HAT Platform

REGIONAL PLATFORM FOR CLINICAL RESEARCH

NEWSLETTER N° 22 / *February 2023*

Special Edition

FIRST VIRTUAL JOINT SCIENTIFIC MEETING

« Achieving the Elimination of Human African Trypanosomiasis. »

1-3 February 2022 (webinar series)

LONDON CENTRE FOR NEGLECTED TROPICAL DISEASE RESEARCH

DNDi Best Science for the Most Neglected

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Our thanks to Violaine Dallenbach, Louise Burrows and Francine Ngalula for proofreading the newsletter.

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I. Editorial

Dear readers,

This 22nd HAT Platform Newsletter is a special edition dedicated to the first joint scientific meeting co-hosted by the HAT Platform and the London Centre for Research in Neglected Tropical Diseases (LCNTDR), with DNDi and the Royal Society of Tropical Medicine & Hygiene (RSTMH). The theme of the meeting, held via Zoom on 1-3 February 2022, was «***Achieving the Elimination of Human African Trypanosomiasis***.» Several researchers took part in this meeting organised as roundtable discussions, to identify research gaps for the elimination of human African trypanosomiasis. The Zoom meetings, translated directly into English and French, brought together over 150 participants from more than 60 countries. The presentations, pre-recorded as 8-15 minute videos, fuelled the discussions. The abstracts of all 14 presentations are provided here.

This bulletin also focuses on access activities for fexinidazole, the first all-oral treatment for human African trypanosomiasis, now added to the World Health Organization (WHO) Essential Medicines Lists. The HAT Platform launched a programme, with the WHO, to promote access to this fully oral drug in the most remote settings.

The WHO supports the integrated control of neglected tropical diseases (NTDs). The HAT Platform is already moving in this direction, and it will broaden its scope to other neglected tropical diseases or health problems, combining clinical research and access to treatment as it has done for HAT treatments, such as the nifurtimox-eflornithine combination therapy (NECT) and fexinidazole, and will do for acoziborole in the future. This issue also contains an overview of ongoing clinical trials with two macrofilaricidal drugs for the treatment of onchocerciasis in the DRC and Ghana.

“The HAT Platform launched a programme, with the WHO, to promote access to this fully oral drug in the most remote settings.”

We take this opportunity to pay tribute to four key people in the fight against HAT who have recently passed away: researcher at Swiss TPH, Dr. Gabriele Pohlig; the national Coordinator of the NSSCP of Chad, Dr. Jean-Claude Peka Mallaye; Mr. Mathias Mba Ndong, a tireless supervisor in the fight against HAT and other neglected tropical diseases in Gabon, and Dr. Pierre Cattand, who worked for a long time at the WHO in Geneva. All these people contributed to the fight against HAT through their research and mentoring of young researchers.

Happy reading to all.

Dr. Florent Mbo Kuikumbi

II. Summary of the first HAT Platform – LCNTDR joint scientific meeting

Kathryn Forbes, Florent Mbo and Olaf Valverde

A. Introduction

On February 1-3 2022, the HAT Platform and the London Centre for NTD Research (LCNTDR) co-hosted a series of webinar roundtables, with DNDi and the Royal Society of Tropical Medicine & Hygiene (RSTMH), bringing together a number of researchers to identify research gaps to eliminate human African trypanosomiasis (HAT). The meetings, held online via Zoom with live English and French translations, were attended by over 150 participants from over 60 countries. The discussions were fuelled by pre-recorded videos of 8 to 15 minutes each, submitted in advance by specialist researchers, providing a good overview of both existing research and future directions. Presentations can be viewed on the RSTMH YouTube channel by clicking on the following link: https://www.youtube.com/playlist?list=PLLRqrk2kjm2faDkrO50JNQpc-lzvNlgZC.

The 14 studies presented below focus on HAT as well as on larger projects carried out with international partners. As expected, most studies were conducted in the most endemic country, the Democratic Republic of the Congo (DRC), but also in the Central African Republic, Chad, Burkina Faso and South Sudan. Two seroprevalence surveys in the DRC and South Sudan provided up-to-date information from areas where information has previously been scarce, and from a focus of re-emergence in the Central African Republic. Two abstracts focused on the One Health concept, which involves veterinary and entomological research, and is essential to understanding vector distribution and the impact of the animal reservoir. One abstract presented a new method of diagnostic qPCR, and another analysed the important issue of cost as a barrier to access diagnosis and treatment. Two partners presented social science research, exploring community involvement and the perspectives of health workers. Members of the Liverpool School of Tropical Medicine gave an overview of vector control history and perspectives, while researchers from Warwick University introduced new opportunities to fine-tune HAT elimination modelling, supported by a specific example from a student at Swiss TPH, who modelled the impact of a new drug in the DRC. DNDi presented its drug development programme, and the Institute of Tropical Medicine Antwerp presented its strategy to support HAT elimination in the DRC. These presentations fuelled the three roundtable discussions between HAT specialists and experts from other medical fields.

B. Presentation of the abstracts

1. Modelling of the impact of fexinidazole on gHAT transmission in the Democratic Republic of the Congo

Das Aatreyee (PhD student, Swiss TPH, Basel, Switzerland)

Background: Human African trypanosomiasis due to *T.b. gambiense* (gHAT) is a deadly disease, whose incidence has been declining since the start of the century, primarily due to increased screening, diagnosis and treatment of infected people. The

World Health Organization (WHO) is aiming to reach interruption of gHAT transmission by 2030. The main treatment regimen currently in use requires a lumbar puncture as part of the diagnostic process to determine disease stage, and hospital admission for intravenous drug administration.

Fexinidazole is a new oral treatment for stage 1 and non-severe stage 2 human African trypanosomiasis. The WHO has recently incorporated fexinidazole into its treatment guidelines for human African trypanosomiasis. This treatment does not require hospital admission or a lumbar puncture for all patients, which is likely to ease access for patients; however, it requires concomitant food intake, which is likely to reduce treatment adherence.

Methodology: We used a mathematical model calibrated to case and screening data from the Mushie territory of the DRC, to explore the potential negative impact of poor compliance to an oral treatment on the transmission dynamics, and the potential gains to be made from increases in the number of patients seeking treatment.

Results: We found that reductions in treatment compliance in stage 1 patients are projected to result in the largest increase in further transmission of the disease, with failing to cure stage 2 cases posing a smaller concern. Reductions in compliance may be offset by increases in the rate at which cases are passively detected. Efforts should therefore be made to ensure good fexinidazole compliance by stage 1 patients, and to improve access to care. Further studies are needed to better quantify fexinidazole adherence in the field, and to monitor any changes in the passive detection rate.

2. Ethnographic study on human African trypanosomiasis (HAT): an ecological model to understand contributory factors to community engagement in HAT control in the DRC

Background: HAT prevalence in the Democratic Republic of the Congo (DRC), once known as having the highest number of cases, has dropped significantly due to more effective drugs, regular mass screening, and simple screening tools. While this is good news for the elimination of HAT as a public health issue, it also threatens HAT control activities, especially in terms of community engagement.

Methodology: In this qualitative study, we used an ecological model framework to understand how various factors interact at the individual, community and societal levels to shape local communities' knowledge, perceptions, and behaviour towards HAT activities in low endemicity settings. Our ethnographic approach involved community members and frontline health providers from 14 communities across 6 provinces in Western and Central DRC, and provincial and national policymakers were consulted.

Results: The findings show that local communities living in endemic areas are knowledgeable about HAT, including its causes, symptoms, and treatment. Community members' practices and behaviour relating to HAT screening and treatment are influenced by several factors: (i) at the individual level, by knowledge about HAT, personal beliefs (including traditional beliefs), age, proximity to the disease, perception of the risk, and gender; (ii) at the community level, by the quality and cost of health services and access to them (distance); the family's financial and social assets and beliefs; the community's perception of HAT patients (stigma); the local leadership; and HAT related education activities; (iii) at the societal level, by the social representation of HAT, endemicity, culture and social norms, economic and livelihood situation, and HAT policies and programme on community engagement.

Conclusion: We proposed concrete recommendations on how to achieve community engagement, including the development of an Education, Information and Communication strategy (EIC) adapted to HAT.

Charlie Kabanga (Independant consultant in research and evaluation, London, United Kingdom)

3. HAT situation in Dingila (Bas Uélé Province, DRC), and results six years after all screening activities had ceased

Erick Mwamba Miaka (Médecin Directeur, PNLTHA, RDC)

Background: In the Ganga-Dingila health zone, Bas-Uélé Province, Democratic Republic of the Congo, the numbers of HAT cases dropped until 2015. Médecins Sans Frontières stopped operating in the area in 2015, and no further cases have been reported since. In 2021, we explored the prevalence of HAT in the area to inform the need for additional control activities in our effort to move toward elimination of HAT transmission.

Methodology: Based on historical data and feedback from the health zone management team, we selected health areas and villages with the highest HAT prevalence in 2013/2014 and dispatched a fully equipped team of experts from the National Sleeping Sickness Control Programme (NSSCP) to perform active screening with RDTs (rapid diagnostic tests) and confirmatory tests, and provide treatment if needed. Following passive screening with RDTs, the NSSCP team performed confirmatory testing in serological suspects, as per the simplified algorithm of microscopy of lymph node aspirate of palpable lymph nodes, followed by mini Anion Exchange Centrifugation Technique (mAECT) on a blood sample. Dried blood spots (DBS) were also collected and a blood sample was stored with DNA/ RNA shield for further serological and molecular analyses.

Results: A total of 2430 individuals were screened, mostly (n=2364) through active screening, between 2 and 14 December 2021, in 18 villages in eight health areas. Two scheduled villages could not be reached due to poor road conditions. The male/ female ratio in active screening was 1.02, and 48.4% of individuals were younger than 15 years. Thirty-two (1.35%) individuals had a positive RDT, but none were parasitologically confirmed after 8 lymph node aspirates and 32 mAECT blood tests. Seropositivity ranged between 0% in children <5 years, and 1.7% in those 25-45 years old. Seroprevalence in the screened villages ranged between 0 and 2.9%. Additionally, 66 individuals were screened via passive screening in the CSR Bambesa health centre; 6 had a positive RDT, but none were confirmed after 4 lymph node aspirates and 6 mAECT blood tests. Passive screening in the other sites was not performed due to general strikes of health workers. None of the serological suspects reported a previous history of HAT. Further analyses on stored samples have not yet been performed.

Conclusion: Our results confirm (pending results of the complementary analyses) the absence of active HAT foci in Ganga-Dingila. It is, however, premature to draw conclusions for the whole Bas-Uélé Province, and further explorations should be planned in the Doruma and Ango health zones.

4. Views of frontline health workers on HAT training, expertise and elimination

Jean-Benoît Falisse (Lecturer, Center of African Studies, University of Édinburgh) and Jennifer Palmer (Co-Director, Health in Humanitarian Crises Centre and HAT researcher, London School of Hygiene and Tropical Medicine)

Background: Frontline health workers play a crucial role in the elimination of human African trypanosomiasis (HAT), due to their experiential knowledge of the disease and the health systems and social environments in which it spreads. Unlike theoretical knowledge which may be taught in textbooks, experiential knowledge is essential to solving health problems based on the setting. Such knowledge is acquired through practice and maintained through continual exposure. In this presentation, we looked closely at the careers of frontline HAT workers, and on how their HAT-

related knowledge is generated and maintained within wider national systems to understand their hopes and fears regarding disease elimination.

Methodology: We examined two contrasting nationwide case studies, conducted in South Sudan where HAT expertise is scattered and constantly being rebuilt, and in the Democratic Republic of the Congo (DRC), where specialised mobile detection teams have pro-actively tested people at risk for almost a century. We used interviews conducted between 2012 and 2018 to determine how HAT workers understand, maintain, and adjust their skills amidst global and national level challenges.

Results: The DRC has provided more stable opportunities to develop careers related to HAT control because of its strong, vertical programme compared to South Sudan where health systems planning is short-term and more reliant on international organizations. However, in both settings, HAT workers have spent decades rebuilding human resources infrastructures, following failed attempts at elimination in a context of major political changes. HAT control is seen as a long-term and collective struggle involving generations of workers trained in special programmes. More recently, clinical trials have offered frontline health workers an opportunity to continue working on HAT, both in the field and at the coordination levels, as well as a sense of belonging to a global HAT community. The decrease in case numbers and the global drive towards elimination have changed the nature of HAT-related work. Working in treatment wards has become less overwhelming, although screening teams feel pressure to identify cases, both as something to show for extended time away from families, and a desire to contribute towards global research trials to improve HAT technologies. De-skilling is a threat for HAT workers whose exposure to the disease diminishes as case numbers drop and elimination strategies re-configure the learning environment. Many see the training and networking opportunities that come with vertical programmes being diluted through programme initiatives to decentralise and integrate HAT testing and treatment, which have yet to prove their effectiveness and robustness. Furthermore, the population's declining trust in government in the DRC and the high prevalence of armed conflict in South Sudan have hampered community engagement, making it difficult to maintain local vigilance for HAT and understand disease transmission patterns. The global decrease in HAT case numbers brings hope, but most informants also expressed a deeply ingrained fear that many patients may not be accessing services.

Conclusions: After decades of work in the field of HAT, our informants are aware of what has been done well and of the herculean effort it takes to rebuild lost infrastructures, but they stress the need to extend HAT training to more health workers while simultaneously valuing and reinforcing expert knowledge hubs. These frontline workers also invite us to consider more carefully the value of practical field expertise built up in teams and networks.

5. An atlas to support the progressive control of tsetse-transmitted animal trypanosomiasis in Burkina Faso

Lassané Percoma (PhD Student, Rural Development Engineer, Nazi Boni University, Burkina Faso)

Background: Animal African trypanosomiasis (AAT), transmitted by tsetse flies, is arguably the main disease constraint to integrated crop-livestock agriculture in sub-Saharan Africa, and African heads of state and government have adopted a resolution to rid the continent of this scourge. In order to sustainably reduce or eliminate the burden of AAT, a progressive and evidence-based approach is needed, which must hinge on harmonized, spatially explicit information on the occurrence of AAT and its vectors.

Methodology: We assembled a digital repository containing tsetse and AAT data collected from control activities or research settings in Burkina Faso, between 1990 and 2019. Data were systematically verified, harmonised, georeferenced and integrated into a PostgreSQL database. Entomological tsetse data were mapped at the level of individual monitoring traps. When this was not possible, mapping was

done at the site or village level. Epidemiological data on AAT were mapped at the location or village level.

Results: Entomological data identified four tsetse species in Burkina Faso. *Glossina tachinoides* was the most widespread and abundant species (56.35% of the catches), present from the eastern to the western part of the country. *Glossina palpalis gambiensis* was the second most abundant species (35.56%), mainly found in the West. *Glossina morsitans submorsitans* was present in lower densities (6.51%), with a patchy distribution in the southern parts of the country. One only cluster of *G. medicorum* was detected at a density < 0.25% in the Southwest. AAT data were collected from 54,948 animal blood samples from 218 geographic locations. The samples were tested with a variety of diagnostic methods. AAT was found in all surveyed departments, including the tsetse-free areas in the North. *Trypanosoma* infections were mostly due to the dominant species *T. vivax* and *T. congolense* (6.11±21.56% and 5.19±18.97%, respectively), and to a lesser extent to *T. brucei* infections (0.00±0.10%).

Conclusion: The atlas provides a synoptic view of the available information on tsetse and AAT distribution in Burkina Faso. Data is very scanty for most of the tsetse-free areas in the northern part of the country. Despite this limitation, this study generated a robust tool to aid the targeting of future monitoring and control activities. The development of the atlas also strengthened the collaboration between the different institutions involved in tsetse and AAT research and control in Burkina Faso, which will be crucial for future updates and the sustainability of the initiative.

6. Advances and next steps in gHAT modelling

Kat Rock (Leader, HAT Modelling and Economic Predictions for Policy Project, Warwick University, UK)

This presentation will provide a whistle-stop tour of the progress made in gHAT modelling since 2015, showing how methodological advances and access to increasing amounts of gHAT data have produced new insights on infection trends, drivers of transmission, and the probability of reaching the 2030 elimination goal. Consideration of costs through health economic evaluation is presented as a means of suggesting resource-efficient strategies to further reduce the burden of disease, while highlighting the potential conflict between cost-effectiveness goals and a high probability of achieving transmission elimination by 2030. The online graphical user interface of the *HAT Modelling and Economic Predictions for Policy* project, designed to communicate large amounts of data in a format that is easy to use and interactive for non-modellers, was briefly presented and then made available for the meeting participants to try out.

The demonstration showed how a one-size-fits-all approach is unlikely to suit the gHAT endgame, and on the contrary, that the range of diagnostic, treatment and vector control tools currently available, or in the pipeline, is likely to be sufficient if they are operationalised strategically and supported by necessary funding and political will. Finally, an overview of the next modelling steps was provided, using different data types and aimed at continuing to support decision-making across different geographies and providing assessment of progress achieved towards zero transmission.

7. Contributions of tsetse control to the HAT elimination goals

Inaki Tirados (Medical Entomologist, Liverpool School of Tropical Medicine, UK) and Andrew Hope (Programme Manager, Liverpool School of Tropical Medicine, UK)

Vector control strategies to interrupt HAT transmission involve the use of insecticides. In

the 1960s and 1980s, insecticides were sprayed from aircrafts or from the ground in large-scale campaigns in countries such as Botswana, Nigeria and Zimbabwe. These techniques achieved good control or even eliminated tsetse populations, but they were expensive (~$450-550/km^2 and ~$250-350/ km^2, respectively), logistically demanding, and often dependent on governmental and/or external support for implementation. In the 1980s, the development of odour-baited targets impregnated with insecticide offered a new and more economical approach (~$250-300/ km^2).

This method was used primarily against savanna tsetse, important vectors of animal African trypanosomiasis (AAT) and the relatively rare *rhodesiense* HAT (r-HAT). Also in the 1980s, the use of insecticide-treated cattle (ITC) was developed as an affordable (~$50-120/ km^2) *One Health* approach, and to control the transmission of AAT and r-HAT in areas where cattle are abundant. ITC controls not only tsetse but also the vectors of important tick-borne diseases such as East Coast fever. More recently, analyses of tsetse behaviour resulted in the development of insecticide-impregnated tiny targets, the first control tool specifically designed against tsetse of the riverine group, vectors of the most common human disease, *gambiense* HAT (gHAT). Control strategies, based on tiny targets are relatively affordable (~$75-125/ km^2), community-friendly, and they require minimal external support. Field trials demonstrated that the deployment of tiny targets can reduce tsetse populations by ~90% and epidemiological models indicated that this level of control will interrupt transmission. Adding vector control to case-detection and treatment would hasten local elimination of HAT transmission.

The implementation of tiny targets in five endemic countries showed similar trends, with a sustained ~80-90% reduction in tsetse abundance across all foci. Currently, this approach is protecting around 100,000 km^2 and around 3,000,000 people in countries such as Cameroon, Chad, Côte d'Ivoire, Guinea, DRC and Uganda.

8. DNDi developed new simplified treatments to support HAT elimination: NECT, fexinidazole and acoziborole

Olaf Valverde (Team Leader & Medical Manager, DNDi, Geneva, Switzerland) and Sandra Rembry (Clinical Project Leader, DNDi, Geneva, Switzerland)

At its creation in 2003, DNDi set up a programme to develop new drugs for sleeping sickness, necessary due to the toxicity or complex administration requirements of the drugs available at the time. The nifurtimox and eflornithine combination therapy (NECT) developed jointly with Epicentre and MSF was made available in 2009. It simplified the previous treatment with eflornithine alone, as the addition of the oral drug nifurtimox reduced the number of intravenous administrations required. Even though hospitalisation was still necessary, NECT quickly became the reference treatment for advanced HAT.
Fexinidazole, the first all-oral treatment taken once a day for 10 days with food, became available for extended use in 2020. It is now the first-line treatment for early and advanced disease stages, although NECT remains the first choice for patients with severe central nervous system infection, or for children weighing less than 20 kg. Training on the new treatment guidelines in endemic areas of Sub-Saharan Africa, together with other activities promoting access to fexinidazole and HAT awareness, are ongoing.

DNDi's latest drug candidate, oral single-dose acoziborole, is still under clinical development but it has shown very promising results in a recently completed pivotal trial. It could play a key role in HAT elimination by introducing a very simple treatment into peripheral health systems. Two further clinical trials will be conducted, one in children at least 1 year old, and the other in people serologically reactive to the parasite, without the present requirement of a formal microscopic confirmation of trypanosome presence in at least one of the patient's body fluids. Acoziborole is expected to be available for general use in all parasitologically confirmed adults from 2024. The target approval date for use in children and serologically reactive individuals is 2026.

9. Novel qPCRs to detect single nucleotide polymorphisms and copy-number variations in TBR (Trypanosoma brucei repeat) sequences in Trypanozoon and *T.b. gambiense*

Nick Van Reet (Senior Researcher, Trypanosoma Unit, Institute of Tropical Medicine, Antwerp, Belgium)

Recently published research described the tandem repeat sequence *Trypanosoma brucei* repeat (TBR), on *Trypanozoon* minichromosomes. Here, we report that the TBR sequence is not as homogenous as previously believed. BLAST analysis of the available *T. brucei* genomes reveals various TBR sequences of 177 bp and 176 bp in length, which can be sorted into two TBR groups based on a few key single nucleotide polymorphisms. Conventional and quantitative PCR, with primers matched to consensus sequences that target the TBR group, show substantial copy-number variations in the TBR repertoire within a collection of 77 *Trypanozoon* strains. We developed the qTBR, a novel PCR consisting of three primers and two probes, to simultaneously amplify target sequences from each of the two TBR groups into one single qPCR reaction. Compared to existing TBR PCRs, this dual probe setup offers increased analytical sensitivity for the molecular detection of all *Trypanozoon* taxa, in particular for *T. b. gambiense* and *T. evansi*. By combining the qTBR with 18S rDNA amplification as an internal standard, the relative copy-number of each TBR target sequence can be calculated and plotted, allowing for further classification of strains into TBR genotypes associated with East, West or Central Africa. Thus, the qTBR takes advantage of the single-nucleotide polymorphisms and copy number variations in the TBR sequences to enhance amplification and genotyping of all *Trypanozoon* strains, making it a promising tool for prevalence studies of both human and animal African trypanosomiasis. Ongoing research using Sanger sequencing of cloned TBR sequences from 8 *Trypanozoon* strains (5 *T.b. gambiense* and 3 non-*gambiense*) revealed even higher polymorphisms in the TBR region. We evaluated the prevalence of 18 SNPs found only in *gambiense* strains on a collection of more than 200 *Trypanozoon* strains using genotyping qPCRs. One SNP (G37C) specifically identifies *T.b. gambiense* strains originating from the Democratic Republic of the Congo with a sensitivity almost comparable to that of the original TBR-qPCR, yet curiously, the same SNP is absent, or present in minimal amount, in *T. b. gambiense* strains originating from West Africa (Côte d'Ivoire). Interestingly, West African *gambiense* strains appear to contain different *gambiense* specific SNPs according to Sanger sequencing, yet it proved impossible to generate primer sets or probes in the surrounding nucleotide region to robustly amplify these SNPs. While the discovery of *gambiense* specific TBR sequences seems promising, the format is not easily translatable to qPCR and likely requires next-generation amplicon-sequencing to be successful. Still, the promise of both sensitive and specific detection makes TBR a promising target as a marker for *Trypanozoon* and *T.b. gambiense* in particular.

10. Identification of potential gHAT animal reservoirs in domestic animals from HAT foci in Chad and their implications for control strategies

Joel Vourchakbe (Researcher and Professor, Faculty of Science and Technology, University of Doba, Chad)

Background: Zero transmission of human African trypanosomiasis (HAT) has been targeted for 2030, but animal reservoirs of gHAT could jeopardise this elimination goal. This study was undertaken to identify of potential reservoirs of *Trypanosoma*

brucei gambiense in domestic animals from HAT foci in Chad.

Methodology: Blood samples were collected from 443 goats, 339 sheep, 228 dogs, 98 pigs, 155 donkeys and 131 horses. Rapid diagnostic tests (RDTs) and capillary tube centrifugation (CTCs) were performed to search for trypanosomes. DNA was extracted from the buffy coat, and trypanosomes of the subgenus *Trypanozoon* as well as *T. b. gambiense* were identified by PCR.

Results: Of 1394 blood samples, 13.20% were positive by RDT, and 6.88% were positive by CTC. PCR revealed the presence of trypanosomes of the sub-genus *Trypanozoon* in 234 animals (16.78%), *T.b. gambiense* been detected in 21 of them (1.5%). This trypanosome was found in all investigated animal species and in all HAT foci. Significant differences were found between villages, and in the number of animals harboring *T. b. gambiense* DNA.

Conclusion: This study shows that pigs, dogs, sheep, goats, donkeys and horses are potential reservoir hosts of *T. b. gambiense* in Chad. The identification of *T. b. gambiense* in all animal species in all HAT foci suggests that these animals should be considered when designing new control strategies for sustainable HAT elimination. To achieve the goal of zero HAT transmission, further studies evaluating their specific role in each epidemiological setting must be conducted.

11. First step towards the interruption of gHAT transmission in the DRC

Anja De Weggheleire (Epidemiologist, Mycobacterial and Neglected Tropical Diseases, Institute of Tropical Medicine, Antwerp, Belgium) Paul Verle (Project Coordinator, HAT, Institute of Tropical Medicine, Antwerp, Belgium)

In the next few years, support will be provided to the National Sleeping Sickness Control Programme of the DRC (NSSCP) to implement a countrywide comprehensive strategy, based on depleting the HAT parasite reservoir in humans, and reducing the density of the tsetse fly vector.

The Institute of Tropical Medicine, Antwerp (ITM) will ensure the coordination, and the most important implementation partners will be the the Liverpool School of Tropical Medicine and the Belgian development agency Enabel. Active case finding through voluntary screening of the population at risk by mobile teams will continue to play an important role for several years. We foresee four active monitoring modalities: i) routine active screening according to the current WHO strategy; ii) monitoring of historic foci; iii) probing of blind spots; and iv) reactive screening in the villages where the HAT cases were originally detected passively in patients visiting fixed health facilities.

The passive case finding approach will be integrated in the primary health care system. Priority will be given to the health zones that reported the most cases in the previous years. Targeted vector control with tiny targets will be applied through a vertical, riverine deployment approach and a community-based approach. Field validation of new diagnostic tools will be conducted. Action research to improve the impact of the different approaches and to optimise available diagnostic and vector control tools will be high on the agenda. Available digital tools will be fine-tuned for better data collection and their application will be extended. A major challenge is to improve data management and real-time data assessment. The quality assurance system will be further developed, beyond pictures and videos used to check serological testing by mobile teams.

Dried blood spots and other samples will be checked at regional laboratories, including for external quality assurance of passive screening. Updated Standard Operating Procedures will be made available on a wider scale. We will prepare a transformative screen-and-treat strategy, anticipating the availability of acoziborole by 2024. The overall goal is the interruption of HAT transmission.

12. Evaluation of medical and non-medical expenses related to HAT screening, diagnosis and treatment incurred by patients in the DRC

Rian Snijders (PhD student, Health Economist, Institute of Tropical Medicine, Antwerp, Belgium)

Objective: The reduction in human African trypanosomiasis (HAT) cases indicates that we are on the right track for the elimination of HAT as a public health problem and for its sustained elimination by 2030, but it will require a continued commitment to disease control activities. The arrival of easier-to-use screening tests and improved treatments created a shift from mass screening to integrated disease monitoring in the primary health care system. However, previous studies have shown that financial barriers are one reason why people do not get screened. There is little information on personal expenses related to case detection. This study aims to fill this gap and estimate medical and non-medical expenses incurred during the various stages of HAT detection and management, related to serological tests, parasitological tests, disease stage determination and treatment, and how these expenses influence the perception of and participation in these activities.

Methodology: This study used qualitative and quantitative methods. First, group discussions and semi-structured interviews were carried out with people who had been in contact with HAT screening activities in order to identify the expenses they incurred and how the latter may influence their behaviour. Then an investigation was conducted on a random sample of 400 people who had been in contact with HAT screening activities in the last 12 months, in order to estimate HAT-related medical and non-medical expenses and to assess how these costs have influenced behaviour towards HAT control activities.

Results: The study estimates the expenses related to HAT control, indicates the importance of these expenses even when screening tests and HAT treatment are provided free of charge, and how it influences behaviour and participation**.**

Conclusion: System-integrated HAT health care monitoring will be essential to achieving a sustained elimination of the disease. This study informs policy makers and supports contextual adaptations to improve the coverage of innovative approaches to disease control.

13. Re-emergence of human African trypanosomiasis in Bangassou, Central African Republic

Romaric Nzoumbou-Boko (Head of Parasitology Service, Pasteur Institute, Bangui, CAR) Pascal Mbelesso (Deputy Dean of Health Sciences, University of Bangui, CAR)

Introduction: The World Health Organization has set a goal to eliminate human African trypanosomiasis (HAT) by 2030. The prevalence of this neglected tropical disease has dropped significantly in recent decades, but foci of infection remain, especially in inaccessible or conflict areas, and may lead to a re-emergence of the disease.

Methodology: We conducted a retrospective study of 34 months (January 2016 to October 2018) at the Bangassou Regional University Hospital (HRUB) to determine the disease's epidemiological situation.

Results: During the study period, out of a total of 2312 patients hospitalised at the HRUB, 21 were admitted for confirmed HAT infection. The average age of the patients was 27 years ± 18 years, with

extremes of three months and 75 years. Clinical signs were dominated by sleep disorders (95.2%), sleep disorder behaviour (66.6%), and pruritus (19%). Trypanosomes were isolated from the CSF of all patients. Cytorachia ranged from 20-2000 cells/mm^3, with an average of 464.14 elements/mm^3. Five subjects had previously travelled to Haut Mbomou, one of the prefectures that host the three active HAT foci. The other 4 cases had never left the city of Bangassou, hence the likely hypothesis of local transmission and, therefore, re-emergence of HAT in this historic focus.

Conclusion: Coupling active parasitological prospecting to an ongoing entomological survey, to search for tsetse flies in and around of Bangassou, will confirm this hypothesis.

14. Contribution of fixed health facilities to HAT elimination

Patrice Kabangu (National Case Management supervisor, NSSCP DRC)

Introduction: In line with Jamot's premise, for several years, mobile teams seemed to be the most effective way to control human African trypanosomiasis (HAT). The effectiveness of this approach was such that, in 2011, the WHO estimated that the elimination of HAT as a public health problem was possible by 2020. However, these Jamot mobile teams are currently considered more expensive than fixed health facilities, and almost all technical and financial partners want to support the latter. In view of this situation, we conducted a study to assess the contribution of these fixed facilities to the elimination of human African trypanosomiasis, compared to that of mobile teams. Our study, which lasted from 2010 to 2019, focused on 27 HAT control provincial coordination centres in East Kasai in the DRC, which included 23 fixed health facilities and 4 mobile teams.

Objective: Our goal was to determine the contribution of fixed health facilities towards the HAT elimination goal advocated by the World Health Organization (WHO), and to propose a paradigm which could help reduce the cost.

Methodology: We performed a literature review to assess the contribution of fixed health facilities towards HAT elimination compared to that of mobile units. We consulted the annual reports of the mobile units of the HAT control provincial coordination centres in East Kasai covering a period of ten years (from 2010 to 2019). To define this contribution, we calculated, for the entire study population, the number and corresponding percentages of patients diagnosed according to the diagnostic method used, the fixed or mobile health facility, and the stage of the disease.

Results: After comparing the proportions of patients diagnosed by the mobile teams and the fixed health facilities, it appears that mobile teams produced more stage 1 cases than fixed facilities, approximately 80% and 20%, respectively. In his thesis *Towards strengthening passive screening and its contribution to the control of human African trypanosomiasis*, Florent Mbo also demonstrated that between 2001 and 2005, over 70% of HAT cases passively detected each year were at an advanced stage. Despite these differences, the contribution of fixed heath facilities to elimination remains irrefutable.

C. Summary of the three days of roundtable discussions

a) First day of roundtable discussions

The first day of the roundtable discussions and held online on 1 February 2022 was opened by Prof. Sir Roy Anderson, Director of the London Centre for NTD Research (LCNTDR), who spoke about the importance of developments in diagnostics, monitoring, treatment and vector control, as well as the gaps in research that, once filled, could support the HAT elimination effort in 2022 and beyond.

The panelists included Prof. Stephen Torr, Liverpool School of Tropical Medicine UK; Philippe Büscher, ITM Belgium; Gerardo Priotto, WHO; Wilfried Mutombo, DNDi; and Deirdre Hollingsworth, NTD Modelling Consortium, Oxford, UK. They discussed the need to adapt case finding techniques, and identify the optimal balance between active, passive and reactive case finding. However, this will not be easy, and partners will have to take into account the context, including economic and programmatic considerations.

Throughout the discussions, participants recognised the importance of diagnostics to achieve elimination targets. They discussed the role of molecular testing for HAT, and the lack of information about the performance of diagnostic PCR in terms of sensitivity and specificity. Moreover, it was noted that molecular tests are very difficult to implement in settings with poor health infrastructure, and that further research in this area would be beneficial. Molecular tests could also be deployed or made available at a central laboratory to confirm cases, or help define the time to stop screen-and-treat strategies.

Diagnostics for animals were also discussed. A question was raised about whether domestic animals could be treated for trypanosomiasis to stop the transmission to tsetse flies, provided their role in HAT transmission to humans and the impact of animal reservoirs, however small, could be proved. It was noted that rapid diagnostic tests are unlikely to be effective, and molecular tests would be too expensive in a non-research setting. There is a lack of tools available in this area.

Throughout the discussions, vector control was considered as an important pillar of elimination efforts. Participants discussed the importance of vector migration to achieve roadmap targets. Tsetse flies can cover a distance of up to 1 km a day and about 25 km a year, and although this is not as far as other vectors such as black flies, a lot of progress can be lost if this migration is not prevented. This has been a perennial problem for tsetse control. The link between HAT due to *T.b. rhodesiense* and national parks raises questions about the migration of tsetse flies from those areas and into farmland. In other settings, understanding how they move between river systems will help to deploy targeted strategies for preventing reinvasion of cleared areas, or avoid a rebound once tsetse control measures are lifted.

Vector control was presented as an intervention to protect vulnerable populations, including refugees and internally displaced persons. In Uganda, tsetse control interventions quickly implemented in refugee settlements protected newcomers and those already present alike. This approach could be implemented at short notice, alongside clinical interventions.

Lastly, climate change was discussed, along with anthropogenic changes to the environment that influence HAT transmission. In Zimbabwe, there is strong evidence that hotter weather has influenced tsetse populations, as they move to increasingly habitable new areas and cause a rise in HAT cases. Climate change will also affect livestock and significant research is needed in this area.

b) Second day of roundtable discussions

The second day of the scientific roundtable discussions on HAT was held online on 2 February 2022.

The day was introduced by Olaf Valverde Mordt from DNDi and moderated by Jennifer Palmer from the London School of Hygiene & Tropical Medicine, with the participation of Salome Bukachi, University of Nairobi, Charlie Kabanga, researcher consultant, and Ann Kelly, Kings College London.

The first topic to be discussed was the usefulness of elimination targets, and it was generally agreed that these targets help focus energies and increase funding. However, numerical targets often do not take into account the experience of those affected, and people treated for HAT are still often stigmatised. It is also important that elimination programmes do not result in a one-size-fits-all strategy, but rather in context-specific programming.

The importance of people-centred approaches was emphasised throughout the session. Participants acknowledged that the person conveying a message can be as important as the message itself, and that messages should be delivered by people trusted by the communities. There was also an important discussion about the role of indigenous knowledge

in programmes. Local knowledge is not always sufficiently acknowledged, and we tend to impose our knowledge on communities. Better collaboration is needed, including a need to recognise that indigenous knowledge is scientific, real and logical.

Several research gaps were identified during the session, including:

1. Actor mapping is needed to identify different ways to increase HAT awareness, among children and other community members. As we are aiming for elimination, we will need a very granular approach.

2. More research is needed to reduce the psychosocial effects of HAT. Progress has been made in diagnostics and treatment, but more is needed to tackle the stigmatising effects of HAT.

3. Digital technologies, often used to transfer information from a monitoring to a higher level are lacking. However, there is an urgent need for community members, such as farmers, to have access to health information, e.g, in the form of digital platforms to support health education.

4. As the prevalence of the disease decreases, knowledge and attitudes about the disease also change. More research is needed, such as a gap analysis on how to mobilise communities, including through community leaders, such as churches.

C) Third day of roundtable discussions

The third and final roundtable meeting on human African trypanosomiasis, hosted by the London Centre for NTD Research (LCNTDR), the HAT Platform, DNDi and the Royal Society of Tropical Medicine & Hygiene (RSTMH), was held online on 3 February 2022.

The event was opened by Prof. Sir Roy Anderson, Director of LCNTDR, who spoke about the challenges arising from the COVID-19 pandemic for NTD programmes, and the importance of convening stakeholders to identify gaps and share research and knowledge towards the common objective of HAT elimination.

The roundtable discussions were moderated by Florent Mbo, DNDi-HAT Platform DRC, and included Simon Croft, LSHTM; Paulo Makana, Institute for Combat and Control of Trypanosomiasis, Angola and José Ramón Franco, WHO.

The participants acknowledged the significant progress achieved towards HAT elimination. They noted that HAT is no longer considered a public health problem in many regions, and that the progress made in tools and drug donations has motivated global partners to work towards the elimination of the disease. However, to achieve WHO NTD road map targets, improved and more versatile tools are needed.

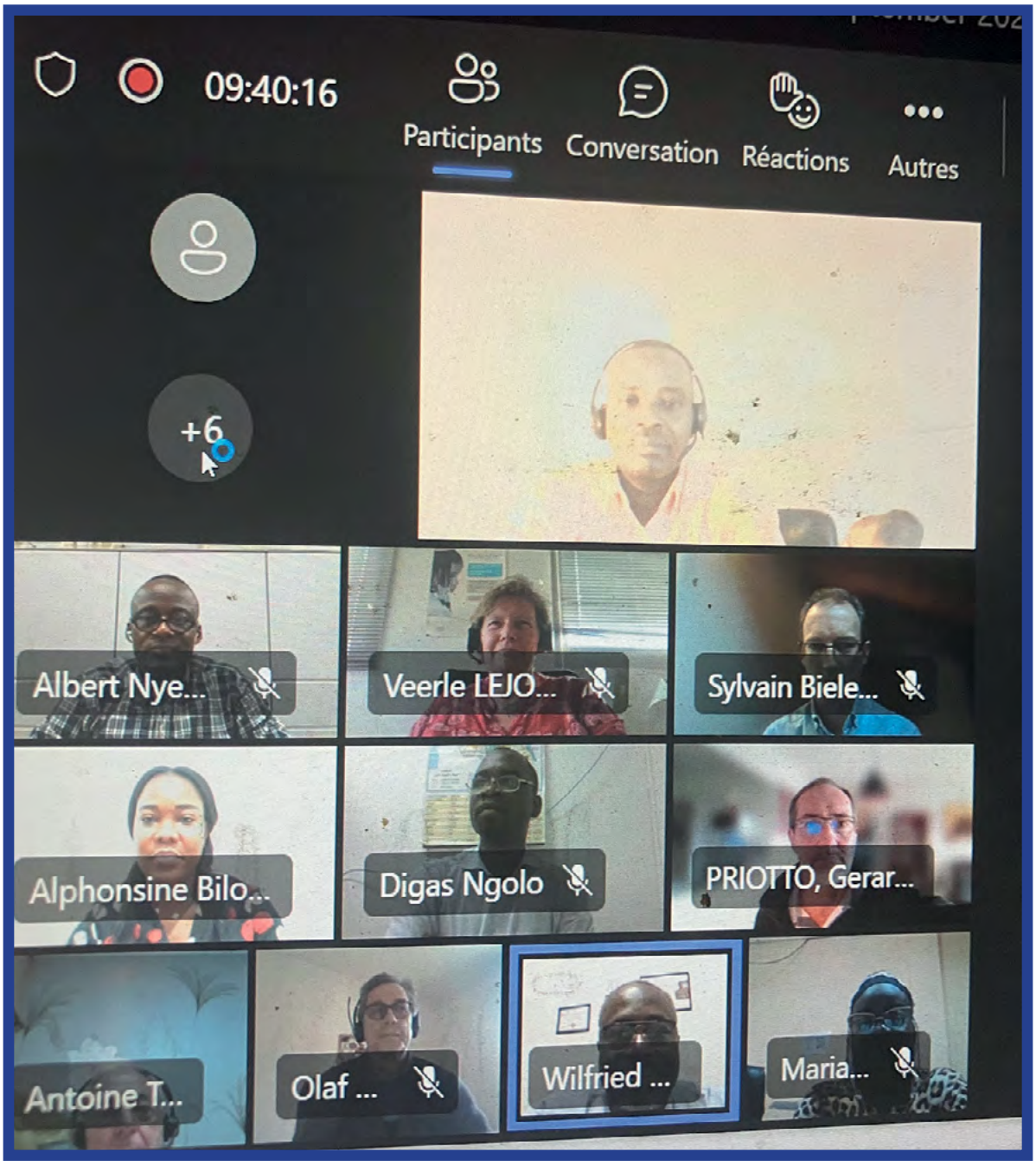
The panel also talked about acoziborole, the new drug developed by DNDi and Sanofi. If approved, acoziborole administered in a single dose at the point of diagnosis would be a game changer to support the sustainable elimination of the disease. Participants acknowledged its significant potential and discussed its potential use for chemoprophylaxis. However, it would require significant research into the safety of the drug and raises the question of drug resistance.

The panel discussed the importance of human resources to support the efforts towards HAT elimination. In particular, it was noted that as the programme has matured and the prevalence has decreased, fewer people gain expertise in HAT. As health workers treat fewer and fewer cases, it will be important to provide sufficient training so they can continue to identify and treat new cases. This might require new tools to be used by people without expertise, as well as stronger referral systems. This was followed by a call for more research on a sustainability research agenda.

Panelists discussed the importance of vector control as a central pillar of HAT elimination efforts. They recognised that HAT is endemic to geographically diverse areas, with transmission occurring in mangroves, in cocoa plantations, along rivers or in forests. Each setting will require a tailored approach to effectively implement interventions, including vector control.

Lastly, the panelists discussed the importance of new economic analyses, including modelling, to estimate

the cost-benefit of HAT elimination. HAT prevalence is decreasing and new drugs will be manufactured in relatively low numbers compared to other more prevalent NTDs. The cost of maintaining supply for an increasingly rare disease will be high, and it will be important to continuously demonstrate the positive economic returns of HAT elimination.



III. Reports of the regional HAT Platform steering committee meetings of 20 September 2021 and 30 September 2022

Albert Nyembo and Florent Mbo

1. Regional HAT Platform steering committee meeting of 20 September 2021

The meeting was chaired by a delegate from the Republic of Guinea, Dr. Camara Mamady, supported by the HAT Platform Coordinator, Dr. Florent Mbo. The secretariat was provided by the Chad delegate, Dr. Peka Mallaye, co-reporter for the DRC and South Sudan (Mansisa and Mabrouk).

This meeting was attended by the following member countries: Angola, Republic of Congo, Guinea, Uganda, Central African Republic, Democratic Republic of the Congo and Chad. The usual partners for HAT control, WHO, DNDi, FIND, IMT, IRD, LSTM and Swiss TPH, were also present.

The opening of the session by the HAT Platform Coordinator was followed by a presentation of the participants, as well as a reading of the recommendations of the previous meeting and of the HAT Platform activities in 2019 and 2020.

A. Activities planned for the fourth quarter 2019, in 2020 and the first semester 2021

- Continued advocacy with member countries for the authorisation of fexinidazole in 2020
- Support of strategic programme reviews
- Support of pharmacovigilance in 5 endemic countries (DRC, South Sudan, Angola, CAR and Guinea)
- Support of training on fexinidazole in endemic countries (Gabon, Chad, Equatorial Guinea and Congo)
- Support of ethics committees to develop their own guidelines (Guinea, Republic of Congo)

B. Activities carried out in the fourth quarter 2019, 2020 and the first semester 2021

Authorisation to use fexinidazole obtained (Chad, Gabon, CAR, Angola, Equatorial Guinea)

Annual strategic reviews of supported programmes (DRC)

Training of country pharmacovigilance units (DRC and CAR)

Training on fexinidazole in endemic countries (Gabon, Chad, Equatorial Guinea and Congo)

C. Presentation of the HAT Platform member countries

Each country then presented a report on its activities, as well as their difficulties experienced in HAT research, coordination and/or control.

a. Angola

Mapping of the disease and the epidemiological situation in the country showed a clear decrease in the number of new cases of HAT (18 in 2017, 79 in 2018 and 30 in 2019), followed by an increase in 2020 with 33 new cases.

The difficulties experienced by the country included:

- Low research funding

- Lack of a national protocol on the use of fexinidazole
- Obsolete means of transport, reducing the teams' ability to reach at-risk populations
- Lengthy administrative procedures to acquire trypanocides

The country wishes to strengthen its national HAT Platform activities, with the recruitment of two new team members.

b. Republic of Congo

After he presented the mapping showing HAT foci mainly along the Congo River, the country's representative indicated that active screening in 2020 had found one new HAT case at stage 2. From January to September 2020, another active screening campaign resulted in the diagnosis of 6 new HAT cases after visiting 6 villages.

The difficulties experienced by the country included:

- Lack of financial resources to conduct field surveys
- Lack of support to strengthen passive surveillance

c. Guinea

The different disease foci (active, old, historical, and foci that had not recorded any cases for 10 years), and the epidemiological situation were presented, with the same observation of a gradual decrease in new HAT cases, from 140 in 2017, to 73 in 2018, 69 in 2019, 35 in 2020, and 16 between January and September 2021.

The difficulties experienced by the country included:

- Drug stock-outs (November 2020)
- Inability to provide food for hospitalised patients
- Need for more human and financial resources

d. Central African Republic

A map was presented, with a drastic decrease in new HAT cases in recent years: 124 in 2016, 75 in 2017, 55 in 2018 and 85 in 2019.

The difficulties experienced by the country included:

The country expressed a desire to carry out knowledge, attitude and practice surveys among service providers and exposed populations.

e. Democratic Republic of the Congo

A map showed the 11 provincial HAT control coordination centres and the epidemiological survey reported 1769 new cases in 2016, 1100 in 2017, 660 in 2018, 613 in 2019, and 389 NC in 2020.

The difficulties experienced by the country included:

- Difficult advocacy with partners in a context of decreasing cases
- Low level of funding for control activities compared to the country's real needs
- Inaccessibility of certain geographical areas (insecurity, natural obstacles)
- Existence of foci of unknown status

f. Chad

The mapping of the country showed the disease foci within the current epidemiological situation of low endemicity (28 new cases in 2017, 12 in 2018, 17 in 2019, 17 in 2020 and 3 in 2021).

The difficulties experienced by the country included:

- Lack of research direction for the elimination of HAT by 2030
- Lack of interest in HAT research by academics
- Low participation of the population in active screening activities
- Reduction in funding of activities

D. Partner presentations

a) World Health Organization (WHO)

The WHO's presentation focused on the objective of eliminating HAT by 2020 and breaking the chain of transmission by 2030. Although these objectives are ambitious, the epidemiological curve shows that the number of new HAT cases has continued to decline, to such an extent that, across the whole of the African continent, the number of cases no longer exceeds 2,000 per year.

There are 5 categories of countries based on their HAT elimination status:

- Category 1: HAT elimination effective and validated, and switch to the monitoring stage (Togo and Côte d'Ivoire).

- Category 2: HAT elimination threshold reached but validation pending (Benin, Equatorial Guinea, Rwanda, Uganda for gHAT and Ghana).
- Category 3: HAT eliminated as a public health problem and elimination close to being validated (Burkina Faso, Cameroon, Kenya and Mali).
- Category 4: HAT eliminated as a public health problem but monitoring insufficient (Botswana, Burundi, Eswatini, Ethiopia, Gambia, Guinea Bissau, Liberia, Mozambique, Namibia, Niger, Nigeria, Senegal, Sierra Leone, Tanzania, Uganda for gHAT, Zambia and Zimbabwe).
- Category 5: HAT elimination not yet achieved (Angola, CAR, Chad, Congo, DRC, Gabon, Guinea, Malawi and South Sudan).

The WHO believes that to reach the 2030 objective, innovative strategies must be used, and each strategy must be adapted to the country and the setting.

The remaining major challenges are to find new tools and to integrate HAT monitoring and control into the health systems.

b) Drugs for Neglected Diseases initiative (DNDi)

DNDi presented its various activities in drug development and access, with a history of HAT treatments from melarsoprol to eflornithine, NECT and fexinidazole. The pharmacovigilance of drugs was also described. The DNDi representative discussed the ongoing clinical trials of acoziborole for gHAT, OXA004 for unconfirmed seropositive cases, and OXA005 for children with HAT.

c) Institut de Recherche pour le Développement (IRD)

IRD was created to promote research on new diagnostic tools for HAT.

INTERTRYP is a research unit based in Montpellier, France, created in 1999 from the union of two research laboratories, namely IRD and CIRAD. Several clinical trials were discussed (Trypaderm, Trypano-GEN+), including those relating to the animal reservoir. All these innovative tools and robust strategies require the involvement of all stakeholders (scientists, farmers, veterinarians, politicians, industrialists, etc.).

d) Institut de Médecine Tropicale (IMT)

The presentation focused on the support IMT provides to HAT elimination, and in particular on the financial support to projects (FA4-OS2, FA5-OS2, HAT+, etc.), as well as the support to HAT control in the DRC at the central (monitoring), provincial coordination (activity planning) and mobile units and mini-units levels. IMT also supports various activities, such as digitisation, scaling up the integration of passive testing, quality assurance and INRB activities. Various past and ongoing research projects were reviewed, including on new diagnostic tools (such as molecular tests), new screening strategies, and the identification of probable sites of infection.

e) Liverpool School of Tropical Medicine (LSTM)

LSTM is active in vector control, with two flagship projects in progress:

- *Trypa-No!* conducted in Guinea, Côte d'Ivoire, Chad, Uganda and Cameroon with the help of other partners, such as FIND and IRD.
- *TrypElim Bandundu* conducted in the DRC with the help of partners, such as PATH.

LSTM uses a vertical approach to tsetse fly control (entomological survey, tiny target deployment, entomological assessment, capacity building), as well as a horizontal approach (community sensitisation, community level interventions). In addition to these two approaches, LSTM also provides data management. Vector control remains targeted, but there is a real need for extension to other endemic health zones.

The LSTM representative concluded by saying that the tiny target technology is appropriate, but that the following factors should not be overlooked: capacity building, scaling up of vector control in the DRC, validation of the criteria for ending vector control in certain areas, the need for new assessment tools in elimination areas (xenomonitoring?), and challenges related to cross-border areas that must be analysed and resolved.

f) Swiss TPH

This presentation focused on the impact of the use of fexinidazole on HAT elimination. The Swiss TPH representative reviewed the progress made in











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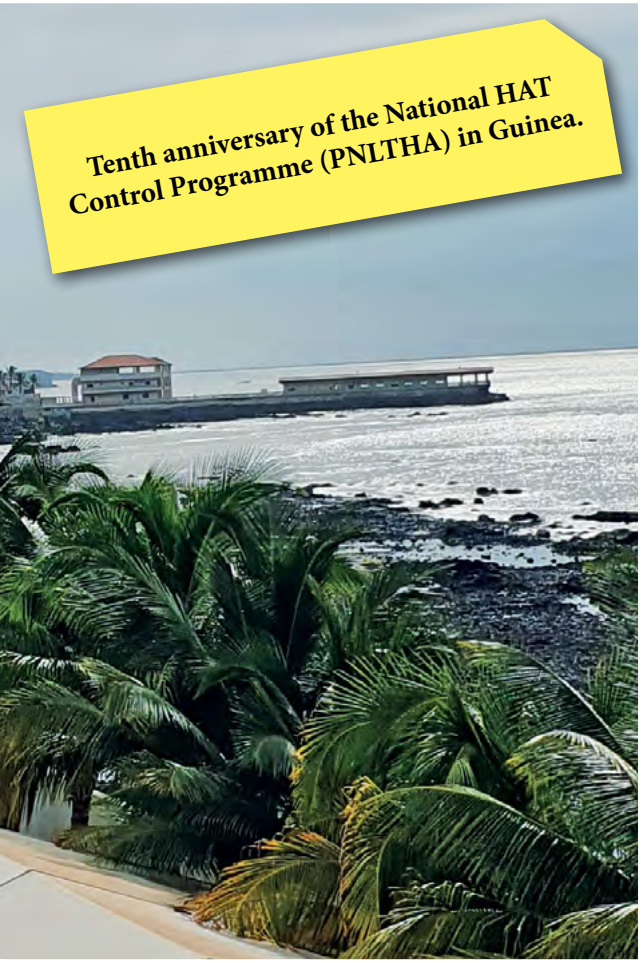
Tenth anniversary of the National HAT Control Programme (PNLTHA) in Guinea.



HAT treatments, which required not only complex knowledge and techniques but also significant logistics. With fexinidazole, communities now have access to an easy-to-use treatment. Further studies on fexinidazole are underway.

g) FIND

The FIND representative presented the implementation of new diagnostic solutions to support the elimination of *g*-HAT. The development of new diagnostics has involved partnerships, from the fluorescence microscope with Carl Zeiss in 2010, to second generation RDTs (with recombinant antigens) with Abbott in 2020. FIND is supporting projects to use RDTs for HAT in several African countries, including Angola, DRC, Uganda, Guinea, Chad, Côte d'Ivoire and South Sudan.

At the end of the presentation, the following recommendations were made:

1. Member countries must meet the following prerequisites before receiving fexinidazole from the WHO (Congo, South Sudan and Cameroon):
   - Revision of the HAT management protocol or adoption of WHO guidelines;
   - Authorisation for the use of fexinidazole delivered by the ministries of health;
   - Training of service providers with the support of the HAT platform and WHO.
2. Cross-border control activities will be carried out between CAR and Chad, as well as between Guinea and Sierra Leone with the support of FIND in collaboration with the WHO.
3. The WHO will support Angola on quality assurance for screening and diagnosis following the increase in cases observed in this country.
4. The recommendations made in 2019 in Abuja and in 2020 were renewed.

2. Report of the regional HAT Platform steering committee meeting of 30 September 2022

The meeting was chaired by the Central African Republic under the coordination of the HAT Platform. The participating countries and partners included the DRC, CAR, Angola, South Sudan, Chad, Guinea, Uganda, the WHO, FIND, IRD, the University of Warwick, INRB and Swiss TPH. After a reminder on the recommendations of the last steering committee meeting of 20 September 2021 and their follow-up, countries and partners made their presentations. After the following exchanges and discussions, the recommendations below were made:

1. Cross-border control activities will be carried out between CAR and Chad, then between Guinea and Sierra Leone, with the support of FIND, with the WHO;
2. The WHO will support Angola with quality assurance for screening and diagnosis, following the increase of diagnosed cases in 2021;
3. The use of mAECT is recommended for the parasitological confirmation of HAT, especially *gHAT*;
4. For all serological suspects who cannot be confirmed parasitologically, but are nevertheless treated for gHAT, dried blood spots should be collected. The WHO can assist by sending the dried blood spots to the reference laboratories for further examination. Detailed information on the context and on the types of diagnostic serologic and parasitological tests used should be sent with the specimen;
5. DNDi can help eligible countries draft project proposals for the REDISSE IV project (Chad, Angola, CAR, Congo), if their ministries of health who manage the project agree to include HAT activities;
6. Vector control with tiny targets should be integrated into our strategies for HAT elimination.

IV. Progress of the fexinidazole access project

This project focuses on HAT diagnosis and access to fexinidazole in populations and communities aware of and affected by the disease, to support the WHO's HAT elimination objective.

These actions are based on the following activities:

1. Capacity building (diagnosis, treatment, search for suspected serological cases, supervision, rehabilitation, equipment, communication);
2. Access to the new drug, fexinidazole;
3. Support to the health system (integration of screening and fexinidazole treatment in primary health care structures, support of the health system via the National sleeping sickness control programmes (NSSCPs) and strengthening of the pharmacovigilance systems in five countries (DRC, Guinea, CAR, Angola and Sudan). The other endemic countries will be covered only for training;
4. Community outreach intervention (behavioural research, information, education and communication).


DRC


GUINEA


CAR


ANGOLA

The results obtained by country since the start of this access project in 2019 are summarised in the table below:

Activities achieved	Countries
Training on the use of fexinidazole according to the new WHO guidelines	DRC, Congo, Guinea, South Sudan, Uganda, Angola, Equatorial Guinea, Gabon, Cameroon, Chad, CAR and Burkina Faso
Training on screening with RDTs	DRC
Training of national pharmacovigilance systems	Guinea, CAR, DRC, South Sudan
Adoption or adaptation of the new WHO guidelines on the treatment of *g*HAT	DRC, Congo, Guinea, South Sudan, Uganda, Angola, Equatorial Guinea, Gabon, Cameroon, Chad, CAR and Burkina Faso
Authorisation for the use and import of fexinidazole by the countries' ministries of health	DRC, Congo, Guinea, South Sudan, Uganda, Angola, Equatorial Guinea, Gabon, Cameroon, Chad, CAR and Burkina Faso
Educational materials for *g*HAT *and* rHAT produced and distributed during training of opinion leaders	Uganda, DRC and Malawi
Rehabilitation and equipment of health centres to improve the provision of HAT services	DRC
Establishment of a reference network and confirmation of passive serological suspects, with samples sent to the national reference laboratory INRB for trypanolysis	DRC
Electronic reporting of adverse events through the national pharmacovigilance system	DRC (pilot project)
Ethnographic study of the population's perceptions and beliefs about *g*HAT in endemic areas	DRC

Current or planned activities	Countries
Supporting adoption of pharmacovigilance guidelines in certain countries	Guinea, CAR
Training of the pharmacovigilance team	Angola
Training of national pharmacovigilance systems	Guinea, CAR, DRC, South Sudan
Screening and treatment strategy with acoziborole (serological suspects and children)	DRC

V. Summary of the scientific days on 6-7 June 2022 marking the tenth anniversary of Guinea's National Sleeping Sickness Control Programme (NSSCP)

The NSSCP Guinea took stock of the last 10 years of HAT control as part of the WHO elimination programme.

Guinea is the only West African country where HAT is endemic. However, the level of endemicity has been in steady and continuous decline for several years. In Guinea, the active foci are in the coastal areas (Dubreka, Boffa, Forécariah). The main control strategies in these endemic foci are screening/ treatment of patients, and vector control. Medical activities are based on both passive and active case finding. Active screening is carried out through so-called mass campaigns by mobile medical teams and, more recently, through targeted door-to-door activities. Passive screening conducted in recent years in former foci in other regions (Pita, Mamou, Kankan, Gueckedou and N'Zérékoré), with the support of the WHO, has not been able to confirm the presence of parasitological cases for over 15 years. With less than 1 case per 10,000 inhabitants per focus since 2018, the objective of eliminating HAT as a public health problem by 2023 is now reachable.

The general objective of these scientific days was to provide a comprehensive review of the HAT control activities carried out over the last 10 years (2012-2022), specifically to:

- Present the operation of the National HAT Control Programme;
- Present the activities carried out over the past 10 years;
- Identify strengths, areas for improvement and recommendations.

This event was organised by the NSSCP under the supervision of the Ministry of Health and Public Hygiene of Guinea, and the first two days took place on 6-7 June 2022 in Conakry. Several national and international institutions and partners were present, such as the Ministry of Higher Education (MESRSI), the National Institute of Public Health (INSP), the Pasteur Institute of Guinea (IP Gui), the Higher Institute of Sciences of Veterinary Medicine of Dalaba (ISSMV), Gamal Abdel Nasser University of Conakry (UGANC), NGOs and the Regional Health Directorate (DRS) and the Prefectural Health Directorate (DPS) of endemic prefectures (Boffa, Dubreka and Forécariah), the Raoul Follereau Foundation, IRD, WHO, the French Embassy in Guinea, the HAT Regional Platform, the NSSCP Côte d'Ivoire, the University of Glasgow, FIND and DNDi.

Day 1: Presentation of the control and research activities in plenary session

After words of welcome from the Director of the NSSCP, the session was opened by the representative of the Minister of Health and Public Hygiene and the adviser of the Minister of Scientific Research who praised the efforts of the NSSCP facilitators, as well as the example they set for other health programs.

In his presentation titled "On the Road to Elimination", the NSSCP Director reviewed the epidemiology, diagnosis, treatment, vector control and research. The session was closed with congratulations to the various HAT actors in the field in Guinea.

Day 2: Discussions followed by proposals and recommendations

During the second day, the partners presented their research projects and the support they provide to NSSCP Guinea.

Days 3 and 4: Field visits

The last two days focused on field visits. The partners visited the Dubreka foci and its treatment centre, as well as the Forécariah centre, which offers opportunities for clinical research on HAT and other neglected tropical diseases.

The efforts of the last ten years, following nearly three decades of control, have led to a significant reduction in the number of cases and the incidence of the disease in the various active foci of the country. Despite the presence of Ebola from 2014-2015 and of COVID-19 since 2020, vector control activities did not stop, and they had a significant impact on interrupting the transmission of the disease. Beyond their impact on health, these epidemic and pandemic situations led to adaptations of the methods and strategies put in place by the NSSCP. The development of community and intersectoral approaches helped lay the foundations for a true integration of control activities. The resulting operational research contributed to the improvement of control strategies due to the innovative tools and methods put in place. The partners helped strengthen the skills of the NSSCP executive team through internships and diploma training (master's and doctorate) in various fields (diagnosis, treatment, entomology/vector control, health geography, clinical trials, etc.). The programme's partnership has been developed and strengthened.

On the basis of these results, the PNLTHA has set the following objectives:

- Preserving the gains in HAT control
- Preparing the elimination file
- Introduction of the Open Data Kit (ODK) system
- Cross-border monitoring with Sierra Leone

The numerous exchanges that took place on different themes, both during the plenary session and in the field, led to the following recommendations:

- Set up a national multidisciplinary committee of national experts and partners, to draft the validation file for the elimination of HAT as a public health problem by the Ministry of Health;
- Organise regular meetings of the committee (working methodology, plenary sessions) over the next 12 months;
- Submit the draft without corrections to the WHO;
- Develop a monitoring plan after validation (bibliography);
- Organise an official event if the WHO validates the file.

VI. Ethnographic study on the perceptions and practices of local communities in relation to HAT in the 14 endemic health zones in the DRC

Charlie Kabanga Hughes

Sleeping sickness still threatens millions of people in the DRC, and many of those affected live in remote areas with limited access to appropriate health services. In addition, population displacement, war and poverty play an important role in the transmission of the disease. Communities living in the most affected areas are not sufficiently informed about the achievements in treatment, diagnosis and vector control.

Since 2020, DNDi (Drugs for Neglected Diseases initiative) has received funding from the Ministry of Health of the Democratic Republic of the Congo (through the Projet de Développement du Système de Santé (PDSS) funded by the World Bank) to support NSSCP control activities with a view to interrupting the transmission of this disease by 2030. This project entitled *Programmatic support for the implementation of activities in the NSSCP in the DRC* had 3 main objectives:

1. Strengthen the capacity of the health system to provide HAT control services in the 14 targeted health zones (HZs);
2. Strengthen community involvement in HAT monitoring and control with a view to its elimination in the 14 HZs;
3. Ensure adequate project management and administration, monitoring and evaluation, as well as the dissemination of knowledge related to NSSCP activities in the 14 targeted HZs.

To achieve the second objective, 4 major activities had to be organised:

1. Conducting a community survey or assessment of behaviours and social dynamics;
2. Organising a cascade training for health personnel and opinion leaders;
3. Organising IEC interventions for the communities;
4. Designing educational materials.

This project focused on 14 HZs in 6 provinces of the DRC, covered by 4 NSSCP regional coordination centres.

The recommendations made to the NSSCP DRC to carry out its activities and achieve its objectives in the context of low prevalence of the disease are described below.

► **Key messages**

- Screening does not transmit other diseases, such as AIDS.
- Early detection does not require a lumbar puncture.
- Sleeping sickness is still present.
- Early detection helps reduce the presence of sleeping sickness.
- Early symptoms are similar to those of malaria.
- Mental disorders are caused by sleeping sickness and not by witchcraft.
- Describe the tsetse fly and its habitat.
- Sleeping sickness is a disease like any other, that can be treated.

- People with the disease need to be supported.
- A new simple and more effective treatment exists in the form of tablets.
- Prohibitions are no longer necessary with the new treatment.
- HAT cases have been found in your community, and you may be infected without knowing it.
- The government wants to eliminate sleeping sickness and, to succeed, it needs everyone's help.

► **Distribution channels**

- Extend distribution channels to households, while favouring interpersonal messages.
- Adapt messages and approaches for different groups (youths, adults).
- Bring the reality of the disease into the local context, e.g, by involving former patients to raise awareness by sharing their experience of the disease and recovery.

► **To obtain community engagement**

- Involve local chiefs and opinion leaders.
- Empower local leaders in the campaign to eliminate the disease.
- Advocate at all levels and involve influencers, such as local chiefs, teachers, politicians, churches.
- Use innovative approaches, such as community competitions.

Other recommendations

- Bring HAT care closer to the community so they do not have to seek treatment elsewhere (especially with new simple treatments).
- Collaborate closely with churches and traditional healers for passive community screening.
- Find a way to provide economic support for the patient and their family.
- Empower communities in HAT control, especially the chiefs.
- Adopt community screening, as is the case for tuberculosis (community health workers).
- Intensify awareness-raising activities.
- Increase funding for outreach activities.
- Maintain confidentiality for cases detected, but it is important to inform communities when a case of HAT is identified.

These recommendations were used to develop communication tools before moving on to the second phase of training and community interventions implementation in the DRC in 2021.

Below are some examples of the tools developed:

6th JOINT HAT PLATFORM-EANETT SCIENTIFIC MEETING

Mombasa, Kenya, 19-22 September 2023

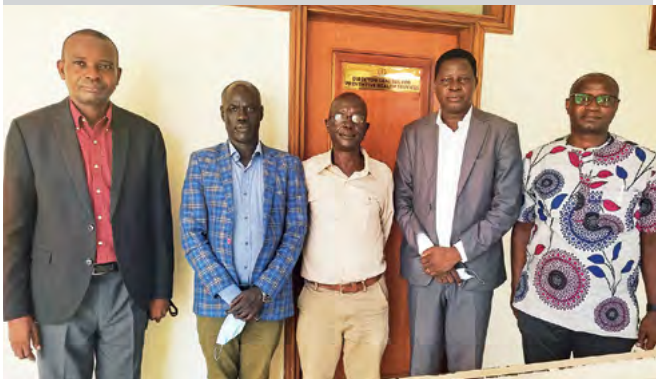
Call for abstracts will be launched in March 2023

VII. Visits and meetings

1. Training of healthcare providers on the use of fexinidazole and training of members of the pharmacovigilance unit Bangui, CAR, 24-31 August, 2021.

2. Congo HAT platform meeting, Brazzaville, 5 August 2022.

3. Training of health workers on the use of fexinidazole and training of members of the pharmacovigilance unit, Juba, South Sudan, 8-11 November, 2021.



4. Meeting with the General Director (second on the right), preventive health services department, Juba, South Sudan, 29 October 2021.

5. Training of healthcare providers on the use of fexinidazole according to the new WHO guidelines, Yaounde, Cameroon, 29 November - 1 December, 2021.

6. Training of healthcare providers on the use of fexinidazole according to the new WHO guidelines and data collection tools, Forecariah, Guinea, 21-22 January, 2022.

7. Training of members of the pharmacovigilance unit, Conakry, Guinea, 20-24 January, 2022.

8. Training of healthcare providers on the use of fexinidazole according to the new WHO guidelines, Bobo Dioulasso, Burkina Faso, 20-21 September 2022.

9. DRC National Day on HAT, Kinshasa, DRC, 30 January, 2022.

10. Uganda HAT platform meeting, Kampala, 4-9 April, 2022.

11. Training of healthcare providers on the use of fexinidazole according to the new WHO guidelines, Kampala, Uganda, April 2022.

12. Vector control division research ethics committee Members training by UNCST, Kampala, Uganda, 7-10 March 2022.

VIII. Scientific publications in 2021 and 2022

1. Victor Kande *et al.* Efficacy and safety of acoziborole in patients with human African trypanosomiasis caused by Trypanosoma brucei gambiense: a multicentre, open-label, single-arm, phase 2/3 trial. *Lancet Inf Dis.* 2022.

2. Charlie Kabanga *et al.* Communities' Perception, Knowledge, and Practices Related to Human African Trypanosomiasis in the Democratic Republic of the Congo. *Diseases* 2022, 10, 69.

3. Kande Betu Kumesu V *et al.* Safety and efficacy of oral fexinidazole in children with gambiense human African trypanosomiasis: a multicentre, single-arm, open-label, phase 2-3 trial. *Lancet Glob Health.* 2022 Nov;10(11):e1665-e1674. doi: 10.1016/S2214-109X(22)00338-2.

4. Alberto Venturelli *et al.* Current Treatments to Control African Trypanosomiasis and One Health Perspective. *Microorganisms*. 2022 Jul; 10(7): 1298.

5. Kat S. Rock *et al.* Update of transmission modelling and projections of gambiense human African trypanosomiasis in the Mandoul focus, Chad. *Infect Dis Poverty.* 2022; 11: 11.

6. Ronald E. Crump *et al.* Modelling to infer the role of animals in gambiense human African trypanosomiasis transmission and elimination in the DRC. *PLoS Negl Trop Dis.* 2022 Jul; 16(7): e0010599.

7. Olaf Valverde Mordt *et al.* Development and Introduction of Fexinidazole into the Global Human African Trypanosomiasis Program. *Am J Trop Med Hyg*. 2022 May; 106(5 Suppl): 61–66.

8. Mohd Imran *et al.* Discovery, Development, Inventions and Patent Review of Fexinidazole: The First All-Oral Therapy for Human African Trypanosomiasis. *Pharmaceuticals* (Basel) 2022 Feb; 15(2): 128.

9. Jose R. Franco *et al.* The elimination of human African trypanosomiasis: Achievements in relation to WHO road map targets for 2020.*PLoS Negl Trop Dis*. 2022 Jan; 16(1): e0010047.

10. Fabrice Courtin *et al.* The cost of tsetse control using 'Tiny Targets' in the sleeping sickness endemic forest area of Bonon in Côte d'Ivoire: Implications for comparing costs across different settings. *PLoS Negl Trop Dis*. 2022 Jan; 16(1): e0010033.

11. Marina Antillon *et al.* Economic evaluation of disease elimination : An extension to the net-benefit framework and application to human African trypanosomiasis. *Proc Natl Acad Sci* U S A. 2021 Dec 14; 118(50).

12. Aatreyee M. Das *et al.* Modelling the impact of fexinidazole use on human African trypanosomiasis (HAT) transmission in the Democratic Republic of the Congo. *PLoS Negl Trop Dis*. 2021 Nov; 15(11)

13. Kande Betu Ku Mesu V *et al.* Oral fexinidazole for stage 1 or early stage 2 African Trypanosoma brucei gambiense trypanosomiasis: a prospective, multicentre, open-label, cohort study. *Lancet Glob Health.* 2021 Jul;9(7):e999-e1008. doi: 10.1016/S2214-109X(21)00208-4. PMID: 34143998; PMCID: PMC8220131.

14. Ipos Ngay Lukusa *et al.* Trypanosome SL-RNA detection in blood and cerebrospinal fluid to demonstrate active gambiense human African trypanosomiasis infection. *PLoS Negl Trop Dis*. 2021 Sep; 15(9): e0009739.

15. Andrew Hope *et al.* Scaling up of tsetse control to eliminate Gambian sleeping sickness in northern Uganda. *PLoS Negl Trop Dis.* 2022 Jun; 16(6)

16. Kwuntida Uthaisar Kotepui *et al.* Prevalence and outcomes of malaria as co-infection among patients with human African trypanosomiasis: a systematic review and meta-analysis. *Sci Rep*. 2021; 11: 23777.

IX. Update on the onchocerciasis programme and HIV project (access to 4-in-1 treatment)

1. Onchocerciasis programme

a) Preparatory activities carried out before launching the clinical trials

1. Feasibility and evaluation visits to the Masimanimba and Kimpese sites
2. Resuscitation training for staff at potential sites for onchocerciasis trials in Masimanimba, Kimpese and Kinshasa (King Roi Baudouin Hospital)
3. Training on the geolocation of villages endemic to onchocerciasis
4. Epidemiological surveys on onchocerciasis in endemic villages after 10 years of treatment
5. Rehabilitation of clinical trial sites for the macrofilaricidal drug flubentylosine

b) Summary of ongoing clinical trials on onchocerciasis

Onchocerciasis is a cutaneous-dermal filariasis caused by *Onchocerca volvulus*, transmitted to humans by the bites of black fly *spp*. The microfilaricide ivermectin is the currently approved treatment for onchocerciasis. It removes microfilariae from the skin and temporarily prevents the adult female worm from releasing more progeny. Unfortunately, as the microfilariae return 6 to 8 months after the treatment, this control strategy requires a long-term treatment with ivermectin. If onchocerciasis is ever to be eliminated as a public health problem, a macrofilaricide drug (drug which kills the adult worms) must be developed.

This is why DNDi, in partnership with the National Programme for the Control of Neglected Tropical Diseases with Preventive Chemotherapy (PCT), is simultaneously conducting two multicentre studies (Flubentylosine-01 and Emodepside-04) on two macrofilaricidal drugs for onchocerciasis.

Flubentylosine-01 study

Flubentylosine, or ABBV-40803, is a macrolide antibiotic used in animal health. This phase II, randomised, double-blind, parallel-group, proof of concept study evaluating flubentylosine administered for 7 or 14 days, alone or with albendazole, in subjects infested with *Onchocerca volvulus*, includes two parts:

Part 1 assesses the safety, tolerability, efficacy and pharmacokinetics to determine the dose. This stage will help establish whether the treatment with flubentylosine, or flubentylosine + albendazole, leads to the effective depletion of *Wolbachia* bacteria in adult female worms after 6 months, based on immunohistology of onchocercal nodules.

Part 2 assesses the efficacy, safety, tolerability and pharmacokinetics of the selected doses.

- **Emodepside study-04**

Emodepside is another anthelmintic also used in animal health. This phase-II randomised, double-blind, parallel-group study evaluating emodepside (BAY 44-4400) in patients infested with *Onchocerca volvulus*, includes two parts:

Part 1 assesses the safety, tolerability, pharmacodynamics, pharmacokinetics and dose-response relationship for efficacy (proof of concept) to determine whether emodepside will sterilise female adult worms and/or have a macrofilaricidal effect at 12 months.

Part 2 assesses the efficacy, safety, tolerability and pharmacokinetics of selected doses.

These two studies are being carried out at two sites (General Reference Hospital of Masi-Manimba and Reference Health Center of Kimpese) in the Democratic Republic of the Congo.

2. The DNDi HIV team programme to obtain a temporary authorisation for use for therapeutic association "4-in-1" in the DRC

Through its office in DRC, DNDi has initiated a project to support the care of children living with HIV in North and South Ubangi provinces, this was chosen in collaboration with the DRC Ministry of Health, based on the HIV National Programme against AIDS (PNLS) plan to accelerate paediatric HIV case management in the DRC.

This project is therefore being carried out in close collaboration with the Congolese health authorities, PNLS, and other partners such as the Global Fund and PEPFAR.

In accordance with WHO recommendations, this project is working to facilitate access to all ARV formulations suitable for young children, including 10mg dolutegravir and the "4-in-1", while supporting screening and treatment of HIV-positive children.

Until the end of June 2023, DNDi will focus on the following 4 areas/objectives:

- Increase the provision of pediatric HIV services in 7 uncovered or partially covered health zones, including 4 in North Ubangi province and 3 in South Ubangi province;
- Strengthen the capacity of health personnel to provide the pediatric HIV care package (diagnosis, treatment and care for children living with HIV);
- Support the strengthening of the supply chain of screening tests and optimal ARVs, including the "4-in-1" which will be used on a compassionate basis in the DRC;
- Strengthen the data collection system to meet the needs of the PNLS.

X. Birth announcements

Christopher Evan Moke, born on 3 June 2021, son of Christian Mpia Moke, Monitor, DNDi DRC

Acacia Munganga Mbombo, born on 16 January 2022, daughter of Dr. Junior Munganga, monitor, DNDi DRC

Rubi Eale, born on 18 November 2021, daughter of Jessy Eale Ingange, HR administrator, DNDi DRC

Graciela Mbuaya Tshilumba, born on 30 August 2022, daughter of Jacques Tshilumba, programme assistant

Kekoura Mansaré, born in Conakry, on 26 October 2022, daughter of Mansaré, nurse at Dubreka clinical site, Guinea.

Ilunga Mbaya Enzo Solal, born on 15 August 2022, son of Marie France Kitoga, Administrative assistant, DNDi, DRC

Jacob-Dixon Mandoula Makasa born on 8 April 2022, son of Guylain Mandula, monitor, DNDi

Emylla-Emeraude Malu-Kay Mulamba, born on 24 January 2022, daughter of Edmond Mulamba, monitor, DNDi DRC

Obituaries

1. Tribute to the late Mathias MBA Ndong, national supervisor of the national programme of parasitic diseases of Gabon

Dr. Julienne Atsame and Dieudonne Nkhoge

Mathias Mba Ndong was born on 24 February 1971, in Mitzic in the northern region of Gabon. After his primary education at the Catholic School of Angone where he obtained his certificate of primary and elementary studies (CEPE), he went to the Saint Kisito seminary for his secondary education, where he spent 4 years and obtained his Brevet d'Etudes du Premier Cycle (BEPC). He then spent his penultimate year at the Edzang Nkoulou college in Bitam and his final year at the Lycée Djoué Dabany in Libreville. After obtaining his baccalaureate, he went to the Omar Bongo University, where he obtained the ENSAS diploma in public hygiene and sanitation.

In January 2004, he was assigned to the National Sleeping Sickness Control Programme, where his punctuality and dedication to the work were very quickly noticed. In 2008, he decided to continue his studies in Niamey, Niger, where he obtained a degree in public health with an option in community health. In 2015, to broaden his skills further, he trained at INFASS and obtained a diploma in public health management.

For fourteen years, he worked in the development of strategic plans for the fight against NTDs and other diseases of public health significance, such as Ebola, in the development and implementation of HAT control activities (screening, supervision, training in diagnosis and treatment for actors in the fight against HAT), and in the development and implementation of projects and missions of partners, such as the WHO, IRD and OCEAC, regarding mass drug administration, vector control and NTD mapping.

He was a member of the epidemiological surveillance committee for the COVID-19 pandemic. He leaves behind a widow and two children.

2. Tribute to the late Dr. Jean-Claude Peka Mallaye, former Coordinator of the NSSCP Chad

Chad National Sleeping Sickness Control Programme team

Author and co-author of several scientific publications, Dr. Jean-Claude Peka was the Coordinator of the National HAT Programme and a permanent member of the Steering Committee of the HAT Platform until his death, on 13 August 2022 in Paris, France.

He was an active member of the HAT Platform, and chaired several meetings of the HAT Platform Steering Committee. He contributed a lot to HAT research by working closely with all partners, who praised his competence and team spirit. We always admired his availability during our visits to Chad, as well as his willingness to show partners the realities of the fight against HAT in the different foci in Chad.

He leaves behind the image of an open, calm and hardworking man.

May his drive continue to inspire the entire team of the NSSCP Chad.

3. Tribute to the late Dr. Gabriele Pohlig of the Swiss Tropical and Public Health Institute

Swiss TPH Bale and Kinshasa teams

After an intense and challenging life, our colleague and friend Dr. Gabriele Pohlig left us on 30 June 2022.

Gaby, as we all called her, was employed by the Swiss Tropical and Public Health Institute (Swiss TPH) from 2001 to 2018, as Project Manager, Quality Manager, as well as a trainer/coach, which was her true calling.

Over these years, Gaby introduced many of us to the principles of clinical research. We all remember her spirit of cooperation and her motto "GCP first". When conducting monitoring visits or audits, she strived for the highest quality standards and no detail escaped her, no matter how small. She paid the same attention to the well-being of the patients and people she met. During her first project in the DRC, she fell in love with the country and its people, and this love never left her.

Dear Gaby,

You are a pearl returning to your Father's house.

Like the sun, you brightened all our lives, and your light will continue to shine for a long time on the world of clinical trials in the DRC.

Like a single seed at the beginning, your example never ceased to spread and to incite others to follow you. Your rigour, your cheerfulness, your simplicity and your sociability remain a role model for us all.
You were unique, Gaby, and your example will live on in all of us on this earth.
You will live forever in the heart of your second homeland, the DRC.
With great sadness,
The Swiss TPH Team, Allschwil and Kinshasa

4. Tribute to the late Dr. Pierre Cattand, former WHO HAT Coordinator

WHO team

We are saddened to have to inform you of the death, on 13 July 2022, of our former colleague and friend Pierre Cattand, from Saint-Genis-Pouilly, who was responsible for the sleeping sickness programme at WHO during the 1990s.

Pierre did a remarkable job in controlling human African trypanosomiasis at the time of the alarming resurgence of the disease. Among other things, he strengthened the training of health personnel, developed mapping of disease outbreaks and fought tirelessly to ensure the availability of treatment. After his retirement, he remained involved in HAT control and monitoring through ATA (Association against Trypanosomiasis in Africa), where he organised, with the WHO, the International Course on African Trypanosomiasis (ICAT).

Those of us who had the opportunity to know him and work with him will remember his unfailing commitment and his invaluable contributions to improving the situation of people suffering from the disease, as well as his willingness to share his in-depth knowledge on trypanosomiasis with all those who were interested in the subject.

We remember the good times we had together and we are proud to have worked with him.

Christian Burri, Swiss TPH

Pierre was a key person in the fight against HAT and was responsible for initiating the turnaround when the number of patients peaked and the situation in a number of countries was just horrific. With his very pragmatic and integrative approach, he was able to initiate training and collaboration and stimulate interest and scientific work. It is only on the basis of these achievements that future successes and achievements have become possible.

Pierre was an essential mentor for me and he gave me invaluable support. When I presented my PhD work on the pharmacokinetics of melarsoprol in 1990 at a workshop he attended, he thought it was a great and interesting idea, and he immediately pointed out a couple of things I had missed. A week later, two huge piles of French publications and internal reports landed on my desk (at that time there was no internet).

When he saw the results of this pharmacokinetic study in 1995, he contacted my former thesis supervisor, Prof. Reto Brun, to find out if a clinical study was possible. Prof. Reto called me in the US and together we drafted a proposal which, eight months later, led to my return to Swiss TPH. After obtaining SDC funding in Angola covering many years of hard work, the IMPAMEL studies led to the abbreviated 10-day dosing schedule for melarsoprol, and all subsequent GCP-compliant clinical trials.

During this period, Pierre supported us in a very pragmatic way, which unfortunately would be unthinkable nowadays. The WHO field office in Luanda, Angola, was closely involved in the project, hiring staff, providing the vehicle and radio communication. Without this support, the project (which recruited over 500 HAT patients over two years) would never have been possible.

Thank you, Pierre.

XII. Dr. Luis Pizarro takes over from Dr. Bernard Pécoul as Director of DNDi

DNDi's Executive Director, Dr. Bernard Pécoul, retired this year after 19 years of leadership in the research and development of drugs for neglected diseases. His successor, Dr. Luis Pizarro, is a seasoned scientist who has worked extensively in global health.

Under the leadership of Bernard Pécoul (left), a humanitarian doctor accustomed to working in the field, DNDi has made significant progress with 12 major achievements, including the development of new drugs for neglected diseases, such as sleeping sickness and leishmaniasis, and treatments for children and infants living with HIV. He also established public and private partnerships with universities, research institutes and pharmaceutical companies, which had previously shown little interest in neglected diseases.

Building on this momentum, the new director, Dr. Luis Pizarro (right), intends to advance medical innovation with the same vision of bringing the best of science to neglected populations in a challenging environment of climate change and economic instability. He said, "More than ever, we need non-profit, patient-centred drug development models like DNDi.

From left to right, Dr. Bernard Pécoul and Dr. Luis Pizarro at the reference health centre in Kimpese.

Photo credit: Kenny Mbala, DNDi

Acknowledgment of donors

The HAT platform and DNDi thank the following donors for their support

- Dutch Ministry of Foreign Affairs (DGIS), the Netherlands
- European and Developing Countries Clinical Trials Partnership Association (EDCTP2) programme supported by the European Union (grant number CSA2018HS-2526 and RIA2017NCT-1846)
- European Union (Framework Programme 6)
- Federal Ministry of Education and Research (BMBF) through KfW, Germany
- French Development Agency (AFD), France
- French Ministry for Europe and Foreign Affairs (MEAE), France
- Médecins Sans Frontières International
- Medicor Foundation
- Republic and Canton of Geneva, International Solidarity Service, Switzerland
- Spanish Agency for International Development Cooperation (AECID), Spain
- Swiss Agency for Development and Cooperation (SDC), Switzerland
- UK aid, UK
- Other private foundations and individuals