

Report on the 2024 MiSAC Annual Competition

Neglected Tropical Diseases and Climate Change

Sponsored by the Wellcome Centre for Integrative Parasitology

The aim of the 36th MiSAC Annual Competition was to increase an understanding among teenagers of the key roles of pathogens causing a wide variety of diseases in tropical countries. Many of these infect large numbers of people but, with limited resources and under-funded health systems, these neglected diseases proliferate and billions are affected. Such **NTDs** provide an opportunity for students in the UK and elsewhere in the world to learn about global aspects of health which usually do not impact the well-being of populations in wealthier countries.

The requirements of the 2024 competition maintained the well-established approach of basing the competition on a topic that is associated with school curricula but with specifications that require students to explore material beyond the curriculum. It was evident that students had enjoyed researching the topic and demonstrated their enthusiasm in producing an illustrated web-page report in a variety of imaginative ways.

- The publicity flyer gave the background to the topic and suggested web-based articles, which included information from the **World Health Organisation (WHO)** that had published a roadmap to the control of NTDs. *This was a vital reference for students*; it defined neglected tropical diseases and provided a list of **20** NTDs. (Two further NTDs - *Noma* and *Podoconiosis* have since been added to the list*.) The majority of students utilized this important resource although a few chose diseases not classed as NTDs, such as malaria, Ebola, Mpox, or brain-eating amoebae.
- On the publicity flyer, the *Object of the competition* with its four bullet points, defined the structure of the students' entries. Only **one** NTD had to be selected. Most students followed the instructions; those choosing to describe a number of diseases inevitably provided inadequate details.
- Entrants were required to describe the **pathogen** causing the NTD. This was done well by the majority, although a few students described snakebite envenoming and seemed not to appreciate that this 'disease' involved a toxic venom rather than a pathogen. For this competition, snakebite envenoming, along with podoconiosis caused by exposure to irritant soils, are NTDs the students should have avoided.
- The required discussion of the importance of **climate change** in students' web-page reports was not tackled so well, with performance in the KS4 group notably better than at KS3. Coverage was sometimes brief and unclear, with the implications not well explored or understood. Judges were surprised that a number of students failed to include *any* reference to the impact of global warming.
- The vast majority of students selected from the WHO list of NTDs and almost all of these were represented among the entries. The most popularly-chosen NTDs were, in order: Chagas disease, Dengue, Rabies, Trypanosomiasis (Sleeping sickness), Hansen's disease (Leprosy), Schistosomiasis, Leishmaniasis, Onchocerciasis (River blindness), Lymphatic filariasis & Trachoma. The quality of the students' work was particularly impressive this year - especially at KS4. There were far more superbly-compiled entries than in previous competitions. The judges had to make some difficult decisions in deciding on the winners from a rather long shortlist!

Whilst MiSAC is always pleased to welcome back entries from regular school participants, we were delighted by the very large number of newcomers to the competition. As usual, there were two entry groups, KS3 and KS4 (S1/2 and S3/4 in Scotland). Entries were received from a total of **101** establishments in England (83), Wales (3), Scotland (6) and Northern Ireland (6) & also from Jersey, France and Indonesia. One school submitted entries in Cymraeg - the Welsh language.

* W.H.O.-RECOGNISED NTDs

Buruli ulcer	Noma
Chagas disease	Onchocerciasis (river blindness)
Dengue & Chikungunya	Podoconiosis
Dracunculiasis (Guinea worm disease)	Rabies
Echinococcosis	Scabies and other ectoparasitoses
Food-borne trematodiasis	Schistosomiasis
Human African trypanosomiasis (sleeping sickness)	Soil transmitted helminthiasis
Leishmaniasis	Snakebite envenoming
Leprosy (Hansen's disease)	Taeniasis / cysticercosis
Lymphatic filariasis	Trachoma
Mycetoma, chromoblastomycosis and other deep mycoses	Yaws and other endemic treponematoses

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22 schools submitted entries to both entry groups. In total, there were **485** separate entries consisting of **267** in the KS3 group and **218** at KS4. The most dramatic increase was in the numbers submitted at KS4 - more than double the entries in 2023. Many participants took the opportunity to work together in groups of up to 4, making a total of **790** students having entered the competition. The judging took place at the Chesham headquarters of CLEAPSS, one of MiSAC's sponsors, who hosted the event. The judging panel consisted of Emeritus Professor Anthony Whalley, Liverpool John Moores University, Dr. Tansy Hammarton, School of Infection & Immunity, University of Glasgow, together with officers & members of MiSAC.

The creation of a well-designed, eye-catching, illustrated entry is not an easy task. The 2024 cohort of prize winners, and those students who gained a commendation for their entries, are to be congratulated for the high standards they achieved. There were also many exceptional entries that just failed to gain sufficient credit for an award. The biggest challenge is deciding on the right amount of textual information to include, whilst allowing sufficient room for attractive illustrations which make an immediate and visual impact. In their online searches, many students found a great deal of interesting information. Some felt compelled to communicate *everything* they had learned. Inevitably, this resulted in the use of a font that is too small, together with a reduction in size and number of illustrations. Students should also be restrained in their choice of colours for their entries; multiple-background shades and too many different coloured fonts for the overlaid text will make the information extremely difficult to read.

The competition entry had to be printed on one **A3 sheet** (or two A4 pages attached side-by-side). Most entries were of the required format, but students should be discouraged from writing the necessary list of reference sources on the *reverse* of their entries; it need not take up much space but the list should be placed where it can be seen. Similarly, students who expand the available surface area by creating a series of flaps which the reader has to lift, should be reminded that these are *not* appropriate for a web-page report and will be regarded *as an infringement*.

Many students should be congratulated for having learned how to write correctly genus and species names, such as *Schistosoma mansoni*; this can be abbreviated to *S. mansoni* after its first use. However, for a number of their students, teachers still need to emphasise the use of an upper-case initial letter for the genus name and a lower-case initial letter for the species name. This should be in *italics* when printed and underlined when hand-written. The names of all living organisms are written in this way.

The judges continued to be impressed by the imagination and creativity of the students as they compiled their entries. A number of their favourites were highlighted @MiSAC_UK on X (formerly Twitter). Many students showed remarkable technical skills in using their computer to design their submission. In 2023, judges commended the skill of producing a *working* QR code with a smartphone to connect to URLs giving further information. This year, it was gratifying to find several entries that incorporated functioning QR codes. Students who were awarded the KS4 first prize this year digitally drew their parasitic organisms' images. They then produced a QR code to play an animation using their drawn creations. Those who chose to work by hand could also achieve notable results. Some schools integrate the MiSAC competition into their science curriculum; teachers tell us of the pride of their students in the work that they do in producing their entries.

This year, MiSAC introduced a new student entry form giving teachers more space for recording students' names. It was also designed to be downloaded and *completed digitally before printing* and so improve the legibility of entries. We thank the many teachers who did this, which helps in the preparation of personalised certificates of entry, by which we acknowledge and reward the students' contribution to the competition. However, some teachers printed the blank form and then completed it by hand. *We encourage more forms in 2025 with typed student names...*

We should also like to thank teachers for responding to the request to record full identification details on the back of each entry which eases the administration of several hundred entries, many involving more than one student. A total of **£1320.00** was awarded to prize winners and their establishments, and several entries gained a commendation for their design & creativity or artwork. Winning and commended entries are displayed on the MiSAC web site www.misac.org.uk which includes a list of the prize-winning students and their schools. MiSAC thanks all the students for making the 2024 competition an outstanding success and their teachers for their support. We look forward to entries for the next MiSAC competition in 2025, which will explore **Human Fungal Diseases and Antifungal Drug Resistance**, sponsored by the British Mycological Society.