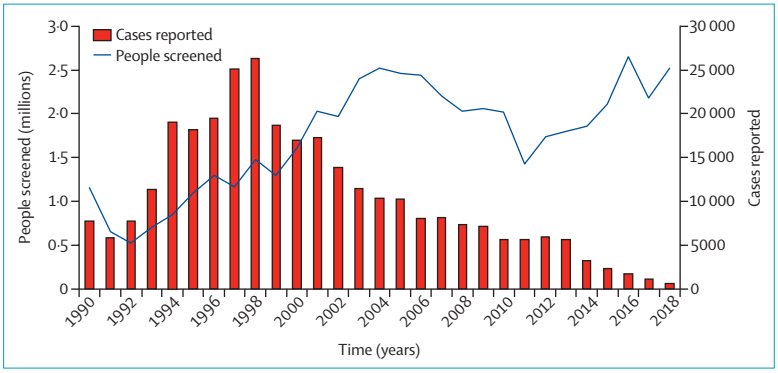

Figure: **Number of people screened for trypanosomiasis and number of confirmed human African trypanosomiasis cases reported in the Democratic Republic of the Congo**
Belgian aid was withdrawn between 1990 and 1998. Data source: National Sleeping Sickness Control Programme in DR Congo (PNLTHA-DRC).

and implementation agencies in support of the HAT elimination agenda, and received funding from the Bill & Melinda Gates Foundation and the Belgian government. We intensified screening efforts and integrated tsetse control based on riverine deployment of so-called tiny targets (small, insecticide-treated screens that attract and kill tsetse flies).[4] We added digital data-driven microplanning of screening operations and quality control of test results.[5] Overt clinical HAT cases were for long thought to be the main if not only source of infection but, if pathogenic trypanosomes are present in animal hosts and undetectable in some human carriers, then the serological screening will indeed leave a proportion of infected hosts untreated. The size and epidemiological significance of this hidden reservoir is uncertain and the research highlighted by Burton[1] is of immediate relevance to our work. Vector control is part of the HAT control strategy in DR Congo, providing an intervention that can interrupt transmission, no matter the host of the parasite. Availability of oral drugs to treat HAT in the DR Congo health system will play an important role for elimination of both HAT as a public health problem and the infection, because it will greatly improve access to care.

We declare no competing interests. We acknowledge the generous financial support of the Bill & Melinda Gates Foundation and the Belgian government for this HAT elimination program, as well as a drug donation by Sanofi-Aventis.

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COST Actions: fostering collaborative research for rare diseases

The European Cooperation in Science and Technology (COST) Association is the longest-running framework supporting transnational cooperation. COST Actions are networks that, once approved, are not restricted to the original applicants: in fact, they are open to anyone with a legitimate interest to join the network. The funding is used for workshops, training schools, short scientific missions, and dissemination activities.

The COST webpage shows 22 Actions based on rare diseases (12 currently active) and many more that are methodological and could also be applicable to rare disease research.

Between 2013 and 2017, we participated in the COST Action BM1207, which aimed to accelerate the clinical development of antisense-mediated splicing modulation for rare diseases, with a first focus on Duchenne muscular dystrophy. The Action started out in five countries and ended up including more than 100 participants from 18 countries.

Before the BM1207 Action, only two antisense oligonucleotide therapies had been approved: fomiversen for cytomegalovirus retinitis, and pegaptanib for macular degeneration. During the course of this Action, three new therapeutic antisense oligonucleotides were approved: mipomersen to treat homozygous familial hypercholesterolaemia, eteplirsen for Duchenne muscular dystrophy, and nusinersen for spinal muscular atrophy. These approved antisense drugs represent a landmark for the field,[1,2] boosting preclinical studies in different rare diseases in which this approach might be applicable.

COST Action BM1207 played a seminal part in the development of splice-switching oligonucleotide therapy in Duchenne muscular dystrophy. Before the Action, the antisense splice-modulating field of research was fragmented, and knowhow on the perspective of industry, regulators, and patients was very limited. Through its four working groups (biochemical outcome measures, regulatory models, networking meetings, and stakeholder communication), the Action was instrumental in generating standard protocols for dystrophin quantification

For the **COST webpage** see https://www.cost.eu/cost-actions/browse-actions/

For more on **COST Action BM1207** see http://www.cost.eu/COST_Actions/bmbs/BM1207

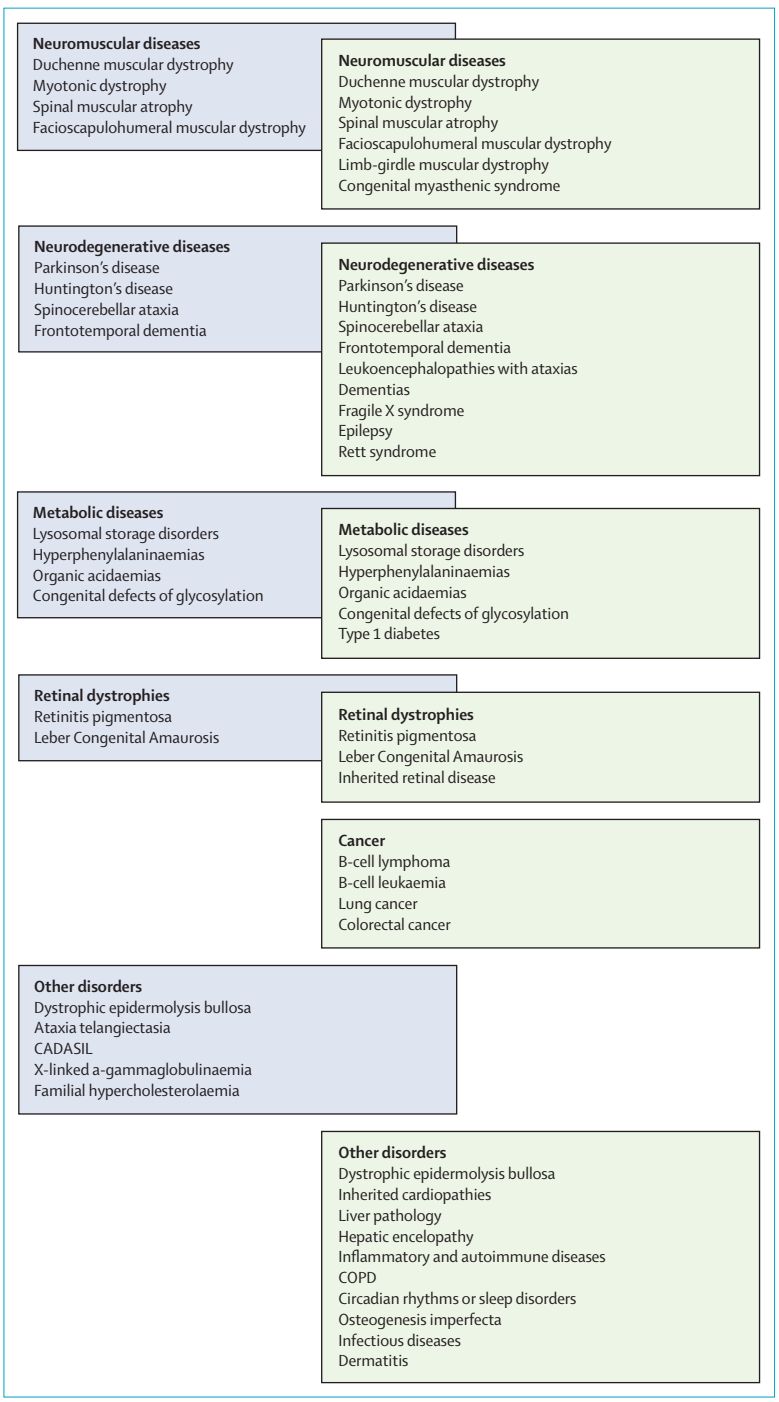

Figure: **Diseases covered by the COST Actions BM1207 (2013–17) and CA17103 (2018–2022)**
The blue boxes represent diseases covered by BM1207 (2013–17) and the green boxes those covered by CA17103 (2018–22). CADASIL=cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy. COPD=chronic obstructive pulmonary disease.

as a biochemical outcome measure to be used in clinical trials,[3] and for training personnel in how to perform this analysis. The Action established interactions with industry and with regulatory bodies, such as the European Medicine Agency (EMA) for drafting the corresponding guidelines,[4] as well as with patients, organising training schools for early stage researchers to present their research work in a clear and understandable way to lay people. At the end of the Action, a series of recommendations were compiled and published.[5] The figure shows rare diseases that are under study by participating groups.

As an example, in Spain the research on this topic was particularly dispersed, with few groups working on this therapeutic approach, and often limited to collaborations within the same disease group. Although Spain was not one of the five countries in the original application, it joined COST Action BM1207 before the kick-off meeting, and by the end of the Action there were seven participating groups from different Spanish centres. They contributed to the development of standardised protocols for dystrophin quantification;[6,7] participated in the workshop hosted by EMA focused on discussing the regulatory and translational challenges of developing exon-skipping therapies for Duchenne muscular dystrophy;[4] and organised two workshops, one in Madrid and another in Bilbao.

Collaborations during the workshops resulted in a series of joint publications. These include articles describing multicentre validation of standard operation procedures,[7] reviews and news and views,[3-5,8,9] and other research articles.[10–12] In summary, participation in this action achieved not only many research outcomes, but also new collaborations.

A new COST Action, under the title "Delivery of Antisense RNA Therapeutics" was approved in 2018, and will run until October, 2022. As it is customary in COST projects, it will be organised in working groups: the first working group will include researchers interested in the development of new delivery systems and their mechanisms of action; the second will investigate the models currently used to evaluate the efficacy of antisense oligonucleotides, both in vivo and in

vitro; the third will deal with safety and toxicology issues that might arise because of the implementation of new delivery approaches, and the fourth will make sure this new knowledge is distributed among all stakeholders, including patients, clinicians, academics, and industry. Additionally, this new Action will have a special focus on sharing negative results: a session on negative results will be included in each workshop and training school, and we will promote actions to share those results as widely as possible. This new network currently represents 27 European countries, plus three non-European ones (USA, Canada, and China). Currently, it includes more than 240 researchers.

COST Actions are a flexible and efficient networking instrument for researchers, allowing cooperative development of novel ideas in any science and technology field, as has been the case for rare diseases. Even though the goal of these actions is international collaboration, one very welcomed unexpected outcome from our experience has been the new ties created within Spanish research groups who were, often, unaware of each other because of working either on different rare diseases or on different pre-existing networks. We firmly believe that our experience could be replicated by other research groups and enthusiastically encourage those willing to participate in COST Actions in the future.

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