UK NEQAS

International Quality Expertise

UK NEQAS for Microbiology Scheme best practices

Shila Seaton bacteriology/mycology scheme manager

February 2017

UK NEQAS

International Quality Expertise

Objectives

- History of UK NEQAS
- UK NEQAS today
- Scheme information
- Web entry
- Scoring
- Performance

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History of UK NEQAS

- UK NEQAS for Microbiology is one of a number of UK NEQASs which provide quality assessment in most disciplines of laboratory medicine.
- The UK NEQASs began in 1969 and Microbiology was added in 1971. Schemes were initiated by and continue to be overseen by the professions and learned societies. Up until March 1992, schemes were financially supported by central funding from the Department of Health (DH).
- Since April 1992, schemes are funded by income derived from participants' subscriptions. Schemes are physically located with host authorities, usually health authorities and in the case of the microbiology schemes, Public Health England

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History –cont'd

- Day to day management of the UK NEQASs is vested in the Organiser. The Organiser is responsible for local administrative matters to the host authority. The Organiser receives advice on the running of the scheme from a Steering Group on Quality Assessment
- Comprises of practising professionals specific to the discipline.
- Matters relating to participants' performance are dealt with by the relevant National Quality Assurance Advisory Panel which comprises nominees from the professional and learned societies.
- The Panel also advises the Organiser on matters relating to assessment of performance.

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Our host authority

Public Health England

Colindale site:

- Surveillance
- Microbiology (specialist and reference)
  - Reference microbiology
  - Outbreak investigation
  - FEW microbiology
  - Specialist advice and guidance
  - Research and development (R&D)
  - Assuring Quality

UK NEQAS Divisions

website: ukneqas.org.uk

Andrology	male fertility investigations
Clinical Chemistry	blood chemical components: cardiac markers, drug assays, peptide hormones, trace elements
Genetics	cytogenetics and molecular genetic analysis
Haematology	blood cellular components, blood grouping, blood coagulation, haematinics, feto-maternal haemorrhage, leucocyte Immunophenotyping
Cellular pathology	structure and function of body tissues
Immunology and immunocytochemistry	components of the immune system in blood, histocompatibility and immunogenetics
Microbiology	infectious agents, parasites & antibiotics assays

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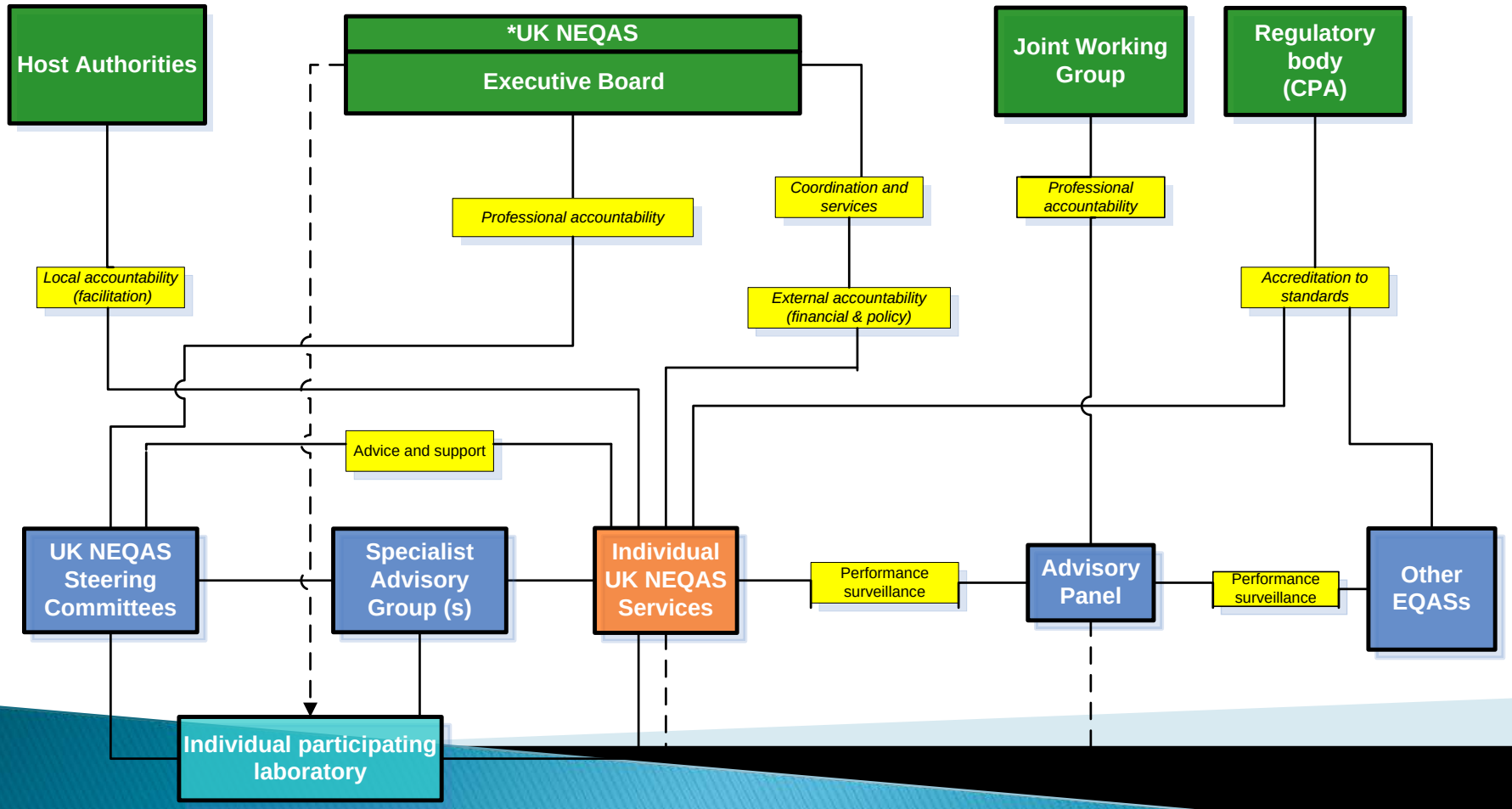
Structures for UK NEQAS Oversight



*UK National External Quality Assessment Services:
-A charitable company limited by guarantee
-Company membership (guarantor) open to those services entitled to use the name UK NEQAS
-Executive elected from and by the membership
Entitlement to UK NEQAS status is determined through compliance with the UK NEQAS Code of Practice.

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Microbiology

UK NEQAS for Microbiology PO Box 63003, NW9 1GH
Tel: + 44 (0)20 8905 9890 Fax: + 44 (0)20 8205 1488 E-mail: organiser@ukneqasmicro.org.uk web: http://www.ukneqasmicro.org.uk

European Countries

Non European Countries

Information correct as of September 2016

Published: 07/10/2016 Expires: N/A

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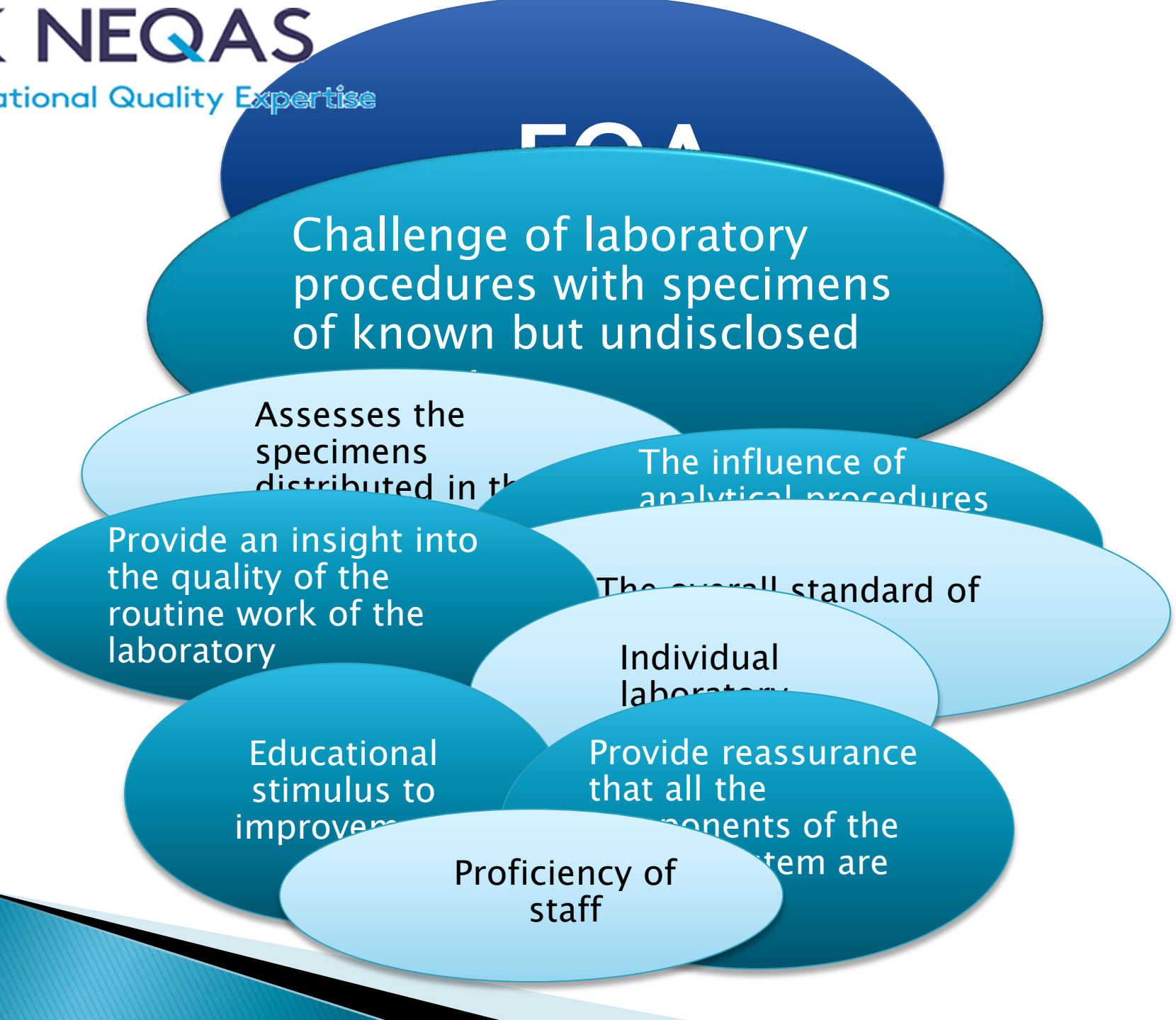

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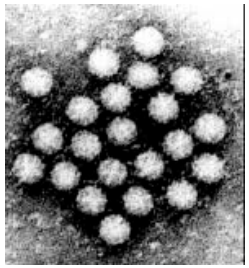
Schemes overview



Virology
•23 schemes

Mycology
•2 schemes

Bacteriology
•12 schemes

Parasitology
•8 schemes

45 SCHEMES

Identification
•Biochemistry
•Antigen (IF / agglutination…)
•Growth characteristics
•Molecular

Typing / subtyping
•Biochemistry
•Antigen
•Molecular

Quantification
•Microscopic
•Molecular

Susceptibility
•phenotype
•genotype

Serology
•EIA
•Agglutination
•Line assays
•IF

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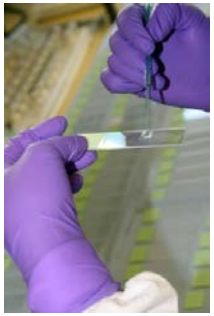
Specimen preparation



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UK NEQAS WEBSITE

http://ukneqasmicro.org.uk

WEB ENTRY

http://ukneqasmicro.org.uk/

phe-eqad-sql2 | Google | Shila Seaton - Outlook... | Google | New Tab | UK NEQAS Results Ent... | Home

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Mycology Practical Foreig... | Home | Scheme Organiser's Tools... | Shila Seaton - Outlook We... | Standards for microbiolog... | eucast Clinical breakpoints | Outlook Web App (2)

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- Directory/Participants' Manual
- UK NEQAS for Parasitology
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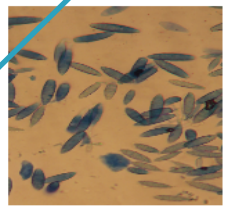
- Guidance on use of secure site
- Special Survey Login
- Interpretive Comments – new login
- Order Repeat Specimens
- Current pilots
- FAQ
- Accreditation
- Links to Related Websites

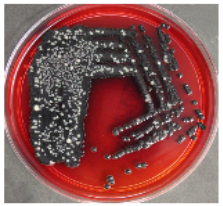
EQA provision with UK NEQAS



The United Kingdom National External Quality Assessment Service for Microbiology, operated by Public Health England, offers a number of features and benefits: Professionally led and educational service. The service is organised by professional microbiologists...

Read more...

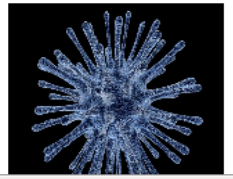
Introduction to schemes



UK NEQAS for Microbiology provides external quality assessment for clinical laboratories that carry out examinations in; General bacteriology, Virology, Serological testing, Blood donor testing (blood borne viruses and syphilis) and Parasitology...

Read more...

News, Meetings and Events

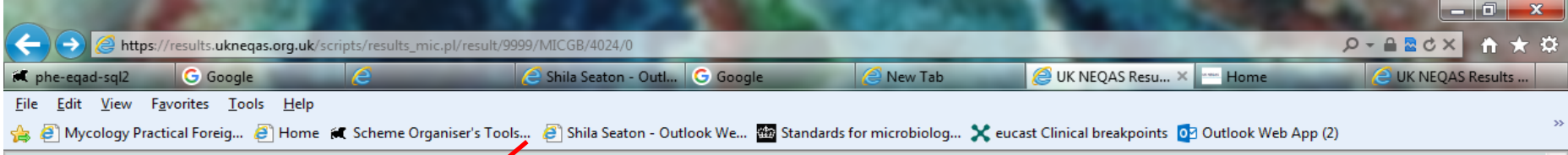


Registration steps for new participants

Newsletters

Current News

105%



UKNEQAS

United Kingdom National External Quality Assessment Schemes

UK NEQAS Birmingham Home Page | Results and Reports | Change ID | Help | PDF Help

Results Entry

Laboratory:

Scheme: **UK NEQAS for General bacteriology**
Distribution: **4024**
Dispatch date: **30-01-2017**
Return results: **20-02-2017**

Status: **Last submitted on 26-01-2017 14:25:36**

Page: Info | Spec:3556 | Spec:3557 | Spec:3558 | Final Page | Print | Blank form

Web form guidelines for use

A **Blank form** is available and can be printed so that you can make a note of your test results during testing.
This web form consists of 6 pages. It is recommended that you move sequentially through the pages to enter your results. As you move through the pages the information you have entered is automatically saved. Any error or omission on the page will be highlighted in red and a suitable error message provided. You may make changes to the saved data at any time until you have submitted. If you make an error when re entering data select **Reset** to take you back to the last saved information.
By re-accessing this form you can amend and resubmit your results at anytime before the close of the distribution. However, please note, if you make a change to any field the submission status will change to 'not submitted'. Please make sure you resubmit.

Please note that the layout has been updated: there are separate pages for each specimen and from now on all distributions will be analysed by the method(s) used. You are now required to enter at least one method, the result obtained with that method and an overall result for the pathogens you detect.

Select the **Save Specimen** button to save the results before moving on to the next specimen.

Once you have completed your results entry click on **Final page** to access the final page.

The final page contains a text box for free text. Please provide an e-mail address if you require a response to your comment. Select the **Submit** button to send your results. Once your results have been submitted print or save a copy of your results by selecting the **Print** button.

If you cannot see the predictive menu dropdown lists please see the 'Guidance on use of secure site' document which can be found on the home page of our main website 'http://ukneqasmicro.org.uk/'. If you have any problems entering your results please email us at organiser@ukneqasmicro.org.uk

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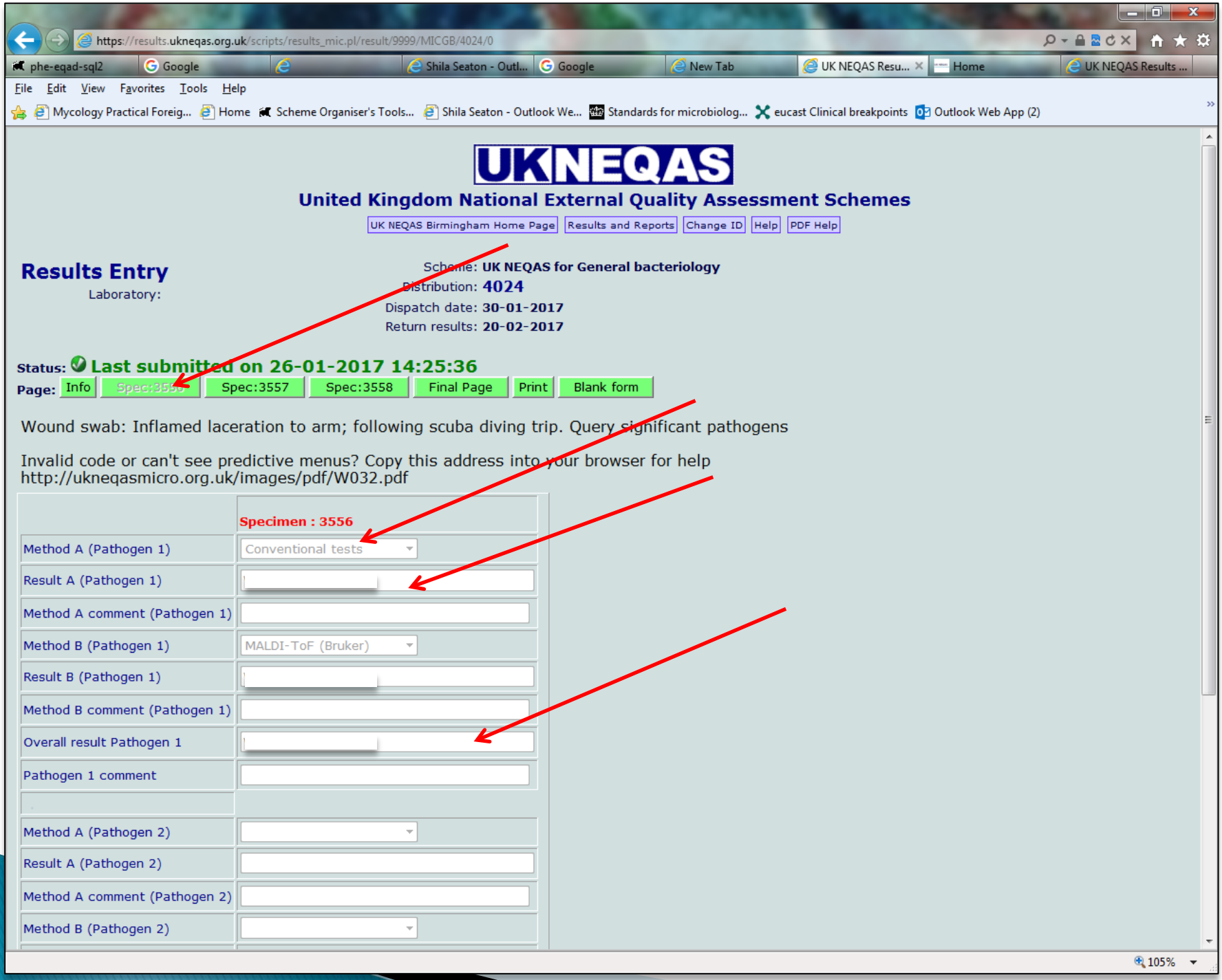
NIS - Specialist Microbiology Services
133-155 Waterloo Road
Wellington House
London SE1 8UG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UK NEQAS Birmingham Home Page
Results and Reports
Change ID
Help
PDF Help
Results Entry
Laboratory:
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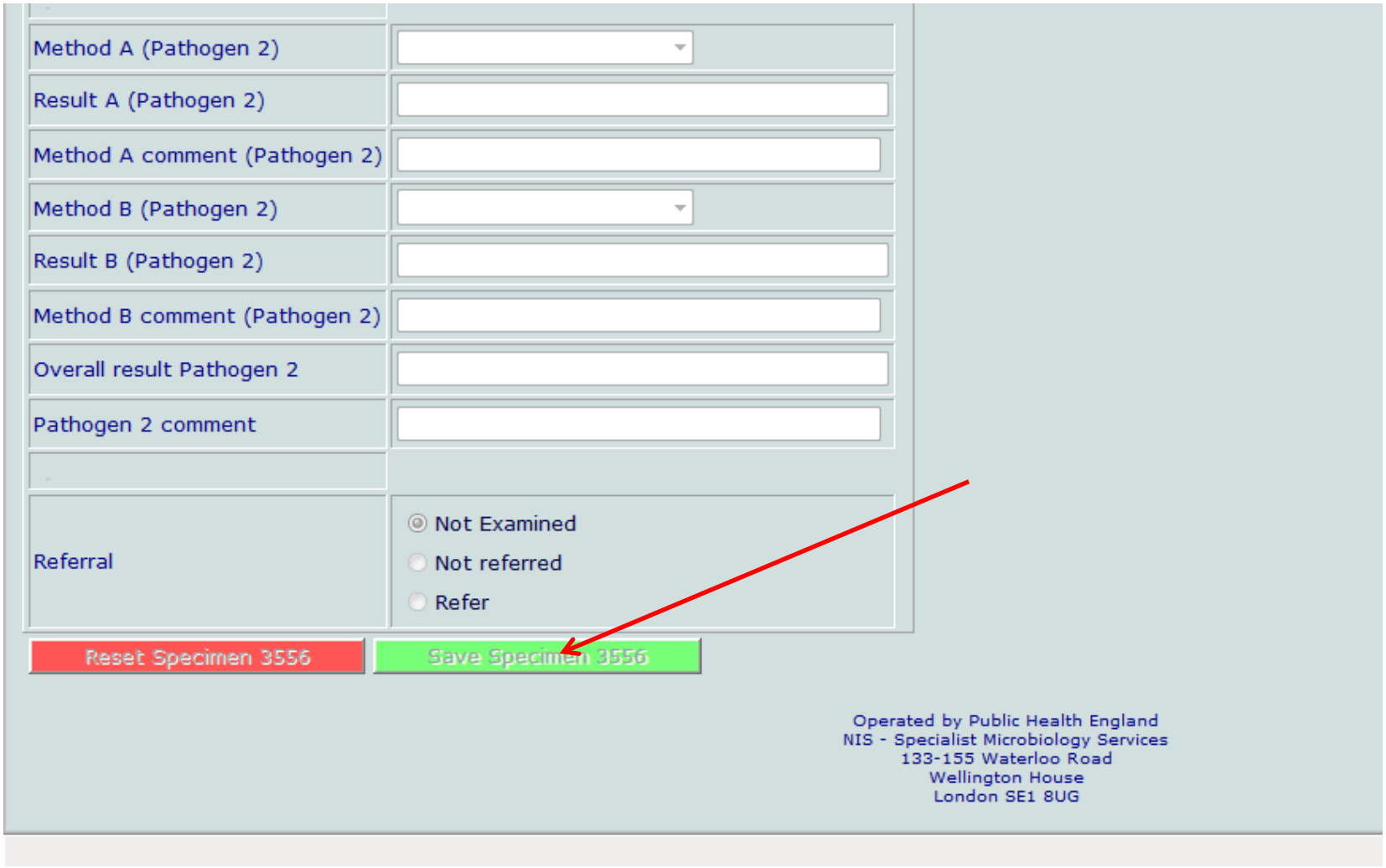
Status: Last submitted on 26-01-2017 14:25:36
Page: Info
Spec:3556
Spec:3557
Spec:3558
Final Page
Print
Blank form
Wound swab: Inflamed laceration to arm; following scuba diving trip. Query significant pathogens
Invalid code or can't see predictive menus? Copy this address into your browser for help
http://ukneqasmicro.org.uk/images/pdf/W032.pdf
Specimen : 3556
Method A (Pathogen 1)
Conventional tests
Result A (Pathogen 1)
Method A comment (Pathogen 1)
Method B (Pathogen 1)
MALDI-ToF (Bruker)
Result B (Pathogen 1)
Method B comment (Pathogen 1)
Overall result Pathogen 1
Pathogen 1 comment
Method A (Pathogen 2)
Result A (Pathogen 2)
Method A comment (Pathogen 2)
Method B (Pathogen 2)


Method A (Pathogen 2)
Result A (Pathogen 2)
Method A comment (Pathogen 2)
Method B (Pathogen 2)
Result B (Pathogen 2)
Method B comment (Pathogen 2)
Overall result Pathogen 2
Pathogen 2 comment
Referral
Not Examined
Not referred
Refer
Reset Specimen 3556
Save Specimen 3556
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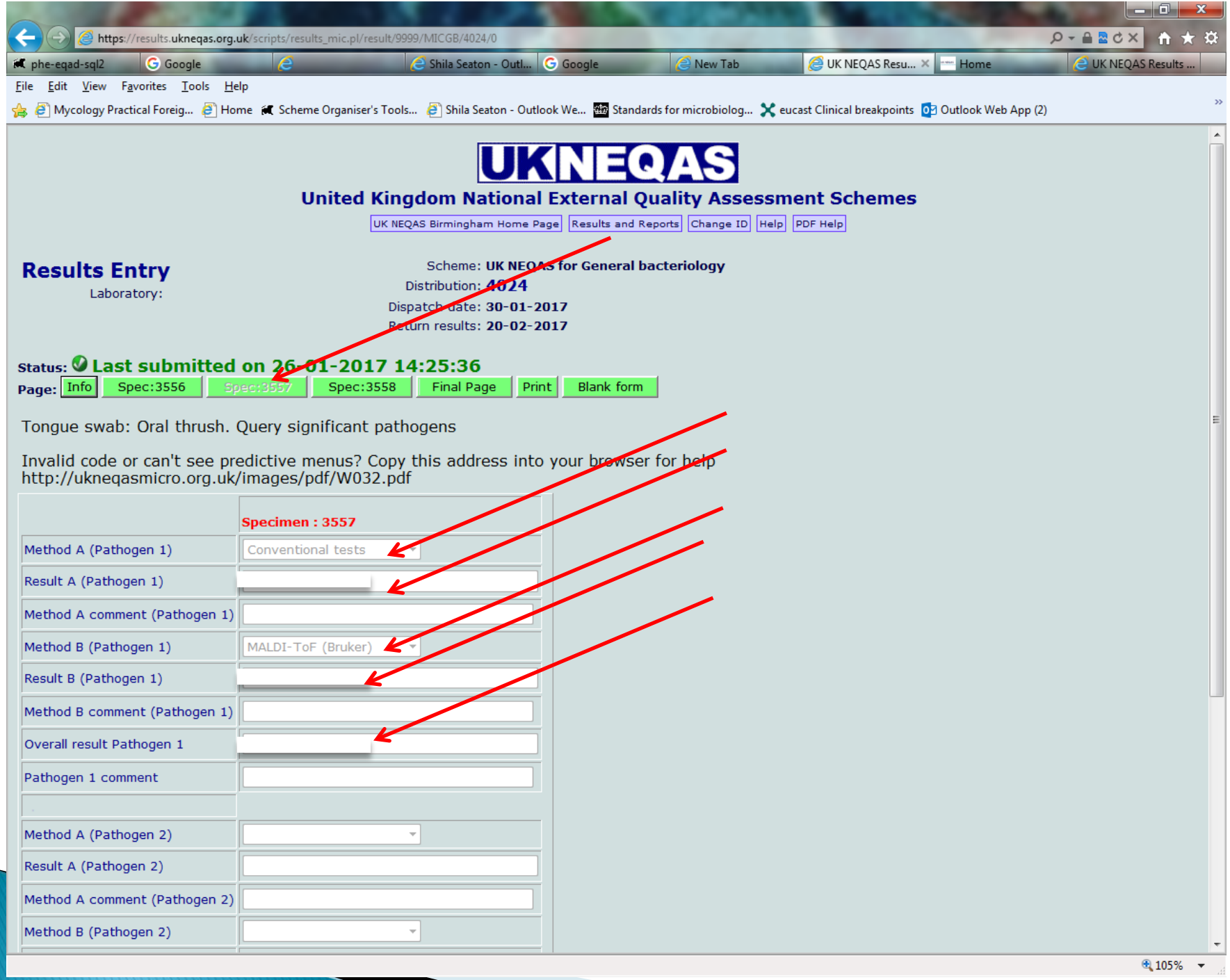
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Laboratory:
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Page: Info
Spec:3556
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Spec:3558
Final Page
Print
Blank form
Tongue swab: Oral thrush. Query significant pathogens
Invalid code or can't see predictive menus? Copy this address into your browser for help
http://ukneqasmicro.org.uk/images/pdf/W032.pdf
Specimen : 3557
Method A (Pathogen 1)
Conventional tests
Result A (Pathogen 1)
Method A comment (Pathogen 1)
Method B (Pathogen 1)
MALDI-ToF (Bruker)
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Method B comment (Pathogen 1)
Overall result Pathogen 1
Pathogen 1 comment
Method A (Pathogen 2)
Result A (Pathogen 2)
Method A comment (Pathogen 2)
Method B (Pathogen 2)


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Page: Info
Spec:3556
Spec:3557
Spec:3558
Final Page
Print
Blank form
Specimen received: 31-01-2017 (dd-mm-yyyy)
Please provide an email address if you require a response to your comment.
Comments box:
:)
Submit Results
Must press submit again after any changes!
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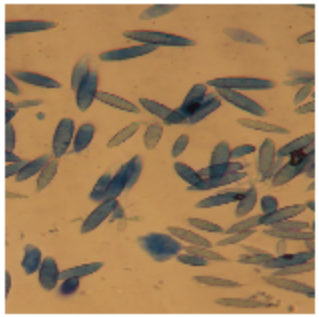
- Current pilots
-

EQA provision with UK NEQAS



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Microbiology, operated by Public Health England, offers a
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professional microbiologists...

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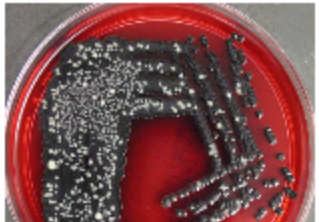
Introduction to schemes



UK NEQAS for Microbiology provides external quality assessm
laboratories that carry out examinations in; General bacteriolog
testing, Blood donor testing (blood borne viruses and syphilis)

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Microbiology

UK NEQAS for Microbiology, P O Box 63003, NW9 1GH
Tel: +44 (0)20 8905 9890 Fax: +44 (0)20 8205 1488 email: organiser@ukneqasmicro.org.uk web: http://www.ukneqasmicro.org.uk

Bacteriology and Mycology Scheme Scoring

Guide to schemes included in this information sheet

Table 1. General bacteriology - single 'core' or 'advanced' pathogen
(for specimens containing *C. difficile* see table 4)

Response	Core*	Advanced*
Unexpected pathogen	-1	-1
Negative result	0	0
Unnamed/unspecified micro-organism	0†	0†
Correct genus only	0‡	2
Correct species§	2	2
Correct species but incorrect serotype	0	1
Incorrect species	0	1
Incorrect genus	0	0
Additional unexpected pathogen	-1	-1

* See table 3 for categorisation of core and advanced pathogens
† 'Unnamed anaerobe' or 'unnamed yeast', scored as 1
‡ Correct yeast genus specified, scored as 1
§ With or without the correct serotype / toxin result

Table 2. General bacteriology - Mixed 'core' and 'advanced' pathogen

Response	Core	Advanced
Unexpected pathogen	-1	-1
Negative result	0	0
Unnamed/unspecified micro-organism	0	0
Correct genus for both	0	2
Correct species for both	2	2
One incorrect species for either	0	1
Incorrect species for both pathogens	0	0
Incorrect genus for one pathogen	0	0
Only one pathogen isolated	0	0
Additional unexpected pathogen	-1	-1

Rationale:
Organisms categorised as 'core' can be readily identified in-house without the requirement for specialist methodology or expertise.

Organisms categorised as '**advanced**' normally referred to a reference or expert laboratory for confirmation and/or specialist testing

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- Core
- Advanced
- Educational

BACTERIA and FUNGI	
Core	Advanced
Aeromonas hydrophila	*Actinomadura madurae*
Arcanobacterium haemolyticum	*Acinetobacter lwoffii*
Bacteroides fragilis group	*Acinetobacter baumanii*
Beta haemolytic streptococcus group A, B, C, G	*Actinomyces israelii*
Candida albicans	*Actinomyces odontolyticus*
Citrobacter koseri	*Agrobacter radiobacter*
Clostridium bifermentans	*Aspergillus flavus* species complex
Clostridium difficile	*Aspergillus fumigatus* species complex
Clostridium histolyticum	*Aspergillus niger* species complex
Clostridium innocuum	*Aspergillus terreus* species complex
Clostridium perfringens	*Bacillus cereus* group
Clostridium septicum	*Bacillus subtilis*
Clostridium sporogenes	*Bergeyella zoohelcum* [Educational]
Clostridium tetani	*Bordetella parapertussis*
Corynebacterium diphtheriae	*Bordetella pertussis*
Corynebacteriumjeikeium	
Corynebacterium striatum	*Burkholderia cepacia*
Corynebacterium ulcerans	*Campylobacter coli*
Cryptococcus neoformans	*Campylobacter jejuni*
Enterobacter cloacae complex	*Candida krusei*
Enterococcus faecalis	*Candida parapsilosis*
Enterococcus faecium	*Candida tropicalis*
Enterococcus gallinarum	*Capnocytophaga canimorsus*
Erysipelothrix rhusiopathiae	*Cardiobacterium hominis*
Escherichia coli O157	*Clostridium novyi*
Escherichia coli	*Corynebacterium pseudodiphtheriticum*
Haemophilus influenzae	*Eikenella corrodens*
Haemophilus parainfluenzae	*Fusobacterium necrophorum*
Klebsiella oxytoca	*Kingella kingae*
Klebsiella pneumoniae	*Lactobacillus acidophilus*
Morganella morganii	*Lactobacillus paracasei*
Moraxella catarrhalis	*Lactobacillus rhamnosus*
Neisseria gonorrhoeae	*Legionella pneumophila*
Neisseria meningitidis	*Leuconostoc mesenteroides* [Educational]
Pasteurella multocida	*Listeria ivanovii*
Plesiomonas shigelloides [Educational]	*Listeria monocytogenes*
Prevotella intermedia	*Mycobacterium* spp.
Prevotella melaninogenica	*Nocardia (Cyriacigeorgica) asteroides*
Pseudomonas aeruginosa	*Peptostreptococcus anaerobius*
Pseudomonas putida	
Pseudomonas stutzeri	
Ralstonia mannitolilytica	*Peptostreptococcus asaccharolyticus*
Ralstonia picketii	*Peptostreptococcus (Finegoldia) magnus*
Rothia mucilaginosa	*Porphyromonas endodontalis*
Serratia marcescens	*Propionibacterium acnes*
Serratia liquefaciens	*Rhodococcus equi*
Shigella sonnei	*Rothia dentocariosa*
Stenotrophomonas maltophilia	*Salmonella* spp.
Streptococcus anginosus group	*Shigella boydii*
Streptococcus bovis	*Shigella dysenteriae*
Streptococcus milleri group	*Shigella flexneri*
Streptococcus mutans group	*Sphingomonas paucimobilis*
Streptococcus oralis	*Vibrio alginolyticus*
Streptococcus pneumoniae	*Vibrio vulnificus*
Staphylococcus aureus	*Vibrio fluvialis*
Staphylococcus epidermidis	
Staphylococcus lugdunensis	
Staphylococcus saprophyticus	
Vibrio cholerae	
Vibrio parahaemolyticus	
Yersinia enterocolitica	

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Report form for General Bacteriology

UK NEQAS Microbiology

General bacteriology | Laboratory :

Distribution : **3938** | Page 1 of 4

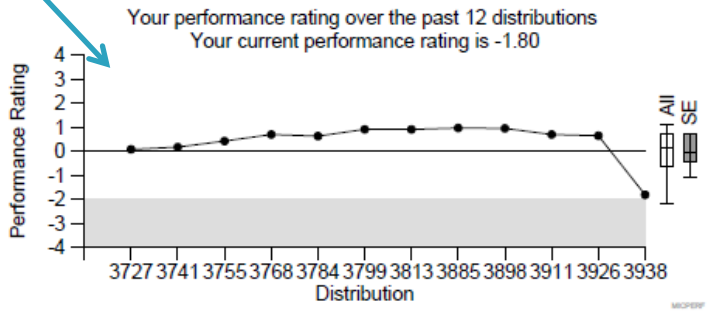
Dispatch Date : 01-Aug-2010

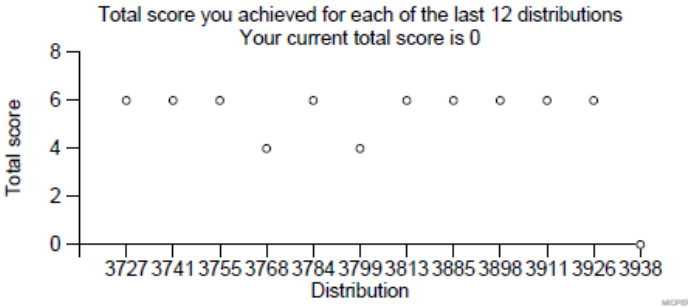
Intended Result		Your Report	Your Score
Specimen 3294	*Streptococcus pneumoniae*	Unexpected pathogen	-1
Specimen 3295	*Nocardia cyriacigeorgica* complex	Unexpected pathogen	-1
Specimen 3296	*Shigella flexneri* serotype 2a	*Shigella flexneri*	2

Cumulative score information
Total number of specimens sent to you for **UK NEQAS for General bacteriology** over the last 6 distributions is 18
Specimen numbers 3010 3011 3012 3128 3129 3130 3173 3174 3175 3208 3209 3210 3250 3251 3252 3294 3295 3296 have been analysed and scored.
Number of reports returned and scored 18
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 30 out of a possible total of 36
The mean score calculated from the reports returned by **Sweden** laboratories was 34.21 with a standard error of 2.34.

Performance rating
Your performance rating for **UK NEQAS for General bacteriology** (i.e. the number of standard errors by which your cumulative score lies above or below the mean for **Sweden** laboratories) is -1.80.

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 21- day(s). This information is provided for your own use and does not form part of your performance assessment.

Performance rating

Cumulative scoring

Turnaround time

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PERFORMANCE

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Participation

	Number of participants per country				
Scheme	AE	KW	OM	UK	**Global**
AAFB microscopy	1	13		153	**354**
Antimicrobial susceptibility	2	16	1	183	**636**
Clostridium difficile		3		171	**400**
Community Medicine		1		4	**131**
Faecal pathogens		2		1	**48**
General bacteriology	2	16	1	179	**616**
Mycobacterium culture		1		105	**308**
Antifungal susceptibility		1		71	**230**
MRSA screening		14		178	**328**

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Methods in identification

- There has been an evolution in the methods used in identification of micro- organisms in diagnostic clinical samples.
- Methods selected by participants depend on the organism being identified.
- Conventional methods rarely used in busy clinical microbiological settings demanding a high TAT

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Trends in methods identification

- Overall the percentage of participants obtaining a fully correct result for specimens examined since April 2013 compared with those selected from 5 years ago containing the same organism **were not significantly different.**

- With some organisms there was a change in the level of identification reported from **genus** only to species level.

Microscan, Vitek

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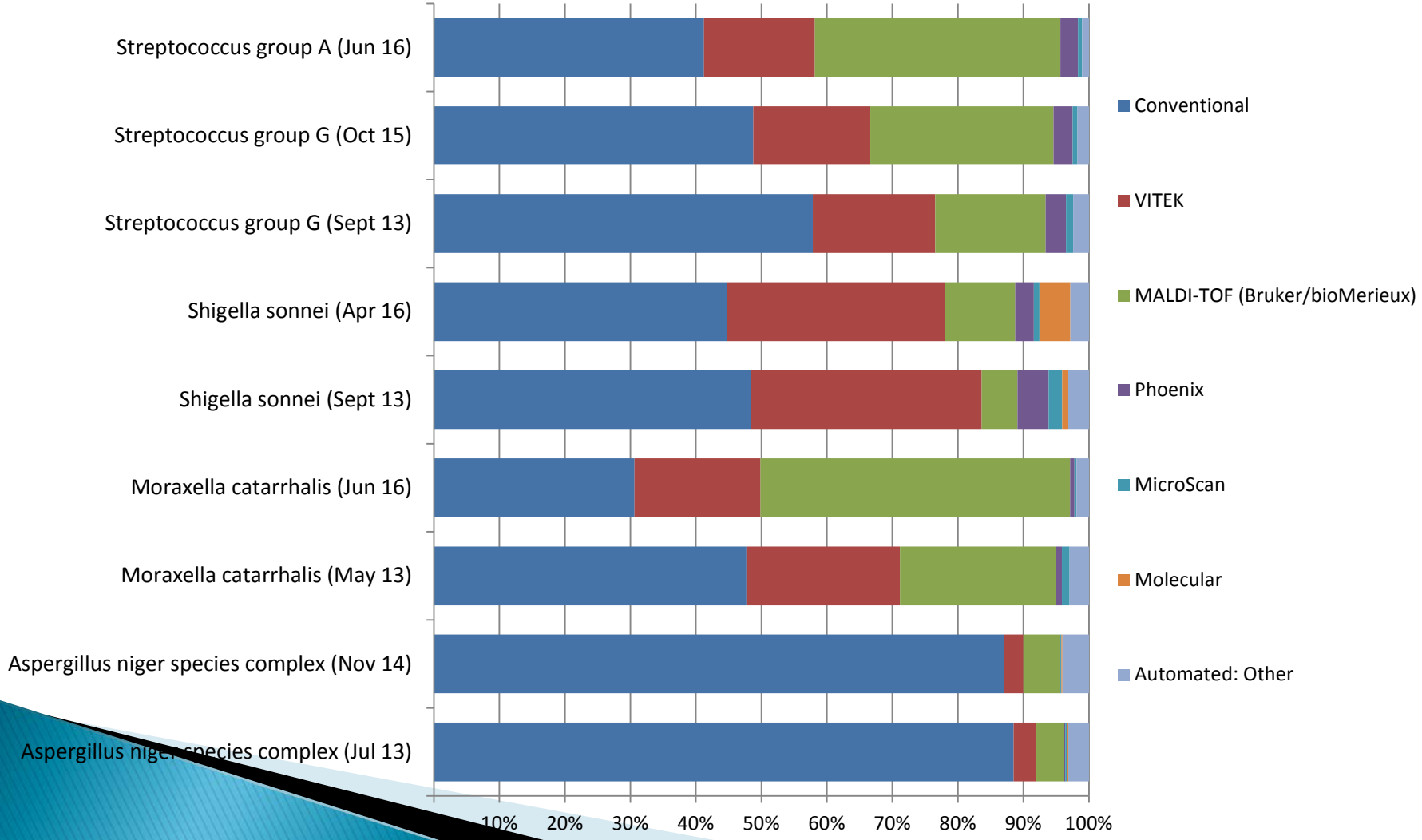
Trends in methodology –General bacteriology



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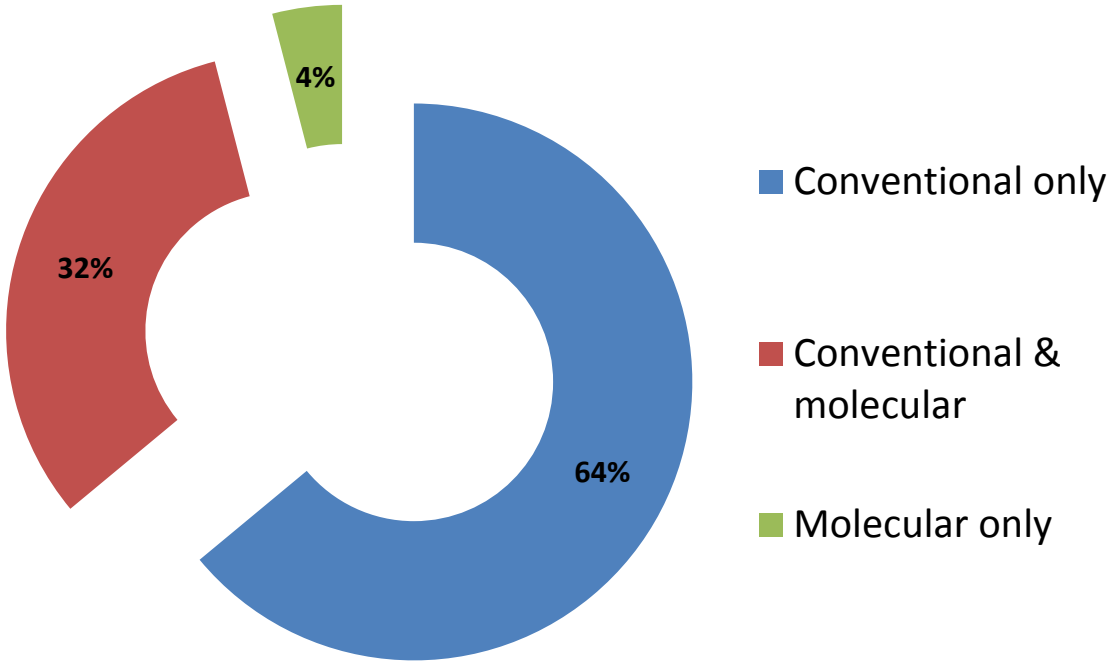
MRSA screening

- Majority use conventional methods (309/322)
  - Chromogenic agar
- One third use molecular methods (116/322)
  - Cepheid Xpert



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International Quality Expertise

MRSA-screening

MRSA screening: 12 month roling period						
			Culture		Molecular	
Distribution	Specimen	Intended results: culture/molecular	KW	UK	KW	UK
3805	29		91.7% (11/12)	98.9% (175/177)	100% (7/7)	95.7% (45/47)
3805			90.9% (10/11)	98.3% (174/177)	100% (7/7)	93.0% (40/43)
3902			100% (12			00% (42/42)
3902	31		100% (			0% (43/43)
3945	3320	MRSA detected	100% (			% (43/43)
3945	3321	MRSA detected	91.7% (1			9.3% (28/41)
3985	3429	MRSA not detected	83.3% (10/12)	95.4% (165/173)	77.8% (7/9)	87.8 % (36/41)
3985	3430	MRSA detected	100% (12/12)	97.7% (168/172)	100% (7/7)	97.9% (46/47)

Molecular
Majority laboratories – Cepheid Expert

Conventional
Microscan (1)/mannitol salt agar (6)/TSA (2)/Blood agar (1)

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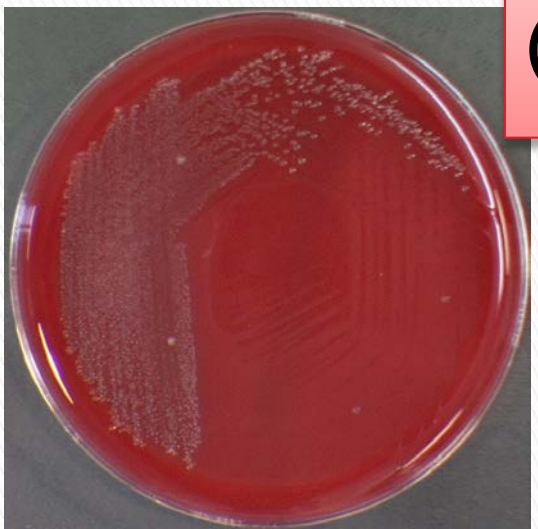
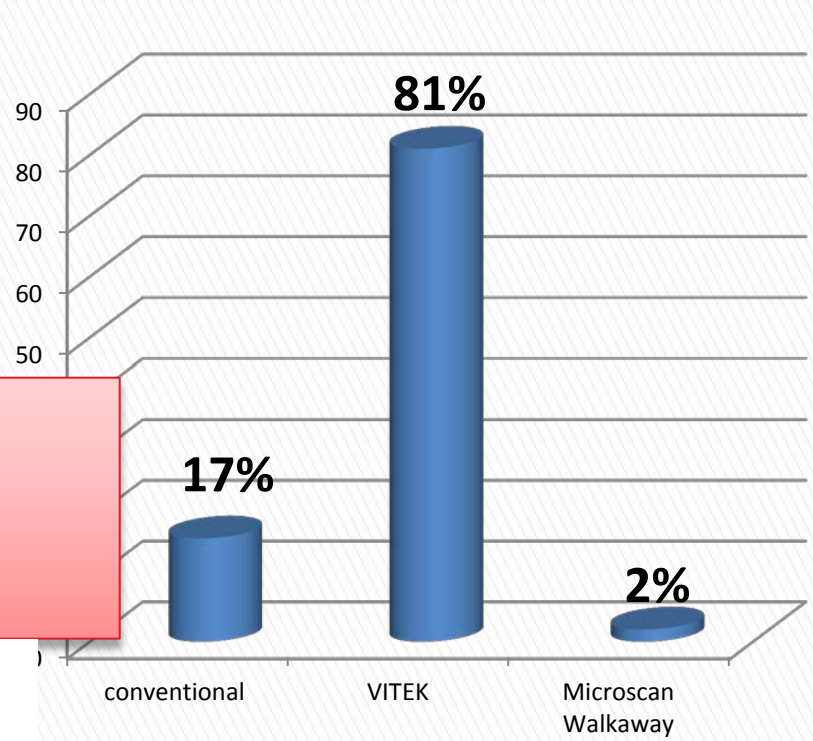
Fusobacterium necrophorum

- Incorrect identification of *Fusobacterium* species increased from 1% (5/691) in (distn 2211) 2007 to 19% (116/597) in 2013 (distn3216).

30% (3/10)

91.7% (11/12)





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Enterococcus gallinarum

- 69% correct (dist 3230 2013) in a urine.
- Problems with identification of some enterococcal species using commercially available challenging for the automated systems
- *E. gallinarum* is a reportedly rare cause of urinary tract infections (UTI)
- Organism was identified as *E. gallinarum* using the bioMerieux API Rapid ID 32 Strep 92.2%

  by a species specific PCR

  MALDI-ToF

UK NEQAS

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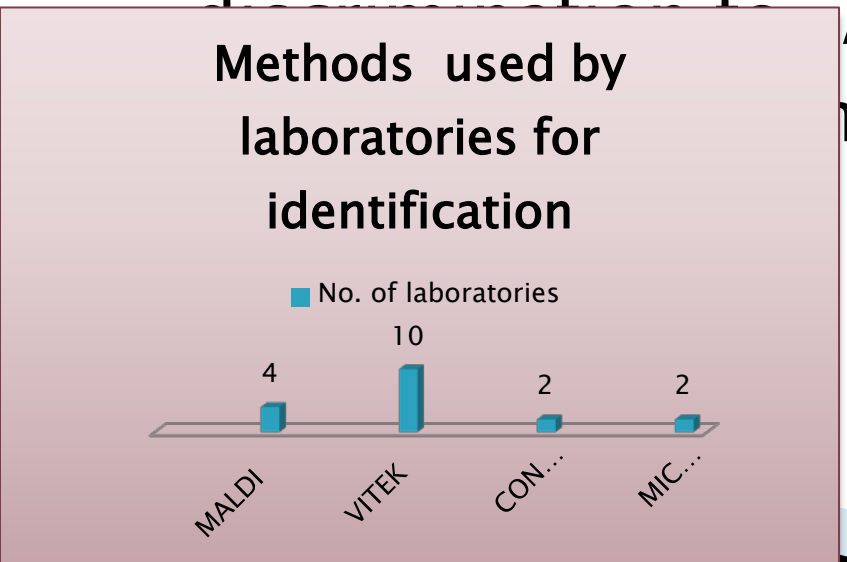
E. gallinarum

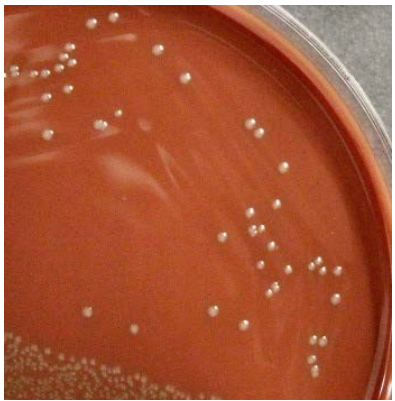
- 79.3% (dist … 589) in blood,
- 70 labs rep… *sseliflavus*, 37 labs *Enteroco*… s (*E. faecalis* =5, *E. faecium* =31 a… *osus* =1)
- Conventional tes… d an excellent discrimination fo… *E. gallinarum*

Kuwait
92.3% (12/13)

…mined an index of 2.271.

… method reported)





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RAPID DIAGNOSTICS

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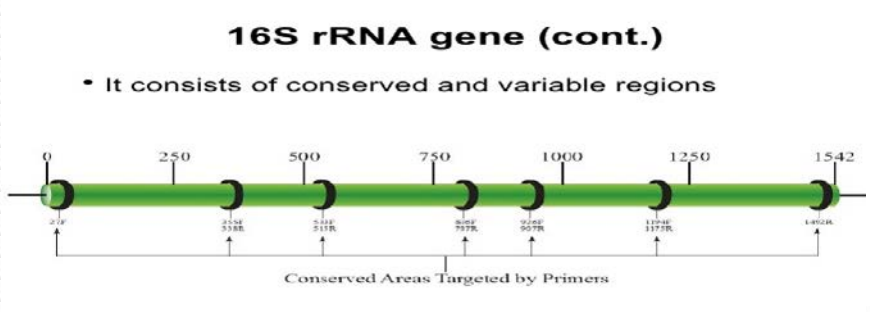
Molecular diagnostics–culture/ non culture (direct)

Advantages

- Power to identify the increasing numbers of organisms
- Taxonomy and phylogeny
- Con/RT/qPCR
- No need for viable cells
- No need for culture
- High sensitivity specificity

Limitations

- Great variability of PCR methods and confirmatory nature of the technology
- Variable in PPV NPV
- Skill mix required
- Costly
- Genebank



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Non culture-Faecal Enteric bio

- RT PCR No DNA Extraction
- No manual pipetting steps
- Rapid results within 3 hours
- Previous molecular experience not required
- Negative screening reduces culturing 90-95%
- Positive PCR results allow lab to perform targeted culturing specific to pathogen detected
- Throughput of 48 samples per ru
- Test panels all use same setup p a single platform

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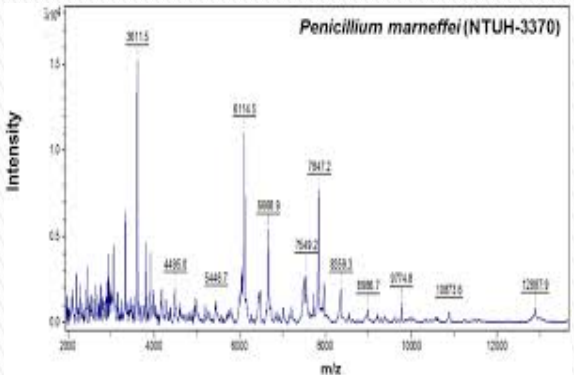
Proteomics

Advantages

- Power to identify the increasing numbers of micro-organisms
- Speed (~ 5mins)
- No downstream manipulation
- Minimal training
- ID good as the database

Limitations

- Need an existing database
- Initial outlay
- Immobile
- Skill required to analyse spectra



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Interpretive comments

- The role of interpretative comments in improving patient outcomes has been acknowledged
- UK NEQAS for Microbiology deliver an interpretative comments scheme to provide the opportunity for medical personnel to participate in inter-laboratory communication on previous clinical case reports
- The results obtained indicate that interpretation provided by laboratory professionals with inadequate expertise can be detrimental to the care of the patient, and highlight the need for improvement in the standard of interpretation
- The possibility of Interdepartmental cooperation (Round robin testing) may help avoid errors in medical laboratories
- Subscription charge is only £60 per annum to medical personnel registered to UK NEQAS schemes.

UKNEQAS

United Kingdom National External Quality Assessment Schemes

Results Entry

Laboratory:

Scheme: **UK NEQAS for Interpretive Comments[M]**
Distribution: **3883**
Dispatch date: **01-02-2017**
Return results: **28-02-2017**

PLEASE TICK THE BOX BEFORE THE QUESTIONS WHEN THIS TOPIC IS OUTSIDE OF YOUR CLINICAL PRACTICE.

CLINICAL INFORMATION:

A community faeces sample from a 25 year old man is received for laboratory testing. The clinical details provided are '? terminal ileitis'.

INVESTIGATIONS REQUESTED:

The sample is tested for *Giardia* and *Cryptosporidium* by EIA and cultured for bacterial pathogens on a range of standard selective agars.

RESULTS:

Giardia and *Cryptosporidium* are NOT detected by EIA

No pathogens are isolated after 48 hours of incubation on *Campylobacter* selective agar, xylose lysine deoxycholate (XLD) agar (with and without mannitol selenite broth enrichment) or cefixime tellurite sorbitol MacConkey (CT-SMAC) agar.

On Cefsulodin Irgasan Novobiocin (CIN) agar, which has been incubated in air at 30°C for 18 hours, there are colonies with a red centre surrounded by a transparent border (see the figure under 'Dist' button). The organism is a Gram-negative coccobacillus, which is catalase positive and oxidase negative.

☐ Response not submitted because the scope is outside of my clinical practice; you must provide a brief explanation in the comments box below.

Question : Q1

Which **one** of the following is the most likely identity of the organism isolated on CIN agar?

- ◉ -- No selection --
- ○ Bacillus cereus
- ○ Clostridium perfringens
- ○ Salmonella enteritidis
- ○ Vibrio parahaemolyticus

Which **one** of the following is the most likely identity of the organism isolated on CIN agar?	◉ -- No selection -- ○ Bacillus cereus ○ Clostridium perfringens ○ Salmonella enteritidis ○ Vibrio parahaemolyticus ○ Yersinia enterocolitica

Question : Q2

Assuming that your provisional identification (Q1 above) is confirmed by either biochemical tests or MALDI-TOF MS, which **two** of the following further actions would you undertake?	☐ Obtain further clinical details ☐ Refer the isolate for serotyping ☐ Refer the isolate for toxin testing ☐ Screen family contacts for carriage ☐ Transfer the isolate to Containment Level 3 (CL3)

Question : Q3

Which **one** of the following antimicrobial regimens would you be most likely to recommend?	◉ -- No selection -- ○ Ceftriaxone ○ Ciprofloxacin ○ Co-trimoxazole ○ Tetracycline ○ None - antimicrobial therapy is not routinely indicated

Comments box:

Reset Submit Results

Operated by Public Health England
MS Specialist Microbiology Services
133-155 Waterloo Road
Wellington House
London SE1 8UG

105%

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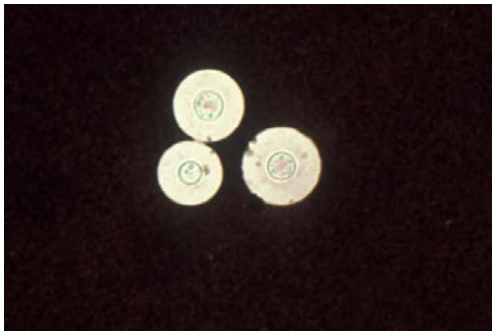
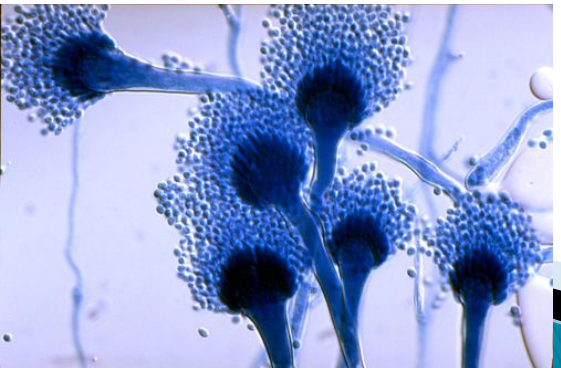
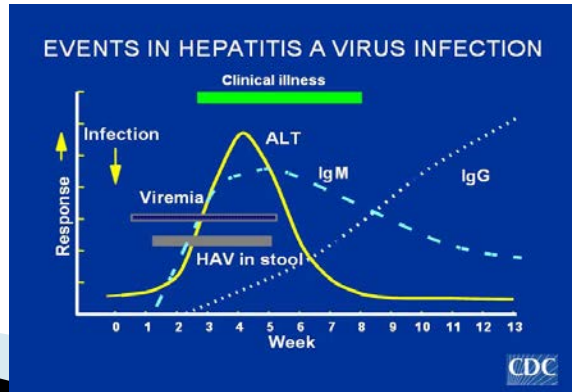
New developments



- Pilot in Fungal biomarkers
- Pilot in cryptococcal antigen
- Molecular detection of Bordetella pertussis and other respiratory pathogens.
- Mycology workshop
- HEV serology
- HEV RNA qualitative/quantitative detection





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EQA benefits

- Maintain and improve analytical quality
- Improve inter-laboratory agreement and raise

Ongoing monitoring of EQA performance using an accredited EQA scheme will help to reduce laboratory errors, produce accurate patient test results and most importantly improve patient care.

- Educational stimulus (rarely encountered organisms)