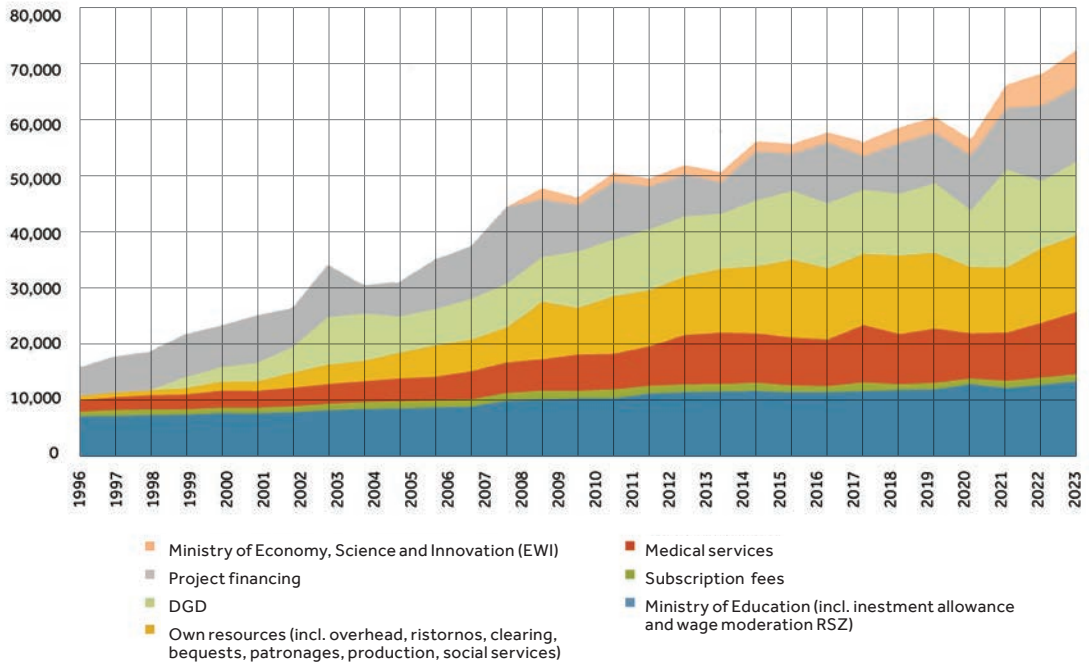
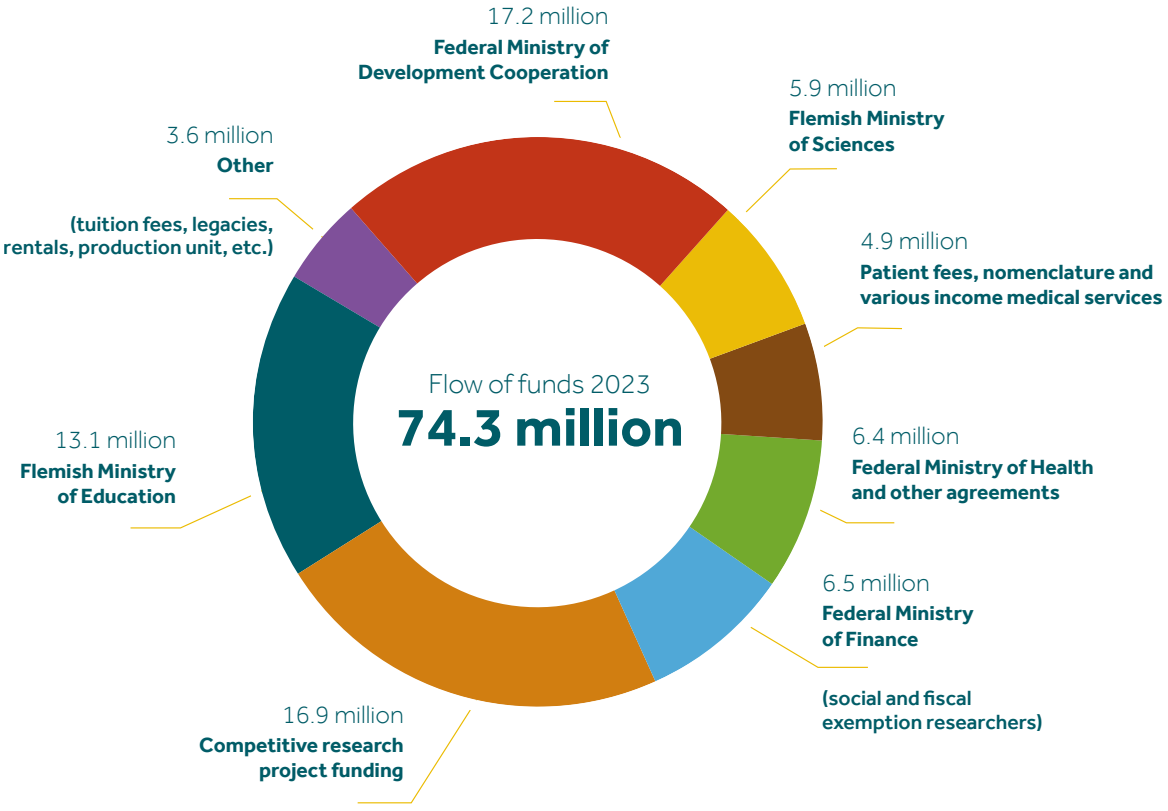


Figure 20. Flow of funds 2023



e. Risk management policy

Responsible service = service Quality

1. Risk management

Risk management at ITM is carried out according to the Higher Education Risk Management Review Model. As part of the ITM Policy Plan 2020-2024, a review was conducted in 2020 with identification of ITM risks. In 2022, this analysis was continued, with the identified risks were evaluated and the status of control measures was discussed.

At the organisational level, risks are identified within the following areas:

- Risks linked to ITM's core functions (teaching, research and service provision)
- Risks relating to reputation of ITM
- Risks relating to our employees (Recruitment and retention policy, welfare, etc.) and externals (patients, students, partners, etc.)
- Risks related to compliance (meeting laws and regulations)
- Financial risks

In addition, ITM has an operational management system for Quality, Safety and Environment that enables ad hoc responses to emerging risks.

Besides controlling risks at organisational level, risk management is also applied at process level within the various domains in which ITM operates. This is mostly driven by norm ative requirements (in accredited laboratories, central processes, clinical trials, educational activities, ...).

For the highest-priority risks, measures are drawn up to minimise the risks. If new control measures need to be developed for a risk, this is followed up with an action plan.

Detected risks are reported to Management (Executive Committee). And discussed annually in a management review. The main results are reported to the audit committee, single audit and board of directors.

2. Dynamic risk management system (DRBS)

Within the framework of welfare legislation and the integrated policy Quality, Safety, Welfare and Environment, ITM must have a DRBS. This is a system where risks are mapped at the level of organisation, department/workstation and individual.

In terms of DRBS, the main risks identified for ITM in the past were:

- Working with biological agents
- Travel
- Psychosocial burden
- Ergonomics

3. Integrity policy and complaints handling

ITM staff, researchers and students must respect internationally recognised standards of academic and scientific integrity. Reports of possible violations of scientific integrity are handled independently by reviewed by the Scientific Integrity Committee.

In its research activities, ITM aims to produce results that are reliable, reproducible and, as far as possible, accessible to the relevant scientific research community. Where relevant, this is done prior to the start of the research obtained authorisation from a review board, such as the internal Institutional Review Board (see above), biobank manager or an external ethics committee.

In addition, employees of ITM undertake to preserve at all times the confidentiality of the data with which they are confronted in the context of their teaching, research or service, as well as in their administration. In contacts or collaborations with others, ITM employees guard against self-interest and conflicts of interest.

Reports around integrity, fraud and complaints

Incidents concerning integrity, scientific integrity, information security, fraud and complaints, including those related to services in the outpatient clinic, are followed up through established procedures. Following an investigation of the report, appropriate action is taken to make corrections and implement corrective measures where necessary.

Eight reports were made about patient aggression towards outpatient clinic staff. These reports were handled by the VWM service, in cooperation with the psychosocial aspects prevention advisor and the outpatient clinic's aggression team.

There were no external reports related to integrity of ITM employees in 2023. No reports related to financial fraud were reported.

ITM established a whistleblower reporting channel and a process for follow-up and protection of whistleblowers in accordance with legislation by February 2023. No reports were recorded in 2023.

In 2023, there were no reports of violation against scientific integrity. The ITM Committee on Scientific Integrity was consulted for three opinions.

f. Audits and evaluations

Responsible service = service Quality

1. External evaluations

Below are the results of the external audits carried out on ITM during 2023. No critical observations were noted with a direct impact on the continuity of our operations.

Clinical and reference laboratories

Periodically, our clinical and reference laboratories are audited by BELAC (Belgian Accreditation Organisation FPS Economy). These laboratories perform tests accredited to ISO15189, ISO17025 and ISO17043. In 2023, the second follow-up audit was requested and finally scheduled in early 2024. The accreditation certificates remain valid until 2026.
The accreditation scope was retained.

Management and general management services

The Management and General Management Services have been ISO9001 certified since 2014. In 2023, these services received an external audit as part of the certification renewal process. The certificate was retained and is valid until 2026.

Financial processes

Our financial services are audited annually in accordance with Belgian Law by the company auditor. Comments are reported to management and the Board of Directors.

Inspection of the Clinical Trial Site by the FAMHP

The Clinical Trial Site (CTS) of ITM conducts clinical studies with healthy volunteers and patients with specific conditions such as infectious diseases. The studies are organised in collaboration with academic and life science partners. In a clinical study, participants are selected, treated and followed up according to a strictly regulated procedure and international guidelines for 'good clinical practice' (GCP). The Federal Agency for Medicines and Health Products (FAGG) came to inspect the activities at the CTS. No critical or major observations were noted. Where necessary, an action plan was drawn up to resolve minor observations and recommendations.

Internal audits and evaluations

The ITM Quality Coordinator is designated as the organisation's Internal Auditor. The ITM internal audit programme is co-constituted by the Audit Committee of the Board of Directors.

Internal audit programme:

In accordance with the requirements of the standards applicable to the various activities of ITM, an internal audit programme is defined annually from the Quality Service. The main purpose of internal audits is to pursue continuous improvement.

The internal audit programme is risk-based and compiled taking into account results historical audits, risk analyses, management reviews, reported complaints and deviations, ... The programme covers the basic activities of ITM:

- Services: accredited laboratories, outpatient clinic, clinical trials, CATT production, ...
- Research with focus on the riskiest activities and studies
- General legislation: e.g. GDPR, security, biosafety, welfare and environment
- Central processes (e.g. procurement, recruitment, IT infrastructure, financial processes, etc.)

Internal audits are carried out by ITM staff qualified for this purpose through a training programme (training, internship, etc.). If the required competence for the domain to be audited is not present or independence is not fully assured, external experts are called in.

The results are reported separately for each audit. This is done at least to the head of service or person responsible for the activity.

Where relevant, critical audit results are reported to Management by the Quality Coordinator (Service Head Quality), Data Protection Officer and/or the Service Head VWM.

As Internal Auditor, the Quality Coordinator reports the results of both internal and external reviews to the Audit Committee of the Board of Directors. Results of the audits may give rise to areas for improvement, comments and recommendations in Management Reviews, external reports, ...

In 2023, internal and external reviews reported no critical deficiencies with direct impact on the continuity of ITM's core business.

g. Safety, wellbeing and environment policy

Responsible department = VWM department and management

The policy plan on Safety, Wellbeing and Environment is, on the one hand, grafted onto ITM's core tasks of teaching, research and service provision and, on the other hand, carrying out risk analyses and formulating advice to further shape the safety culture within ITM.

On this basis, an annual action plan is formulated every year in consultation with the management and CPBW members. Despite a long-term understaffing of the department, 80% of the set targets were still met.

1. Safety

In the first quarter of 2023, the focus was mainly on the elaboration and roll-out of an action plan resulting from the results of the well-being survey conducted in 2022. From the results it could be concluded that, among other things, there was a need for clarification of ITM's vision and mission and a leadership programme for all managers. A specific action point towards outpatient clinic staff was to provide additional support when they were exposed to aggression.

This by installing silent alarm buttons, providing de-escalation training and establishing a buddy system for psychosocial support.

Resulting from the recommendations of an external KVWM audit, the process around incident reporting and analysis was optimised and digitised and brought more in line with the processes within the Quality Department. In addition, together with the Quality Department and Personnel Management made the necessary preparations for the launch of the new learning management system, scheduled for 2024, so that all (new) employees, among others, are offered the same and high-quality (bio)safety training.

Striving to continuously improve the internal safety culture, efforts were also made in 2023 to further train the hierarchical line regarding their accountability and responsibilities in terms of the seven welfare domains.

In terms of crisis management, a large-scale fire drill with external emergency services was deployed in 2023, with success.

Finally, several other risk analyses were also carried out in accordance with the DRBS. This at organisational, workplace and individual level. At the level of the individual, the medical risk item list (exclusively for CMRH substances) was updated so that in future medical follow-up by the occupational physician can even better match the risks to which an employee is exposed when performing his/her activities.

2. Safe travel

ITM is strongly committed to safe travel. Together with Travel Office, a new safety partner was selected in 2023 to help travellers, on the one hand, easily gather all the necessary information so that they can travel safely and, on the other, provide the necessary support if an incident occurs during the mission trip. All travellers were sensitised through a plenary session and online using a comprehensive information page on Tropbox.

3. Biosafety

Details related to biosafety can be found in the biosafety coordinator's annual report, which is available internally at the Safety, Welfare and Environment Department and was discussed at the CPBW. In summary:

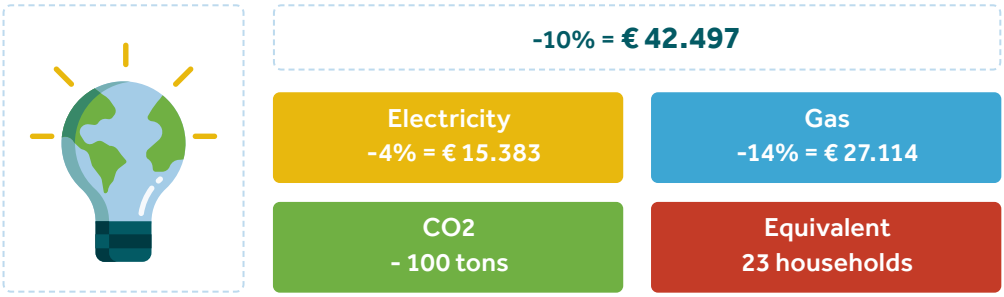
- Biosafety approval:
- Three activities were updated in 2023. In addition, authorisation was granted for the activities of the new clinical immunology and experimental immunology services provided.
  This means ITM currently has a valid biosafety authorisation for 27 activities.
- Advisory services:
  - Renovation of immunology lab
  - Replacement autoclaves BSL3s
  - Validation file fumigation ACL3 and BSL3 Virology

4. Environment and sustainability

In 2023, energy prices declined again to 2021 levels, which still means a doubling of annual energy costs for ITM compared to the period 2016 to 2020. Thanks to energy-saving measures such as maintaining 19°C and replacing energy wasters, 10% less energy was consumed in 2023 than in 2022. This decrease is largely due to less natural gas consumption for heating, but for the first time there was also a 4% structural reduction in electricity consumption, which is also the most expensive energy component. Here, a number of measures were implemented in autumn 2023, so the positive effects will only become visible in 2024.

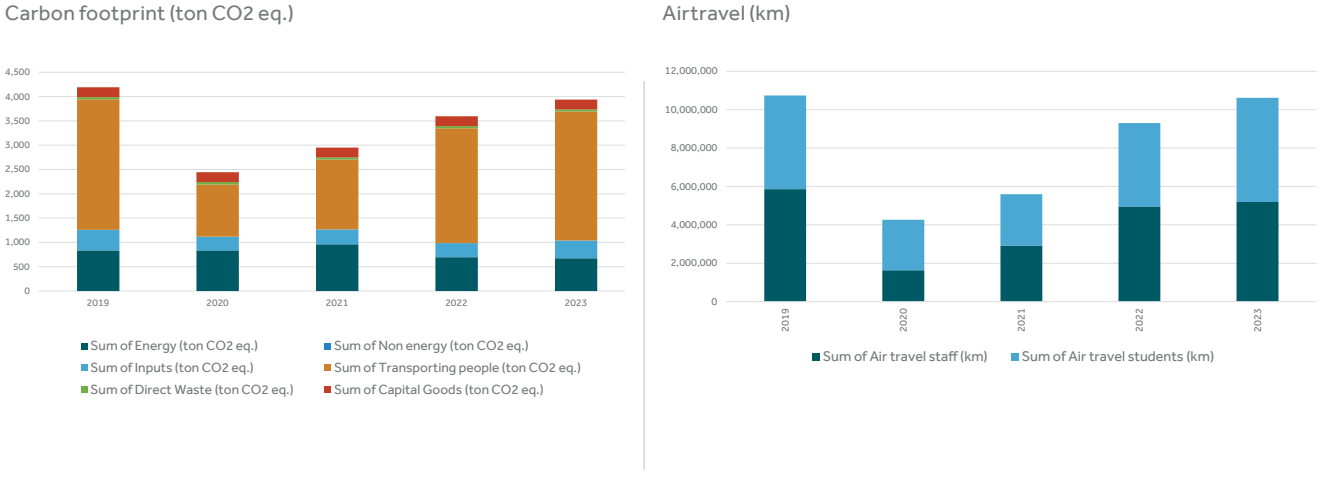
Also in 2024, the Technical Administrator and the energy working group continue to plan and follow up the measures, in cooperation with the ITM management. Co-financing for this was requested and granted from a number of guardian ministers in 2023. The Buildings Master Plan project leader will help ensure their incorporation in the short and medium term.

Figure 21. Energy savings achieved in 2023 compared to 2022.



The share of energy consumption in the ITM carbon footprint fell to 17% (natural gas only, 100% purchased green electricity is considered 'offset'), while the share from international travel increased to 67%. This is explained by the fact that air miles travelled increased again to 10.6 million km, almost the same level as in 2019 (pre-COVID). To reduce the impact of emissions from international travel, an expansion of approved the ITM travel policy. After a broad survey and dialogue with ITM travellers and management, from 1 January 2024 they can indicate to offset the CO2 emissions of their travel through e an ITM climate fund.

Figuur 22. Evolution of flight kilometres travelled and carbon footprint ITM (data carbon footprint 2019 & 2020 were externally validated).



Furthermore, ITM is preparing for a new reporting requirement from amended EU legislation: the CSRD[1] directive. By FY2025, the financial report must be supplemented with data on non- financial sustainability issues that key ITM stakeholders consider 'material'.

Workplace accidents and incidents:

To measure the evolution of occupational accidents, relative figures such as severity and frequency rates (Eg and Fg) are used. These figures only take into account work accidents with temporary incapacity for work and do not include work accidents without work loss, first aid and accidents on the way to or from work. The Fg2 has decreased slightly compared to 2022 with respect to an increase in the number of hours worked. The Eg3 also has a slight decrease due to a reduction in the number of calendar days lost compared to 2022.

Figure 23. Evolution of the frequency rate of occupational accidents of ITM employees from 2017 to 2023.

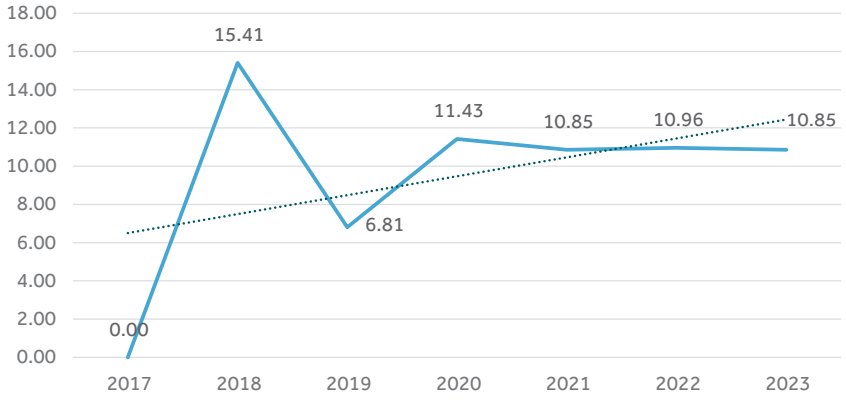
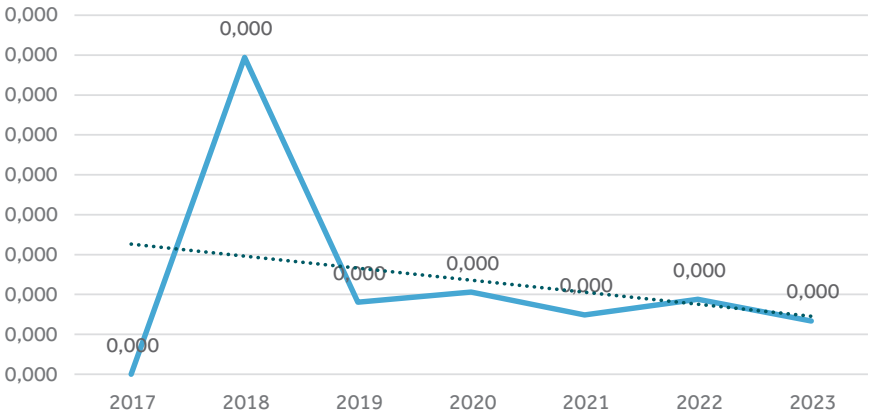


Figure 24. Evolution of the severity rate of occupational accidents of ITM employees from 2017 to 2023.



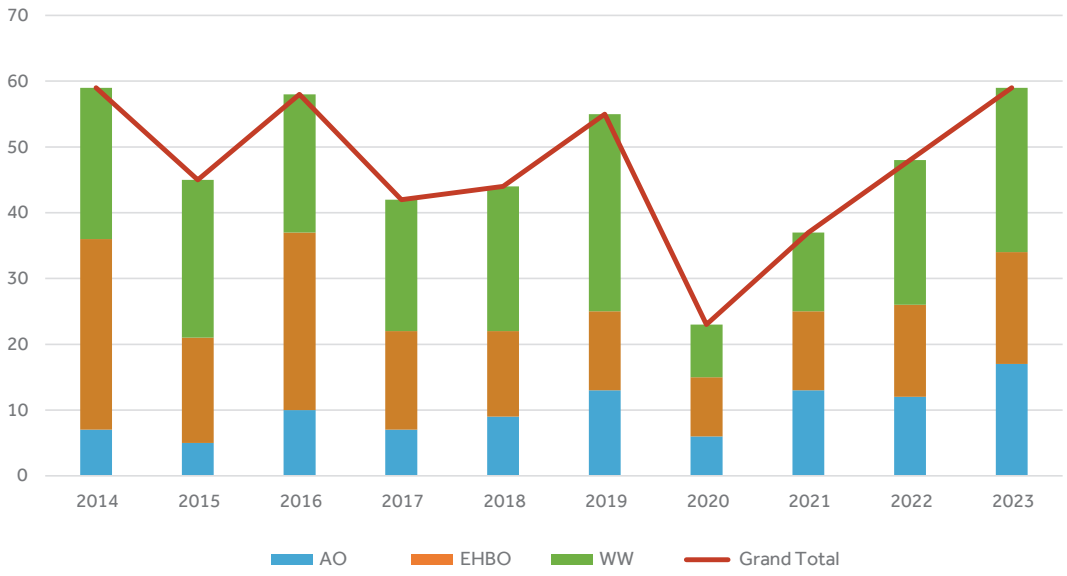
1 The Corporate Sustainability Reporting Directive: DIRECTIVE (EU) 2022/2464 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, with regard to sustainability reporting by companies

2 Fg (frequency rate) = number of accidents x 1,000,000/number of hours of exposure per year (Fg = x, where x corresponds to thenumber of workplace accidents per year out of approximately 600 workers)

3 Eg (Severity rate) = number of days of incapacity x 1,000/number of hours of exposure per year (Eg = 1 corresponds to 1.5 days of absence for all workers)

Occupational accidents were mainly caused by slips, trips and falls, potential exposure to biological agents and/or body fluids, falls from objects on employees' limbs and physical overexertion, accounting for 43 lost calendar days. In addition, 17 first aid accidents were reported. The increase in the number of reported first aid incidents is partly explained by the continued increase in the reporting culture within ITM. Indeed, every incident is seen as an opportunity to learn and improve safety at ITM.

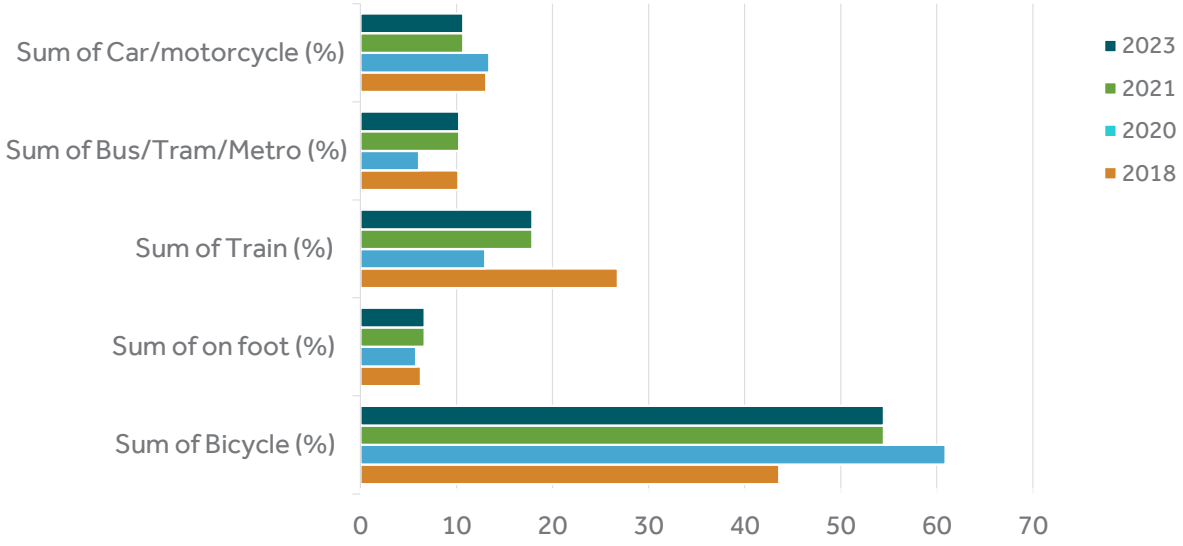
Figure 25. Evolution of the number of incidents on ITM from 2014 to 2023.



Accidents on the way to or from work:

At ITM, 90% of staff come by bike, on foot or by public transport. This is a positive in terms of the environment and sustainability, but sometimes pernicious in terms of commuting accidents. 42% per cent of all recorded incidents in 2023 were due to a commuting accident.
76% of commuting accidents in 2023 were by bicycle, some resulting in serious or multiple bone fractures and lost work. 86 lost calendar days were counted, almost doubling the number of calendar days lost compared to 2022. The number of incidents themselves also increased slightly, this despite the awareness campaigns organised by ITM in 2023 including bicycle repair days and a fluorescent jacket visibility campaign. Given the high percentage of commuting incidents, ITM will continue to focus on sensitizing employees around safe commuting.

Figure 26. ITM Modal Split measured at various time points (Mobiscan 2018, 2020: Intro CAO 3/12/2019 PC337, 2021: Federal Mobility Survey, 2023 preparation file Commuter Fund).



h. Infrastructure (IT and Buildings)

Responsible service = Technical Management and IT

1. Building management

Building management at the Institute of Tropical Medicine is crucial to ensure an optimal living and working environment. Effective management is essential to ensure that users can function safely, sustainably, comfortably and efficiently. Their proper management contributes to maintaining structural integrity, minimising operational costs, ensuring safety and reducing ecological impact. In this context, the management of the Institute's buildings becomes a key factor in seeking to improve the quality of work, the efficient use of resources and a sustainable future.

With this in mind, the following works and projects were carried out in 2023:

- Renovating part of the showers in student lodge Napay;
- Adapting the office spaces of the communications department;
- The installation of solar panels on the roofs of the buildings Kronenburgstraat 25 and St. Rochusstraat 21;
- The implementation of a people alarm in the outpatient counselling rooms;
- Heat pump replacement in Campus Rochus;
- The replacement of the central osmosis plant;
- Start-up of the tender procedure for the replacement of the exterior joinery and façade renovation of the building located at Kronenburgstraat 25 (Mortelmans Campus);
- Tender and award of waste disposal contract;
- Tender and award of garden maintenance contract;
- Public publication for catering assignment;
- Preparation of a Heritage Management Plan;

- Preparation of a Business Continuity Plan and renovation of the HVAC installation and replacement of the motors of the high-security laboratories in St Rochusstraat 6;
- Replacement of the autoclaves of the Mycobacteriology and Virology laboratories at St Rochusstraat 6;
- Renovation of the Post PCR in building St Rochusstraat 4;
- Noise study and enclosure of the heat pump at the Clinical Trial Centre;
- Tender and award of renovation of Immunology laboratory;
- Recruitment of a Buildings Master Plan Project Manager;
- Installation of energy meters and energy monitoring software;
- Conversion space Karibu to optimise social meeting place;
- Replacement of boiler and water heater in student accommodation Napay.

Figure 27. Evolution of the various Technical Management cost centres since 2012.

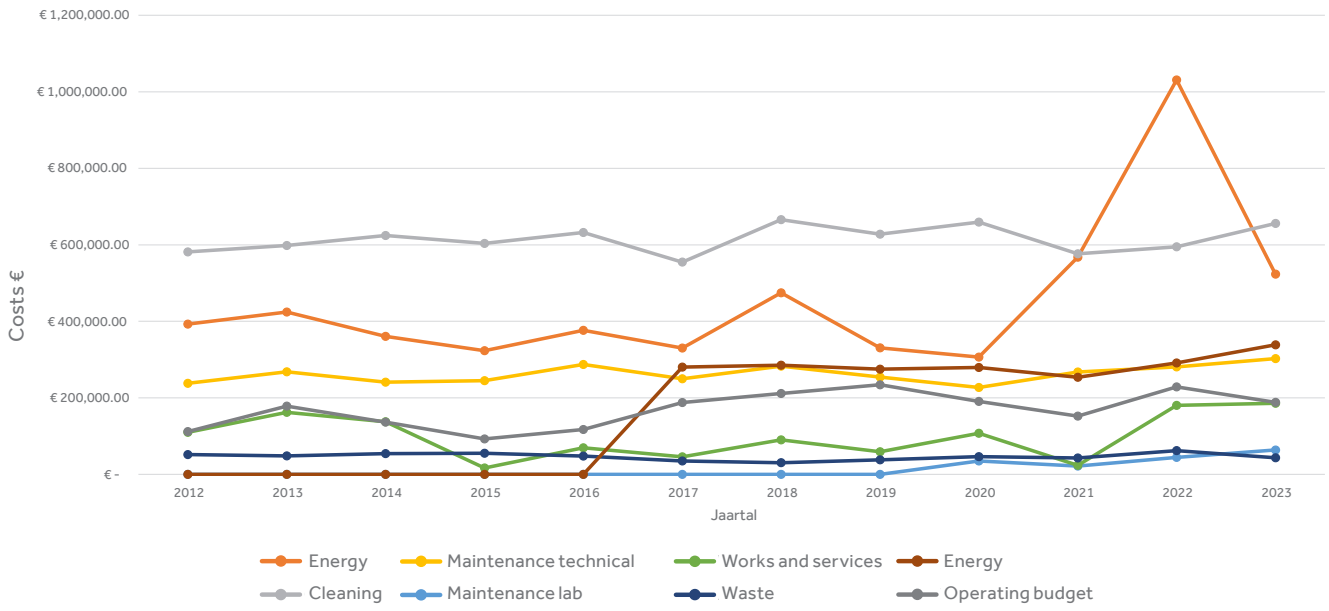


Figure 28. Evolution of the total cost of ITM buildings since 2012.

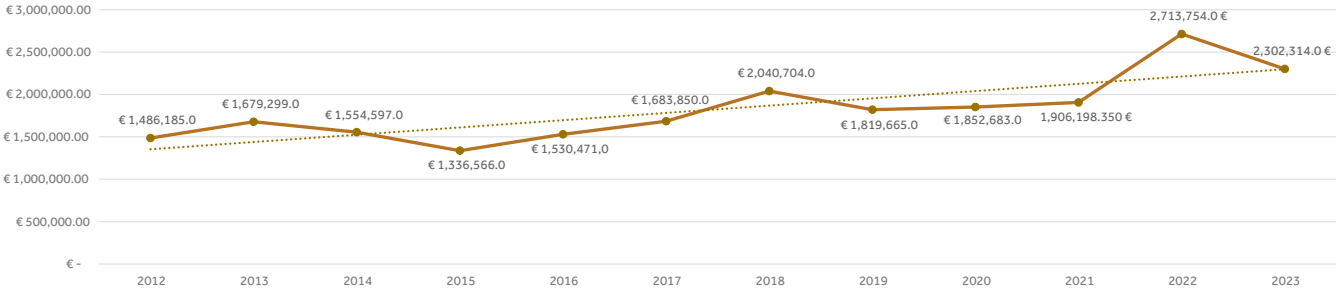
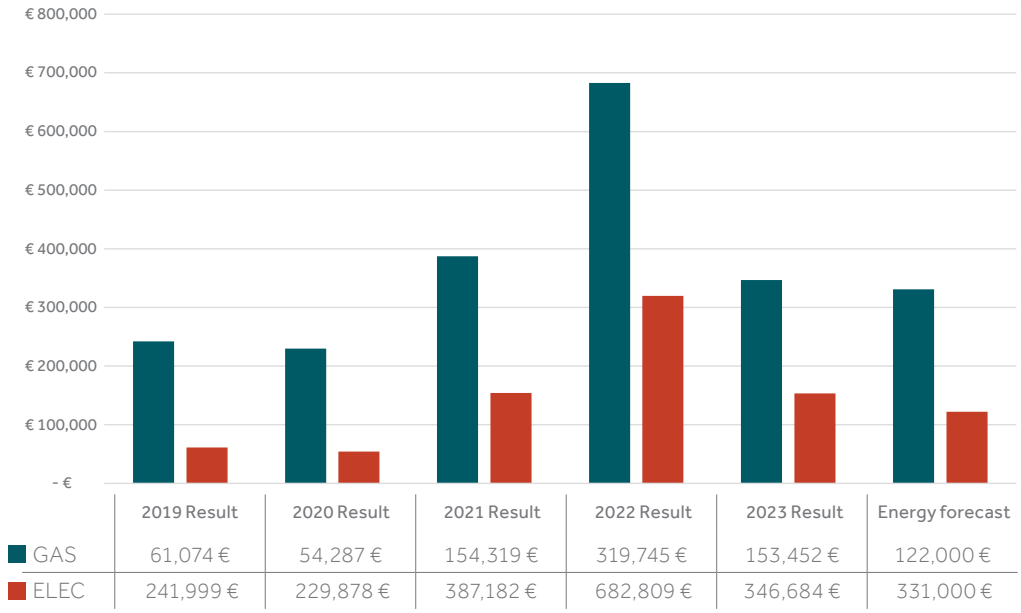


Figure 29. Evolution of energy costs ITM (without lodgings).



	2019 Result	2020 Result	2021 Result	2022 Result	2023 Result	Energy forecast
GAS	61,074 €	54,287 €	154,319 €	319,745 €	153,452 €	122,000 €
ELEC	241,999 €	229,878 €	387,182 €	682,809 €	346,684 €	331,000 €

2. IT infrastructure

ITM's ICT service builds, manages and secures the ICT infrastructure and provides the ITM-wide ICT service desk. In addition, the service also provides business applications to ITM staff to perform ITM's core tasks efficiently and effectively.

Besides the execution of operational activities and a delivery of a significant number of smaller projects, the main achievements in 2023 can be described as follows:

- The roll-out of the ERP Upgrade project. This project brings a renewal of the core purchase-to- pay (Medius), record-to-report (DC1) and business project management (KRYSS) processes as well as modifications to a lot of applications that integrate with the ERP, with the financial data warehouse at the forefront.
- Migration to the new social secretariat (Acerta).
- Building the Test-2-Know application that allows for SOA-related testing to be offered to specific target groups.
- Building a number of internal applications (Hello, Claro, Clipp) to organise uniform, efficient internal processes based on well-chosen digitisation projects.
- Renewing the entire switch infrastructure with an accompanying simplification in management processes.
- Renewing the entire virtualisation infrastructure with deduplication across 2 sites to mitigate a potential single point of failure.

i. Communication and fundraising

Responsible service = Communication

The overarching objective of a coordinated approach to internal and external communication is to protect and build ITM's reputation in line with institutional goals.

In terms of internal communications, the communications service provides ITM staff with the framework, tools, guidance and training to communicate internally and act externally as ambassadors of the institute. By doing so, we try to create a communicative organisation and a sense that all ITM staff contribute to a common goal.

Through external communications, the communications service aims to introduce the general public and external audiences to the full range of ITM activities with a focus on ITM as an innovative centre of excellence in tropical medicine and international health with the aim of building ITM's brand awareness and brand positioning.

Through fundraising, we seek to encourage current and future donors to financially support the core missions of ITM.

1. Science Communication

Within ITM's science communication strategy, the focus is on informing the widest possible national and international audience about the science and health topics in which ITM is active. We do this by engaging with the public and engaging in dialogue in an accessible way. In May 2023, we participated in the Nerdland Festival for this purpose, among others, with 20,000 visitors, to Heritage Day i.c.w. City of Antwerp and we organised the 'Children of Care' exhibition at ITM in the autumn.

In October 2023, we launched the brand new science podcast series 'Transmission', which addresses key international health topics. In it, we bring the stories of ITM researchers and their colleagues to partner institutions in their fight for global health. We also elaborated explainer videos in which ITM scientists answer health issues in an understandable way.

2. Media coverage

In 2023, ITM had a high media reach with 1,760 editorial press mentions[4], a potential reach of 2.88 billion article views[5] and an AVE[6] of €26.6 million. Compared to 2022, a decline on all indicators which can be explained by the fact that 2022 had an exceptionally high number of press mentions (1,100) on one topic, mpox. The relatively lower potential reach and AVE relative to the number of mentions is due to the fact that in 2023, ITM was mostly mentioned in national media with lower reach. In 2021 and 2022, more international media with higher reach were represented.

4 The number of appearances in online and print articles. (Source: Meltwater)
5 Number of (approximate) article views ITM has appeared in. (Source: Meltwater)
6 Advertising Value Equivalency (AVE) is used to assign a value to a published article. (Source: Meltwater)

The main news items in 2023 were 'travel medicine' and 'exotic mosquitoes in Belgium' and 'mpox and network immunity'. The focus in media coverage in terms of ITM's research ambitions was mainly on 'emerging infections and outbreaks'.

The main print and online media were Het Nieuwsblad and Gazet van Antwerpen (Mediahuis) and De Morgen (DPG Media). The sentiment of the articles was positive with a Net Tonality score of +54.

Television and radio reach declined 19% from 2022. The main television media were ATV (Mediahuis) and VTM (DPG Media). For Radio, these were Business AM radio, Nostalgie and VRT Radio.

Globally, ITM was mentioned in 41 countries which is a 20% decrease from 2022. 93% of the reach was in the regions of Western Europe, North America and Southeast Asia. The United States and Belgium had the most reach.

Figure 30. Evolution of ITM's visibility in national and international media.

3. Social media

ITM has five social media accounts: LinkedIn, Facebook, X (Twitter) Dutch-language, X (Twitter) English-language and Instagram. The number of followers of all our accounts increased by 29% in 2023 compared to 2022. In which our largest and most important account, LinkedIn, increased by 35%. The strongest riser was Instagram at 57%.

Engagement and reach

Besides followers, we also measure reach and engagement for our social media channels, as these parameters largely determine how high we end up in the algorithm, meaning how often our content is shown to users. Overall reach on all our channels combined has increased by almost 480% while engagement (interactions, reactions, dialogue) has increased by 847%.

Consistency and commitment to video

In 2023, two key goals were more consistency in messaging on social media and commitment to video content. The number of posts on our accounts increased by 200%. On LinkedIn, it was up 81% and on Instagram it was up 587%.

Looking at the deployment of video content, we see that on Facebook, our views increased by 5 916%. With these Facebook figures, it is important to note that there is also an ad campaign has been running for some videos linked to our podcast Transmission. Also on Twitter, we see that the number of video views increased by 1 750%. No ad campaign ran here.

4. Website

An important milestone in 2023 was the revamping of ITM's institutional website (www.itg.be), which was launched on 9 January 2023. The new website sought to present the institute's activities clearly and in a more focused way to its target audiences.

The website was structured based on ITM's core missions:

- Research: representation of the main research lines and integration of the institute's departmental structure, linked to the research portal research.itg.be (integration Pure database)
- Education: representation of the training offer and positioning of ITM as an open and global campus and reference point in the science and practice of tropical medicine and public health (integration Archie database)
- Medical services: presentation and overview of specialised outpatient clinic services (HIV/soa and travel clinic) and integration of a sophisticated appointment flow to facilitate the appointment process for both the clinic and the user.

In addition, a separate section was developed around international cooperation and the institute's partnerships.
www.itg.be counted 215,000 users in 2023 and www.wanda.be, our travel medicine website, 180,000 users. In 2023, Google switched to the new Google Analytics 4 (GA4) system to measure website data. A completely different system that also uses new data models compared to the previous system (Universal Analytics), making data comparison with previous years impossible.

5. Newsletter

Subscriptions to our monthly external newsletter increased by 29% to 5,690 in 2023.

6. Internal communication

Besides the day-to-day role played by internal communications in supporting the management and other departments of ITM, the service contributed to these realisations in 2023.

- Managing change: we handled the communication of the various change processes within the organisation, including the launch of a new ERP system, the start of the interim director and the switch to another 'travel safety partner' and a new social secretariat.

- Supporting services in the organisation of events: we organised and supported various internal events, such as the webinar series 'A Date with Science', the EcoHealth seminars and initiatives of the Safety, Welfare and Environment Department.
- Promote culture and connection: some examples include the 'ITM in Conversations', the internal launch of the Transmission podcast and the organisation of onboarding days for new employees.
- Optimisation of internal communication channels: in cooperation with the PMO department, the tender for technical modifications to Tropbox (intranet) was completed. In cooperation with IT department, the number of TV screens in the organisation was increased, allowing us to reach more employees.

7. Events and room rental

In 2023, we worked out a room rental strategy, hosting a number of successful events such as the FWO Conclave on 23 and 24 May, Hospital by Hospital on 13 June and the EMBA Sustainability Forum on 19 and 20 October.

We also got to meet, among others, development minister Caroline Gennez, welcoming DRC ambassador Roxane de Bilderling, Eurocommissioner Jutte Urpilainen and Education Minister Ben Weyts to ITM.

From 21 to 23 November 2023, the 64th ITM Colloquium took place in Nepal with the topic 'Understanding the Global Landscape of Disease Burden in the Context of Climate Change'. We organised this together with our Nepalese partner Nepal Health Research Council (NHRC). There were lectures by 40 researchers, 12 session chairs, 8 keynote speakers and 21 oral presentations. 324 registered participants from 37 countries participated in the Colloquium physically and 138 online.

8. Fundraising

In 2023, the focus of the Fundraising team was on increasing revenue from donations. The number of donors making one-off or monthly donations doubled. However, annual revenue from donations in 2023 remained almost identical to that of 2022.

In 2023, public outreach was added to the fundraising package. This opens up our assets to a wider audience: our science, our patrimony and our art and academic heritage collections.

Salesforce

In 2023, analysis was launched to commission the Salesforce platform. This enables tracking of donor information such as donor data and donation patterns, among others. Different types of integrations and links were implemented to bundle donor information previously available in different systems in Salesforce, making it available in one place.

"Fundraising is all of our business"

An internal mail is sent out monthly with three current calls for scientific prizes, research and teaching projects. These philanthropic funding opportunities support research and teaching teams in their search for additional resources. ITM achieved another success in 2023 with candidate Adwine Vanslembrouck, who received a Dubois- Brigué fellowship in tropical pathology worth €50,000 from the Belgian Royal Academy of Medicine.

Myrthe Pareyn's research proposal received €25,000 under the KBS (King Baudouin Foundation) call from the Poelmans-Van Meulder Fund for the implementation of the project 'Improving access to diagnostics and treatment for skin diseases to vulnerable populations in Ethiopia'.

Participation in the networking event KBS Support Council Antwerp also provided a donation of €5,000 from the SIPEF/AvH company. Also, the last edition of Antwerp Diner raised €41,000 in donation funds for Irith De Baetselier's 'Test2Know' project.

Establishment of Marleen Boelaert Fund

The Marleen Boelaert student fund campaign was launched in January 2023. Various internal and external media channels were used to promote the donation programme for LMIC (Low or Middle- Income) students. Sufficient funding was raised in 2023 to offer the first Marleen Boelaert scholarship to a short-course student in 2024.

Bequest

In early 2023, ITM was informed about the distribution of a bequest that included the institute as a beneficiary. Preparations to distribute this bequest were made during 2023 and discussions with the notary and the other two charities named in the will, among others, took place.

Academic chairs at ITM

In May 2023, the Executive Committee approved the basic principles and conditions for establishing an academic chair at ITM. From now on, researchers or research teams can sit down with external parties, such as wealthy individuals, organisations or companies, to develop a joint research and/or education project with social finality. The external partner's contribution in the form of an endowment provides ITM with opportunities to carry out research that is difficult to is fundable, and/or to perpetuate staff not eligible for funding from the more familiar funding channels.

Romain De Cock tribute

On 20 September 2023, we had the pleasure of meeting Kevin De Cock and his family members welcome during a tribute to Dr Romain De Cock. Kevin De Cock is the son of Romain De Cock Sr. and related to Firmin De Waele, a philanthropist who included ITM in his will and earmarked the proceeds from the sale of three houses for ITM. In honour of Dr Romain De Cock's legacy, we launched the Romain De Cock scholarship, which is awarded annually to a student from a low- or middle-income country to enrol in a master's degree programme at ITM.

Exhibition Children of Care

As part of public engagement, the Children of Care exhibition was organised. The exhibition ran in autumn 2023, from 11 September to Sunday 7 January 2024. Led by curator Dirk Luyten, three partners were involved in the project: the Maagdenhuis Museum, the University of Antwerp and ITM. During the exhibition, 1,574 people visited ITM, including 24 schools with 658 students. The exhibition was a unique opportunity to expose an underexposed piece of Antwerp history and highlight the contemporary functioning of ITM. It was very well received both internally and externally.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DRC Office

8. DRC Office

Since the end of 2020, ITM has had a central service in DRC. The 'ITM-DRC Service' or 'ITM- DRC Office' is headed by the ITM DRC representative and is composed of a team of 2 to 4 scientific project people, a logistics team and a financial-administrative team. This service monitors both policy and management aspects of ITM in DRC. The ITM DRC team aims to carry out close project management in DRC to enable more flexible management of the programme, as it is more adapted to the local context.

In 2023, there were no changes in terms of partner organisations. The framework agreement with DGD in its second year of implementation also had no significant strategic changes.

The sleeping sickness programme increased its presence with a full-time epidemiologist and a full-time medical doctor during 2023.

Ongoing mpox projects continued in the same geographical region with budgets from different sources largely managed by the DRC Office and with a team of local staff of about 4 people.

The first edition of the "Academic Writing" course was completed in January 2023 and a second edition of the course also took place. An evaluation of these two editions will lead to a more adapted version in 2024 according to the availability of participants.

An important role of the office in Kinshasa is representation towards local authorities, other organisations and visitors. In 2023, the Catholic University of Leuven, together with its sister organisation UCL, visited Kinshasa. During this visit, the KUL confirmed that it wants to strengthen its cooperation with Congo, but also with institutions such as ITM that have representation in Congo.

Annexes

9

9. Annexes

a. List of abbreviations

Abbreviation	Meaning
AI	Artificial Intelligence
ALERT	Action Leveraging Evidence to Reduce perinatal morTality and morbidity in sub-Saharan Africa
ATP	Administrative & Technical Staff
BCCM	Belgian Culture Collection of Microorganisms
BELAC	Belgian Accreditation Body
BMGF	Bill and Melinda Gates Foundation
BMS	Department of Biomedical Sciences
BSL3	Biosafety Level 3
CATT	Card Agglutination Test
COS	Development Cooperation Committee
CoZo	Collective Care Platform
CPBW	Committee for Prevention and Protection at Work
CREDO	COVID-19 and (re)-emerging diseases studies in Democratic Republic of Congo
CS	Department of Clinical Sciences
CTU	Clinical Trial Unit
DAT/VL	Direct Agglutination Test for Visceral Leishmaniasis
DGD	Belgian Directorate-General for Development Cooperation and Humanitarian Aid
DNDi	Drugs for Neglected Diseases initiative
DRC	Democratic Republic of Congo
ECHE	Erasmus Charter for Higher Education
EDCTP	European and Developing Countries Clinical Trials Partnership
EEA	European Economic Area
EER	European Entrepreneurial Region
EMBO	European Molecular Biology Organization
ERA-NET	European Research Area Net
ERC	European Research Council
EU	European Union
EWI	Economy, Science & Innovation
FAGG	Federal Agency for Medicines and Health Products
FAO	Food and Agriculture Organization
FAVV	Federal Agency for the Safety of the Food Chain
FOSB	Flemish Open Science Board
FRIS	Flanders Research Information Space
FWO	Scientific Research Fund
GCLP	Good Clinical Laboratory Practices
GCP	Good Clinical Practices
GDPR	General Data Protection Regulation
HAT	Human African Trypanosomiasis
HFSP	Human Frontier Science Program
HR	Human Resources

IATI	International Aid Transparency Index
IP	Intellectual property
IRD	Institut de Reserche pour le Développement (IRD)
ISI	International Scientific Indexing
IT	Information Technology
ITG	Instituut voor Tropische Geneeskunde
ITM	Institute of Tropical Medicine
JIF	Journal Impact Factor
KPI	Key Performance Indicator
KRL	Clinical Reference Laboratory
LIMS	Laboratory Information Management System
LMIC	Low and Middle Income Countries - Lage en Midden Inkomens landen
MaNaMa	Master-after-master
MEMO	Monitoring Exotic Mosquitos
MOOD	Monitoring Outbreak events for Disease Surveillance
MPH	Master of Science in Public Health
MPH-HSDC	Master of Science in Public Health - Orientation Health Systems and Disease Control
MPH-IH	Master of Science in Public Health - Orientation International Health
MPH-TMIH	Master of Science in Public Health - Orientation Tropical Medicine and International Health
MSCA	Marie Skłodowska-Curie Actions
MSM	Men having sex with men
MSTAH	Master of Science in Tropical Animal Health
NIH	National Institutes of Health
NRC	National Reference Centre
OIE	World Organisation for Animal Health
ORT	Outbreak Research Team
PH	Department of Public Health
PI	Principal Investigator
PPP	Pump Priming Project
PrEP	Pre-Exposure Prophylaxis
QA	Quality Assurance
RAG	Risk Assessment Group
RIZIV	National Institute for Sickness and Disability Insurance
RO	Research Office
SD	Strategic Objective
SO	Strategic Objective
SOA	Sexually transmitted diseases
SORT-IT	Structured Operational Research and Training IniTiatives
SSA	Sub-Saharan Africa
TB	Tuberculosis
TTP	Department of Applied Technology and Production
UA	University of Antwerp
UnCoVer	Unravelling Data for Rapid Evidence-Based Response to COVID-19
UP	University of Pretoria
UZA	University Hospital Antwerp

VSG	Variable Surface Glycoprotein
VTE	Full-time equivalent
VWM	Safety, Health and Environment
WGO	Wereld Gezondheids Organisatie
WHO	World Health Organization
ZAP	Independent Academic Staff

b. List of tables

c. List of figures

d. Survey lists Critical Performance Indicators research 2023

KPI-1 ISI publications with JIF>=5 (n=140)

1. Acotchéou PE, Affo MA, Dansou J, Delvaux T, Saizonou ZJ. La pratique contraceptive moderne chez les adolescentes au Bénin: Tendances, déterminants et perspectives / Modern contraceptive use among adolescents in Benin: trends, determinants and prospects. Sex Reprod Hlth Matters. 2023;31(5):47.

2. Alenichev A, Kingori P, Grietens KP. Reflections before the storm: the AI reproduction of biased imagery in global health visuals. Lancet Glob Health. 2023;11(10):E1496-E8.

3. Amancha G, Celis Y, Irazabal J, Falconi M, Villacis K, Thekkur P, et al. High levels of antimicrobial resistance in Escherichia coli and Salmonella from poultry in Ecuador. Rev Panam Salud Publica. 2023;47:9.

4. Amare GA, Mekonnen GG, Kassa M, Addisu A, Kendie DA, Tegegne B, et al. First report of cutaneous leishmaniasis caused by Leishmania donovani in Ethiopia. Parasites Vectors. 2023;16(1):9.

5. Angelo KM, Smith T, Camprubí-Ferrer D, Balerdi-Sarasola L, Menéndez MD, Servera-Negre G, et al. Epidemiological and clinical characteristics of patients with monkeypox in the GeoSentinel Network: a cross-sectional study. Lancet Infect Dis. 2023;23(2):196-206.

6. Apers H, Van Praag L, Nöstlinger C, Agyemang C. Interventions to improve the mental health or mental well-being of migrants and ethnic minority groups in Europe: A scoping review. Camb Prism Glob Ment Health. 2023;10:25.

7. Arinik N, Van Bortel W, Boudoua B, Decoupes R, Busani L, Interdonato R, et al. An annotated dataset for event-based surveillance of antimicrobial resistance. Data in Brief. 2023;46:8.

8. Badejo O, Noestlinger C, Wouters E, Laga M, Okonkwo P, Jwanle P, et al. Understanding why and how youth-friendly health services improve viral load suppression among adolescents and young people living with HIV in Nigeria: realist evaluation with qualitative comparative analysis. BMJ Glob Health. 2023;8(9):16.

9. Baert S, De Buyser S, Van Belle S, Gemmel P, Rousseau C, Roelens K, et al. Factors Related to Police Reporting in Sexual Assault Care Centers: Are We Underestimating the Role of Support Persons? Violence Against Women. 2023:27.

10. Baert S, Fomenko E, Machiels A, Bicanic I, Van Belle S, Gemmel P, et al. Mental health of sexual assault victims and predictors of their use of support from in-house psychologists at Belgian sexual assault care centres. Eur J Psychotraumatol. 2023;14(2):13.

11. Bebe DN, Kwilu FN, Mavila A, Mafuta EM, Mangalu JM, Jessani NS, et al. Making health insurance responsive to citizens: the management of members' complaints by mutual health organisations in Kinshasa, Democratic Republic of Congo. BMJ Glob Health. 2023;7(SUPPL_6):16.

12. Benová L. Empowering local researchers toward using local data to identify local health priorities: A reflection on three cohorts of the course "Write your own paper using Demographic and Health Survey data on reproductive and child health". J Glob Health. 2023;13:4.

13. Benová L, Semaan A, Afolabi BB, Amongin D, Babah OA, Dioubate N, et al. Obstetric referrals, complications and health outcomes in maternity wards of large hospitals during the COVID-19 pandemic: a mixed methods study of six hospitals in Guinea, Nigeria, Uganda and Tanzania. BMJ Open. 2023;13(9):14.

14. Berendes DM, Fagerli K, Kim S, Nasrin D, Powell H, Kasumba IN, et al. Survey-Based Assessment of Water, Sanitation, and Animal-Associated Risk Factors for Moderate-to-Severe Diarrhea in the Vaccine Impact on Diarrhea in Africa (VIDA) Study: The Gambia, Mali, and Kenya, 2015-2018. Clin Infect Dis. 2023;76:S132-S9.

15. Berens-Riha N, Andries P, Aerssens A, Ledure Q, van der Beken Y, Heyndrickx L, et al. Five accelerated schedules for the tick-borne encephalitis vaccine FSME-Immun® in last-minute travellers: an open-label, single-centre, randomized controlled pilot trial. J Travel Med. 2023:10.

16. Berens-Riha N, Bracke S, Rutgers J, Burm C, Van Gestel L, Hens M, et al. Persistent morbidity in Clade IIb mpox patients: interim results of a long-term follow-up study, Belgium, June to November 2022. Eurosurveillance. 2023;28(7):8.

17. Bero DM, da Silva EE, de Sousa IP, Nhassengo SA, Machado RS, Bauhofer AFL, et al. Enterovirus detection in stool samples from Mozambican children with acute gastroenteritis. Acta Trop. 2023;238:5.

18. Boodman C, Gupta N, Nelson CA, van Griensven J. Bartonella quintana Endocarditis: A Systematic Review of Individual Cases. Clin Infect Dis. 2023:8.

19. Boodman C, van Griensven J, Gupta N, Diro E, Ritmeijer K. Anticipating visceral leishmaniasis epidemics due to the conflict in Northern Ethiopia. Plos Neglect Trop Dis. 2023;17(3):3.

20. Bou-Orm I, deVos P, Diaconu K. Experiences of communities with Lebanon's model of care for non-communicable diseases: a cross-sectional household survey from Greater Beirut. BMJ Open. 2023;13(9):12.

21. Brosius I, Van Dijck C, Coppens J, Vandenhove L, Bangwen E, Vanroye F, et al. Presymptomatic viral shedding in high-risk mpox contacts: A prospective cohort study. J Med Virol. 2023;95(5):8.

22. Camara O, Camara M, Falzon LC, Ilboudo H, Kaboré J, Compaoré CFA, et al. Performance of clinical signs and symptoms, rapid and reference laboratory diagnostic tests for diagnosis of human African trypanosomiasis by passive screening in Guinea: a prospective diagnostic accuracy study. Infect Dis Poverty. 2023;12(1):14.

23. Casas-Sanchez A, Ramaswamy R, Perally S, Haines LR, Rose C, Aguilera-Flores M, et al. The Trypanosoma brucei MISP family of invariant proteins is co-expressed with BARP as triple helical bundle structures on the surface of salivary gland forms, but is dispensable for parasite development within the tsetse vector. PLoS Pathog. 2023;19(3):36.

24. Chhim S, Te VNR, Buffel V, van Olmen J, Chham S, Long S, et al. Healthcare usage and expenditure among people with type 2 diabetes and/or hypertension in Cambodia: results from a cross-sectional survey. BMJ Open. 2023;13(1):14.

25. Coppens J, Vanroye F, Brosius I, Liesenborghs L, van Henten S, Vanbaelen T, et al. Alternative sampling specimens for the molecular detection of mpox (formerly monkeypox) virus. J Clin Virol. 2023;159:4.

26. Cornet L, Durieu B, Baert F, D'Hooge E, Colignon D, Meunier L, et al. The GEN-ERA toolbox: unified and reproducible workflows for research in microbial genomics. GigaScience. 2023;12:10.

27. Cuella-Martin I, Ngabonziza JCS, Torrea G, Meehan CJ, Mulders W, Ushizimpumu B, et al. Rifampicin resistance conferring mutations among Mycobacterium tuberculosis strains in Rwanda. Int J Mycobact. 2023;12(3):274-81.

28. de Regt AK, Anand K, Ciupka K, Bender F, Gatterdam K, Putschli B, et al. A conserved isoleucine in the binding pocket of RIG-I controls immune tolerance to mitochondrial RNA. Nucleic Acids Res. 2023;51(21):11893-910.

29. de Rooij ML, Lynen L, Decroo T, Henriquez-Trujillo AR, Boyles T, Jacobs BKM. The therapeutic threshold in clinical decision-making for TB. Int Health. 2023;15(6):615-22.

30. Denouel A, Brandel JP, Peckeu-Abboud L, Seilhean D, Bouaziz-Amar E, Quadrio I, et al. Prospective 25-year surveillance of prion diseases in France, 1992 to 2016: a slow waning of epidemics and an increase in observed sporadic forms. Eurosurveillance. 2023;28(50):12.

31. Derendinger B, Dippenaar A, de Vos M, Huo S, Alberts R, Tadokera R, et al. Bedaquiline resistance in patients with drug-resistant tuberculosis in Cape Town, South Africa: a retrospective cohort. Lancet Microbe. 2023;4(12):E972-E82.

32. Domagalska MA, Barrett MP, Dujardin JC. Opinion Drug resistance in Leishmania: does it really matter? Trends Parasitol. 2023;39(4):251-9.

33. Duamor CT, Hampson K, Lankester F, Lugelo A, Changalucha J, Lushasi KS, et al. Integrating a community-based continuous mass dog vaccination delivery strategy into the veterinary system of Tanzania: A process evaluation using normalization process theory. One Health. 2023;17:10.

34. Dub T, Mäkelä H, Van Kleef E, Leblond A, Mercier A, Hénaux V, et al. Epidemic intelligence activities among national public and animal health agencies: a European cross-sectional study. Bmc Public Health. 2023;23(1):13.

35. Dubail A, Lejuste FX, Bottieau E, Koopmansch C. A suspicious subcutaneous nodule in a woman with a history of breast carcinoma. Ann Pathol. 2023;43(1):65-8.

36. Dusadeepong R, Delvallez G, Cheng S, Meng SD, Sreng N, Letchford J, et al. Phylogenomic investigation of an outbreak of fluoroquinolone- resistant Salmonella enterica subsp. enterica serovar Paratyphi A in Phnom Penh, Cambodia. Microb Genomics. 2023;9(3):12.

37. Elomrani S, Utz B, De Brouwere V, Kajjoune I, Assarag B. Avortement au Maroc et virage au drame : femmes et professionnels de santé en parlent ! Une étude transversale mixte à Agadir. Sex Reprod Hlth Matters. 2023;31(5):32.

38. Emukule GO, Osoro E, Nyawanda BO, Ngere I, Macharia D, Bigogo G, et al. Healthcare-seeking behavior for respiratory illnesses in Kenya: implications for burden of disease estimation. Bmc Public Health. 2023;23(1):13.

39. Enbiale W, Bekele A, Manaye N, Seife F, Kebede Z, Gebremeskel F, et al. Subcutaneous mycoses: Endemic but neglected among the Neglected Tropical Diseases in Ethiopia. Plos Neglect Trop Dis. 2023;17(9):12.

40. Ezema A, Caputo M, Semaan A, Benova L, Liang ST, Hirschhorn LR. Stress and safety of maternal and newborn healthcare workers early in the COVID-19 pandemic: a repeat cross-sectional analysis from a global online survey from March 2020 to March 2021. BMJ Open. 2023;13(8):10.

41. Falay D, Hardy L, Bonebe E, Mattheus W, Ngbonda D, Lunguya O, et al. Intestinal carriage of invasive non-typhoidal Salmonella among household members of children with Salmonella bloodstream infection, Kisangani, DRC. Front Microbiol. 2023;14:9.

42. Fikre H, Teklehaimanot E, Mohammed R, Mengistu M, Abebe B, van Griensven J, et al. Atypical Mucocutaneous Leishmaniasis Presentation Mimicking Rectal Cancer. Case Rep Infect Dis. 2023;2023:4.

43. Fouogue JT, Semaan A, Smekens T, Day LT, Filippi V, Mitsuaki M, et al. Length of stay and determinants of early discharge after facility-based childbirth in Cameroon: analysis of the 2018 Demographic and Health Survey. BMC Pregnancy Childbirth. 2023;23(1):12.

44. Fracasso G, Grillini M, Grassi L, Gradoni F, da Rold G, Bertola M. Effective Methods of Estimation of Pathogen Prevalence in Pooled Ticks. Pathogens. 2023;12(4):9.

45. Francis MF, Vianney SJM, Heitz-Tokpa K, Kreppel K. Risks of snakebite and challenges to seeking and providing treatment for agro-pastoral communities in Tanzania. PLoS One. 2023;18(2):22.

46. Gabriel S, Dorny P, Saelens G, Dermauw V. Foodborne Parasites and Their Complex Life Cycles Challenging Food Safety in Different Food Chains. Foods. 2023;12(1):27.

47. Gestels Z, Manoharan-Basil SS, Kenyon C. Doxycycline post exposure prophylaxis could select for cross-resistance to other antimicrobials in various pathogens: An in silico analysis. Int J STD AIDS. 2023;34(13):962-8.

48. Gils T, Kamele M, Madonsela T, Bosman S, Ngubane T, Joseph P, et al. Implementation of the advanced HIV disease care package with point-of-care CD4 testing during tuberculosis case finding: A mixed-methods evaluation. PLoS One. 2023;18(12):18.

49. Gupta N, Boodman C, Jouego CG, van den Broucke S. Doxycycline vs azithromycin in patients with scrub typhus: a systematic review of literature and meta-analysis. BMC Infect Dis. 2023;23(1):12.

50. Hassane-Harouna S, Braet SM, Decroo T, Camara LM, Delamou A, de Bock S, et al. Face mask sampling (FMS) for tuberculosis shows lower diagnostic sensitivity than sputum sampling in Guinea. Ann Clin Microbiol Antimicrob. 2023;22(1):7.

51. Hensen B, Floyd S, Phiri MM, Schaap A, Sigande L, Simuyaba M, et al. The impact of community-based, peer-led sexual and reproductive health services on knowledge of HIV status among adolescents and young people aged 15 to 24 in Lusaka, Zambia: The Yathu Yathu cluster-randomised trial. PLos Med. 2023;20(4):21.

52. Heyerdahl LW, Dielen S, Dodion H, Van Riet C, Nguyen T, Simas C, et al. Strategic silences, eroded trust: The impact of divergent COVID-19 vaccine sentiments on healthcare workers' relations with peers and patients. Vaccine. 2023;41(4):883-91.

53. Heylen DJA, Kumsa B, Kimbita E, Frank MN, Muhanguzi D, Jongejan F, et al. Tick-borne pathogens and body condition of cattle in smallholder rural livestock production systems in East and West Africa. Parasites Vectors. 2023;16(1):12.

54. Hobeika A, Stauffer MHT, Dub T, van Bortel W, Beniston M, Bukachi S, et al. The values and risks of an Intergovernmental Panel for One Health to strengthen pandemic prevention, preparedness, and response. Lancet Glob Health. 2023;11(8):E1301-E7.

55. Hofkens N, Gestels Z, Abdellati S, De Baetselier I, Gabant P, Martin A, et al. Microbisporicin (NAI-107) protects Galleria mellonella from infection with Neisseria gonorrhoeae. Microbiol Spectr. 2023:12.

56. Holm-Hansen CC, Lund S, Skytte TB, Molenaar J, Steensgaard CN, Mohd UA, et al. Neonatal mortality and video assessment of resuscitation in four district hospitals in Pemba, Tanzania. Pediatr Res. 2023:10.

57. Huits R, Angelo KM, Amatya B, Barkati S, Barnett ED, Bottieau E, et al. Clinical Characteristics and Outcomes Among Travelers With Severe Dengue: A GeoSentinel Analysis. Ann Intern Med. 2023;176(7):940-+.

58. Huyst V, Dewinter J, Noens I, Platteau T, Tsoumanis A. Measuring the prevalence of autistic traits in a cohort of adults living with HIV or taking HIV pre-exposure prophylaxis and mapping safer-sex barriers and facilitators: a study protocol. BMJ Open. 2023;13(9):10.

59. Ilombe G, Matangila JR, Lulebo A, Mutombo P, Linsuke S, Maketa V, et al. Malaria among children under 10 years in 4 endemic health areas in Kisantu Health Zone: epidemiology and transmission. Malar J. 2023;22(1):11.

60. Ingelbeen B, Valia D, Phanzu DM, van der Sande MAB, Tinto H. Setting a realistic AWaRe target for primary care antibiotic use in LMICs. Lancet Infect Dis. 2023;23(2):152-3.

61. Jara M, Arevalo J, Llanos-Cuentas A, Van den Broeck F, Domagalska MA, Dujardin JC. Unveiling drug-tolerant and persister-like cells in Leishmania braziliensis lines derived from patients with cutaneous leishmaniasis. Front Cell Infect Microbiol. 2023;13:11.

62. Jones HS, Hensen B, Musemburi S, Chinyanganya L, Takaruza A, Chabata S, et al. Temporal trends in, and risk factors for, HIV seroconversion among female sex workers accessing Zimbabwe's national sex worker programme, 2009-19: a retrospective cohort analysis of routinely collected HIV testing data. Lancet HIV. 2023;10(7):E442-E52.

63. Jongen VW, Reyniers T, van der Loeff MS, Smekens T, Hoornenborg E, van den Elshout M, et al. Trajectories of PrEP use among men who have sex with men: a pooled analysis of two prospective, observational cohort studies. J Int AIDS Soc. 2023;26(7):10.

64. Kadio K, Ly A, Ouédraogo A, Ahmed MAA, Yaya S, Gagnon MP. "if we don't regroup, hunger will kill us…": a qualitative study on measures of physical distancing during covid-19 among internally displaced persons in Burkina Faso. Front Sociol. 2023;8:8.

65. Kagaruki GB, Mahande MJ, Mayige MT, Kreppel KS, Ngadaya ES, Haydon D, et al. The effectiveness of interventions to reduce cardio-metabolic risk factors among regular street food consumers in Dar es Salaam, Tanzania: The pre-post findings from a cluster randomized trial. PLoS One. 2023;18(11):18.

66. Kariuki JW, Jacobs J, Ngogang MP, Howland O. Antibiotic use by poultry farmers in Kiambu County, Kenya: exploring practices and drivers of potential overuse. Antimicrob Resist Infect Control. 2023;12(1):11.

67. Kattenberg JH, Fernandez-Miñope C, van Dijk NJ, Allcca LL, Guetens P, Valdivia HO, et al. Malaria Molecular Surveillance in the Peruvian Amazon with a Novel Highly Multiplexed Plasmodium falciparum AmpliSeq Assay. Microbiol Spectr. 2023;11(2):21.

68. Kemlin D, Gemander N, Depickère S, Olislagers V, Georges D, Waegemans A, et al. Humoral and cellular immune correlates of protection against COVID-19 in kidney transplant recipients. Am J Transplant. 2023;23(5):649-58.

69. Kenyon C, Gestels Z, Vanbaelen T, Abdellati S, van den Bossche D, De Baetselier I, et al. Doxycycline PEP can induce doxycycline resistance in Klebsiella pneumoniae in a Galleria mellonella model of PEP. Front Microbiol. 2023;14:8.

70. Kenyon C, Herrmann B, Hughes G, de Vries HJC. Management of asymptomatic sexually transmitted infections in Europe: towards a differentiated, evidence-based approach. Lancet Reg Health-Eur. 2023;34:1-10.

71. Kingori P, Grietens KP, Abimbola S, Ravinetto R. Uncertainties about the quality of medical products globally: lessons from multidisciplinary research. BMJ Glob Health. 2023;6(SUPPL_3):3.

72. Künzler-Heule P, Schmidt AJ, Fierz K, Battegay M, Engberg S, Kouyos RD, et al. Exploring group differences in the response to a sexual risk reduction intervention to prevent hepatitis C virus reinfection in HIV-infected MSM: a mixed-methods study. Aids Care-Psychol Socio-Med Asp Aids-Hiv. 2024;36(4):442-51.

73. Liesenborghs L, Huyst V, Van Dijck C, Rutgers J, De Baetselier I, Kenyon C, et al. Urethritis Without Skin Lesions as the Primary Manifestation of Mpox Virus Infection. Eur Urol. 2023;83(4):378-9.

74. Lopez M, Martinez A, Bustos YC, Thekkur P, Nair D, Verdonck K, et al. Antibiotic consumption in secondary and tertiary hospitals in Colombia: national surveillance from 2018-2020. Rev Panam Salud Publica. 2023;47:8.

75. Macé C, Nikiema JB, Sarr OS, Hamuli PC, Marini RD, Neci RC, et al. The response to substandard and falsified medical products in francophone sub-Saharan African countries: weaknesses and opportunities. J Pharm Policy Pract. 2023;16(1):4.

76. Macharia PM, Banke-Thomas A, Benová L. Advancing the frontiers of geographic accessibility to healthcare services. Communications Med. 2023;3(1):4.

77. Makio A, Widdowson MA, Ambala P, Ozwara H, Munyua P, Hunsperger E. Flavivirus Antibodies Reactive to Zika Virus Detected in Multiple Species of Nonhuman Primates in Kenya, 2008-2017. Vector-Borne Zoonotic Dis. 2023;23(7):393-6.

78. Manzambi EZ, Mbuka GB, Ilombe G, Takasongo RM, Tezzo FW, Marquetti MD, et al. Behavior of Adult Aedes aegypti and Aedes albopictus in Kinshasa, DRC, and the Implications for Control. Trop Med Infect Dis. 2023;8(4):12.

79. Marchal B, Michielsen J, Mirzoev T, Paina L, Van Belle S. Editorial: Urban health: the next frontier for health policy and systems research. Front Public Health. 2023;11:3.

80. Martens M, van Olmen J, Wouters E, Boateng D, Van Damme W, Van Belle S. Using the multiple streams model to elicit an initial programme theory: from policy dialogues to a roadmap for scaling up integrated care. BMJ Glob Health. 2023;8(9):14.

81. Masquillier C, Cosaert T. Facilitating access to primary care for people living in socio-economically vulnerable circumstances in Belgium through community health workers: towards a conceptual model. BMC Prim Care. 2023;24(1):17.

82. Masunaga Y, Ribera JM, Nguyen TT, de Vries DH, Grietens KP. Why Communities Participate in Malaria Elimination Projects: Case Studies from Vietnam, Laos, and Cambodia. J Dev Stud. 2023;59(11):1670-82.

83. Mayoyo EM, Criel B, Michielsen J, Chuy D, Coppieters Y, Chenge F. Mental health care in the city of Lubumbashi, Democratic Republic of the Congo: Analysis of demand, supply and operational response capacity of the health district of Tshamilemba. PLoS One. 2023;18(4):22.

84. Melkamu R, Berhane N, Jacobs BKM, Mohammed R, Kassa M, Yeshanew A, et al. PCR for detection of Leishmania donovani from microscopically negative tissue smears of suspected patients in Gondar, Ethiopia. Plos Neglect Trop Dis. 2023;17(2):13.

85. Mertes H, Rezende AM, Brosius I, Naesens R, Michiels J, deBlock T, et al. Tecovirimat Resistance in an Immunocompromised Patient With Mpox and Prolonged Viral Shedding. Ann Intern Med. 2023;176(8):1141-3.

86. Mesic A, Decroo T, Florence E, Ritmeijer K, van Olmen J, Lynen L. Systematic review on cumulative HIV viraemia among people living with HIV receiving antiretroviral treatment and its association with mortality and morbidity. Int Health. 2023:18.

87. Millimouno TM, Dioubaté N, Niane H, Diallo MC, Maomou C, Sy T, et al. Effect of the COVID-19 pandemic on maternal and neonatal health services in three referral hospitals in Guinea: an interrupted time-series analysis. Reprod Health. 2023;20(1):13.

88. Millimouno TM, Meessen B, van de Put W, Garcia M, Camara BS, Christou A, et al. How has Guinea learnt from the response to outbreaks? A learning health system analysis. BMJ Glob Health. 2023;8(2):22.

89. Mohammed R, Melkamu R, Pareyn M, Abdellati S, Bogale T, Engidaw A, et al. Detection of asymptomatic Leishmania infection in blood donors at two blood banks in Ethiopia. Plos Neglect Trop Dis. 2023;17(3):12.

90. Mueller R, Balint M, Hardes K, Hollert H, Klimpel S, Knorr E, et al. RNA interference to combat the Asian tiger mosquito in Europe: A pathway from design of an innovative vector control tool to its application. Biotechnol Adv. 2023;66:13.

91. Mukadi-Bamuleka D, Bulabula-Penge J, Jacobs BKM, De Weggheleire A, Edidi-Atani F, Mambu-Mbika F, et al. Head-to-head comparison of diagnostic accuracy of four Ebola virus disease rapid diagnostic tests versus GeneXpert® in eastern Democratic Republic of the Congo outbreaks: a prospective observational study. EBioMedicine. 2023;91:10.

92. Mukadi-Bamuleka D, Mambu-Mbika F, De Weggheleire A, Edidi-Atani F, Bulabula-Penge J, Mfumu MMK, et al. Efficiency of Field Laboratories for Ebola Virus Disease Outbreak during Chronic Insecurity, Eastern Democratic Republic of the Congo, 2018-2020. Emerg Infect Dis. 2023;29(1):e1-e9.

93. Mustafa UK, Kreppel KS, Brinkel J, Sauli E. Digital Technologies to Enhance Infectious Disease Surveillance in Tanzania: A Scoping Review. Healthcare. 2023;11(4):22.

94. Mustafa UK, Sauli E, Brinkel J, Kreppel KS, Viennet E. Health professionals' knowledge on dengue and health facility preparedness for case detection: A cross-sectional study in Dar es Salaam, Tanzania. Plos Neglect Trop Dis. 2023;17(11):21.

95. Nadia R, Vicky C, Ruxana S, Oderay G, Yudira S, Rafael L, et al. Pooling Triple Site Samples to Detect Sexually Transmitted Infections Can Also Be Implemented in Cuba by Using the Sacace Neisseria gonorrhoeae/Chlamydia trachomatis/Mycoplasma genitalium/ Trichomonas vaginalis Real-TM Kit. Open Forum Infect Dis. 2023;10(4):2.

96. Natama HM, Moncunill G, Vidal M, Rouamba T, Aguilar R, Santano R, et al. Associations between prenatal malaria exposure, maternal antibodies at birth, and malaria susceptibility during the first year of life in Burkina Faso. Infect Immun. 2023:20.

97. Nguyen T, Boey L, Van Riet C, Dielen S, Dodion H, Giles-Vernick T, et al. Embracing context: Lessons from designing a dialogue-based intervention to address vaccine hesitancy. Front Public Health. 2023;11:7.

98. Ochieng JB, Powell H, Sugerman CE, Omore R, Ogwel B, Juma J, et al. Epidemiology of Enteroaggregative, Enteropathogenic, and Shiga Toxin-Producing Escherichia coli Among Children Aged <5 Years in 3 Countries in Africa, 2015-2018: Vaccine Impact on Diarrhea in Africa (VIDA) Study. Clin Infect Dis. 2023;76:S77-S86.

99. Olayide P, Alexandersson E, Tzfadia O, Lenman M, Gisel A, Stavolone L. Transcriptome and metabolome profiling identify factors potentially involved in pro-vitamin A accumulation in cassava landraces. Plant Physiol Biochem. 2023;199:12.

100. Pierneef L, Malaviya P, van Hooij A, Sundar S, Singh AK, Kumar R, et al. Field-friendly anti-PGL-I serosurvey in children to monitor Mycobacterium leprae transmission in Bihar, India. Front Med. 2023;10:10.

101. Pitta J, Bezerra MF, Fernandes D, Block TD, Novaes AD, de Almeida AMP, et al. Genomic Analysis of Yersinia pestis Strains from Brazil: Search for Virulence Factors and Association with Epidemiological Data. Pathogens. 2023;12(8):14.

102. Platteau T, Herrijgers C, Florence E, Poels K, Verboon P, Apers L, et al. Drug behaviors, sexually transmitted infection prevention, and sexual consent during chemsex: insights generated in the Budd app after each chemsex session. Front Public Health. 2023;11:6.

103. Priotto G, Franco JR, Lejon V, Buscher P, Matovu E, Ndung'u J, et al. Target product profile: Trypanosoma brucei gambiense test for low-prevalence settings. Bull World Health Organ. 2023;101(8):541-5.

104. Priotto G, Franco JR, Lejon V, Büscher P, Matovu E, Ndungu J, et al. WHO target product profiles: four diagnostic tests needed in the effort to eliminate African trypanosomiasis. Bull World Health Organ. 2023;101(8):546-8.

105. Putturaj M, Van Belle S, Krumeich A, Ns P, Engel N. "It's like asking for a necktie when you don't have underwear": Discourses on patient rights in southern Karnataka, India. Int J Equity Health. 2023;22(1):14.

106. Rahmalia A, Poespoprodjo JR, Landuwulang CUR, Ronse M, Kenangalem E, Burdam FH, et al. Adherence to 14-day radical cure for Plasmodium vivax malaria in Papua, Indonesia: a mixed-methods study. Malar J. 2023;22(1):16.

107. Reyniers T, Babo SAY, Ouedraogo M, Kanta I, Agbegnigan LE, Rojas D, et al. Strategies to improve PrEP uptake among West African men who have sex with men: a multi-country qualitative study. Front Public Health. 2023;11:10.

108. Rezende TMT, Macera G, Heyndrickx L, Michiels J, Coppens S, Thibaut HJ, et al. Validation of a Reporter Cell Line for Flavivirus Inhibition Assays. Microbiol Spectr. 2023;11(2):10.

109. Rigouts L, Keysers J, Rabab R, Fissette K, van Deun A, de Jong BC. GeneXpert MTB/RIF Ultra performance to detect uncommon rpoB mutations in Mycobacterium tuberculosis. BMC Res Notes. 2023;16(1):5.

110. Rodríguez WB, Mirabal M, Van der Stuyft P, Padrón TG, Fonseca V, Castillo RM, et al. The Potential of Surveillance Data for Dengue Risk Mapping: An Evaluation of Different Approaches in Cuba. Trop Med Infect Dis. 2023;8(4):23.

111. Rotsaert A, Ogara C, Mwanga-Amumpaire J, Kekitiinwa AR, Musiime V, Najjingo E, et al. Acceptability of a new 4-in-1 Abacavir/Lamivudine/Lopinavir/Ritonavir paediatric fixed-dose combination: the caregiver-child dyads' perspective. Ther Adv Infect Dis. 2023;10:13.

112. Rotsaert A, Smekens T, Vuylsteke B, van der Loeff MS, Hensen B, Nöstlinger C, et al. Patterns of PrEP and condom use among PrEP users in Belgium: a web-based longitudinal study. Bmc Public Health. 2023;23(1):13.

113. Rovira-Vallbona E, Kattenberg JH, Hong NV, Guetens P, Imamura H, Monsieurs P, et al. Molecular surveillance of Plasmodium falciparum drug-resistance markers in Vietnam using multiplex amplicon sequencing (2000-2016). Sci Rep. 2023;13(1):11.

114. Roy L, Cloots K, Uranw S, Rai K, Bhattarai NR, Smekens T, et al. The ongoing risk of Leishmania donovani transmission in eastern Nepal: an entomological investigation during the elimination era. Parasites Vectors. 2023;16(1):11.

115. Rupasinghe P, Driesen M, Vereecken J, de Jong BC, Rigouts L. Re-evaluation of critical concentrations of antituberculosis fluoroquinolones in the Mycobacteria Growth Indicator Tube 960 system. Int J Mycobact. 2023;12(3):316-23.

116. Snobre J, Villellas MC, Coeck N, Mulders W, Tzfadia O, de Jong BC, et al. Bedaquiline- and clofazimine- selected Mycobacterium tuberculosis mutants: further insights on resistance driven largely by Rv0678. Sci Rep. 2023;13(1):11.

117. Som SV, Wieringa FT, Ponce MC, Polman K, Dakurah P, Duncan D, et al. Association of both Water, Sanitation and Hygiene (WASH) and Infant and Young Child Feeding (IYCF) practices with childhood malnutrition in Lao PDR: a cross-sectional study of the 2017 Lao Social Indicator Survey II. BMJ Open. 2023;13(10):9.

118. Ssennyonjo A, Wanduru P, Omoluabi E, Waiswa P. The 'decolonization of global health' agenda in Africa: harnessing synergies with the continent's strategic aspirations. Eur J Public Health. 2023;33(3):358-9.

119. Sterie AC, Potthoff S, Erdmann A, Burner-Fritsch IS, Aluh DO, Schneiders ML. Dimensions of Researcher Vulnerability in Qualitative Health Research and Recommendations for Future Practice. Int J Qual Meth. 2023;22:13.

120. Te VNR, Chhim S, Buffel V, Van Damme W, van Olmen J, Ir P, et al. Evaluation of Diabetes Care Performance in Cambodia Through the Cascade-of-Care Framework: Cross-Sectional Study. JMIR Public Health Surveill. 2023;9:14.

121. Thibaut V, Eric F, Christophe V, Achilleas T, Laumen JGE, Sheeba MBS, et al. Effect on the Resistome of Dual vs Monotherapy for the Treatment of Neisseria gonorrhoeae: Results From a Randomized Controlled Trial (ResistAZM Trial). Open Forum Infect Dis. 2023;10(10):8.

122. Tshomba AO, Mukadi-Bamuleka D, De Weggheleire A, Tshiani OM, Kayembe CT, Mbala-Kingebeni P, et al. Cost-effectiveness of incorporating Ebola prediction score tools and rapid diagnostic tests into a screening algorithm: A decision analytic model. PLoS One. 2023;18(10):21.

123. Tun NN, Smithuis F, Tun NL, Min M, Hlaing MMM, van Olmen J, et al. Near point-of-care HIV viral load testing: Cascade after high viral load in suburban Yangon, Myanmar. PLoS One. 2023;18(4):15.

124. Upadhaya S, Acharya J, Zolfo M, Nair D, Kharel M, Shrestha A, et al. Has Data Quality of an Antimicrobial Resistance Surveillance System in a Province of Nepal Improved between 2019 and 2022? Trop Med Infect Dis. 2023;8(8):13.

125. Valia D, Kouanda JS, Ingelbeen B, Derra K, Kaboré B, Kiemdé F, et al. Healthcare seeking outside healthcare facilities and antibiotic dispensing patterns in rural Burkina Faso: A mixed methods study. Trop Med Int Health. 2023;28(5):391-400.

126. Van Belle S, Abejirinde IO, Ssennyonjo A, Srinivas PN, Hebbar P, Marchal B. How to develop a realist programme theory using Margaret Archer's structure-agency-culture framework: The case of adolescent accountability for sexual and reproductive health in urban resource-constrained settings. Evaluation. 2023;29(3):259-75.

127. Van Dijck C, Laumen JGE, de Block T, Abdellati S, De Baetselier I, Tsoumanis A, et al. The oropharynx of men using HIV pre-exposure prophylaxis is enriched with antibiotic resistance genes: A cross-sectional observational metagenomic study. J Infect. 2023;86(4):329-37.

128. van Griensven J, Dorlo TP, Diro E, Costa C, Burza S. The status of combination therapy for visceral leishmaniasis: an updated review. Lancet Infect Dis. 2024;24(1):e36-e46.

129. van Henten S, Bialfew F, Hassen S, Tilahun F, van Griensven J, Abdela SG. Treatment of Cutaneous Leishmaniasis with Sodium Stibogluconate and Allopurinol in a Routine Setting in Ethiopia: Clinical and Patient-Reported Outcomes and Operational Challenges. Trop Med Infect Dis. 2023;8(8):14.

130. Van Landeghem E, Dielen S, Semaan A, Rotsaert A, Vanhamel J, Masquillier C, et al. Insights into barriers and facilitators in PrEP uptake and use among migrant men and transwomen who have sex with men in Belgium. Bmc Public Health. 2023;23(1):13.

131. van Woerden WF, van de Pas R, Curtain J. Post-growth economics: a must for planetary health justice. Global Health. 2023;19(1):6.

132. Vanbaelen T, Manoharan-Basil SS, Kenyon C. Doxycycline Postexposure Prophylaxis Could Induce Cross-Resistance to Other Classes of Antimicrobials in Neisseria gonorrhoeae: An In Silico Analysis. Sex Transm Dis. 2023;50(8):490-3.

133. Vanhooren M, Stoefs A, van den Broucke S, Van Esbroeck M, Demuyser T, Kindt S. Intestinal helminthic infections: a narrative review to guide the hepatogastro-enterologist. Acta Gastro-Enterol Belg. 2023;86(3):460-73.

134. Vargas I, Mogollón-Pérez AS, Eguiguren P, Samico I, Bertolotto F, López-Vázquez J, et al. Lessons learnt from the process of designing care coordination interventions through participatory action research in public healthcare networks of six Latin American countries. Health Res Policy Syst. 2023;21(1):17.

135. Vujkovic A, Ha M, de Block T, van Petersen L, Brosius I, Theunissen C, et al. Diagnosing Viral Infections Through T-Cell Receptor Sequencing of Activated CD8 T Cells. J Infect Dis. 2024;229(2):507-16.

136. Whitworth HS, Baisley KJ, Nnko S, Irani J, Aguirre-Beltran A, Changalucha J, et al. Associations between age of menarche, early sexual debut and high-risk sexual behaviour among urban Tanzanian schoolgirls: A cross-sectional study. Trop Med Int Health. 2023;28(3):237-46.

137. Younoussa A, Samidine SN, Bergeman AT, Piubello A, Attoumani N, Grillone SH, et al. Protocol, rationale and design of BE-PEOPLE (Bedaquiline enhanced exposure prophylaxis for LEprosy in the Comoros): a cluster randomized trial on effectiveness of rifampicin and bedaquiline as post-exposure prophylaxis of leprosy contacts. BMC Infect Dis. 2023;23(1):9.

138. Zethof S, Christou A, Benova L, Beyuo TK, van Roosmalen J, van den Akker T. Out of sight, out of mind? Evidence from cross-sectional surveys on hidden caesarean sections among women with stillbirths in Ghana, 2007 and 2017. BMJ Glob Health. 2023;8(6):13.

139. Zortman I, de Garine-Wichatitsky M, Arsevska E, Dub T, Van Bortel W, Lefrançois E, et al. A social-ecological systems approach to tick bite and tick-borne disease risk management: Exploring collective action in the Occitanie region in southern France. One Health. 2023;17:9.

140. Zsurka G, Appel MLT, Nastaly M, Hallmann K, Hansen N, Nass D, et al. Loss of the Immunomodulatory Transcription Factor BATF2 in Humans Is Associated with a Neurological Phenotype. Cells. 2023;12(2):14.

KPI-2 Fraction of peer-reviewed publications that are cited 1.5x more than the world average of all publications of the same type, published in the same year and within the same Web of Science research domain (n=73 or 23.4%)

1. Affun-Adegbulu C, Cosaert T, Meudec M, Michielsen J, van de Pas R, Van Belle S, et al. Decolonisation initiatives at the Institute of Tropical Medicine, Antwerp, Belgium: ready for change? BMJ Glob Health. 2023;8(5):8.

2. Aguilar GR, Swetschinski LR, Weaver ND, Ikuta KS, Mestrovic T, Gray AP, et al. The burden of antimicrobial resistance in the Americas in 2019: a cross-country systematic analysis. Lancet Regional Health-Americas. 2023;25:16.

3. Alenichev A, Kingori P, Grietens KP. Reflections before the storm: the AI reproduction of biased imagery in global health visuals. Lancet Glob Health. 2023;11(10):E1496-E8.

4. Angelo KM, Smith T, Camprubí-Ferrer D, Balerdi-Sarasola L, Menéndez MD, Servera-Negre G, et al. Epidemiological and clinical characteristics of patients with monkeypox in the GeoSentinel Network: a cross-sectional study. Lancet Infect Dis. 2023;23(2):196-206.

5. Apers H, Noestlinger C, Van Praag L. Explanatory Models of (Mental) Health Among Sub-Saharan African Migrants in Belgium: A Qualitative Study of Healthcare Professionals' Perceptions and Practices. Cult Med Psychiatr. 2023;47(4):878-97.

6. Awuor AO, Ogwel B, Powell H, Verani JR, Sow SO, Hossain MJ, et al. Antibiotic-Prescribing Practices for Management of Childhood Diarrhea in 3 Sub-Saharan African Countries: Findings From the Vaccine Impact on Diarrhea in Africa (VIDA) Study, 2015-2018. Clin Infect Dis. 2023;76:S32-S40.

7. Bartholomeeusen K, Daniel M, LaBeaud DA, Gasque P, Peeling RW, Stephenson KE, et al. Chikungunya fever. Nat Rev Dis Primers. 2023;9(1):21.

8. Bates BR, Carrasco-Tenezaca M, Mendez-Trivino AM, Mendoza LE, Nieto-Sanchez C, Baus EG, et al. Identifying Barriers and Facilitators for Home Reconstruction for Prevention of Chagas Disease: An Interview Study in Rural Loja Province, Ecuador. Trop Med Infect Dis. 2023;8(4):15.

9. Berendes DM, Fagerli K, Kim S, Nasrin D, Powell H, Kasumba IN, et al. Survey-Based Assessment of Water, Sanitation, and Animal-Associated Risk Factors for Moderate-to-Severe Diarrhea in the Vaccine Impact on Diarrhea in Africa (VIDA) Study: The Gambia, Mali, and Kenya, 2015-2018. Clin Infect Dis. 2023;76:S132-S9.

10. Brosius I, Van Dijck C, Coppens J, Vandenhove L, Bangwen E, Vanroye F, et al. Presymptomatic viral shedding in high-risk mpox contacts: A prospective cohort study. J Med Virol. 2023;95(5):8.

11. Camprubí-Ferrer D, Cobuccio L, Van Den Broucke S, Balerdi-Sarasola L, Genton B, Bottieau E, et al. Clinical evaluation of BioFire® multiplex-PCR panel for acute undifferentiated febrile illnesses in travellers: a prospective multicentre study. J Travel Med. 2023;30(3):8.

12. Cheah PK, Jalloh MB, Cheah PK, Ongkili D, Schneiders ML, Osterrieder A, et al. Experiences, coping strategies and perspectives of people in Malaysia during the COVID-19 pandemic. Bmc Public Health. 2023;23(1):14.

13. Chhim S, Ku GC, Mao S, van de Put W, Van Damme W, Ir P, et al. Descriptive assessment of COVID-19 responses and lessons learnt in Cambodia, January 2020 to June 2022. BMJ Glob Health. 2023;8(5):10.

14. Chhim S, Te VNR, Buffel V, van Olmen J, Chham S, Long S, et al. Healthcare usage and expenditure among people with type 2 diabetes and/or hypertension in Cambodia: results from a cross-sectional survey. BMJ Open. 2023;13(1):14.

15. Chhim S, Vong WI, Pa K, Chhorn C, Housen T, Parry AE, et al. A descriptive assessment of the National Institute of Public Health's role in supporting the COVID-19 response in Cambodia, 2020-2021. West Pa Surveill Response. 2023;14(1):1.

16. Chilot D, Mondelaers A, Alem AZ, Asres MS, Yimer MA, Toni AT, et al. Pooled prevalence and risk factors of malaria among children aged 6-59 months in 13 sub-Saharan African countries: A multilevel analysis using recent malaria indicator surveys. PLoS One. 2023;18(5):16.

17. Coppens J, Vanroye F, Brosius I, Liesenborghs L, van Henten S, Vanbaelen T, et al. Alternative sampling specimens for the molecular detection of mpox (formerly monkeypox) virus. J Clin Virol. 2023;159:4.

18. Cornet L, Durieu B, Baert F, D'Hooge E, Colignon D, Meunier L, et al. The GEN-ERA toolbox: unified and reproducible workflows for research in microbial genomics. GigaScience. 2023;12:10.

19. Debie Y, Van Audenaerde JRM, Vandamme T, Croes L, Teuwen LA, Verbruggen L, et al. Humoral and Cellular Immune Responses against SARS-CoV-2 after Third Dose BNT162b2 following Double-Dose Vaccination with BNT162b2 versus ChAdOx1 in Patients with Cancer. Clin Cancer Res. 2023;29(3):635-46.

20. Devnath P, Karah N, Graham JP, Rose ES, Asaduzzaman M. Evidence of Antimicrobial Resistance in Bats and Its Planetary Health Impact for Surveillance of Zoonotic Spillover Events: A Scoping Review. Int J Environ Res Public Health. 2023;20(1):17.

21. Domagalska MA, Barrett MP, Dujardin JC. Opinion Drug resistance in Leishmania: does it really matter? Trends Parasitol. 2023;39(4):251-9.

22. Fouogue JT, Semaan A, Smekens T, Day LT, Filippi V, Mitsuaki M, et al. Length of stay and determinants of early discharge after facility-based childbirth in Cameroon: analysis of the 2018 Demographic and Health Survey. BMC Pregnancy Childbirth. 2023;23(1):12.

23. Gabriel S, Dorny P, Saelens G, Dermauw V. Foodborne Parasites and Their Complex Life Cycles Challenging Food Safety in Different Food Chains. Foods. 2023;12(1):27.

24. Galle A, Kavira G, Semaan A, Kaj FM, Benova L, Ntambue A. Utilisation of services along the continuum of maternal healthcare during the COVID-19 pandemic in Lubumbashi, DRC: findings from a cross-sectional household survey of women. BMJ Open. 2023;13(6):11.

25. Hens M, Brosius I, Berens-Riha N, Coppens J, Van Gestel L, Rutgers J, et al. Characteristics of confirmed mpox cases among clinical suspects: A prospective single-centre study in Belgium during the 2022 outbreak. New Microbes New Infect. 2023;52:6.

26. Hensen B, Floyd S, Phiri MM, Schaap A, Sigande L, Simuyaba M, et al. The impact of community-based, peer-led sexual and reproductive health services on knowledge of HIV status among adolescents and young people aged 15 to 24 in Lusaka, Zambia: The Yathu Yathu cluster-randomised trial. PLos Med. 2023;20(4):21.

27. Heylen DJA, Kumsa B, Kimbita E, Frank MN, Muhanguzi D, Jongejan F, et al. Tick-borne pathogens and body condition of cattle in smallholder rural livestock production systems in East and West Africa. Parasites Vectors. 2023;16(1):12.

28. Holst J, Tinnemann P, van de Pas R. The Virchow Prize: cementing commodification, coloniality and biomedical reductionism in global health? BMJ Glob Health. 2023;8(5):3.

29. Holst J, van de Pas R. The biomedical securitization of global health. Global Health. 2023;19(1):9.

30. Huerga H, Bastard M, Lubega AV, Akinyi M, Antabak NT, Ohler L, et al. Novel FujiLAM assay to detecttuberculosis in HIV-positive ambulatory patients in four African countries: a diagnostic accuracy study. Lancet Glob Health. 2023;11(1):E126-E35.

31. Huits R, Angelo KM, Amatya B, Barkati S, Barnett ED, Bottieau E, et al. Clinical Characteristics and Outcomes Among Travelers With Severe Dengue: A GeoSentinel Analysis. Ann Intern Med. 2023;176(7):940-+.

32. Ibiloye O, Decroo T, van Olmen J, Masquillier C, Okonkwo P, Lynen L, et al. Initial programme theory for community-based ART delivery for key populations in Benue State, Nigeria: a realist evaluation study. Bmc Public Health. 2023;23(1):25.

33. Kariuki JW, Jacobs J, Ngogang MP, Howland O. Antibiotic use by poultry farmers in Kiambu County, Kenya: exploring practices and drivers of potential overuse. Antimicrob Resist Infect Control. 2023;12(1):11.

34. Kattenberg JH, Fernandez-Miñope C, van Dijk NJ, Allcca LL, Guetens P, Valdivia HO, et al. Malaria Molecular Surveillance in the Peruvian Amazon with a Novel Highly Multiplexed Plasmodium falciparum AmpliSeq Assay. Microbiol Spectr. 2023;11(2):21.

35. Kattenberg JH, Van Dijk NJ, Fernández-Miñope CA, Guetens P, Mutsaers M, Gamboa D, et al. Molecular Surveillance of Malaria Using the PF AmpliSeq Custom Assay for Plasmodium falciparum Parasites from Dried Blood Spot DNA Isolates from Peru. Bio-protocol. 2023;13(5):23.

36. Kemlin D, Gemander N, Depickère S, Olislagers V, Georges D, Waegemans A, et al. Humoral and cellular immune correlates of protection against COVID-19 in kidney transplant recipients. Am J Transplant. 2023;23(5):649-58.

37. Kingori P, Grietens KP, Abimbola S, Ravinetto R. Uncertainties about the quality of medical products globally: lessons from multidisciplinary research. BMJ Glob Health. 2023;6(SUPPL_3):3.

38. Kong FYS, Kenyon C, Unemo M. Important considerations regarding the widespread use of doxycycline chemoprophylaxis against sexually transmitted infections. J Antimicrob Chemother. 2023;78(7):1561-8.

39. Lambing S, Tan YP, Vasileiadou P, Holdenrieder S, Mueller P, Hagen C, et al. RIG-I immunotherapy overcomes radioresistance in p53-positive malignant melanoma. J Mol Cell Biol. 2023;15(1):14.

40. Macharia PM, Benová L, Pinchoff J, Semaan A, Pembe AB, Christou A, et al. Neonatal and perinatal mortality in the urban continuum: a geospatial analysis of the household survey, satellite imagery and travel time data in Tanzania. BMJ Glob Health. 2023;8(4):17.

41. Macharia PM, Wong KLM, Olubodun T, Benová L, Stanton C, Sundararajan N, et al. A geospatial database of close-to-reality travel times to obstetric emergency care in 15 Nigerian conurbations. Sci Data. 2023;10(1):8.

42. Marchal B, Michielsen J, Simon S, Verdonck K, Accoe K, Tonga C, et al. Making 'resilience' useful again: recognising health system resilience as an effective boundary object. BMJ Glob Health. 2023;8(5):4.

43. Mayoyo EM, Criel B, Michielsen J, Chuy D, Coppieters Y, Chenge F. Mental health care in the city of Lubumbashi, Democratic Republic of the Congo: Analysis of demand, supply and operational response capacity of the health district of Tshamilemba. PLoS One. 2023;18(4):22.

44. McFarland SE, Marcus U, Hemmers L, Miura F, Martínez JI, Martínez FM, et al. Estimated incubation period distributions of mpox using cases from two international European festivals and outbreaks in a club in Berlin, May to June 2022. Eurosurveillance. 2023;28(27):8.

45. Mertes H, Rezende AM, Brosius I, Naesens R, Michiels J, deBlock T, et al. Tecovirimat Resistance in an Immunocompromised Patient With Mpox and Prolonged Viral Shedding. Ann Intern Med. 2023;176(8):1141-3.

46. Mukadi-Bamuleka D, Bulabula-Penge J, Jacobs BKM, De Weggheleire A, Edidi-Atani F, Mambu-Mbika F, et al. Head-to-head comparison of diagnostic accuracy of four Ebola virus disease rapid diagnostic tests versus GeneXpert® in eastern Democratic Republic of the Congo outbreaks: a prospective observational study. EBioMedicine. 2023;91:10.

47. Nasreddine R, Florence E, Yombi JC, Henrard S, Darcis G, Van Praet J, et al. Efficacy, durability, and tolerability of bictegravir/emtricitabine/tenofovir alafenamide for the treatment of HIV in a real-world setting in Belgium. HIV Med. 2023;24(8):914-24.

48. Nasrin D, Liang YY, Powell H, Casanova IG, Sow SO, Hossain MJ, et al. Moderate-to-Severe Diarrhea and Stunting Among Children Younger Than 5 Years: Findings From the Vaccine Impact on Diarrhea in Africa (VIDA) Study. Clin Infect Dis. 2023;76:S41-S8.

49. Ng'eno E, Lind M, Audi A, Ouma A, Oduor C, Munywoki PK, et al. Dynamic Incidence of Typhoid Fever over a 10-Year Period (2010-2019) in Kibera, an Urban Informal Settlement in Nairobi, Kenya. Am J Trop Med Hyg. 2023;109(1):22-31.

50. Omore R, Powell H, Sow SO, Hossain MJ, Ogwel B, Doh S, et al. Norovirus Disease Among Children <5 Years in 3 Sub-Saharan African Countries: Findings From the Vaccine Impact on Diarrhea in Africa (VIDA) Study, 2015-2018. Clin Infect Dis. 2023;76:S114-S22.

51. Pasquier E, Owolabi OO, Fetters T, Ngbale RN, Gbanzi MCA, Williams T, et al. High severity of abortion complications in fragile and conflict-affected settings: a cross-sectional study in two referral hospitals in sub-Saharan Africa (AMoCo study). BMC Pregnancy Childbirth. 2023;23(1):15.

52. Platteau T, Herrijgers C, Florence E, Poels K, Verboon P, Apers L, et al. Drug behaviors, sexually transmitted infection prevention, and sexual consent during chemsex: insights generated in the Budd app after each chemsex session. Front Public Health. 2023;11:6.

53. Platteau T, Herrijgers C, Kenyon C, Florence E. Self-control for harm reduction in chemsex. Lancet HIV. 2023;10(1):E8-E.

54. Priotto G, Franco JR, Lejon V, Buescher P, Matovu E, Ndung'u J, et al. Target product profile: diagnostic test for Trypanosoma brucei rhodesiense. Bull World Health Organ. 2023;101(8):529-34.

55. Rahmalia A, Poespoprodjo JR, Landuwulang CUR, Ronse M, Kenangalem E, Burdam FH, et al. Adherence to 14-day radical cure for Plasmodium vivax malaria in Papua, Indonesia: a mixed-methods study. Malar J. 2023;22(1):16.

56. Reyniers T, Babo SAY, Ouedraogo M, Kanta I, Agbegnigan LE, Rojas D, et al. Strategies to improve PrEP uptake among West African men who have sex with men: a multi-country qualitative study. Front Public Health. 2023;11:10.

57. Rotsaert A, Smekens T, Vuylsteke B, van der Loeff MS, Hensen B, Nöstlinger C, et al. Patterns of PrEP and condom use among PrEP users in Belgium: a web-based longitudinal study. Bmc Public Health. 2023;23(1):13.

58. Sahun M, Privat-Maldonado A, Lin ABH, De Roeck N, van der Heyden L, Hillen M, et al. Inactivation of SARS-CoV-2 and Other Enveloped and Non- Enveloped Viruses with Non-Thermal Plasma for Hospital Disinfection. ACS Sustain Chem Eng. 2023:10.

59. Sahun M, Privat-Maldonado A, Lin ABH, De Roeck N, van der Heyden L, Michiels J, et al. Inactivation of SARS-CoV-2 and Other Enveloped and Non-Enveloped Viruses with Non-Thermal Plasma for Hospital Disinfection. ACS Sustain Chem Eng. 2023;11(13):5206-15.

60. Snobre J, Villellas MC, Coeck N, Mulders W, Tzfadia O, de Jong BC, et al. Bedaquiline- and clofazimine- selected Mycobacterium tuberculosis mutants: further insights on resistance driven largely by Rv0678. Sci Rep. 2023;13(1):11.

61. Stelzle D, Makasi C, Schmidt V, Trevisan C, Van Damme I, Ruether C, et al. Efficacy and safety of antiparasitic therapy for neurocysticercosis in rural Tanzania: a prospective cohort study. Infection. 2023;51(4):1127-39.

62. Stelzle D, Makasi C, Welte TM, Ruether C, Schmidt V, Gabriel S, et al. Report of three patients with extensive neurocysticercosis in rural southern Tanzania: neurological, serological and neuroradiological findings. J Med Case Rep. 2023;17(1):9.

63. Tack B, Vita D, Nketo J, Wasolua N, Ndengila N, Herssens N, et al. Health itinerary-related survival of children under-five with severe malaria or bloodstream infection, DRC. Plos Neglect Trop Dis. 2023;17(3):24.

64. Tadele H, Kassa DH, Gebriel FW, Bilal SM, Gedefaw A, Teshome M, et al. Development and evaluation of a kangaroo mother care implementation model in South Ethiopia. Acta Paediatr. 2023;112:65-76.

65. Tchounga CAW, Sacré PY, Ravinetto R, Lieberman M, Ciza PH, Mballa RN, et al. Usefulness of medicine screening tools in the frame of pharmaceutical post-marketing surveillance. PLoS One. 2023;18(8):24.

66. Tsoumanis A, Van Dijck C, Hens N, Kenyon C. Rethinking Screening Intensity in Terms of Reducing Prevalence or Increasing Selection Pressure for the Emergence of Resistant Gonorrhea: A Modeling Study of Men Who Have Sex With Men in Belgium. Open Forum Infect Dis. 2023;10(4):9.

67. Van Belle S, Abejirinde IO, Ssennyonjo A, Srinivas PN, Hebbar P, Marchal B. How to develop a realist programme theory using Margaret Archer's structure-agency-culture framework: The case of adolescent accountability for sexual and reproductive health in urban resource-constrained settings. Evaluation. 2023;29(3):259-75.

68. Van Dijck C, De Baetselier I, Kenyon C, Liesenborghs L, Vercauteren K, Van Esbroeck M, et al. Mpox screening in high- risk populations finds no asymptomatic cases. Lancet Microbe. 2023;4(3):e132-e3.

69. Van Dijck C, Laumen JGE, de Block T, Abdellati S, De Baetselier I, Tsoumanis A, et al. The oropharynx of men using HIV pre-exposure prophylaxis is enriched with antibiotic resistance genes: A cross-sectional observational metagenomic study. J Infect. 2023;86(4):329-37.

70. Van Landeghem E, Dielen S, Semaan A, Rotsaert A, Vanhamel J, Masquillier C, et al. Insights into barriers and facilitators in PrEP uptake and use among migrant men and transwomen who have sex with men in Belgium. Bmc Public Health. 2023;23(1):13.

71. Vanbaelen T, Manoharan-Basil SS, Kenyon C. Doxycycline Postexposure Prophylaxis Could Induce Cross-Resistance to Other Classes of Antimicrobials in Neisseria gonorrhoeae: An In Silico Analysis. Sex Transm Dis. 2023;50(8):490-3.

72. Vliegenthart-Jongbloed K, Jacobs J. Not recommended fixed-dose antibiotic combinations in low- and middle-income countries - the example of Tanzania. Antimicrob Resist Infect Control. 2023;12(1):10.

73. Zethof S, Christou A, Benova L, Beyuo TK, van Roosmalen J, van den Akker T. Out of sight, out of mind? Evidence from cross-sectional surveys on hidden caesarean sections among women with stillbirths in Ghana, 2007 and 2017. BMJ Glob Health. 2023;8(6):13.

KPI-3 Number of Clinical trials coordinated by CTU

The total number of CTU-supported studies in 2023 is broken down as follows:

- Clinical Studies (i.e. 'Clinical Trials' according to ICH-GCP definition): 18
- Interventional studies: 2
- Observational studies: 7

Clinical studies:

1. **TriDoRe Niger** – *ongoing* - Novel TRiple-DOse tuberculosis REtreatment regimens: how to overcome resistance without creating more (Clinicaltrials.Gov. NCT04260477); in Niger

2. **PEOPLE** – *ongoing* - Post ExpOsure Prophylaxis for LEprosy in the Comoros and Madagascar (Clinicaltrials.Gov. NCT03662022); in de Comoren en Madagascar

3. **AntiCOV –** *ongoing* **-** An open-label, multicentre, randomised, adaptive platform trial of the safety and efficacy of several therapies, including antiviral therapies, versus control in mild / moderate cases of COVID-19. (PACTR202006537901307), in Ethiopië

4. **THECA –** *ongoing* **–** 3 components (census study / mass vaccination campaign / surveillance study). An open-label effectiveness study of a typhoid conjugate vaccine in Kisantu, Democratic Republic of Congo (TyVECO) – Step 2: Typhoid Conjugate Vaccine (TCV) mass-vaccination campaign (Clinicaltrials.Gov. NCT05119426); in de Democratische Republiek Congo

5. **Cutaneous Leishmaniasis** – *stopped before initiation* - A randomized clinical trial comparing 6 weeks of miltefosine to 6 weeks of systemic sodium stibogluconate in patients with complicated cutaneous leishmaniasis in Ethiopia (MiSoLeish) (Clinicaltrials.Gov pending); in Ethiopia

6. **SingleR** – *ongoing* – A single centre open-label non-inferiority trial to assess the immuno-genicity and safety of an intradermal and an intramuscular single-visit dosing regimen of purified chick-embryo cell-culture rabies vaccine in adults. (EudraCT 2022-002367-29); in België

7. **IMCOVAS** – *completed* – Assessment of the immunogenicity and safety of marketed vaccines for COVID-19 after regular schedule and adapted vaccine schedules and routes: BNT162b2 (Comirnaty®;Pfizer-BioNTech), mRNA-1273 Vaccine (®; Moderna) and COVID-19 Vaccine (ChAdOx1-S [recombinant]) (Vaxzevria®, AstraZeneca). (EudraCT 2021-001993-52); in België

8. **BE-PEOPLE** - *ongoing* – Bedaquiline Enhanced Post ExpOsure Prophylaxis for Leprosy. (Clinicaltrials.Gov NCT05406479 (phase II) and NCT05597280 (phase III)); in de Comoren

9. **ResistAZM** - *completed* – An open label randomized controlled trial comparing the effect of ceftriaxone plus azithromycin versus ceftriaxone for the treatment of Neisseria gonorrhoeae on the resistome (EudraCT 2021-003616-10); in België

10. **HealthyFood** – *in preparation* - A single blind, placebo controlled, single center, randomized controlled pilot study to assess if low dose ciprofloxacin can induce antimicrobial resistance in Escherichia coli (EudraCT 2023-506208-18); in België

11. **RABISKIMM** - *in preparation* - Skin imprinting in intradermal rabies vaccination: a prioritized outcome in vaccine trials? (EudraCT 023-507065-26), in België

12. **AIM-CL** - *in preparation* - Antimicrobial adjuvants to revert the Imbalance of skin Microbiota for improved outcomes of Cutaneous Leishmaniasis treatment in Ethiopia (AIM-CL) (Clinicaltrials.gov pending); in Ethiopië

13. **LAI-PrEP** - *in preparation* – Preparing for the new generation of long-acting pre-exposure prophylaxis (PrEP): investigating the feasibility of injectable PrEP for the prevention of HIV in Flanders (EudraCT pending), in België

14. **STAKE** - *ongoing* - Preventing Acquired Resistance: Strengthen TB treatment by adding Amikacin in the first treatment week of multidrug-resistant tuberculosis (Clinicaltrials.gov NCT05555303); in Rwanda

15. EBO-BOOST – *in preparation* - Safety and immunogenicity of Ervebo® and Zabdeno® booster vaccines against Ebola Virus following previous vaccination with the Zabdeno/Mvabea® or Ervebo® vaccine schedules in DRC: a mix-and-match phase II RCT (Clinicaltrials.gov NCT06126822); in de Democratische Republiek Congo

16. SafedoxyPEP – *in preparation* - A pilot single center, open label trial to assess the impact of doxycycline postexposure prophylaxis on antimicrobial resistance (EudraCT 2023-507137-24-00); in België

17. RABIDIC – *in preparation* - An open-label pilot study to assess pain experience and usability of different injection techniques and devices for the administration of the purified chick-embryo cell-culture rabies vaccine in children aged 4 to 10 years (EudraCT pending); in België

18. RABIBOOST – *in preparation* - Comparing the boostability of rabies neutralizing antibodies with a simulated post-exposure prophylaxis 3 years versus 6 years following a 2-visit intramuscular pre-exposure prophylaxis schedule: a non-inferiority study (EudraCT pending; in België)

Interventional studies:

1. **GonoScreen** – *completed* - Is screening for gonorrhea and chlamydia cost-effective in reducing the incidence of these infections in men who have sex with men taking HIV pre-exposure prophylaxis (PrEP): a randomized, multicentre controlled trial (Clinicaltrials.Gov. NCT04269434); in België

2. **AfriCOVER** – *ongoing* - Characterising transmission of SARS-CoV-2 in a peri-urban population in Mozambique using population-based (sero) surveillance (Clinicaltrials.Gov. NCT04442165); in Mozambique

Observational studies:

1. **Preleish** – *ongoing* - Predicting Visceral Leishmaniasis in HIV Infected Patients (NCT03013673); in Ethiopië

2. **ALERRT** – *completed* - African coalition for Epidemic Research, Response and Training (niet geregistreerd); verschillende landen in Afrika (CTU: co-lead WP3 Data Management)

3. **SIMBLE** – *ongoing* - Clinical diagnostic trial in Western Africa of a simplified blood culture system to improve healthcare in low-resource settings (Clinicaltrials.Gov. NCT05722184), in Benin en Burkina Faso

4. **FIKI2** – *ongoing* – Febrile Illness in Kinshasa and Kimpese (Clinicaltrials.Gov. NCT04760678); in de Democratische Republiek Congo

5. **PALU-COVID** – *completed* - Paludisme comme facteur de protection contre la COVID19 sévère en république démocratique du Congo. (Clinicaltrials.Gov. NCT05012280); in de Democratische Republiek Congo

6. **MuSiFe** - *ongoing* - Multidisciplinary Surveillance and Investigation of Febrile Illness in Guinea (Clinicaltrials.gov NCT06122259); in Guinea

7. **MBOTE** – *ongoing* - MPOX biology, outcome, transmission and epidemiology project (Clinicaltrials.Gov. NCT06136117); in de Democratische Republiek Congo

KPI-4 Number of ongoing competitively awarded research projects, incl. FWO, H2020, Horizon Europe, NIH, ... (cumulative) in 2022

Typing in the project number at https://research.itg.be/ provides more information about the project. Projects started in 2023 are indicated in bold.

FOLLOW NO.	PROJ NO.	FINANCIER	MONEY FLOW	ACRONIAL	PI	START (DD/MM/YY)	END (DD/MM/YY)
1	426211	FWO - ERA-Net	2nd money flow	CABU-EICO	Van Der Sande Marianne	1/05/22	30/04/25
2	426252	FWO - ERA-Net	2nd money flow	COINCIDE	Peeters Koen	1/06/22	31/05/25
3	429005	FWO - ERA-Net	2nd money flow	DiMoc	Müller Ruth	1/03/20	3/09/23
4	425407	FWO - Internat. Collaboration	2nd money flow	FAPESP	Rosanas Urgell Anna	01/04/20	31/03/23
5	426246	FWO - Internat. Collaboration	2nd money flow	MMA InjPrEP	Hensen Bernadette	01/01/22	31/12/23
6	429007	FWO - Internat. Collaboration	2nd money flow	FasciCom	Dorny Pierre/ Dermauw Veronique	01/01/21	31/12/23
7	424206	FWO – Research projects	2nd money flow	DeepMTB	de Jong Bouke	01/01/20	31/12/23
8	424207	FWO – Research projects	2nd money flow	IntegrOmicsDR. MTB	de Jong Bouke	01/01/22	31/12/25
9	424208	FWO - Scientific Research Communities	2nd money flow	TB/NTM research cluster	de Jong Bouke	01/01/22	31/12/26
10	424415	FWO – Research projects	2nd money flow	Identification re-sevoir types	Ariën Kevin	01/01/20	31/12/25
11	424417	FWO – Research projects	2nd money flow	MUCIN	Ariën Kevin	01/11/20	31/10/23
12	425408	FWO – Research projects	2nd money flow	LeishQ	Dujardin Jean-Claude	01/01/21	31/12/24
13	425409	FWO – Research projects	2nd money flow	LeishEvol.	Dujardin Jean-Claude	01/01/21	31/12/24
14	425410	FWO – Research projects	2nd money flow	Innatebite	Van Den Abbeele Jan	01/01/22	31/12/25
15	**425411**	**FWO – Research projects**	**2nd money flow**	**Immetasex**	**Rosanas Urgell Anna**	**01/01/23**	**31/12/26**
16	426251	FWO – Research projects	2nd money flow	TransVaxx	Peeters Koen	01/11/20	31/10/23
17	426261	FWO – Research projects	2nd money flow	Diet_NCD	Peñalvo José	01/01/20	31/12/23
18	427100	FWO – Research projects	2nd money flow	Monkeypox virus	Bottieau Emannuel	01/01/22	31/12/25
19	429009	FWO – Research projects	2nd money flow	River epilepsy	Polman Katja	01/01/22	31/12/25
20	426243	FWO – SBO*	2nd money flow	Optimise PrEP to maximise Impact	Hensen Bernadette	01/01/19	31/12/23
21	427250	FWO - SBO	2nd money flow	Appliedx	Vercauteren Koen	01/10/22	30/09/26
22	426247	FWO-TBM	2nd money flow	Injectable PrEP	Hensen Bernadette	01/10/22	30/09/26
23	427222	FWO-TBM	2nd money flow	PReGo	Kenyon Chris	01/10/18	30/09/24
24	316123	EC	3rd money flow	SCUBY	Van Damme Wim	01/01/19	30/06/23

FOLLOW NO.	PROJ NO.	FINANCIER	MONEY FLOW	ACRONIAL	PI	START (DD/MM/YY)	END (DD/MM/YY)
25	316261	EC	3rd money flow	unCoVer	Peñalvo José	15/11/20	14/05/23
26	319005	EC / CIRAD	3rd money flow	MOOD	Müller Ruth	01/01/20	31/12/24
27	**310002**	**EC / Farbentech**	3rd money flow	**e-Fabric**	**Ariën Kevin**	**01/12/23**	**30/11/27**
28	315403	EC / Institut Pasteur	3rd money flow	LeiSHield-MATI	Dujardin Jean-Claude	01/04/18	30/09/23
29	316142	EC / Karolinska	3rd money flow	ALERT	Benova Lenka	01/01/20	31/12/24
30	**317250**	**EC / KUL**	3rd money flow	**FortifiedX**	**Vercauteren Koen**	**01/08/23**	**31/07/27**
31	317112	EC / SVA	3rd money flow	Vacc-Ints	Jacobs Jan	01/10/19	30/09/24
32	**316124**	**EC / Vumc**	3rd money flow	**YoPAAPE**	**Van Damme Wim**	**01/01/23**	**31/12/27**
33	320021	EDCTP2	3rd money flow	AfriCoVER	Widdowson Marc-Alain	01/06/20	31/10/23
34	324202	EDCTP2	3rd money flow	PEOPLE	de Jong Bouke	01/09/18	28/02/23
35	327110	EDCTP2	3rd money flow	SIMBLE	Jacobs Jan	01/07/21	31/12/24
36	327260	EDCTP2/DNDi	3rd money flow	VL-INNO	Adriaensen Wim	01/10/21	31/12/24
37	327231	EDCTP2/Oxford	3rd money flow	ALERRT	Van Griensven Johan	01/12/17	30/11/24
38	327202	EDCTP2/SWISS TPH	3rd money flow	TB-TRIAGE+	Lynen Lutgarde	01/01/20	31/12/23
39	327111	EDCTP2/University of Cambridge	3rd money flow	THECA	Jacobs Jan	01/01/19	31/12/23
40	**326201**	**EDCTP3**	**3rd money flow**	**STROGHAT**	**Hasker Epco**	**01/07/23**	**30/06/28**
41	**410004**	**Federal Science Policy**	**3rd money flow**	**BE-PIN**	**Kreppel Kathy**	**01/12/23**	**01/03/27**
42	526225	NIH, via Banaras Hindu University	3rd money flow	TMRC III	Hasker Epco	01/08/17	31/03/23
43	526201	NIH, via Washington State Uni.	3rd money flow	CREID-ECA	Hasker Epco	01/06/20	31/05/25
44	**424420**	**VLAIO, via Janssen**	**3rd money flow**	**DenMark**	**Ariën Kevin**	**01/07/23**	**30/06/26**
45	427451	VLAIO, via Voxdale	3rd money flow	Collect2Know	Van den Bossche Dorien	01/07/21	31/12/23
46	526131	MRC, via QMU	3rd money flow	Basyc	Kielmann Karina	01/08/22	31/07/24
47	627232	Dioraphte Foundation	4th money flow	Spacial CL	Adriaensen Wim	01/01/21	31/12/23
48	629004	International Human Frontier Science Programme, via Wageningen University	4th money flow	SWARM	Müller Ruth	01/07/21	30/06/24
49	626257	Welcome Trust, via LSTM	4th money flow	CEASE	Peeters Koen	01/01/21	31/12/24
50	624254	Welcome Trust	4th money flow	Pandr TB	de Jong Bouke	01/05/18	01/02/24

* FWO SBO and TBM are placed by Flemish universities under the 3rd flow of funds. As we have placed both funding channels under the 2nd flow of funds since 2020, we will do the same in 2023 for the sake of comparability.

KPI-5 number of ongoing ORT projects (n=37)

1. Monitoring outbreak events for disease surveillance in a data science context (MOOD, financiering: Horizon2020)
2. Malaria control strategies Burundi, a collaboration with MSF and Ministry of Health Burundi (financiering: MSF-OCB, eigen middelen)
3. European network for sharing data on the geographic distribution of arthropod vectors, transmitting human and animal disease agents (VectorNet, financiering: ECDC/EFSA)
4. Monitoring van exotische steekmuggen in België (MEMO+, financiering: de Vlaamse, Waalse en Brusselse regeringen, de FOD Volksgezondheid, Veiligheid van de Voedselketen en Leefmilieu in het kader van het Nationaal Actieplan Milieu en Gezondheid (NEHAP)
5. Arbovirussen en Aedes in D.R. Congo (financiering: Directie-Generaal Ontwikkelingssamenwerking België)
6. Rift Valley Fever outbreak in Rwanda and Burundi. Description of the outbreaks
7. COVID-19 among migrants and racial/ethnic minorities in Antwerp
8. Determining the drivers behind Monkeypox virus transmission: a multidisciplinary 'one health' study of an emerging zoonotic pathogen (financiering: FA5, FWO, ECHO)
9. Outbreak analysis: mpox in the European Region (financiering: WHO EURO)
10. Mpox outbreak in Belgium: Mpox ASymptomatic Shedding: Evaluation by Self-Sampling MPX-ASSESS
11. Mpox outbreak in Belgium: Mpox seroprevalence and sexual risk behaviour among HIV-PrEP using Men who have Sex with Men (MSM)
12. Mpox in the Democratic Republic of Congo 2010 – 2023 – Analysis of one decade of epidemiological and laboratory surveillance data
13. Mpox outbreak in Belgium: Long term follow-up of mpox patients and vaccinees POQS
14. Mpox outbreak in a mining community in South Kivu, DRC (Kamituga): Clinical evaluation and longitudinal follow-up
15. Mpox cytokines: No distinct cytokine, chemokine and growth factor (CCG) blood profile associated with monkeypox virus clade IIb patients
16. Investigation of Plague in the Congo-Ugandan transborder region
17. Co-circulating Monkeypox and Swinepox viruses, Democratic Republic of Congo
18. Mapping of tecovirimat resistance in Mpox
19. Scabies in Belgium and Europe: epidemiological situation and exploration of possible reasons for increase in number of cases and outbreaks.
20. Investigating cholera outbreaks in Cameroun
21. PALM007, Tecovirimat RC : protocol development and operational support for the multicenter treatment trial for mpox, in collaboration with INRB and NIH/NIAD
22. Muyinga: operational research in collaboration with MSF on outbreak of skin ulcers in Burundi

23. MuSiFe: fever cohort Guinea: development of protocol and collaborative platform for clinical description and biobanking in fever patients in Guinea. Specific extension in cases of detected outbreak.

24. BMGF grant proposal Guinea (Sequencing viral hemorrhagic fevers)

25. FORTIFIEDX: Microfluidic patch for ID diagnosis.

26. CABU - EICO Optimising antibiotic use and infection control at community level through a package of behavioural interventions in Burkina Faso/DRC (JPI-AMR funding)

27. FA5 – One Health: Understanding community-spread of AMR through a One Health perspective in DRC

28. RECoRD Review of health research and data on racialised groups: Implications for addressing racism and racial disparities in public health practice and policies in Europe

29. Sager IOA: Adapting the Sager guidelines for the inclusion of sex-disaggregated data and gendered data in integrated operational analytics in outbreaks and public health emergencies (Integrated Outbreak Analytics)

30. Integration of epidemiological and laboratory surveillance data for respiratory pathogens in the European Region

31. ID-BQI Investigating and defining neglected Bartonella quintana infection and ectoparasitosis among populations experiencing houselessness (financiering: FWO)

32. Africover - Characterising Transmission of SARS-CoV-2 in a Peri-urban Population in Mozambique (EDCTP funded; https://clinicaltrials.gov/study/NCT04442165)

33. Lassa-ASSESS : Lassa ASymptomatic Shedding: Evaluation by Self-Sampling. Prospective follow-up of a group of high-risk contacts

34. FiLiVix : Preparing first-line actors in the Flemish health system for 'virus X' via preparation and validation of a training package using viral hemorrhagic fever as a model (FiLi-Vi-X). Collaboration with the High-Level Isolation Unit of Antwerp University Hospital, including KAP study and Focus groups (financiering: UA grant)

35. Transmission risk of Mpox linked to rodent consumption in DRC. A collaboration with INRB, LSTM and the University of Liverpool (financiering: Pandemic institute, UK)

36. Balancing safety and good care in the context of epidemic outbreaks in Uganda: learning health systems for improved infection prevention & control in Uganda (BASYC), (financiering UK Joint Health Systems Research Initiative, Wellcome Trust, ESRC, MRC, DfID)

37. NIH pilot grant (PS) from the Centers for Research in Emerging Infectious Diseases (CREID) 2023-2024. A collaboration with the Institute of Tropical Medicine, Alexander von Humboldt (ITMAvH), Lima, Peru where we are applying next-generation sequencing diagnostics to identify etiologies of acute undifferentiated fever in the Peruvian Amazon

KPI-6 Number of publicly accessible policy documents, guidelines and recommendations based on ITM research and expertise.

Arising from ITM research priority 1 'Emerging Diseases and Outbreaks'

1. European Food Safety Authority (EFSA), Italy, 2023. "Systematic literature review on the vector status of potential vector species of 36 vecto-borne pathogens" by Massoels B. et al. *This document addresses the critical role of arthropod vectors in transmitting pathogens that affect animal and human health*. DOI: 10.2903/sp.efsa.2023.EN-8484. Available online - Authored by Medical Entomology unit – Department of Biomedical Sciences.

2. European Center For Disease Prevention and Control (ECDC), Sweden, 2023. "Literature review on the state of biocide resistance in wild vector populations in the EU and neighboring countries" by Van Bortel W. et al. *This review addresses the emerging issue of biocide resistance among vector populations, highlighting the need for sustainable vector management strategies.* DOI: **10.2900/05537**. Available online – Co-authored by Medical Entomology unit – Department of Biomedical Sciences.

3. Working Group Belgian Therapeutic Guidelines for COVID 19, Belgium, 2023. "Interim Clinical Guidance for Adults with Confirmed COVID-19 in Belgium". This document, containing guidelines for the treatment of COVID-19, was first developed in March 2020 and has been updated throughout the COVID-19 pandemic; version 37 was published in November 2023 and is still being updated with the most recent version posted on the Belgian KCE website. https://kce.fgov.be/task-force-therapeutics/drug-treatment-of-covid-19 Available online – Prof Bottieau from the department of Clinical Sciences continues to have a leading role in this Belgian Work Group.

4. UK Health Security Agency, United Kingdom, 2023. "Mpox (monkeypox) transmission and mpox infectious and incubation periods: A rapid review." By Harrison S. et al. *This document provides a rapid review on the transmission dynamics and incubation periods of Mpox, offering insights to inform public health responses.* Available online: https://assets.publishing.service.gov.uk/media/640081628fa8f527f110a37c/Mpox__monkeypox__transmission_and_mpox_infectious_and_incubation_periods_A_rapid_review.pdf - The document is referring to the research findings of the interdepartmental mpox study group of ITM.

5. European Centre for Disease Prevention and Control (ECDC), Sweden, 2023. "Public health considerations for mpox in EU/EEA countries." By Sousa, L. et al. *This document outlines the public health considerations and recommendations for managing Mpox within the EU/EEA region, emphasizing surveillance and prevention strategies.* DOI: 10.2900/79332 Available online - The document is referring to the research findings of the interdepartmental mpox study group of ITM.

6. Centers for Disease Control and Prevention (CDC), United States, 2023. "Science Brief: Detection and Transmission of Mpox Virus." *This science brief discusses the latest findings on Mpox virus detection and transmission, contributing to a better understanding of the disease's epidemiology.* Available online: https://archive.cdc.gov/www_cdc_gov/poxvirus/mpox/about/science-behind-transmission.html#:~:text=Science%20Brief%3A%20Detection%20and%20Transmission%20of%20Mpox%20(Formerly%20Monkeypox),the%202022%20Clade%20IIb%20Outbreak&text=Incorporated%20findings%20from%20a%20growing,before%20symptoms%20of%20mpox%20appear - The document is referring to the research findings of the interdepartmental mpox study group of ITM.

7. World Health Organization (WHO), Switzerland, 2023. "Responding to the global mpox outbreak: ethics issues and considerations: a policy brief, 19 July 2023." *This policy brief provides guidance on key ethics issues that have emerged in the context of the global mpox outbreak and its response*. Available online: https://www.who.int/publications/i/item/WHO-Mpox-Outbreak_response-Ethics-2023.1 - The document is referring to the research findings of the interdepartmental mpox study group of ITM.

Arising from ITM research priority 2 'Antimicrobial resistance'

1. The Organization for Economic Co-operation and Development (OECD), France, 2023. "Embracing a One Health Framework to Fight Antimicrobial Resistance." By OECD Health Policy Studies. *This report advocates for a One Health approach to combat antimicrobial resistance, presenting policy recommendations and evidence-based strategies across human, animal, and environmental health sectors*. DOI: **10.1787/ce44c755-en** Available online – This document refers to the evidence gathered on antibiotic stewardship by the Clinical Sciences department.

2. Pan American Health Organization (PAHO), United States, 2023. " WHO consolidated guidelines on tuberculosis. Module 4: Treatment - Drug-Resistant Tuberculosis Treatment, 2022 update." *This module presents the WHO's consolidated guidelines for the treatment of drug-resistant tuberculosis, aiming to standardize care and improve treatment outcomes*. DOI: **10.37774/9789275327869**. Available online – The document is referring to the research findings of the Mycobacteriology group of the Biomedical Sciences Department.

3. European Commission, European Health and Digital Executive Agency, Belgium, 2023. "Study on bringing AMR medical countermeasures to the market – Final Report." This report outlines both the available medical counter measures (MCM) in the market and those under development, providing a systematic approach to prioritizing AMR MCMs based on objective criteria. The study emphasizes the global health concern posed by AMR and the stagnation in the market for new antibacterials, highlighting the necessity for innovative solutions and collaborations to address this pressing issue. DOI: **10.2925/442912**. Available online - The document is referring to the research findings of the HIV/TB group of the Clinical Sciences Department.

Arising from ITM research priority 4 'Sustainable health systems and strategies'

1. Pan American Health Organization (PAHO), United States, 2023. " WHO consolidated guidelines on tuberculosis. Module 4: Treatment - Drug-Susceptible Tuberculosis Treatment." *This module presents the WHO's consolidated guidelines for the treatment of drug-susceptible tuberculosis, aiming to standardize care and improve treatment outcomes*. DOI: **10.37774/9789275327326**. Available online – The document is referring to the research findings of the Mycobacteriology group of the Biomedical Sciences Department.

2. European Centre for Disease Prevention and Control, Sweden, 2023. "Handbook on tuberculosis laboratory diagnostic methods in the European Union – Updated 2022." By Kodmon C. et al. *This document is a handbook of agreed methods in the field of TB diagnostics for laboratories serving reference functions in Europe. It provides a comprehensive compilation of key methods for the diagnosis of TB*. DOI: **10.2900/433652**. Available online. The document is referring to the research findings of the Mycobacteriology group of the Biomedical Sciences Department.

3. Department of Human Health Services, United States, 2023. "Guidelines for the Prevention and Treatment of Opportunistic Infections in Adults and Adolescents with HIV." By Panel on Guidelines for the Prevention and Treatment of Opportunistic Infections in Adults and Adolescents with HIV. *This document provides comprehensive guidance on preventing and treating opportunistic infections in adults and adolescents with HIV. The guidelines cover various infections, including Tuberculosis infections, and offer recommendations on diagnosis, prevention, treatment, and management strategies to improve the health outcomes of individuals with HIV.* Available online: https://clinicalinfo.hiv.gov/en/guidelines/adult-andadolescent-opportunistic-infection – The document is referring to the research findings of the Mycobacteriology group of the Biomedical Sciences Department.

4. Centers for Disease Control and Prevention (CDC), United States, 2023. "CDC Recommendations for Hepatitis C Testing Among Perinatally Exposed Infants and Children — United States, 2023." by Panagiotakopoulos et al. *This document outlines the CDC's updated guidelines for the screening and diagnosis of Hepatitis C in infants, reflecting the latest evidence and best practices.* DOI: 10.15585/mmwr.rr7204a1. Available online - The document refers to the research results published by the Reproductive and Maternal Health Unit – Department of Public Health.

5. Review HCV Clinical Guidelines, United States, 2023 "Updated Clinical Guidelines on the Management of Hepatitis C Infection in Children." by Jarasvaraparn C. et al. *This document provides updated clinical guidelines for the management of Hepatitis C in pediatric patients, focusing on treatment and care.* DOI: 10.3390/pathogens13020180. Available online - The document refers to the research results published by the Reproductive and Maternal Health Unit – Department of Public Health.

6. European Association for the Study of the Liver (EASL), 2023. "Guidelines management of liver disease in pregnancy." By EASL. *These guidelines offer recommendations for the management of liver diseases in pregnant women, aiming to improve maternal and fetal outcomes.* DOI: 10.1016/j.jhep.2023.03.006. Available online - The document refers to the research results published by the Reproductive and Maternal Health Unit – Department of Public Health.

7. Infectious Disease Society of America (IDSA) American Association for the Study of Liver Diseases (AASLD), United States, 2023. "Hepatitis C Guidance 2023 Update: American Association for the Study of Liver diseases – Infectious Diseases Society of America Recommendations for Testing, Managing, and Treating heaptitis C Virus Infection." by Bhattacharya et al. *This document provides comprehensive guidance on the management of Hepatitis C, incorporating the latest research and clinical practice standards.* DOI: 10.1093/cid/ciad319. Available online - The document refers to the research results published by the Reproductive and Maternal Health Unit – Department of Public Health.

8. New York State Department of Health AIDS Institute, United States, 2023. "Hepatitis C Virus Screening, Testing, and Diagnosis in Adults." *This guideline offers recommendations for the screening, testing, and diagnosis of Hepatitis C in adults, aiming to enhance early detection and treatment.* By Aron J. et al. Available online: https://www.hivguidelines.org/guideline/hcv-testing/?mycollection=hepatitis-care - The document refers to the research results published by the Reproductive and Maternal Health Unit – Department of Public Health.

9. The Royal Women's Hospital, 2023. "Infant Feeding - Mastitis and Breast Abscess-Guideline." *This guideline outlines best practices for the management of mastitis and breast abscesses in lactating women, promoting maternal and infant health.* Available online: https://thewomens.r.worldssl.net/images/uploads/downloadable-records/clinical-guidelines/

infant-feeding-mastitis-and-breast-abscess_280720.pdf - The document refers to the research results published by the Reproductive and Maternal Health Unit – Department of Public Health.

10. European Commission, European Health and Digital Executive Agency, Belgium, 2023. «Study on bringing AMR medical countermeasures to the market – Interim Report.» This report outlines both the available medical counter measures (MCM) in the market and those under development, providing a systematic approach to prioritizing AMR MCMs based on objective criteria. The study emphasizes the global health concern posed by AMR and the stagnation in the market for new antibacterials, highlighting the necessity for innovative solutions and collaborations to address this pressing issue. DOI:10.2925/855302 Available online - The document is referring to the research findings of the HIV/TB group of the Clinical Sciences Department."

11. USAID, United States, 2023. "Guide to DHS Statistics." By Croft T. et al. *This guide provides an in-depth overview of the statistical methods and indicators used in the Demographic and Health Surveys, serving as a valuable resource for researchers and policymakers*. Available online**:** https://www.dhsprogram.com/publications/publication-dhsg1-dhs-questionnaires-and-manuals.cfm - The document refers to the methodological approaches developed by Maternal Health Unit – Department of Public Health.

12. Council for International Organizations of Medical Sciences (CIOMS), Switzerland, 2023. "International guidelines on

13. good governance practice for research institutions". By the Working Group on Good governance Practice for Research Institutions. *This document emphasizes the importance of ethical governance in research institutions, providing a framework for accountability and integrity in scientific research*. DOI: **10.56759/hslk3269**. Available online - ITM IRB chair Prof Ravinetto participated in the Working Group on Good Governance Practice for Research Institutions.

KPI-8 Number of ongoing (cumulative) ITM FWO aspirants and mandates, MSCA (personal grants), HSFP, EMBO or ERC grants, seal of excellence, ...: 21

FWO aspirants (13)

1. Tack, Bieke (KU Leuven/ITM), Prediction and treatment of invasive non-typhi Salmonella infections in children in sub-Saharan Africa, 1/11/2019-30/9/2023

2. de Vrij, Nicky (UAntwerpen, ITM), A framework to map the epitope hierarchy and complex repertoire of the human T cell response to visceral leishmaniasis, 1/11/2020-30/9/2024

3. Drissi El Boukili, Yasmina (UAntwerpen, ITM), Unravelling the effect of host, parasite and immunoparasitological factors on Plasmodium falciparum gametocyte conversion, 1/11/2020-30/9/2024

4. Postovskaya, Anna (UAntwerpen, ITM), Machine learning framework for T-cell receptor repertoire-based viral diagnostics, 1/11/2020-30/9/2024

5. Snobre, Jihad (VUB, ITM), Omics Data Integration to Predict Drug Resistance in Mycobacterium tuberculosis, 1/11/2021-30/9/2025

6. Kraußer, Lena (UAntwerpen, ITM), Laboratory and bioinformatics innovations towards culture-free whole genome sequencing of Mycobacterium tuberculosis for clinical care, 1/11/2021-30/9/2025

7. Wuyts, Ellen (UAntwerpen, ITM), Molecular basis for the potency and selectivity of DNDI-6690, a promising lead for the development of novel anti-leishmanial drugs, 1/11/2021-30/9/2025

8. Sauve, Erin (UAntwerpen, ITM), An investigation into the mechanisms of Plasmodium vivax chloroquine resistance (PvCQR): a transcriptomic/transgenic approach, 1/11/2021- 30/9/2025

9. Cuella Martin, Isabel (UAntwerpen, ITM), Curbing rifampicin-resistant tuberculosis in Rwanda and beyond, 1/11/2021-30/9/2025

10. Molenaar, Jil (UAntwerpen, ITM), 'Effective coverage' of facility-based deliveries: exploring the relevance and feasibility of a global health indicator from the bottom up, 1/11/2022- 30/9/2026

11. De Kesel, Wim (UAntwerpen, ITM), Sylvatic cycle of arboviruses in African wildlife, 1/11/2022-30/9/2026

12. Delgado, Dalia Díaz (UAntwerpen, ITM), Determining the role of tryptophan-rich antigens during P. vivax reticulocyte invasion using a functional transgenic P. knowlesi model and P. vivax ex vivo assays, 1/11/2023-30/9/2027

13. Op de Beeck, Hannah (UAntwerpen, ITM), A novel plasmonic nanoparticle amplified photoelectrochemical detection platform for dengue diagnosis (DeNPec), 1/11/2023-30/9/2027

Candidate Orlagh Fennelly was awarded a FWO fundamental PhD fellowship in the 2023 round but decided not to take the offer of the PhD scholarship due to another PhD opportunity.

VLAIO-Baekeland (1)

1. Bouckaert, Johanna (ITG, UAntwerpen), Peptide-based Diagnostics for Re-emerging Flaviviruses of Significant Public Health Concern, 1/02/23 - 31/01/27

FWO-postdocs (7)

1. Trevisan, Chiara (ITM), Playing for health - a mixed-methods approach using the pig tapeworm model, 1/10/2020-30/9/2023

2. Van Belle, Sara (ITM), Girl/Power! Accountability in sexual and reproductive health of girl-adolescents in slums - a realist evaluation, 1/10/2020-30/9/2023

3. Christou, Aliki (ITM), Preventing stillbirths in high burden settings: Examining gaps and opportunities to strengthen routine perinatal data collection and to improve quality of care, 1/10/2021-30/9/2024

4. Asefa, Anteneh (ITM), Is mistreatment of women during facility-based childbirth an independent risk factor for postpartum depression? A mixed methods prospective study in Ethiopia and Guinea, 1/10/2022-30/9/2025

5. Negreira, Gabriel (ITM), Revealing the molecular mechanisms and adaptive role of aneuploidy plasticity in Leishmania spp., 1/10/2023-30/9/2026

6. Van Dijck, Christophe (ITM), Mpox, a tale of two epidemics: unraveling differences in disease expression and transmission between Europe and Central Africa, 1/10/2023- 30/9/2026

7. Daems, Elise (UAntwerpen, ITM), A novel rolling circle amplification-mediated photo-electrochemical detection methodology for arboviruses (ArboSense), 1/10/2023-30/9/2026

KPI - 9 Number of productive (>10 joint publications per year) collaborations with international partners

Affiliations	No. Web of Science documents	% of total (n=322)
UNIVERSITY OF ANTWERP	78	24.2
UNIVERSITY OF LONDON (incl. LSHTM (n=40) and UCL(n=10))	47	14.6
KU LEUVEN	33	10.2
GHENT UNIVERSITY (incl. Ghent Univeristy Hospital (n=11))	25	7.8
UNIVERSITE LIBRE DE BRUXELLES	22	6.8
KENYA MEDICAL RESEARCH INSTITUTE	21	6.5
UNIVERSITY OF CAPE TOWN	20	6.2
CENTERS FOR DISEASE CONTROL PREVENTION USA	18	5.6
UNIVERSITE DE MONTPELLIER (incl IRD (n=11)	18	5.6
INSTITUTE NACIONAL DE RECHERCHE BIOMEDICAL	16	5.0
WORLD HEALTH ORGANIZATION	16	5.0
SCIENSANO	15	4.7
LE RESEAU INTERNATIONAL DES INSTITUTS PASTEUR RIIP	13	4.0
MAKERERE UNIVERSITY	13	4.0
UNIVERSITE PARIS CITE	13	4.0
UNIVERSITE DE KINSHASA	12	3.7
UNIVERSITY OF AMSTERDAM	12	3.7
CIRAD	11	3.4
INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE INSERM	11	3.4
UNIVERSIDAD PERUANA CAYETANO HEREDIA	11	3.4
UNIVERSITY OF OXFORD	11	3.4

e. Balance sheet

	2023	2022	2021	2020	2019	2018
ASSETS						
Fixed assets	**27,023,552**	**27,708,430**	**28,396,435**	**29,365,282**	**29,919,454**	**30,503,080**
Intangible fixed assets	16,301	29,342	0	0	0	0
Tangible fixed assets	27,007,251	27,679,088	28,396,435	29,365,282	29,919,454	30,503,080
Land and buildings	25,821,545	26,474,174	27,254,290	27,780,984	28,500,113	28,515,396
Plants, machinery and equipment	5,663	11,076	20,749	21,638	66,396	80,914
Furniture and motor vehicles	552,877	855,485	864,288	1,158,434	849,129	1,023,523
Leasing	0	0	0	0	0	0
Assets in course of construction and payments on account	627,166	338,354	257.108	404.226	503,816	883,247
Financial fixed assets			0	0	0	0
Current assets	**40,140,397**	**39,607,950**	**37,266,442**	**35,195,301**	**30,322,319**	**37,674,405**
Stock and orders-in-progress	2,707,588	1,725,267	2,050,254	1,580,511	2,009,329	1,704,609
Stock	52,550	52,550	52,550	334,259	424,547	462,875
Orders in progress (projects in progress)	2,655,038	1,672,717	1,997,704	1,246,252	1,584,782	1,241,734
Debtors due in one year or less	4,649,671	6,460,973	4,980,089	2,474,229	2,561,885	2,232,607
Trade receivables	4,419,741	4,798,077	3,213,713	2,366,953	2,498,309	2,101,797
Other debtors	229,930	1,662,896	1,766,376	107,276	63,577	130,810
Investments	2,469,216	2,469,216	2,480,371	2,480,371	2,480,371	2,480,371
Cash and bank balances	29,725,183	27,432,971	26,588,798	26,748,907	21,390,700	29,756,325
Prepayments an accrued income	588,740	1,519,524	1,166,930	1,911,283	1,880,034	1,500,493
TOTAL ASSETS	**67,163,949**	**67.316.380**	**65.662.877**	**64.560.583**	**60.241.774**	**68.177.485**
LIABILITIES						
Capital and reserves	**29,297,966**	**31,021,400**	**30,636,875**	**28,964,857**	**27,408,986**	**27,148,529**
Funds of the foundation	345,712	345,712	345,712	345,712	345,712	345,712
Revaluation surpluses	11,891,000	11,891,000	11,891,000	11,891,000	11,891,000	11,891,000
Earmarked funds	6,049,293	6,657,011	6,137,497	6,223,548	8,118,675	8,119,575
Profit (Loss) brought forward	10,063,846	11,088,169	11,131,763	9,282,301	5,739,908	5,387,157
Capital grant	948.115	1,039,509	1,130,903	1,222,296	1,313,691	1,405,085
Provisions	**-0**	**251,636**	**286,503**	**387,467**	**1,472,621**	**2,099,551**
Provisions for liabilities and charges	-0	251,636	286,503	387,467	1,472,621	2,099,551
Provisions for pensions and similar obligations	0	434,000	28,051	103,025	1,099,169	1,247,979
Other provisions	-0	251,202	258,452	284,442	373,452	851,572
Debts	**37,865,984**	**36,043,344**	**34,739,499**	**35,208,259**	**31,360,167**	**38,929,405**
Creditors due in over one year	5,963,745	6,706,820	7,426,845	8,192,185	8,956,097	9,697,083
Financial debts	5,963,745	6,706,820	7,426,845	8,192,185	8,956,097	9,697,083
Creditors due in one year or less	30,147,955	27,286,641	25,157,775	25,228,926	20,450,841	28,065,051
Creditors becoming due within one year	743,075	720,025	765,340	763,911	740,884	718,642
Trade payables	4,563,757	4,103,982	3,240,702	2,650,432	2,565,898	4,587,003
Received advanced payments (project funding)	19,569,176	16,692,797	17,069,499	17,924,805	13,392,752	18,973,731
Debts in reference to taxes, salaries and social contributions	5,118,448	5,309,038	3,871,496	3,751,586	3,714,339	3,733,313
Various debts	153,499	460,800	210,738	138,192	36,968	52,362
Accruals and deferred Income	1,754,284	2,049,882	2,154,879	1,787,148	1,953,229	1,167,271
TOTAL LIABILITIES	**67,163,949**	**67,316,380**	**65,662,877**	**64,560,583**	**60,241,774**	**68,177,485**

f. Profit and loss account

	2023	2022	2021	2020	2019	2018
OPERATING INCOME (+)	67,822,767	63,554,644	62,513,794	52,331,241	55,151,368	53,129,704
Turnover	19,867,043	18,195,378	15,778,176	16,328,828	18,048,071	7,035,195
Work and services in progress (additions +, withdrawals -)	12,289,685	8,946,607	16,996,229	5,828,446	8,773,473	-3,439,145
Member fees, funds, legacies and subsidies	24,317,743	24,122,056	22,360,649	23,187,787	14,615,889	31,927,897
Other operating income	11,348,297	12,290,603	7,378,740	6,986,180	13,713,934	17,605,757
OPERATING EXPENSES (-)	69,429,479	63,220,911	60,529,527	50,317,409	54,552,689	53,959,554
Cost of) goods for resale & raw materials	7,321,431	7,329,812	9,318,518	6,454,373	7,333,046	6,013,340
(Cost of) goods and services	18,381,607	16,993,380	15,417,966	11,783,594	15,633,428	16,103,270
Personnel expenses	42,769,071	37,667,094	34,556,026	31,889,450	30,999,280	30,737,810
Depreciation and impairments on fixed assets	1,211,420	1,199,052	1,252,901	1,218,758	1,314,963	1,588,422
Impairments on current assets and provisions for liabilities and charges (additions +, withdrawals -)	-293,183	-19,158	-111,941	-1,265,154	-728.180	-781,808
Other operating expenses	39,132	50,731	96,057	236,388	152	298,520
OPERATING PROFIT (LOSS)	-1,606,711	333,733	1,984,267	2,013,832	598,680	-829,850
Financial income (+)	210,220	567,972	144,431	122,375	103,391	314,817
Revenue from current assets	130,908	2,468	1,781	1,216	3,378	3,097
Other financial revenue	79,312	565,504	142,650	121,159	100,013	311,720
Financial expenses (-)	234,737	425,785	357,851	329,423	346,759	559,805
Costs of debt	228,435	240,272	263,538	286,080	307,798	328,819
Other financial costs	6,302	185,513	94,313	43,343	38,961	230,986
PROFIT (LOSS) FROM REGULAR COMPANY ACTIVITIES	-1,631,229	475,920	1,770.847	1,806,784	355,312	-1,074,838
Exceptional income (+)	470	0	20	0	11,864	326,711
Write-back of amortisations and depreciations on fixed assets	0	0	0	0	11,864	0
Other exceptional income	470	0	20	0	0	326,711
Exceptional expenses (-)	1,282	0	7,455	159,519	15,325	808
Exceptional amortisations and depreciations on fixed assets	0	0	0	0	15,325	0
Other exceptional expenses	1,282	0	7,455	159,519	0	808
PROFIT (LOSS) OF THE FINANCIAL YEAR	-1,632,040	475,920	1,763,412	1,647,265	351,851	-720,163

INSTITUTE OF TROPICAL MEDICINE PUBLIC BENEFIT FOUNDATION

Auditor's report to the foundation's board of directors for the financial year ended 31 December 2023

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In connection with the statutory audit of the financial statements of Institute of Tropical Medicine, Foundation of Public Utility (the "Foundation"), we submit to you our auditor's report. This contains our report on the financial statements as well as the other requirements imposed by laws and regulations. This forms a whole and is indivisible.

We were appointed in our capacity as statutory auditors by the board of directors on 15 May 2023, in accordance with the proposal of the governing body. Our mandate expires on the date of the general meeting deliberating on the financial statements closed on 31 December 2023.

We have carried out the statutory audit of the financial statements of Institute of Tropical Medicine, Public Benefit Foundation for 7 consecutive financial years.

REPORT ON THE ANNUAL ACCOUNTS

Unqualified opinion

We have carried out the statutory audit of the Foundation's financial statements, which comprise the balance sheet as at 31 December 2023 and the income statement for the year ended that date and the notes, with a balance sheet total of €67,163,949 and whose income statement closes with a loss for the financial year of €1,632,040.

In our opinion, the financial statements give a true and fair view of the Foundation's net worth and financial position as at 31 December 2023, and of its results for the year then ended in accordance with the financial reporting framework applicable in Belgium.

Basis for unqualified judgment

We conducted our audit in accordance with International Standards on Auditing (ISAs) as applicable in Belgium. Our responsibilities under those standards are further described in the section "Auditor's responsibilities for the audit of the financial statements" of our report. We have complied with all deontological requirements relevant to the audit of the financial statements in Belgium, including those relating to independence.

We have obtained from the Foundation's governing body and its appointees the explanations and information required for our audit.

We believe that the audit evidence we have obtained is sufficient and appropriate as a basis for our opinion.

Responsibilities of the governing body for preparing the financial statements

The management body is responsible for the preparation of financial statements that give a true and fair view in accordance with the financial reporting framework applicable in Belgium and for such internal control as the management body determines is necessary consider the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the governing body is responsible for assessing the Foundation's ability to continue as a going concern, disclosing, where applicable, matters related to going concern and using the going concern assumption, unless the governing body intends to liquidate the Foundation or cease operations or has no realistic alternative but to do so.

Auditor's responsibilities for the audit of the financial statements

Our objectives are to obtain reasonable assurance as to whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and issuing an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit performed in accordance with ISAs will always detect a material misstatement when it exists. Anomalies may occur as a result of fraud or errors and are considered material if they can reasonably be expected, individually or collectively, to influence economic decisions taken by users on the basis of these financial statements.

In conducting our audit, we comply with the legal, regulatory and normative framework applicable to the audit of annual accounts in Belgium. However, a statutory audit does not provide assurance on the future viability of the Foundation or on the efficiency or effectiveness with which the Governing Body has managed or will manage the Foundation's business. Our responsibilities regarding the going concern assumption used by the Governing Body are set out below.

As part of an audit conducted in accordance with ISAs, we apply professional judgement and maintain a professional-critical attitude during the audit. We also perform the following work:

- identifying and assessing the risks that the financial statements contain a material misstatement, whether due to fraud or error, determining and performing audit procedures that address those risks and obtaining audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement is greater if that misstatement is due to fraud than if it is due to error, because fraud may involve collusion, forgery, intentional failure to record transactions, intentional misrepresentation or breach of internal control;
- obtaining an understanding of internal control relevant to the audit, with a view to designing audit procedures that are appropriate in the circumstances but not for the purpose of expressing an opinion on the effectiveness of the Foundation's internal control;
- evaluating the suitability of the accounting policies used and assessing the reasonableness of the estimates made by the governing body and the related disclosures;
- concluding that the going concern assumption used by the governing body is acceptable, and concluding, based on the audit evidence obtained, whether there is a material uncertainty related to events or circumstances that may cast significant doubt on the Foundation's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required

to draw attention in our auditor's report to the related disclosures in the financial statements, or, if these disclosures are inadequate, to adjust our opinion. Our conclusions are based on the audit evidence obtained up to the date of our audit report. However, future events or circumstances may cause the Foundation to be unable to continue as a going concern ;

- evaluating the overall presentation, structure and content of the financial statements, and whether the financial statements reflect the underlying transactions and events in a manner that results in a true and fair view.

Among other things, we communicate with the governing body about the planned scope and timing of the audit and the significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

OTHER LEGAL AND REGULATORY REQUIREMENTS

Responsibilities of the governing body

The governing body is responsible for complying with legal and regulatory requirements applicable to the keeping of accounts, as well as for complying with the Companies and Associations Code and the Foundation's Articles of Association.

Commissioner's responsibilities

In the context of our assignment and in accordance with the Belgian Supplementary Standard (revised version 2020) to the International Standards on Auditing (ISAs) applicable in Belgium, our responsibility is to verify, in all material respects, (the other information included in the annual report and compliance with certain obligations under the Companies and Associations Code and the articles of association, as well as to report on these matters.

Aspects relating to the annual report

After performing specific work on the annual report, we are of the opinion that this annual report is consistent with the financial statements for the same financial year and has been prepared in accordance with Article 3:48 of the Companies and Associations Code.
In the context of our audit of the financial statements, we are also responsible for considering, in particular on the basis of the knowledge gained during the audit, whether the annual report contains a material misstatement, i.e. information that is incorrectly stated or otherwise misleading. In the light of the procedures we have performed, we are not required to report a material misstatement to you.
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Statements regarding independence

- Our auditing firm did not perform any engagements incompatible with the statutory audit of the financial statements, and remained independent from the Foundation during the course of our mandate.
- The fees for additional assignments compatible with the statutory audit of the financial statements referred to in Article 3:65 of the Companies and Associations Code were correctly disclosed and broken down in the notes to the financial statements.

Other entries

- Without prejudice to formal aspects of minor importance, the accounts were kept in accordance with the legal and regulatory requirements applicable in Belgium.
- We should not communicate to you any transactions or decisions made or taken in violation of the articles of association or the Companies and Associations Code.

Antwerp, 27 March 2024

RSM INTERAUDIT BV
AUDITOR REPRESENTED
BY GERT VAN LEEMPUT
PARTNER


MOL

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Responsible annual report

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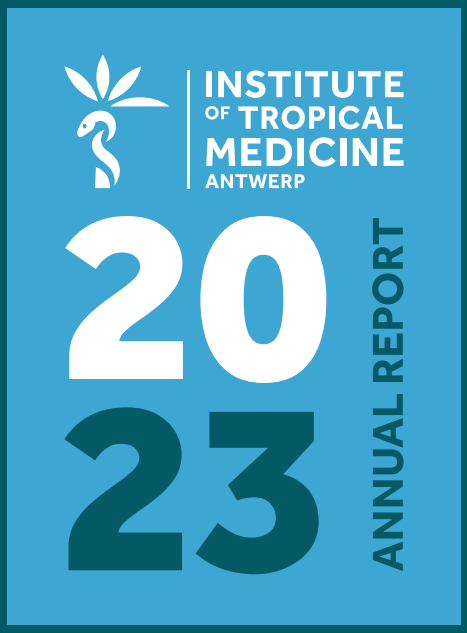
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