Intended Result		Your Report	Your Score
Specimen 4447	*Trichophyton soudanense*	*Trichophyton soudanense*	Not scored
Specimen 4448	*Trichophyton interdigitale*	*Trichophyton interdigitale*	2
Specimen 4449	*Alternaria alternata*	*Alternaria alternata*	2
Specimen 4450	*Aspergillus clavatus* species complex	*Aspergillus clavatus* species complex	2

Cumulative score information

Total number of specimens sent to you for **UK NEQAS for Mycology** over the last 3 distributions is 12
For these distributions specimen numbers 4011 4012 4154 4155 4156 4157 4448 4449 4450 have been analysed and scored.

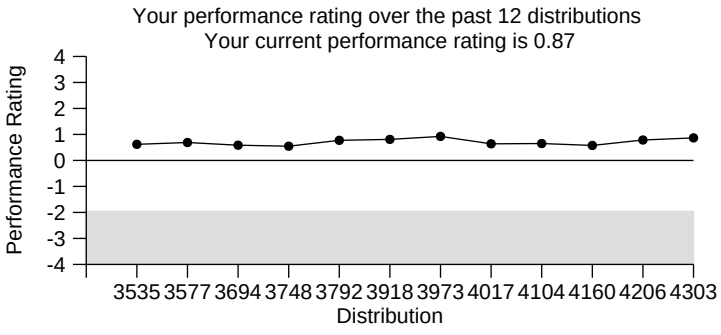
Number of reports analysed 9
Number of specimens reported as not examined (not scored) 0
Number of specimens received too late for analysis (not scored) 0
Number of specimens for which no report was received (not scored) 0
Your cumulative score for these specimens was 18 out of a possible total of 18
The mean score calculated from the reports returned by **UK** laboratories was 16.17 with a standard error of 2.11.

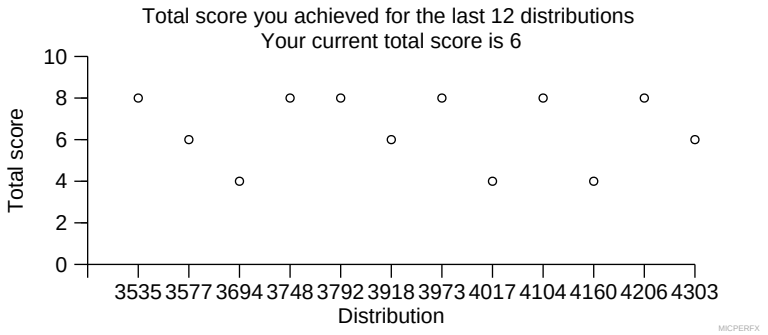
Performance rating
Your performance rating for **UK NEQAS for Mycology** (i.e. the number of standard errors by which your cumulative score lies above or below the mean for **UK** laboratories) is 0.87.

A performance rating of more than 1.96 standard errors below the mean indicates possible poor performance.

Performance ratings may change if other participants' results are amended.

No score penalty is incurred for non return of reports. However non return of results may be used as a measure of poor performance.





Turn around time: The time taken to report your results was 3 days. This information is provided for your own use and does not form part of your performance assessment.

Categorisation for these specimens:
Specimens 4447, 4450: Advanced
Specimen 4448: Core
Specimen 4449: Genus only

Specimen 4447: This specimen contained a *Trichophyton soudanense.* Some 51.1% of participants reported a correct result; 9.8% to genus and 41.3% to species level, compared with 8.2% and 37.9% respectively in February 2010 (distribution 2588), when this anthropophilic dermatophyte was last distributed. This specimen has not been scored, as less than 80% of the referee laboratories obtained the correct result.

Specimen 4448: This specimen contained *Trichophyton interdigitale.* A good performance with 90.8% of participants reporting a fully correct result, compared with 95% in June 2017 (distribution 4104), when this dermatophyte was last distributed.

Specimen 4449: This specimen contained an *Alternaria alternata.* A very good performance with 97.8% of laboratories achieved a fully correct score reporting to genus level, an improvement when compared with 93.0% in July 2012 (distribution 3076), when this fungus was last distributed.

Specimen 4450: This specimen contained an *Aspergillus clavatus* species complex. Some 80% of participants attained the correct result, compared with 86.1% in May 2004 (distribution 1765)when this filamentous fungi was last distributed.

Expert comments by Dr E. Johnson can be found on the final pages of this report. We thank colleagues in Public Health England (PHE) - National Infection Services (NIS): Mycology Reference Laboratory, Bristol for the supply of strains and provision of confirmatory testing. This distribution was organised jointly by UK NEQAS and the Mycology Reference Laboratory, Myrtle Road, Kingsdown, Bristol, BS2 8EL. Comments or queries on mycological aspects of the distribution should be addressed to Dr Elizabeth Johnson of the Mycology Reference Laboratory. Queries on other aspects should be addressed to Shila Seaton, UK NEQAS.

Enquiries: Repeat specimens can be obtained by fax +44 (0)20 8205 1488 or email organiser@ukneqasmicro.org.uk
Please state your laboratory number, distribution number and type, and specimen number/s. Digital images of the results obtained in the Mycology Reference Laboratory with this distribution will be available shortly on our website: www.ukneqasmicro.org.uk
Report authorised by: Dr Sanjiv Rughooputh, Director.

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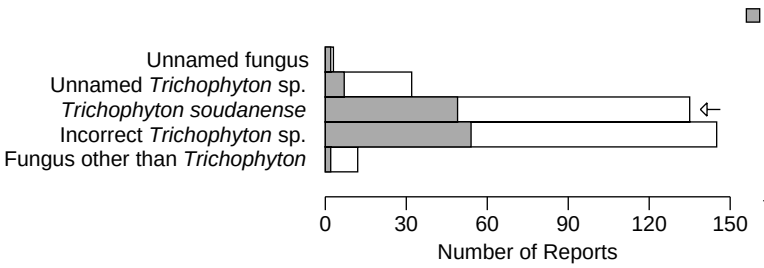
Referee laboratories result

Specimen	Fully Correct	Scored
4447	48%	No
4448	98%	Yes
4449	98%	Yes
4450	88%	Yes

The fifty laboratories achieving the highest cumulative scores in the current distribution are selected and designated referee laboratories. The process is anonymous, selection is made by the computer and the identities of these laboratories are not known to UK NEQAS, to the laboratories concerned or to the participants. Participants' results will only be scored if 80% or more of the referee laboratories examining the specimen achieve fully correct results.

Specimen : 4447

Scalp scrapings: Scaly alopaecia in a 7 year old boy. The identity of the organism was queried. Specimen contained *Trichophyton soudanense.*



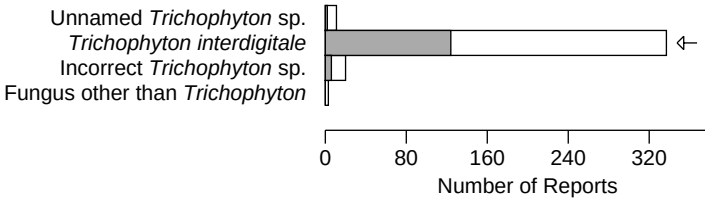
	UK(%)	All(%)
Unnamed fungus	2 (1.8)	3 (0.9)
Unnamed *Trichophyton* sp.	7 (6.1)	32 (9.8)
Trichophyton soudanense	49 (43.0)	135(41.3)
Incorrect *Trichophyton* sp.	54 (47.4)	145(44.3)
Fungus other than *Trichophyton*	2 (1.8)	12 (3.7)
	114	327

Incorrect genus:
Microsporum spp. 11
Trichosporon beigelii 1

Common incorrect species:
T. benhamiae 3
T. rubrum 51
T. tonsurans 76
T. verrucosum 10

Specimen : 4448

Skin scrapings: Scaly toe webs in a 24 year old female. The identity of the organism was queried. Specimen contained *Trichophyton interdigitale.*



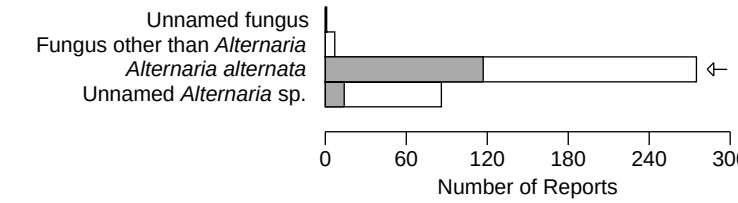
	UK(%)	All(%)	Score
Unnamed *Trichophyton* sp.	2 (1.5)	11 (3.0)	1
Trichophyton interdigitale	124 (93.9)	337(90.8)	2
Incorrect *Trichophyton* sp.	6 (4.5)	20 (5.4)	0
Fungus other than *Trichophyton*	0 (0.0)	3 (0.8)	0
	132	371	

Incorrect genus:
Microsporum persicolor 2
Nannizzia gypsea 1

Incorrect species:
T. erinacei 1
T. rubrum 8
T. terrestre 4
T. tonsurans 7

Specimen : 4449

Biopsy: Cutaneous lesion on leg of 32 year old male kidney transplant patient. The identity of the organism was queried. Specimen contained *Alternaria alternata.*

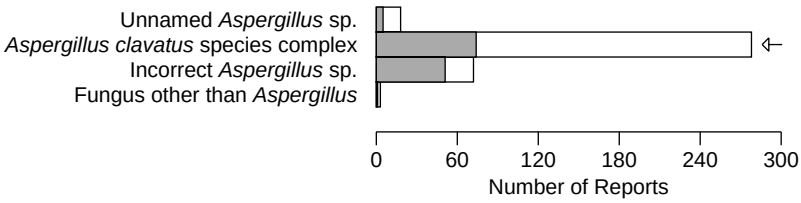


	UK(%)	All(%)	Score
Unnamed fungus	0 (0.0)	1 (0.3)	0
Fungus other than *Alternaria*	0 (0.0)	7 (1.9)	0
Alternaria alternata	117 (89.3)	275(74.5)	2
Unnamed *Alternaria* sp.	14 (10.7)	86(23.3)	2
	131	369	

Incorrect genus:
Bipolaris sp. 1
Curvularia spp. 3
Paecilomyces sp. 1
Ulocladium sp. 2

Specimen : 4450

Ear swab: 84 year old male. The identity of the organism was queried. Specimen contained *Aspergillus clavatus* species complex.



	UK(%)	All(%)	Score
Unnamed *Aspergillus* sp.	5 (3.8)	18 (4.9)	2
Aspergillus clavatus species complex	74 (56.5)	278(74.9)	2
Incorrect *Aspergillus* sp.	51 (38.9)	72(19.4)	1
Fungus other than *Aspergillus*	1 (0.8)	3 (0.8)	0
	131	371	

Incorrect genus:
Cunninghamella bertholletiae 1
Scedosporium sp. 1
Trichophyton sp. 1

Common incorrect species:
A. candidus 2
A. flavus 2
A. fumigatus 56
A. glaucus 5
A. terreus 2
A. versicolor 3

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Distribution 4303

Specimen 4447 *Trichophyton soudanense*

Trichophyton soudanense is an anthropophilic dermatophyte that is a rare cause of tinea corporis and endothrix tinea capitis in Europe. However, it is common in Africa and most of the cases that we see are imported. It was included as an advanced specimen so we would accept identification to genus level and as some authorities classify this together with *T. gourvilii* and *T. yaoundei* under *Trichophyton violaceum* we also accepted this blanket identification. However, on this occasion as less than 80% of the referee labs gave the correct identification it will not be scored.

On Sabouraud's dextrose agar, colonies are relatively slow-growing with a flat to folded, suede-like surface with a slightly heaped centre. This isolate displayed a restricted, glabrous, orange-yellow colony with purple, velvety heaped and folded centre, submerged edge and dark brown/yellow reverse. Often, as with this isolate, there is a broad fringe of glabrous submerged growth which can be seen at the edge of the colony digging into the agar. If this is examined directly by placing the culture plate under the x 10 objective it reveals marked reflexive branching, in which some of the side branches project backwards towards the main colony, or right-angled branching. It is not the only species to produce this reflexive branching but it is often a helpful additional identification feature. Large oval microconidia were occasionally seen along the sides of the hyphae and numerous arthrospores and chlamydospores are often found in older cultures.

Most mis-identifications were as *Trichophyton tonsurans,* another anthropophilic agent of tinea capitis, which is currently encountered more frequently in Europe. From a clinical perspective this would make little difference but is of course important from an epidemiological perspective. Colonies of *T. tonsurans* are usually a darker brown in colour with a powdery surface due to the production of multiple microconidia, although more floccose colonial variants are also seen. On microscopy *T. tonsurans* should display numerous large club-shaped microconidia which were not present in this isolate. Those reporting it as *Trichophyton rubrum* should note that although this is the most common anthropophilic dermatophyte it is rare for it to cause scalp infection, the colony was not right for any of the *T. rubrum* variants except possibly a granular variant but the microscopy would not be in keeping with that. *Trichophyton verrucosum* isolates are slower growing and do not display glabrous edges.

Specimen 4448 *Trichophyton interdigitale*

More than 90% of participants correctly identified this powdery variant of *Trichophyton interdigitale,* the second most common anthropophilic dermatophyte often associated with toe-web and toenail infections. The colony had a typical cream-coloured powdery appearance. The reverse of the colony had a central, diffuse, not well-demarcated circle of brown pigmentation. On microscopy there were abundant small globose microconidia arranged in clusters. Most of the misidentifications were as other common *Trichophyton* species.

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Specimen 4449 *Alternaria alternata*

Nearly 98% of participants correctly attributed this isolate to the *Alternaria* genus recognising the characteristic darkly pigmented holoblastic chains of spores with both longitudinal and transverse septa and quite often an apical beak. These participants will receive a full score as it was distributed as a genus only organism. It is harder to be more precise without a molecular identification as the genus is large and the boundaries between species often quite fluid and difficult to assess on a phenotypic level, although this isolate was an *Alternaria alternata* based on a genotypic analysis. The key to recognising this isolate was to observe that the spores were formed in long chains of three or more spores, not produced individually by a conidiophore. This isolate had a spreading, flat, dark green colony developing grey fluffy aerial mycelium with age.

Confusion usually involved fungi with a similar colonial and microscopic appearance although *Bipolaris*, *Curvularia lunata* and *Ulocladium* do not produce long chains of spores; instead they are produced by sympodial formation along the sides of specialised conidiophores known as geniculate conidiophores (bent at a sharp angle like a knee). Only species of *Ulocladium* produce spores that are similar to those of *Alternaria* with both transverse and longitudinal septa and occasionally a spore will produce a secondary spore to produce a very short chain, those of *Bipolaris* and *Curvularia* are cylindrical and distinctively curved respectively and only have transverse septa.

Isolates of *Alternaria* are saprobes frequently encountered in the environment on dead plant tissue but have been encountered as opportunistic pathogens in many settings including cutaneous, subcutaneous and deep-seated infections in immunocompromised patients, keratitis, endophthalmitis, rhinosinusitis and rare cases of onychomycosis. In recent years we have encountered it on numerous occasions from cutaneous lesions on the limbs of renal transplant recipients. It often displays reduced vorioconazole susceptibility but we have seen successful outcomes with itraconazole.

Specimen 4450 *Aspergillus clavatus* species complex

This *Aspergillus clavatus* species complex was included as an advanced specimen although it is quite easy to attribute it to the complex based on morphological characteristic alone and nearly 75% of participants were correct in their identification. Nearly all recognised it as an *Aspergillus* species. The sporing central parts of the colony had a dark blue-green-gray colour and a granular texture, with a large white margin. On microscopy there were predominantly large, club-shaped vesicles with delicate phialides without metulae crowded over the entire surface. Small, smooth, eliptical spores were produced in short chains from the phialides which is the typical appearance of *Aspergillus clavatus* species complex. Molecular sequencing of ITS1 and beta-tubulin regions suggested *Aspergillus giganteus* which is a member of the *Aspergillus clavatus* species complex.

Surprisingly the most frequent misidentification was as *Aspergillus fumigatus* with 56 participants suggesting this identification. Although the colony colour is similar, with time it is possible to see the individual large club-shaped heads forming at the edge of the colony and it becomes quite granular. On microscopy there were certainly heads that could be mistaken for *Aspergillus fumigatus* but in addition there were numerous much larger, club-shaped heads. These should not have been ignored in favour of calling it *Aspergillus fumigatus.*
Aspergillus clavatus species complex is a rare cause of pulmonary infection and otomycosis but has been recognised as a cause of allergic aspergillosis.

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