

Portuguese EQA Assessment in Parasite Morphology – 26 years experience



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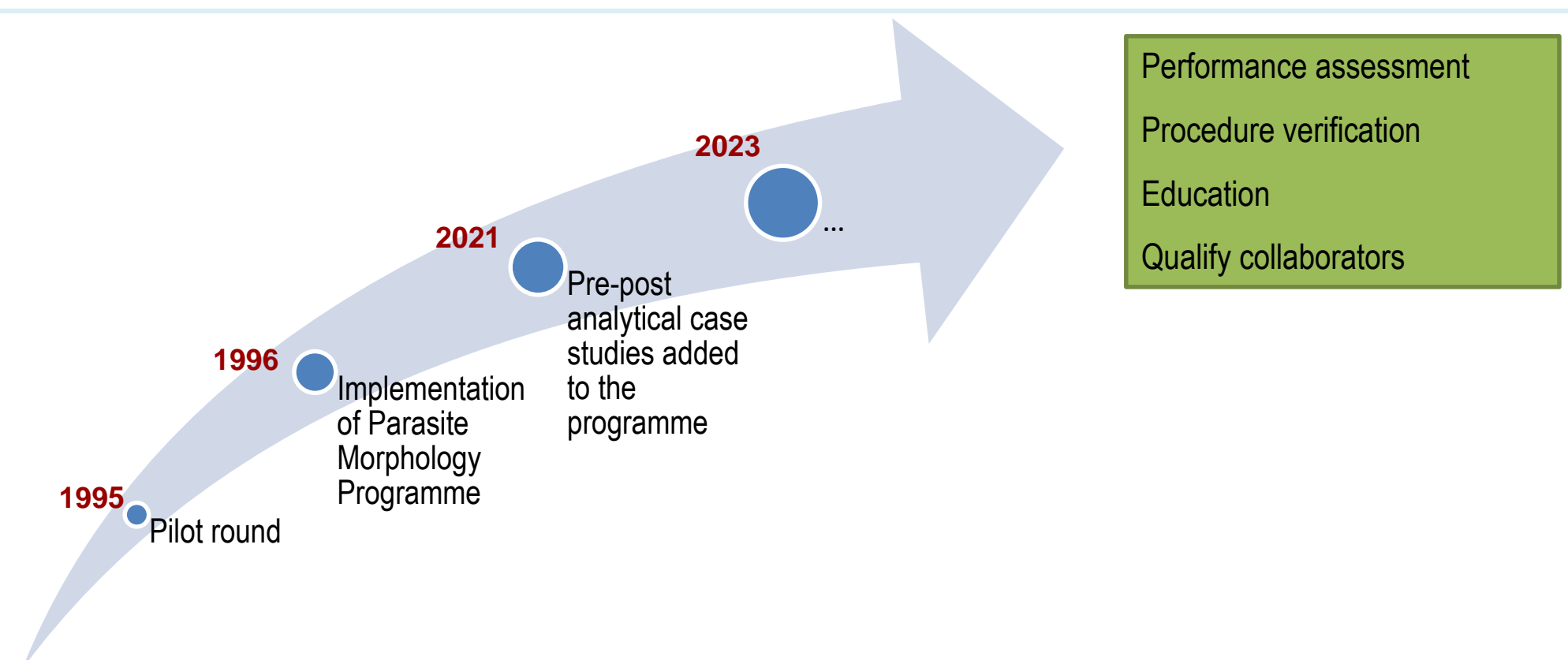
Introduction and Objective

The Parasite Morphology Program was implemented in 1996 by the Portuguese External Quality Assessment Program (PNAEQ), with a pilot round the previous year, which includes the assessment of stool and blood samples, as well as other matrices. The program is supported by a group of experts for sample selection and preparation, result analysis and training.

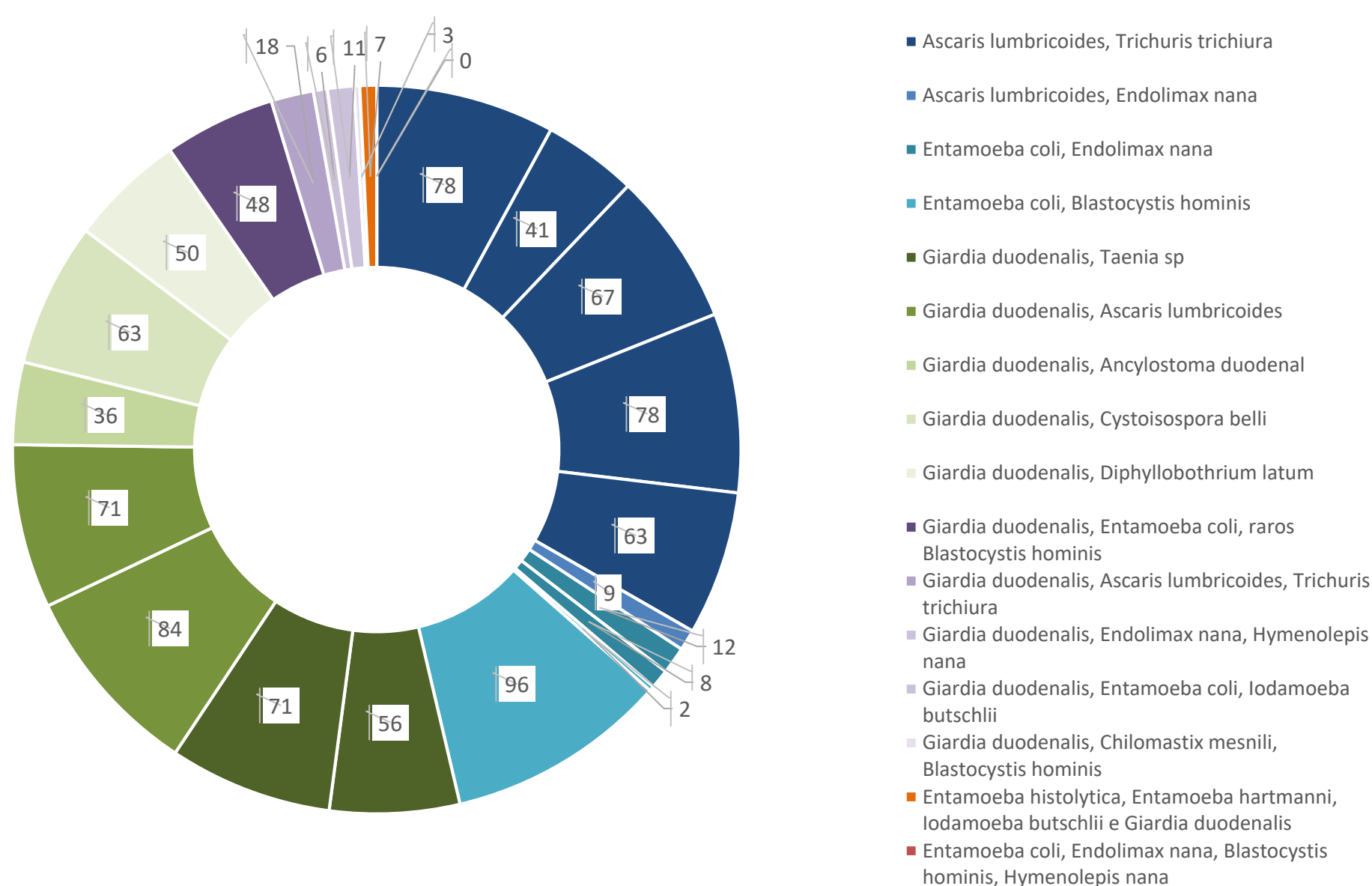
The aim of this work is the evaluation of the performance of participants in the parasite morphology program by optical microscopy (1996-2022).

Methods

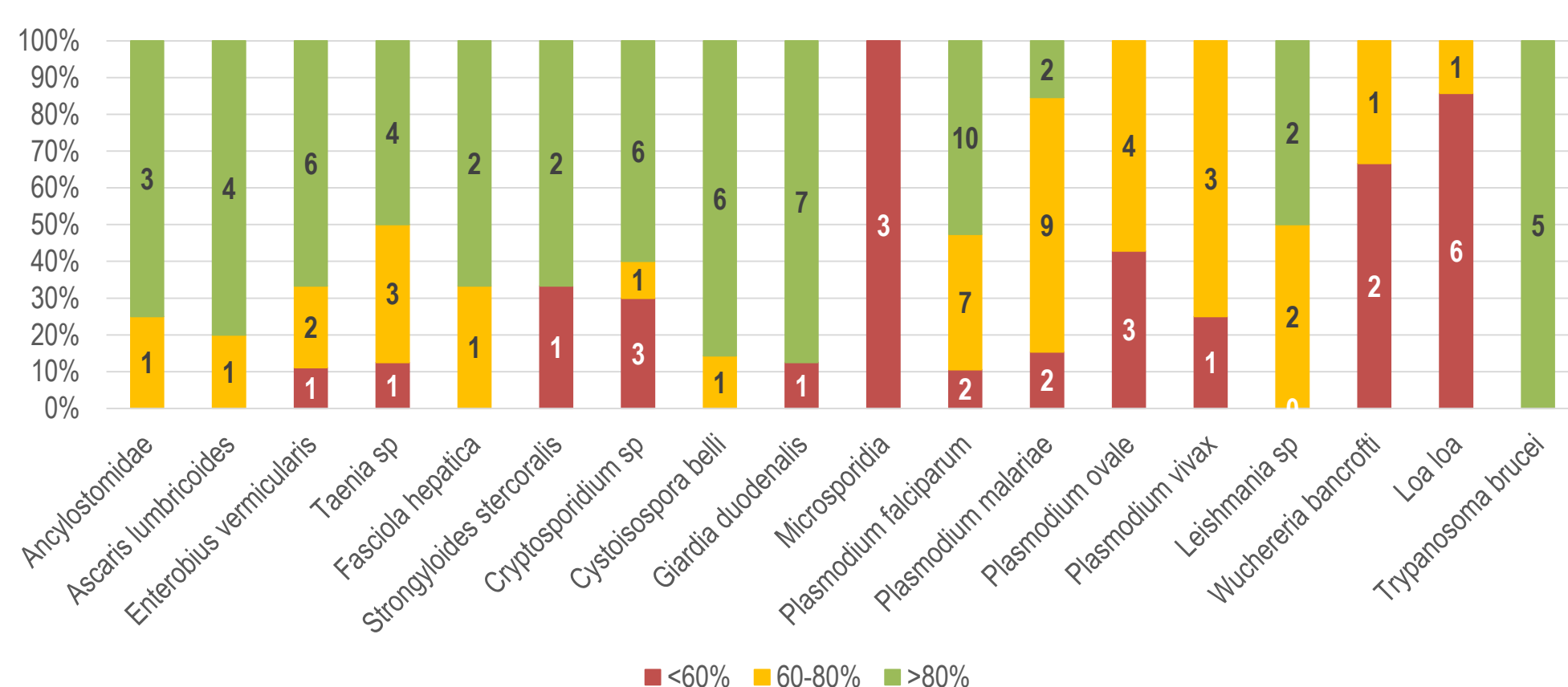
PNAEQ participants are public and private laboratories in outpatient and inpatient settings. Samples, containing protozoa and helminths, were distributed to participants in 3 annual rounds, each consisting of at least one stool sample, one blood sample and randomly other products. Samples without parasites were included. Since 2021, Pre- and post-analytic study cases were added. Participants' responses on parasite identification were subject to qualitative statistical analysis, taking into account the parasite present in the sample. The results are sent in the form of a report and include formative comments from the working group/experts.



Results



Graph 1: Participant performance (%) for stool samples with more than one parasite



Graph 2: Participant performance (%) at 3 levels (<60%, 60-80% and >80%) of the parasites sent 3 times or more. The numbers shown refer to the number of samples

The number of registered participants varied, over the years, between 29 and 128, with a response percentage between 47% and 98%.

A total of 106 **stool samples** (formalized or smear) contained 26 different species, including protozoa and helminths, 24% with more than 1 parasite (Graph 1), and 8% without parasites. Graph 2 shows the performance (%) at 3 levels (<60%, 60-80% and >80%) of parasites sent 3 times or more. In the 3 samples containing Microsporidia, the performance observed was always under 60%. The best performance observed were in the samples containing *Cystoisospora belli* and *Giardia duodenalis*.

98 **blood samples** (thin or thick smears) contained 12 different species, 5% with more than 1 parasite and 15% without parasites. The four Plasmodium species were the most frequently parasite included (52%). *P. falciparum* species was the most frequently sent (19 times), but only in 10 samples was a performance above 80% obtained. In the 7 samples containing *Loa loa* and in the 3 samples containing *Wuchereria bancrofti*, the performance observed was always under 80%. The best performance observed were in the samples containing *Trypanosoma brucei* (>80%).

Six samples from **other matrices** (bronchoalveolar fluid and culture) contained 5 different species with a performance between 25% and 89% (data not shown).

The percentage of correct identification in **samples** containing one parasite varied from 2% to 100% (mean= 72%). 74% was the average number of correct identifications for faecal parasites and 71% for blood parasites.

Samples containing more than one parasite (2-4 parasites) presented a correct identification of all species from 0% to 96% (mean=35%).

Evaluation of the results of pre-analytical cases revealed a range of correct results from 44% and 100%, corresponding to a response range of 44% and 78%.

Discussion and Conclusions

- ✓ In the future, PNAEQ will reinforce the submission of stool and blood samples containing more than one specimen with the same transmission pathway, to improve diagnosis in patients returning from endemic areas such as travelers, migrants, immigrants and others.
- ✓ We consider that the large investment of the program in participant laboratories training has proven to be an asset for the present and future.
- ✓ PNAEQ considers a benefit the inclusion of extra-analytical cases, as it allows an overall analysis and interpretation of the results, and the compliance with regulatory requirements.

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