

# UKNEQAS Parasitology : Education or Punishment?

Monika Manser

# WHY EQA?

UKNEQAS Parasitology was established in 1986 to:

1. Improve the diagnosis of parasitic infections by examination of clinical material from patients with parasitic infections.
2. To provide teaching material illustrating unusual or uncommon parasites and targeting any area where a poor performance is noted
3. To take individual action to investigate and remedy any problems revealed

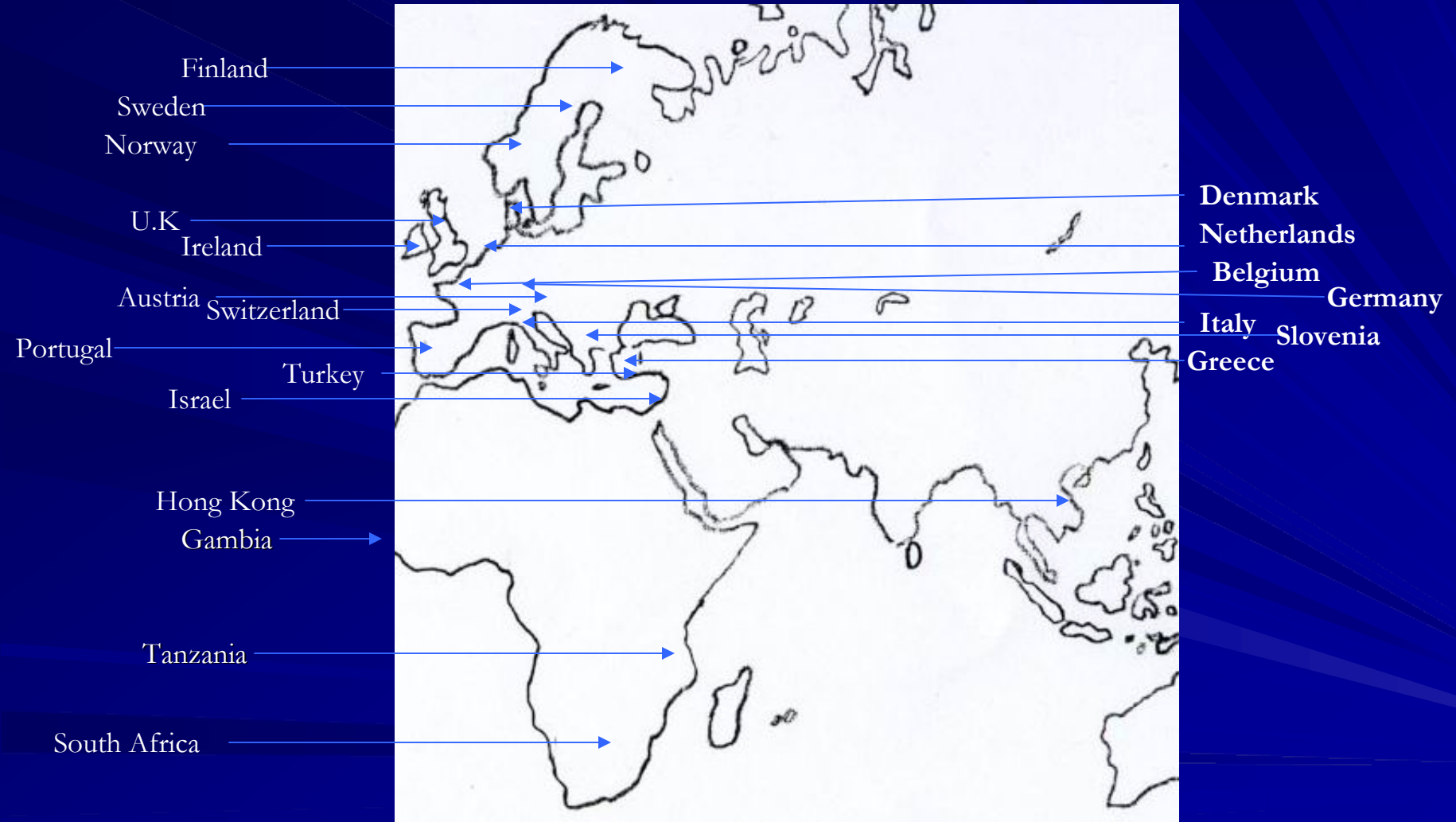
# UK NEQAS Parasitology Subschemes

- Faecal Parasitology established in 1986
- Blood Parasitology established in 1986
- Toxoplasma Serology established in 1993
- Toxoplasma IgM Serology established in 1998
- Parasite Serology established in 2005
- Rapid Diagnostic Techniques for malaria (pilot 2005)

# Participation in the Scheme

	UK	Netherlands	Total Overseas
Faecal Parasitology	299	24	345
Blood Parasitology	92	17	207
Toxoplasma Serology	149	9	173
Toxoplasma IgM Serology	45	9	175
Parasite Serology	4	3	17

# Participation in the Scheme



# Materials distributed in Faecal Parasitology include:

- Formalised faecal suspensions
- Methanol fixed faecal smears
- Fixed urine specimens
- Formalised cyst fluid
- Simulated specimens

# Materials distributed in Blood Parasitology include:

- Stained thick and thin blood films
- Stained bone marrow films
- Stained tissue dabs



## Number of Distributions/Specimens per annum

Subscheme	Distributions/ year	Specimens/ distribution
Faecal Parasitology	8	2/3
Blood Parasitology	8	1
Toxoplasma Serology	3	6
Toxoplasma IgM serology	2	4
Parasite Serology	4	5



# Performance Criteria

For faecal and blood specimens,

- the ability to confirm or exclude the presence of parasites (both pathogenic and non-pathogenic),
- to correctly identify and speciate the parasite(s) present with the aid of the clinical details supplied.

In order for the participants to evaluate their performance, a score is awarded for each result reported.

# Where do the specimens come from

- Patients at the Hospital for Tropical Diseases.
- Culture (e.g. *Strongyloides*, *Giardia* )
- Specialist Institutes (e.g. LSHTM, Vet Lab)
- Trips Abroad

# Field work in Pakistan





# Schistosomiasis country



# Schistosomiasis patients





# Screening in unusual locations



# Willing volunteers in Tanzania





# Hard work in India



# Searching for Parasites in Hong Kong





# Adventures in Peru



# Laborious screening



# Pleased as punch with the pickings



# How are the specimens brought back?

- Past - Hand luggage



- Present - Air Freight



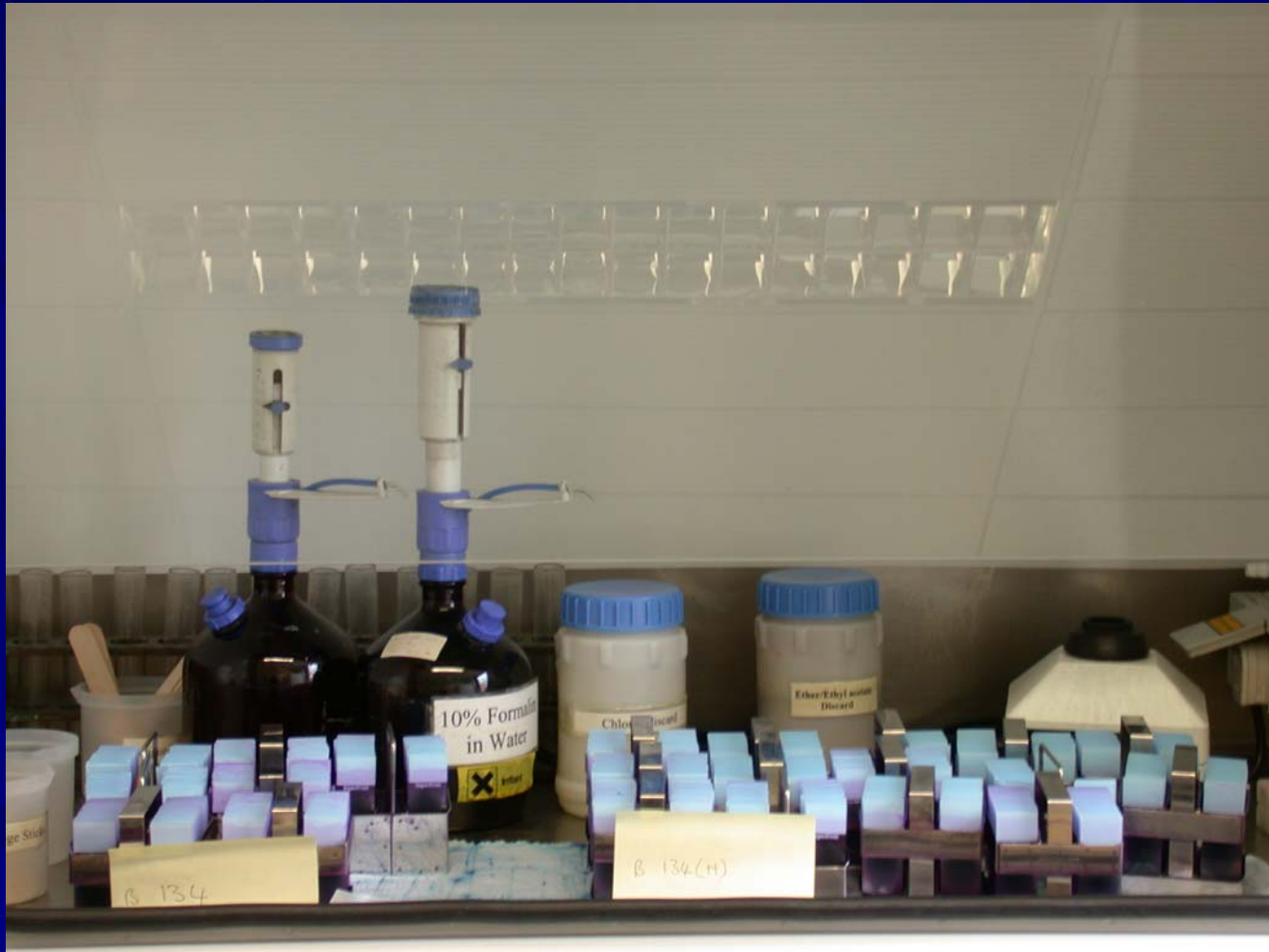


# The return of the specimens





# The making of blood films



# Time allowed for Examination

3 Weeks – a bit too long



# What happens at the close of a distribution?

- Data input
- Analyses of participants results.
- Sending out a report of performance to each participant



# Problems associated with Faecal specimens

- Participants reporting unexpected parasites.
- Disintegration of specimens.
- The number of parasite species present in the specimens
- Consistency with the number of parasites in each specimen

# Problems experienced by participants with faecal parasitology

- Failure to recognise and identify small cysts.
- Confusing vegetable matter with ova, cysts and larvae
- Failure to differentiate ova and cysts where more than one species is present.

# Failure to recognise and identify small cysts

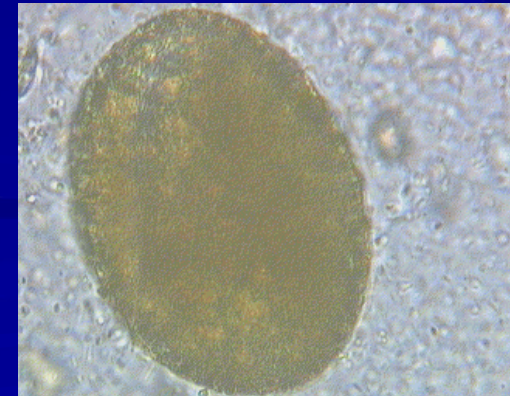
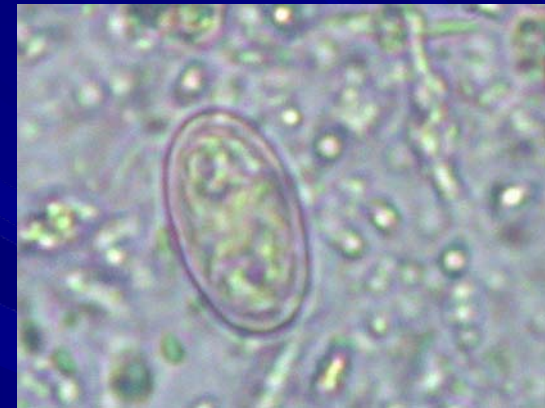
Specimen Content	Participants' responses
Cysts of <i>Endolimax nana</i>	26% reported no parasites present
Cysts of <i>Chilomastix mesnili</i>	23% reported no parasites present
Cysts of <i>Entamoeba coli</i> and <i>Endolimax nana</i>	24% failed to report <i>Endolimax nana</i>
Cysts of <i>Entamoeba coli</i> and <i>Chilomastix mesnili</i>	37% failed to report <i>Chilomastix mesnili</i>





# Confusing vegetable matter with ova, cysts and larvae

Specimen Content	Participants' responses
No parasites present (Numerous yeasts present)	11% reported cysts of <i>E. nana</i>
No parasites present (Mushroom spores present)	20% reported oriental liver flukes
No parasites present (Pollen grains present)	14% reported ova of <i>Ascaris lumbricoides</i> or <i>Taenia</i> sp.





# Failure to differentiate ova and cysts where more than one species is present

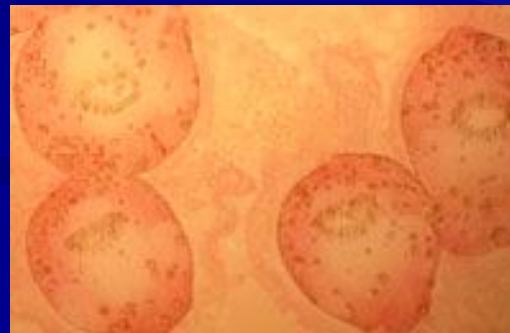
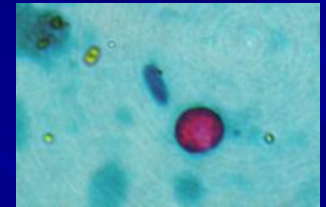
Content of Specimen	Participants' response
Cysts of <i>E. coli</i> , <i>E. nana</i> and <i>E. histolytica</i>	30% of participants reported all 3 cysts
Cysts of <i>E. coli</i> and <i>E. histolytica</i>	34% reported both cysts
Ova of <i>H. nana</i> , Hookworm and rhabditiform larvae of <i>Strongyloides stercoralis</i>	22% of participants reported the 3 parasites
Ova of <i>Ascaris</i> and Hookworm	65% of participants reported both parasites

# Observations

- Lack of experience in examining stools with parasites.
- Failure to use the correct diagnostic procedures, i.e. concentration technique, eyepiece graticule and addition of iodine
- Failure to examine adequate amount of deposit

# What are participants good at?

- Identifying ova when only one species is present
- Identifying parasites that are commonly seen in clinical specimens eg Giardia and Cryptosporidium sp.
- Non faecal specimens e.g. urine or hydatid fluid



# Problems associated with blood films

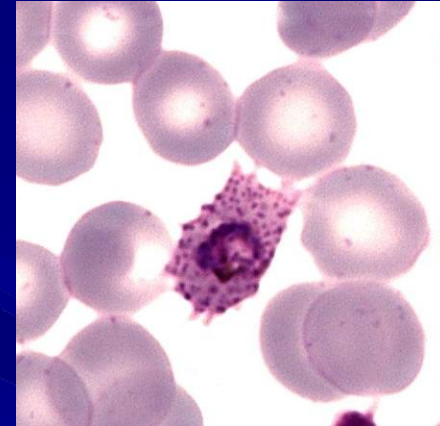
- Consistency with staining
- Intended results

# Problems experience by participants

- Difficulty in identifying the species of malaria parasite
- Difficulty in estimating the percentage parasitaemia of *Plasmodium falciparum* infections
- Difficulty in identifying mixed malaria infections
- Reporting parasites in a negative film

# Incorrectly identifying *Plasmodium vivax* and *Plasmodium ovale*

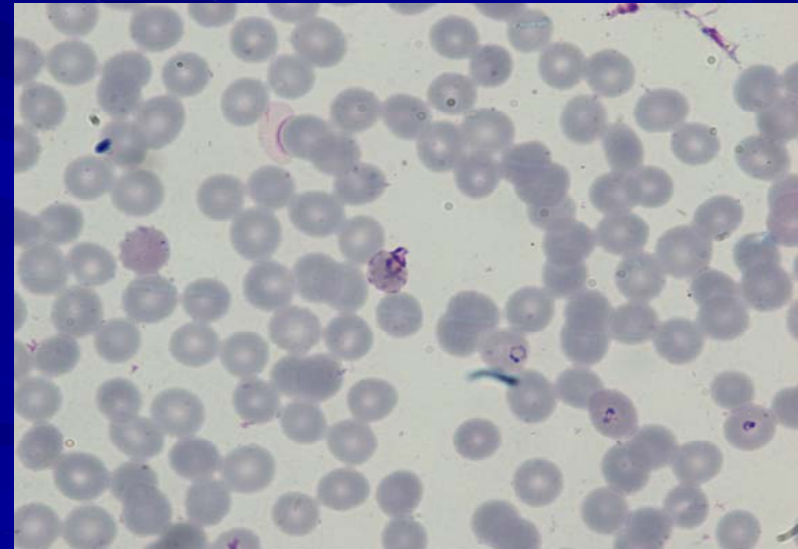
Content of Specimen	Participants' responses
All stages of <i>Plasmodium vivax</i>	14% reported of <i>P. ovale</i>
Trophozoites of <i>P. ovale</i>	42% reported <i>P. vivax</i>





# Difficulty in estimating the percentage parasitaemia

Content of Specimen	Participants' response
Average parasitaemia 1.4%	77% reported the correct parasitaemia
Average parasitaemia 6.5%	38% reported the correct parasitaemia
Average parasitaemia 23%	31% reported the correct parasitaemia





# Difficulty in identifying mixed malaria infections

Content of specimen	Participants' response
All stages of <i>P. vivax</i> and trophozoites of <i>P. falciparum</i>	13% reported both species
All stages of <i>P. malariae</i> and gametocytes of <i>P. falciparum</i>	27% reported both species
All stages of <i>P. ovale</i> and trophozoites of <i>P. falciparum</i>	20% reported both species

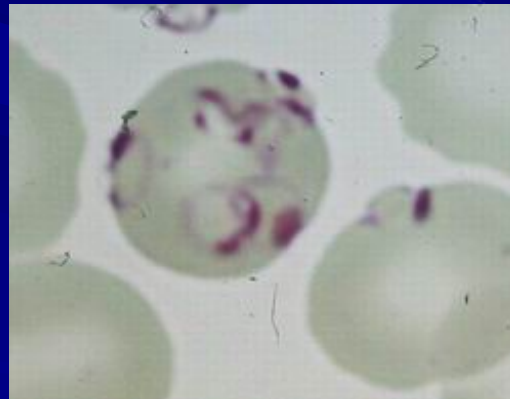
# Negative blood films

- Participants tend to confuse artefacts e.g. Howell-Jolly bodies and fibrin strands with blood parasites.

Content of Specimen	Participants' responses
No parasites present	15% reported a variety of blood parasites
No parasites present	8% reported a variety of blood parasites
No parasites present	10% reported a variety of blood parasites

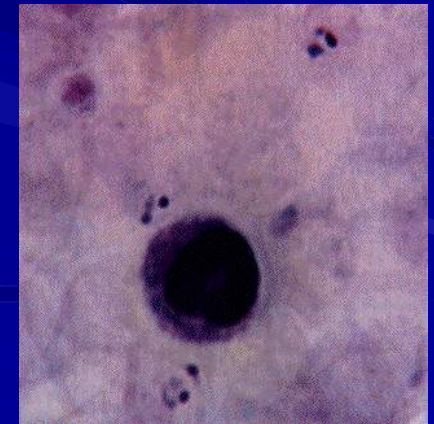
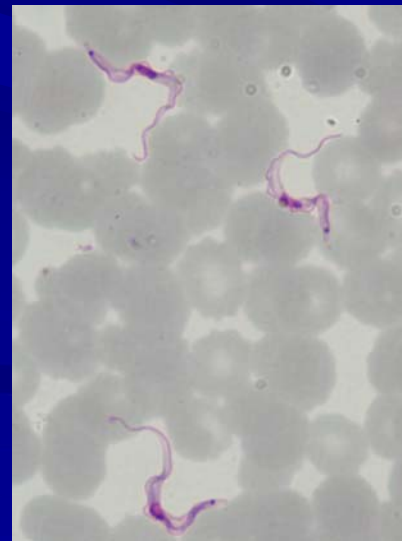
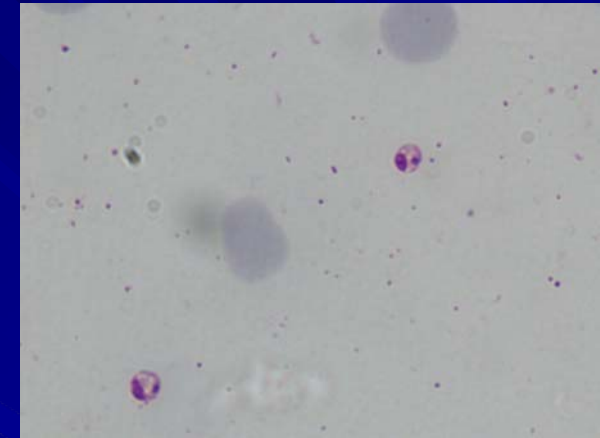
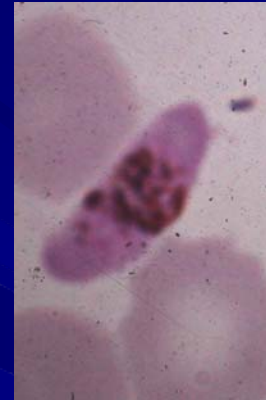
# Observations

- Inexperience in identifying blood parasites
- Over-estimation of parasitaemias



# Successes

- *P. falciparum* gametocytes
- African Trypanosomes
- *Leishmania* species
- Thick blood films

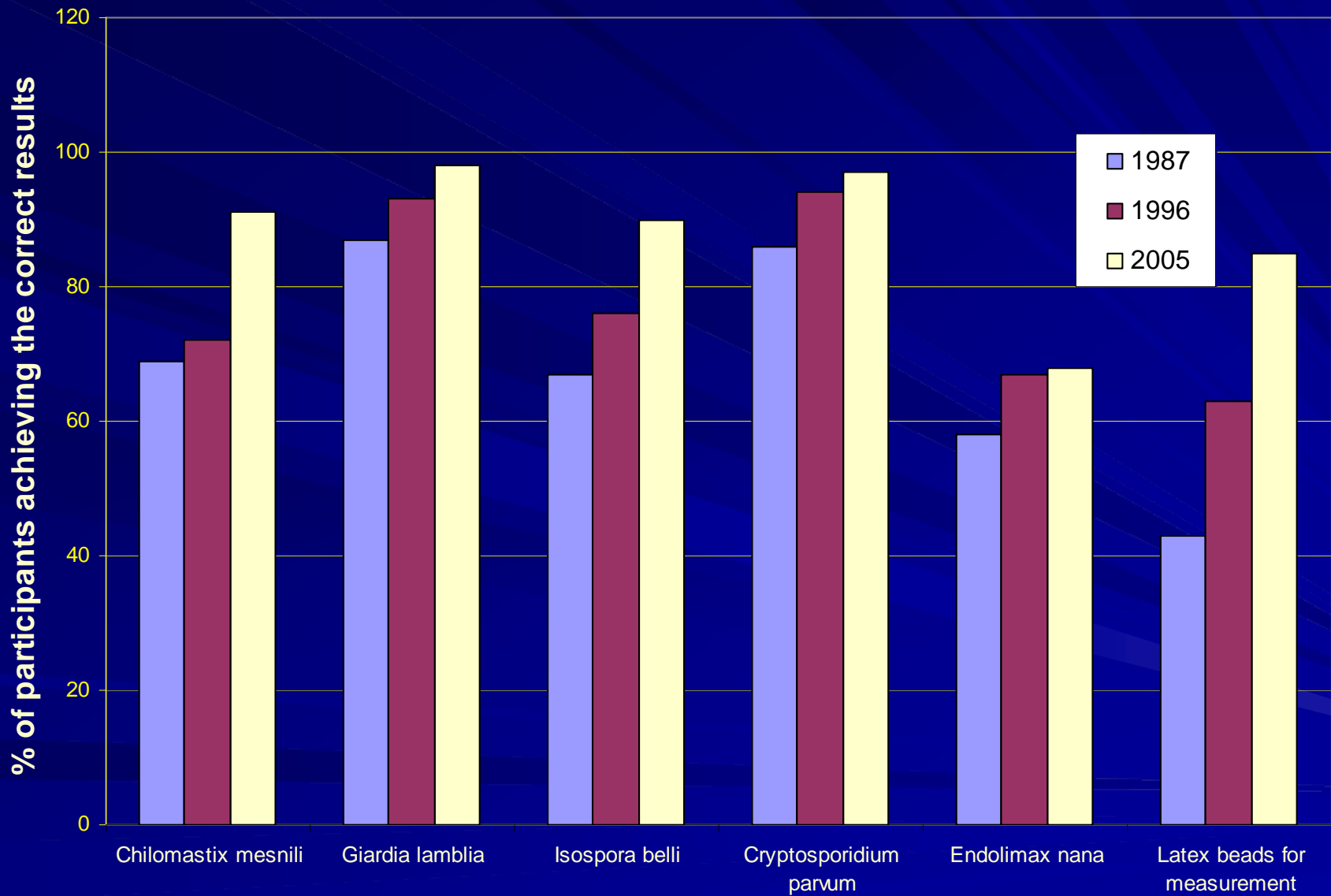


# What does UKNEQAS do to remedy these problems?

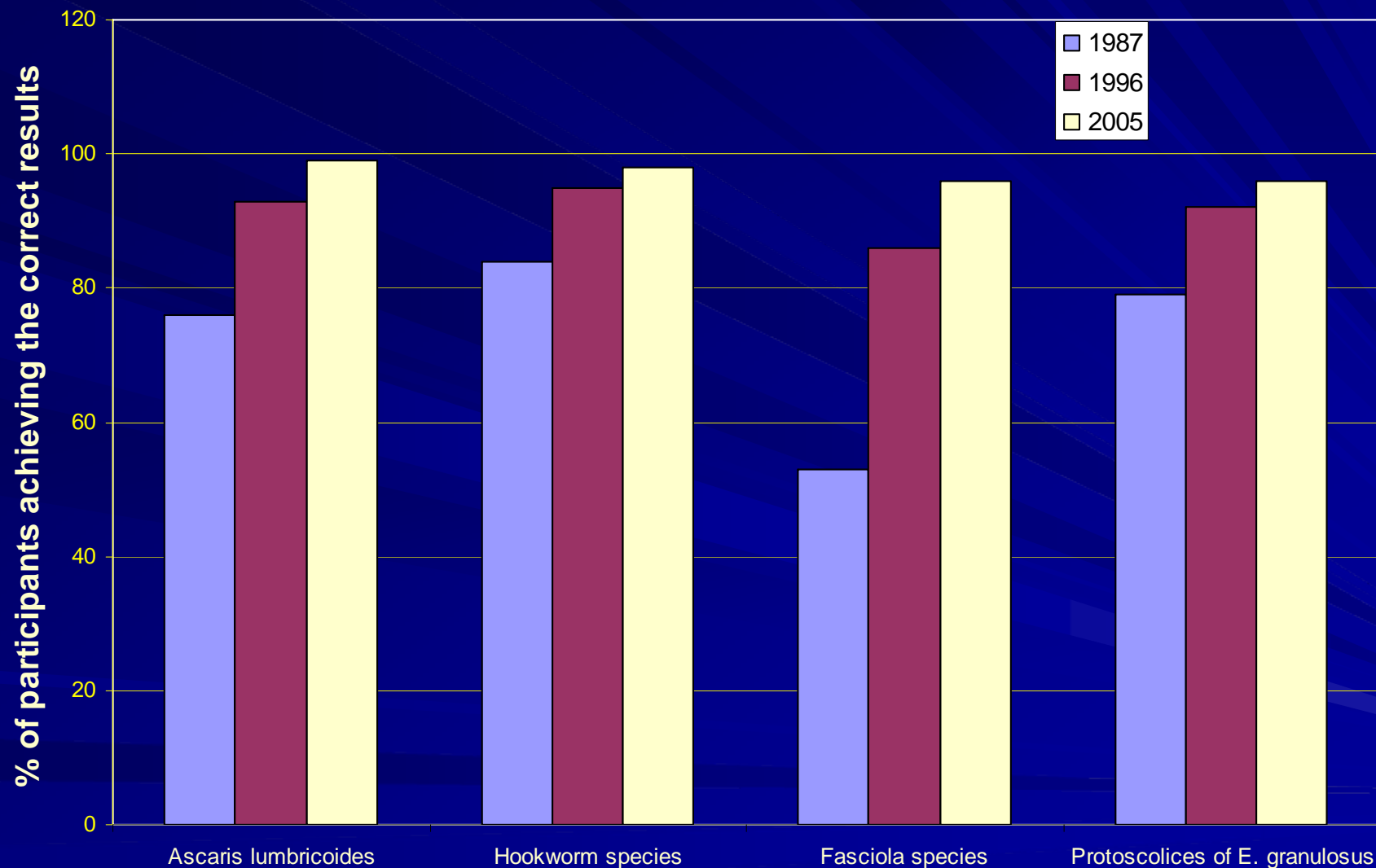
- Distribution of Teaching Sheets
- Introduction of “new” or unusual parasites
- Introduction of “new” techniques
- UKNEQAS Parasitology Web site
- UKNEQAS Blood and Faecal Parasitology Associated Teaching Programme



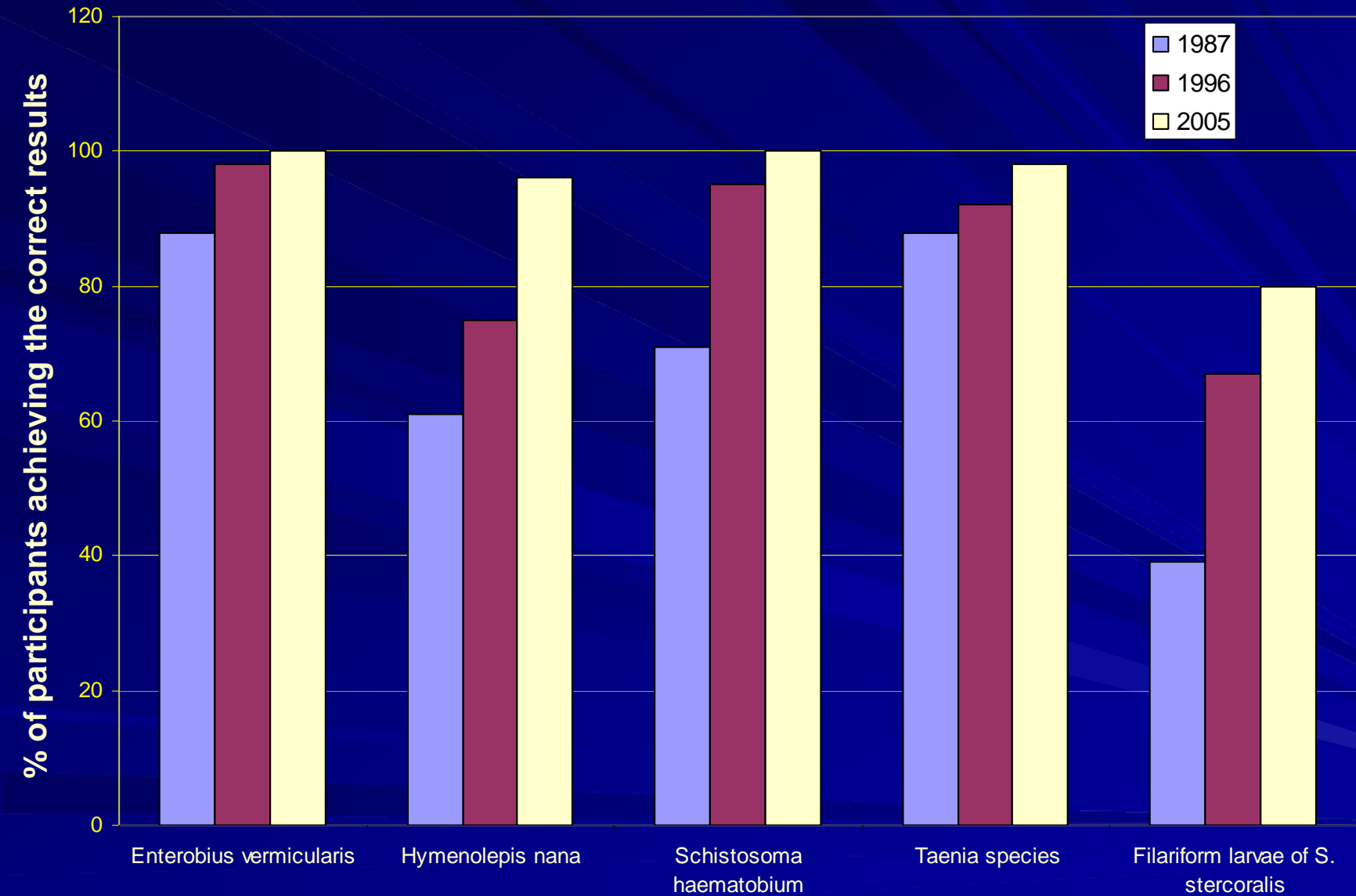
## Comparison of participants performance in examining cysts



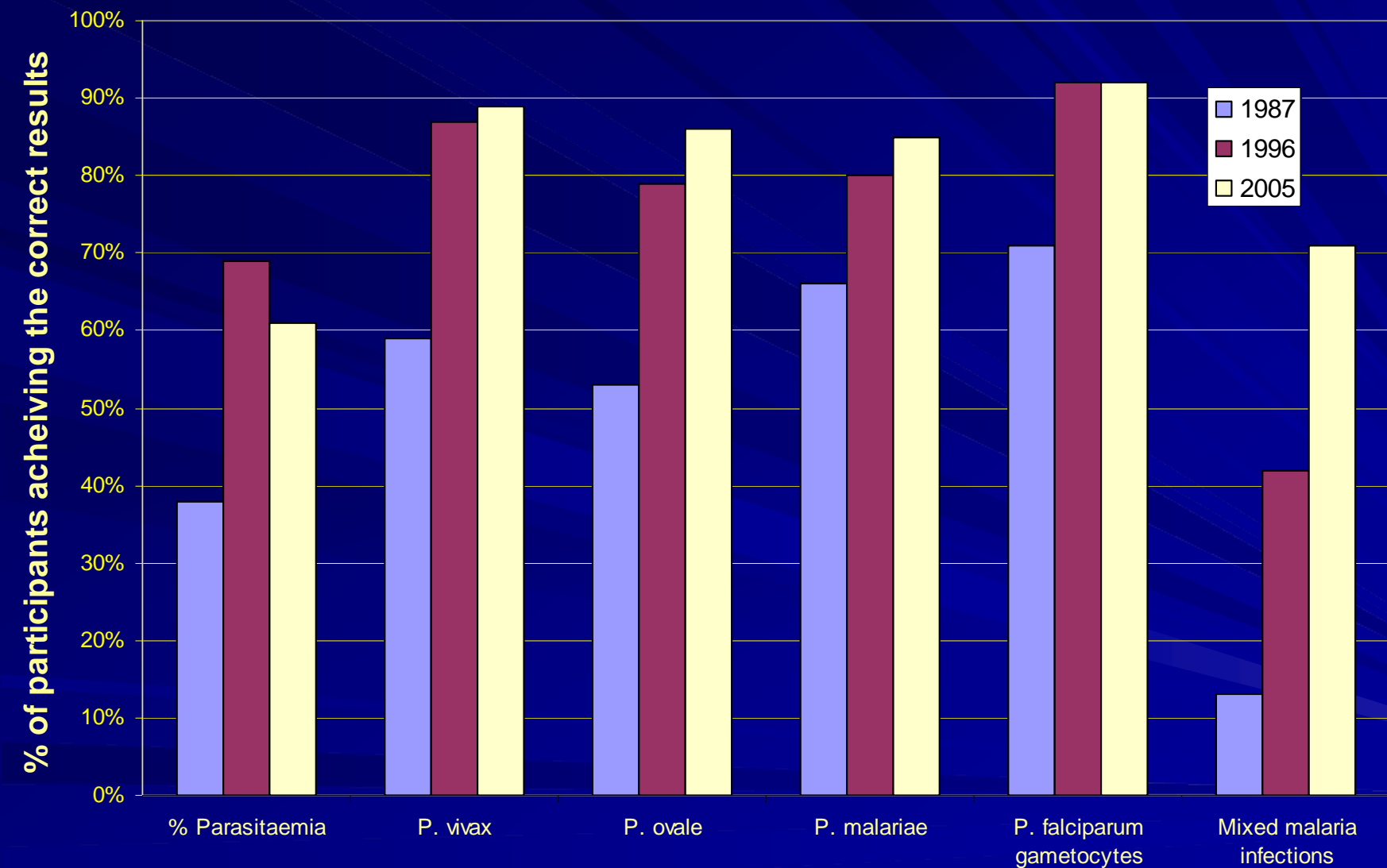
## Comparison of participants' performance in examining for helminths



## Comparison of participants' performance in examining for helminths

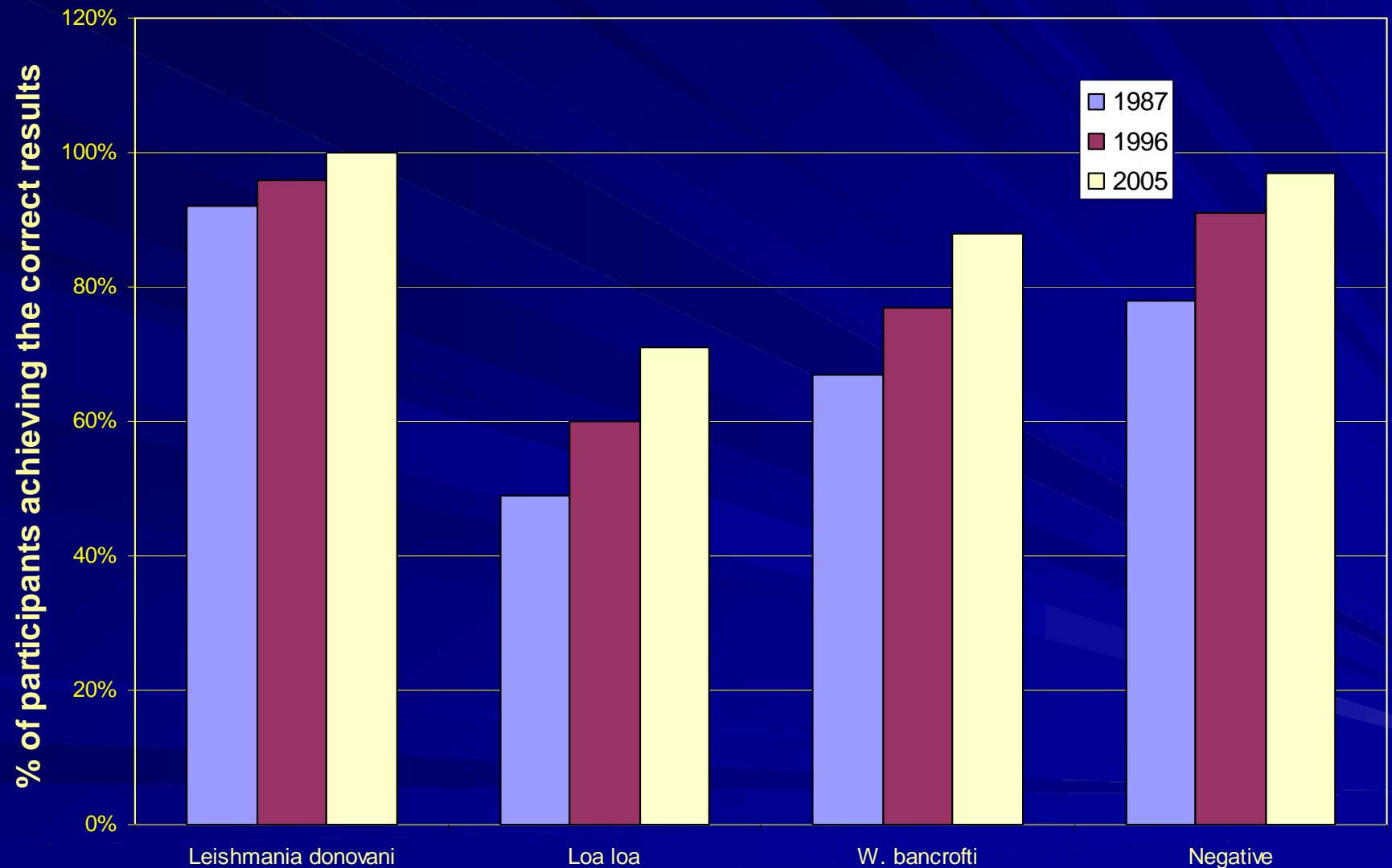


# Comparison of participants' performance in examining for malaria parasites





## Comparison of participants results in the examination of non-malaria parasites



# Conclusion

- EQA can provide a valuable educational stimulus to laboratory staff.
- EQA provides an insight to national performance levels