ERNDIM

QUALITY ASSURANCE IN LABORATORY TESTING FOR IEM

2018 Participant Survey Report:

[2017 scheme year]

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1. Introduction

- Participants (789 contacts from 397 centres) were sent the link to the ERNDIM Participant Survey on the Survey Monkey website (www.surveymonkey.com) on 18th January 2018. We asked participants to answer questions relating to the 2017 EQA schemes. The closing date for the survey was 2nd March 2018.

2. Summary

- Thank you to everyone who took the time to complete this survey. This report is a summary of all the responses we received. The results from the survey will help us to continue to improve the quality and efficiency of the ERNDIM EQA schemes.
- 48% of the laboratories that participated in the 2017 schemes responded to the survey with the response rate for each of the schemes being between 38-69%.
- The survey has again highlighted areas where we need to improve such as low sample volume for some of the qualitative schemes. Some participants are also unhappy with the analyte concentrations in some schemes and specific comments from ERNDIM for the relevant schemes can be found in the summary of 'Remarks, comments or suggestions for improvements' on pages 10 to 13.
- However it is gratifying to see that 95% of respondents rate the quality of products and services we provide as 'excellent' or 'good' and that 69% of respondents believe that the quality of service we offer is getting better. We will continue to make further improvements to the service that we offer as we work towards applying for accreditation.
- We are still working towards moving all the qualitative schemes to website reporting and website reporting for the Qualitative Organic Acids scheme is launching in 2018. The aim is to implement this for the second submission round of the 2018 CDG scheme and the Acylcarnitines in DBS scheme is planned to move to website reporting in 2019.
- The issue of sample volume is more difficult. The schemes that use real clinical samples as the EQA materials are dependent on the Scientific Advisors sourcing suitable clinical samples of sufficient volume either by direct contact with clinicians or via donations from participating laboratories. However we are investigating alternative routes for sample donation. Information on the types of samples that would be useful to ERNDIM can be found on the website (www.erndim.org) under EQA schemes\sample donations. If you would be interested in donating a sample please contact the Administration Office.
- We are especially pleased that so many of you took the time to complete the survey and to send comments on the schemes. We hope you find the summary where we answer some of your comments, interesting (see pages 10 to 13) and we would welcome any other comments or suggestions for improvements.

3. Survey Responses

- 195/789 contacts from 190/397 centres in 51 countries responded to the survey. The response rate by centre was 48% (compared to 60% in the last survey) and the individual response rate was 25% (compared to 34% in the last survey).

Question 1: Please rate the following aspects for each of the ERNDIM quality assurance schemes that you subscribe to

- Number of centre responses = 190 centres (= 97% of all responses)
- The response rate for each EQA scheme is shown in Figure 1 and Table 2. For the individual schemes the highest response rate was for Pterins in Urine (69% of 2017 scheme participants) and the lowest was for Special Assays in Serum (38% of 2017 scheme participants). The response rate for all EQA schemes was lower than in the 2017 survey (= 2016 scheme year, Figure 1).

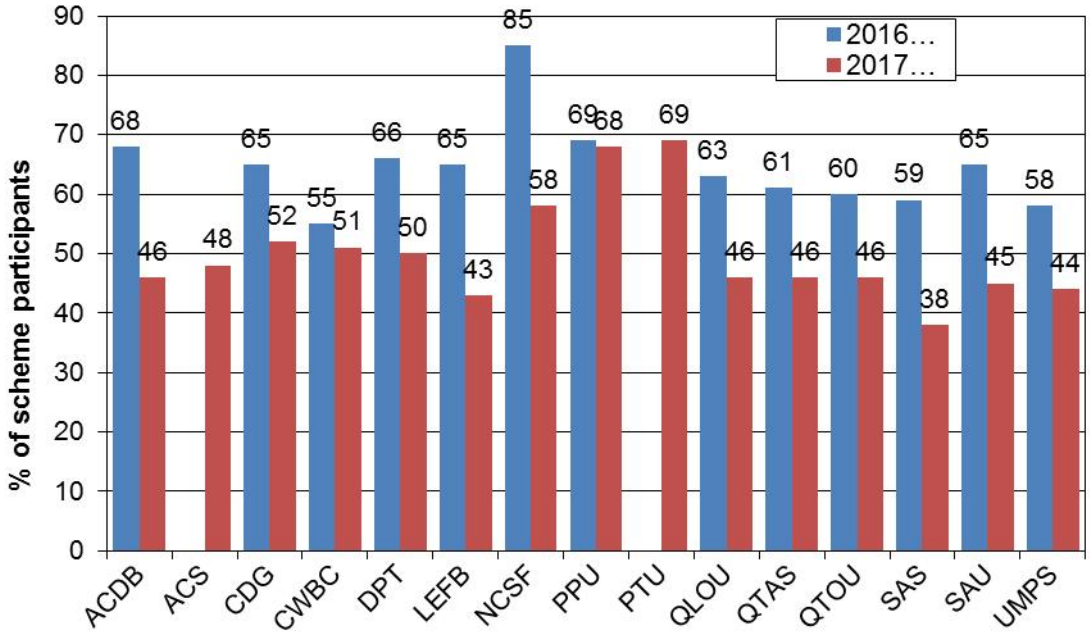


Figure 1. Survey responses per EQA scheme (Question 1) as a percentage of the EQA scheme participants
[no data for ACS and PTU for 2016 scheme year as 2017 was the first year this scheme ran as a full EQA scheme]

Key

EQA Scheme	Code	EQA Scheme	Code
Acylcarnitines in DBS	ACDB	Pterins in urine	PTU
Acylcarnitines in serum	ACS	Qualitative organic acids (urine)	QLOU
Congenital disorders of glycosylation	CDG	Quantitative amino acids (serum)	QTAS
Cystine in white blood cells	CWBC	Quantitative organic acids (urine)	QTOU
Diagnostic Proficiency Testing (urine)	DPT	Special assays - serum	SAS
Lysosomal storage enzymes (fibroblasts)	LEFB	Special assays - urine	SAU
Neurotransmitters in CSF	NCSF	Urine Mucopolysaccharides	UMPS
Purines & pyrimidines (urine)	PPU		

- Participants were asked to rate the following aspects of each scheme:
  - Frequency of samples
  - Appropriateness of analyte concentration
  - Website display
  - Value for money
  - Sample volume
  - Adequacy of the report
  - Usefulness of the annual report
  - Billing arrangements
- Each of the aspects of individual EQA schemes was rated according to the following scoring system:
  1 = Excellent 2 = Good 3 = Poor 4 = Very poor
- The average scores per scheme since 2001 are shown in Table 1 and Figure 2 and scores ≤ 1.5 are highlighted in blue and scores ≥ 2.0 are highlighted in red.
- The overall score for all aspects of all schemes was 1.7 (see Table 1), which is the same as in the 2017 survey. Seven of the EQA schemes had the same score as in the 2017 survey, 1 scheme had a worse score than the 2017 survey (NCSF) and 5 schemes had better scores (CDG, DPT, LEFB, SAS and UMPS).
- The best scoring scheme was ACS, which all scored 1.6. The worst scoring schemes were NCSF and PTU which scored 1.9.
- The scores for each scheme in each of the individual aspects are given in Table 2. The score for 7 out of the 8 of the individual aspects have improved or stayed the same since the 2017 survey, while 'Sample volume' received a slightly worse score than the 2017 survey.
- The worst scoring aspect was 'Sample volume' which scored 1.9; with the best scoring aspect being 'Frequency of samples' which scored 1.6.
- The score for 'Sample volume' is slightly worse than in 2017 (1.9 compared to 1.8) with CDG scoring 2.6, NCSF scoring 2.1, PTU scoring 2.2 and UMPS scoring 2.0. While the score for 'Sample volume' did not improve for any schemes between 2017 and 2018 it remained unchanged for 5 schemes (ACDB, DPT, QLOU, QTOU and SAU. The best score for 'Sample volume' was for the ACS scheme which was added to the survey in 2018 and scored 1.5.

Table 1. Average scores per scheme (Question 1) *[See Figure 1 for key to scheme codes]*

	Average Scores										
EQA Scheme	**2018**	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**	**2007**	**2004**	**2001**
All schemes	**1.7**	**1.7**	**1.7**	**1.8**	**1.7**	**1.7**	**1.7**	**1.8**	**1.7**	**2.0**	**2.0**
ACDB	1.8	1.8	1.9	1.9	2.0	1.9	1.9	2.0	2.0	2.3	-
ACS	1.6	-	-	-	-	-	-	-	-	-	-
CDG	1.8	1.9	1.9	2.0	2.0	1.9	1.8	1.9	-	-	-
CWBC	1.7	1.7	1.7	1.8	1.8	1.6	1.7	1.6	1.4	-	-
DPT	1.6	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.7	2.0	2.0
LEFB	1.7	1.8	1.9	1.9	2.0	1.9	2.0	2.1	-	-	-
NCSF	1.9	1.7	-	-	-	-	-	-	-	-	-
PPU	1.7	1.7	1.8	1.8	1.7	1.7	1.7	1.9	1.6	1.8	2.1
PTU	1.9	-	-	-	-	-	-	-	-	-	-
QLOU	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	2.0	1.9
QTAS	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.7	1.9	2.0
QTOU	1.7	1.7	1.7	1.8	1.7	1.7	1.7	1.9	1.7	1.9	2.1
SAS	1.7	1.8	1.8	1.7	1.7	1.7	1.7	1.8	1.7	1.8	2.0
SAU	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.9	2.1
UMPS	1.7	1.8	1.7	1.8	1.8	1.8	1.8	-	-	-	-

- The 'Sample volume' score for CDG, was again the worst score in the survey. It scored slightly worse in 2018 compared to previous years (2.6 in 2018, 2.4 in 2017, 2.5 in 2016 and 2015, 2.6 in 2014).
- There were a further 6 scores over 2.0 in this survey. The other 3 scores of 2.0 or more were ACDB ('Website display' = 2.2), NCSF ('Sample volume' = 2.1; 'Value for money' = 2.0), PTU ('Sample volume' = 2.2; 'Value for money' = 2.0) and UMPS ('Sample volume' = 2.0).
- The best scores of the whole survey (all 1.5) were for 'Frequency of samples' (ACS, CWBC, DPT, LEFB, QTOU and SAU), 'Sample volume' (ACS), 'Adequacy of report' (DPT) and 'Usefulness of the annual report' (DPT, QLOU and UMPS).

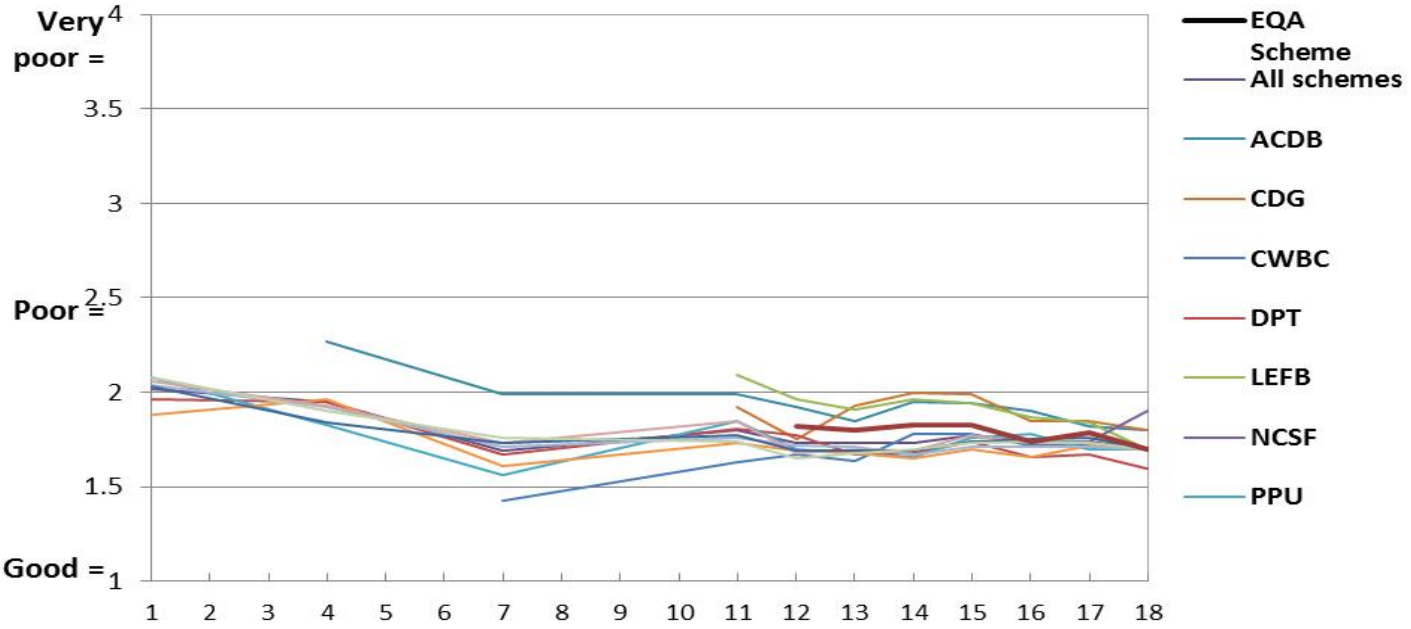


Figure 2. Average score per EQA scheme (Question 1) *[See Figure 1 for key to scheme codes]*

Table 2: Average scores per aspect of each scheme (Question 1) *[See Figure 1 for key to scheme codes]*

Scheme Aspects / EQA Schemes	Frequency of samples	Sample volume	Appropriateness of analyte concentration	Adequacy of the report	Website display	Usefulness of the annual report	Value for money	Billing arrangements	Average per scheme	No. of responses (% of scheme participants)
ACDB	1.9	1.8	1.7	1.7	2.2	1.8	1.8	1.7	1.8	61 (45.6%)
ACS	1.5	1.5	1.7	1.6	1.6	1.6	1.6	1.6	1.6	46 (48.4%)
CDG	1.8	2.6	1.7	1.7	1.9	1.7	1.9	1.6	1.8	37 (51.5%)
CWBC	1.5	1.8	1.7	1.8	1.8	1.7	1.9	1.6	1.7	19 (50.7%)
DPT	1.5	1.8	1.6	1.5	1.9	1.5	1.6	1.7	1.6	59 (50.1%)
LEFB	1.5	1.8	1.7	1.7	1.7	1.6	1.8	1.7	1.7	33 (43.0%)
NCSF	1.7	2.1	1.8	1.9	1.9	1.8	2.0	1.9	1.9	17 (57.8%)
PPU	1.6	1.6	1.7	1.8	1.8	1.7	1.8	1.7	1.7	37 (67.6%)
PTU	1.6	2.2	1.9	1.9	1.8	1.8	2.0	1.9	1.9	21 (68.8%)
QLOU	1.6	1.9	1.7	1.6	1.9	1.5	1.8	1.7	1.7	111 (46.2%)
QTAS	1.6	1.7	1.7	1.6	1.7	1.6	1.9	1.8	1.7	129 (45.8%)
QTOU	1.5	1.6	1.8	1.6	1.7	1.7	1.8	1.7	1.7	63 (45.9%)
SAS	1.6	1.7	1.8	1.6	1.7	1.7	1.8	1.7	1.7	99 (37.6%)
SAU	1.5	1.8	1.7	1.6	1.6	1.6	1.8	1.7	1.7	85 (44.5%)
UMPS	1.6	2.0	1.9	1.6	1.7	1.5	1.7	1.6	1.7	49 (44.4%)
Average for all schemes	**1.6**	**1.9**	**1.7**	**1.7**	**1.8**	**1.7**	**1.8**	**1.7**	1.7	189 (47.6%)

Questions 2 to 10: Analytes in Quantitative Schemes

- A total of 66 individuals (34%) made suggestions for analytes to be added to or removed from the Quantitative schemes.
- Where possible we do try to incorporate suggestions for additional analytes but unfortunately this is not always possible. A summary of the suggestions for analytes to added or removed, with some responses from ERNDIM, is on page 6.

Q.2: Quantitative amino acids (66 responses, 33.8% of all respondents)

Suggested Analytes to be added		Suggested Analytes to be removed	
Total suggested = 22		Total suggested = 9	
Analytes with >1 response		**Analytes with >1 response**	
argininosuccinic acid	n = 11	Homocysteine	n = 8
phosphoethanolamine	n = 5	2-Aminobutyric acid	n = 2
sulphocysteine	n = 4	Asparagine	n = 2
Homocystine	n =2	Homocitrulline	n = 2
Tryptophane	n = 2		

ERNDIM Response:

- Argininosuccinic acid has been included in the 2018 samples.
- The addition of phosphoethanolamine was trialled in 2016 but it was not stable.

Q.3: Quantitative organic acids (15 responses, 7.7% of all respondents)

Suggested Analytes to be added		Suggested Analytes to be removed
Total suggested = 45		Total suggested = 0
Analytes with >1 response		**All Analytes suggested**
3-hydroxy-n-butyric acid	n = 5	
3hydroxypropionic acid	n = 4	
4OHphenylacetic	n = 3	
isovalerylglycine	n = 3	
Lactic acid	n = 3	
malonic acid	n = 3	
propionylglycine	n = 3	
suberylglycine	n = 3	
2-methyl-3-hydroxy-butyric acid	n = 2	
2-methylbutyrrilglycine	n = 2	
3-methylcrotonylglycine	n = 2	
4 phenylpyruvic	n = 2	
dodecanedioc	n = 2	
homogentisic acid	n = 2	
Orotic acid	n = 2	
phenylacetic	n = 2	
succinic	n = 2	

Q.4: Purines & pyrimidines (3 responses, 1.5% of all respondents)

Suggested Analytes to be added		Suggested Analytes to be removed
Total suggested = 3		Total suggested = 0
Analytes with >1 response		**All Analytes suggested**
SAICAR	n = 2	
succinyladenosine	n = 3	

ERNDIM Response:

- SAICAR is not available commercially and it is not financially viable to manufacture it privately.

Q.5: Lysosomal Enzymes (8 responses, 4.1% of all respondents)

Suggested Analytes to be added		Suggested Analytes to be removed	
Total suggested = 8		Total suggested = 2	
Analytes with >1 response		**All Analytes suggested**	
iduronate sulphatase	n = 3	HEXA	n = 1
arylsulfatase A	n = 2	sphingomyelinase	n = 1
TPP1 LAL	n = 2		

Q.6: Special assays – serum (20 responses, 10.3% of all respondents)

Suggested Analytes to be added		Suggested Analytes to be removed	
Total suggested = 27		Total suggested = 3	
Analytes with >1 response		**All Analytes suggested**	
desmosterol	n = 4	7-Ketocholesterol	n = 1
camposterol	n = 3	Cholestane-3b,5a,6b-triol	n = 1
Biotinidase	n = 2	Pyruvic acid	n = 1
C26:1	n = 2		
Carnitine total	n = 2		
lanosterol	n = 3		
lathosterol	n = 3		
lysosphingomyelin	n = 2		
sitosterol	n = 3		

ERNDIM Response:

Suggested additions

- Biotinidase - Enzyme activity, not commercially available analyte. It cannot be added. EQA for Biotinidase in dried blood spots is available in Newborn Screening Quality Assurance Program, Atlanta (www.cdc.gov/nsqap)
- C26:1 - Rejected by SAB (March 2018)
- Carnitine total - Recorded the data in AC serum scheme for comparison
- Desmosterol - Addition not commercially feasible - Rejected by SAB (Nov 2016)
- Lanosterol, sitosterol, lathosterol, camposterol - Rejected by SAB (March 2018)
- Lysosphingomyelin - Rejected by SAB (March 2018)

Suggested removals

- 7-Ketocholesterol: Marker for diagnosis and follow-up of Niemann-Pick type C disease spiked since 2014. There are 8-10 labs reporting results.
- Cholestanetriol: Marker for diagnosis and follow-up of Niemann-Pick type C disease spiked since 2014. There are 10-13 labs reporting results.

Q.7: Special assays – urine (10 responses, 5.1% of all respondents)

Suggested Analytes to be added		Suggested Analytes to be removed	
Total suggested = 14		Total suggested = 4	
Analytes with >1 response		**All Analytes suggested**	
a-Aminoadipicacidsemialdehyde	n = 2	Glycolic acid	n = 2
Carnitine total	n = 2	Lactic acid	n = 1
		Orotic acid	n = 1
		Succinylacetone	n = 1

ERNDIM Response:

Suggested additions

- 2-aminoadipic-semialdehyde (2-AASA) - Not commercial available. Rejected by SAB (Nov 2016)
- Carnitine total - Rejected by SAB (March 2018)

Suggested removals

- The following analytes will not be considered for removal from the scheme:
  - Glycolic acid: 26-28 labs report results.
  - Orotic acid: approximately 100 labs report results.
  - Succinylacetone: marker for Tyrosinemia type I, over 50 labs report results.

Q.8: Neurotransmitters – CSF (4 responses, 2.1% of all respondents)

Suggested Analytes to be added		Suggested Analytes to be removed
Total suggested = 4		Total suggested = 0
Analytes with >1 response		**All Analytes suggested**
Biopterin	n = 2	
Neopterin	n = 2	

Q.9: Pterins – Urine (3 responses, 1.5% of all respondents)

Suggested Analytes to be added		Suggested Analytes to be removed
Total suggested = 3		Total suggested = 0
All analytes suggested		**All Analytes suggested**
Sepiapterin	n = 2	
BH2	n = 1	
NH2	n = 1	

Q.10: Acylcarnitines – Serum (3 responses, 1.5% of all respondents)

Suggested Analytes to be added	Suggested Analytes to be removed
Total suggested = 15	Total suggested = 0
Analytes with >1 response	**All Analytes suggested**

None of the suggested analytes had a response of >1

Question 11: Do you have any other remarks, comments or suggestions for any of the schemes you subscribed to?

- Number of individual responses = 54 (= 28.4% of all responses).
- These comments are summarised on pages 10 to 13 with the comments made in response to Q18.

Question 12: ERNDIM is considering a possible pilot scheme for the monitoring of drug responses in plasma. If this pilot was launched would your laboratory be interested in participating in it?

- A total of 169/195 respondents (86.7%) answered the question asking whether they would be interested in participating in a drug response in plasma pilot scheme if it were to be established. Of these responses 42/169 (24.9%) said yes they would be interested in participating in this type of pilot scheme.

Question 13: If you answered yes to question 12, please indicate which, if any, of the following analytes you would be interested in submitting results for.

- 21/42 (50%) said they would like NBTC to be included
- 15/42 (35.7%) would like to see Phenylbutyrate to be included
- 9/42 (21.4%) would like Cysteamine to be included.

Respondents were asked to suggest any other drugs they would like to see included in a pilot scheme of this type. Twenty suggestions were made by 10 respondents.

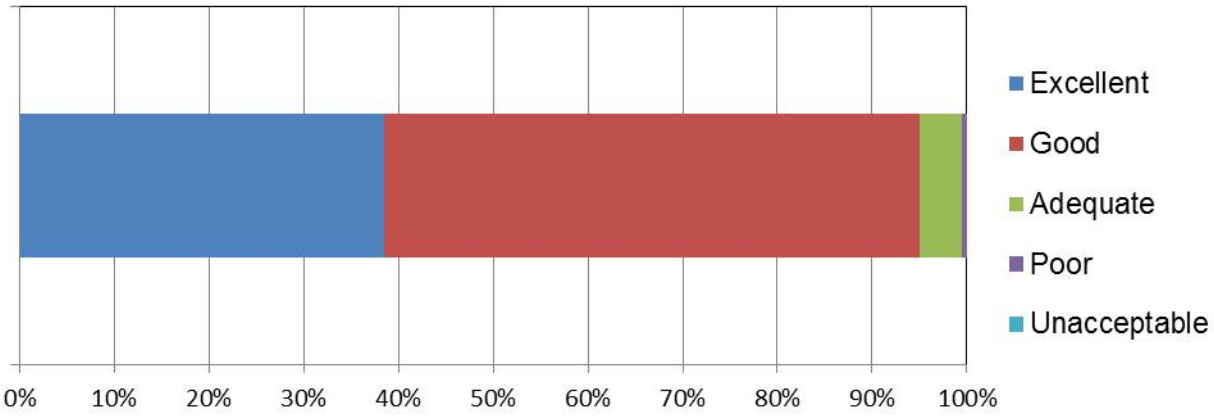
amphetamines	n=2	immunosuppressant drugs	n=1
anti-epileptics	n=1	lyso-Gb3	n=1
aspirin	n=1	metamphetamines	n=1
benzodiazepines	n=1	opiates	n=1
buphrenorphines	n=2	succinyl acetone	n=1
clopidogrel	n=1	tacrolimus	n=1
cyclosporin A	n=1	thc	n=2
delta9-thc	n=1	toxicology	n=1
drug of abuse	n=2	Tricyclic Antidepressants	n=1
Enzyme replacement therapy	n=1	warfarin	n=1

Questions 14 to 17: Comments on the overall performance of ERNDIM

- The aim of this section is to assess participants' perception of the overall performance of ERNDIM.
- In summary:
  - 95% of respondents rated the quality of services provided by ERNDIM as 'excellent' or 'good'; with 94% of respondents having 'complete' or 'a lot' of confidence that ERNDIM can deliver the service required by participants.
  - 69% of respondents agreed that overall ERNDIM's performance is 'getting better' or 'getting much better'; with 97% of respondents stating that it was 'certain' or 'very likely' that they would use ERNDIM services in the future.

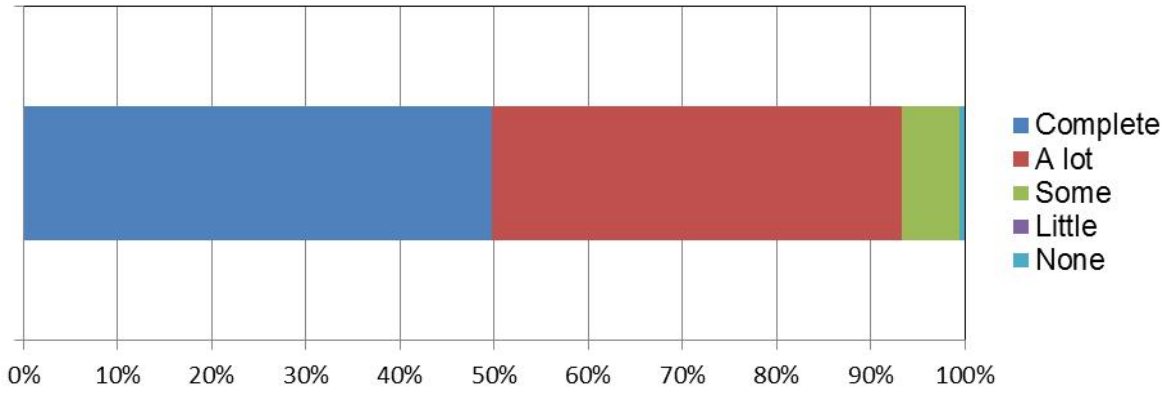
Q.14: Overall, how do you rate the quality of products and services we provide?

(179 individual responses, 92% of all responses for this section)



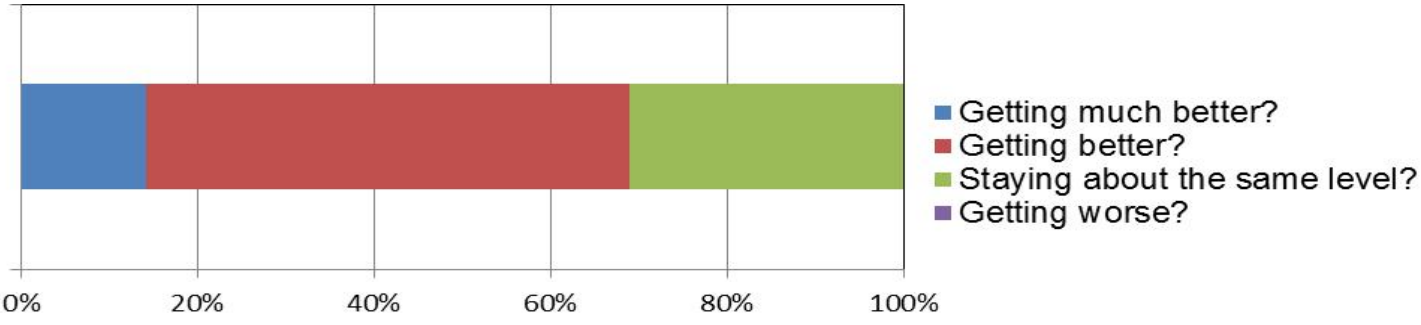
Q.15: What level of confidence do you have in us to deliver the products and services that you require?

(179 individual responses, 92% of all responses for this section)

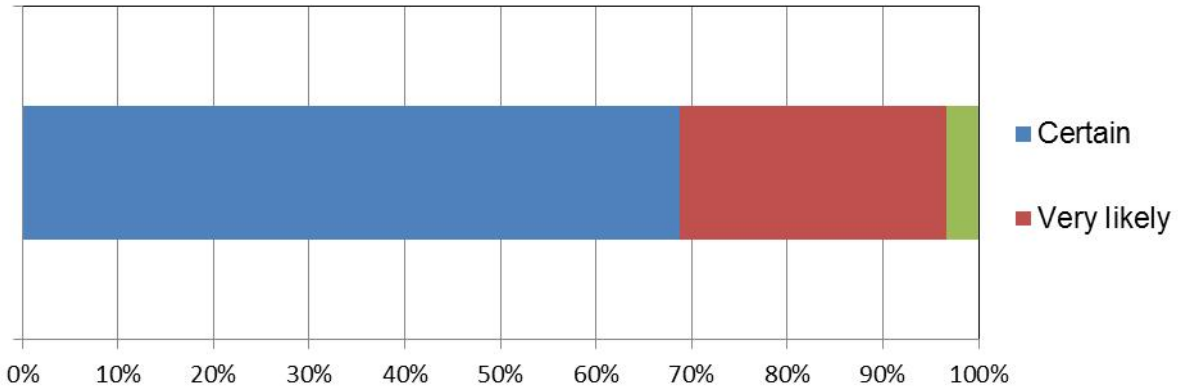


Q.16: Overall, is our performance...

(177 individual responses, 91% of all responses for this section)



Q.17: Based on our performance, how likely is it that you will use us in the future?
(179 individual responses, 92% of all responses)



Question 18: Do you have any other remarks, comments or suggestions for how we could improve the services we provide?

- Number of individual responses = 54 (= 28% of all responses).
- These comments are summarised below with the comments made in response to Q9.

Questions 9 & 18: Remarks, comments or suggestions for improvements

- Total number of responses was 73 from 53 individuals (= 37% of all responses).
- There were a large number of comments and suggestions for improvement. Below is a summary of some of the most frequent comments with responses from ERNDIM.

Participant Comment	ERNDIM Response
1. Administration	
• Why do you split the participant's website from that of results submission?	• The results websites are managed by subcontractors which organise some of the EQA schemes on ERNDIM's behalf while the Registration website is managed by the Administration Office. It is not currently possible for us to combine these different websites.
• Would it be possible to receive separate yearly certificates for each scheme? Other labs ask us for certificate for certain tests they send us but don't need to see all other tests	• It is not possible for us to issue separate certificates of participation for each EQA scheme. It is important that any accreditation body inspecting a participating laboratory know that they are seeing the certificate of participation for all the EQA schemes that ERNDIM provides.
• I hope your CERTIFICATE of PARTCIPATION every year send us more early because our laboratory summary need.	• We have made changes to the EQA scheme calendar which allowed the 2017 Certificates of Participation to be published in May 2018 (2016 & 2015 certificated were both issued in June of the following years). Further changes have been made to the 2018 calendar with the aim of allowing earlier circulation of the 2018 certificates in spring 2019.
2. EQA Schemes	
2.1. General	
• We would prefer if the submission dates are equally distributed over the year. The pause from December to March is too long.	• For the quantitative scheme, the gap in EQA (November – March) relates to organisation issues. This cannot be changed easily however, we are working on a modified scheme calendar which will partially address this. • For the qualitative schemes, sample availability is the main reason for the gaps long between the end one scheme year and the beginning of the next.
• It would be better to suggest the references (published articles) to follow the procedures for performing assays. If standard operating procedures are followed, there would be less chances of errors in all participating laboratories. Quality will be improved for interpretation of the results.	• There are a small number of method documents on www.erndim.org under Training & Education/Educational Documents. However we recognise that these need to be updated and further documents added. The Scientific Advisors for all the EQA schemes are reviewing the methods and references that apply for the analytes in their schemes. We'll publish the updated/new documents on the website as they become available.

Participant Comment	ERNDIM Response
2.2. Sample Volume	
• Urine volume in DPT and in MPS should be increased.	• This is difficult for us to do as real patient samples are used. If you have a large volume urine sample that could be suitable for use as an EQA material that you would like to donate it to ERNDIM, please contact the Admin office who will send you details of how to do this.
• Larger volume of sample for qualitative urine organic acid test.	
• Service is satisfactory except CDG diagnostic because of small sample volume.	• This scheme uses real clinical samples and at least 3ml plasma is needed for each sample. The difficulty obtaining suitable samples of a large enough volume means that the volume per EQA sample is restricted. It is possible to order additional sample volume at a reduced fee but the availability of this is limited. The Scientific Advisor is investigating alternate sources for samples however there are also regularly appeals to participants for sample donations but with few responses. Please contact the Administration office if you would be interested in donating a sample.
2.3. Website reporting	
• Website reporting of qualitative organic acids, qualitative acylcarnitines and CDG would be a major improvement.	• Online results submission for the Qualitative Organic Acids scheme was introduced for the first 2018 submission round onwards. The results website for the Acylcarnitines in DBS and CDG schemes are in development and the aim is to make these available in 2019.
2.4. CDG scheme	
• Are 6 samples per year necessary? 4 may be sufficient.	• The CDG scheme follows the same scheme design as some of the other qualitative schemes which have 2 submission deadlines of 3 samples each. This allows for some redundancy in case of any issues with an individual sample.
2.5. CWBC scheme	
• There was leakage from most of the vials for cystine measurement.	• We are aware of this issue and apologise for any problems this has caused. There was a problem with the vials used for the EQA schemes which the scheme organiser is investigating. We have sent replacement vials to all the labs that have reported broken vials to us so no laboratory should be disadvantaged by this issue.
2.6. DPT scheme	
• In DPT schemes 3 weeks is slightly too little for us. If possible, then 4 weeks would be better.	• It is felt that extending the testing period would not be representative of testing of patient samples.
• We would like to get a YES or NO when we offer a sample for Proficiency testing	• We are sorry if you did not receive a reply to an offer to donate a sample for use as EQA material. We note that this case has been resolved but if it happens again please do contact the Admin Office so we can contact the relevant Scientific Advisor regarding the delay.
2.7. Lysosomal Enzymes in fibroblasts	
• A control sample would be useful to calculate relative activity rather than raw activity, considering the methods variations between labs.	• The participants for this scheme will be sent a survey over the summer which will ask questions about possible improvements to the scheme design, including the possible inclusion of a control sample.
• Since we do not assay all of the lysosomal enzymes in the survey, we do not provide a diagnosis. The survey does fulfil our needs as far as an alternate proficiency survey for the enzymes that we do report, however, the annual report and scoring do not reflect our labs performance since we do not submit all information.	• The annual report and scoring for this scheme do take account that not all labs submit results for all the enzymes. The calculation for satisfactory performance is based on the lab's total score as a percentage of their maximum possible score (the number of enzymes results were submitted for x 4 points).
2.8. Neurotransmitters in CSF	
• Our lab feels much more confident reporting CSF Neurotransmitters and Urinary Pterins as a result of the ERNDIM QAP. We are quite grateful for your efforts	• Thank you for your positive comments regarding this scheme.

Participant Comment	ERNDIM Response
2.9. Pterins in Urine	
• Real samples for pterins in urine	• Unfortunately this is not possible due to the difficulty sourcing clinical samples of sufficient volume to be used as EQA samples.
2.10. Purines and Pyrimidines	
• Urate (and creatinine) not added to P&P scheme and should be removed from list as this is confusing and misleading - discussed with scientific advisor	• Urate and creatinine are not added to the samples but are present in the sample matrix so they are not present at a range of concentrations. However, values for Urate and creatinine can be submitted to the results website to allow comparison between labs. We will update the information for this scheme in the EQA catalogue to make this clearer.
2.11. Qualitative Organic Acids.	
• To provide more interesting cases for qualitative organic acids. We observed most of the samples were repeat cases in previous cycles	• This scheme uses real clinical samples as the EQA materials and it can be difficult to source suitable clinical samples of sufficient volume. If you have a large volume urine samples could be suitable for use as an EQA material and you would like to donate it to ERNDIM please contact the Admin office who will send you details of how to do this.
2.12. Quantitative Amino Acids	
• if possible please, cover the analytical measuring range from 5-2500 umol/L for all analyte of all amino acids	• The concentrations of the analytes in each Quantitative scheme are reviewed by the Scientific Advisor on an annual basis and are designed to reflect the range of concentrations that would be experienced in clinical testing.
• We would appreciate if also the medical assessment of the analysis was included in your amino acid scheme. If not for every sample, at least a couple of times a year.	• The samples in this scheme are spiked serum samples and not clinical samples. The samples are not designed to replicate clinical situations so a 'medical assessment' cannot be provided.
2.13. Special Assays in serum	
• NEFA in SAS: all samples have similar concentrations	• NEFA and Cholesterol are not added to the samples but are present in the serum matrix used to produce the samples so they are not present at a range of concentrations. However, due to demand from participants NEFA and Cholesterol values can be submitted to the results website to allow comparison between labs.
• Cholesterol in Special Assays in Serum, it would be interesting to test (at least) 2 different concentrations	
• The concentrations of methylmalonic acid in serum should also be lower (in the normal range). Now all samples are above the normal range.	• MMA concentrations are basal and above normal range as approved by the SAB.
2.14. Special Assays in urine	
• The s-sulfocysteine in the special assays in urine is always in the normal range. I would also like to see a sample with an elevated amount of the analyte as one would expect to see in an actual patient with this disorder.	• The Scientific Advisor has confirmed that the added amounts are above normal range
• For SA-U, we use MS/MS for the MPS. We noticed only CS is spiked. It would be nice if DS/HS/KS were also spiked and available for separate quantification/reporting. Currently the MPS and Swiss PT schemes are useful for qualitative reporting of those analytes but it would be nice to be able to check the quantification of all four analytes at routine intervals.	• The SAB will look into the possibilities to include DS, HS and KS in the scheme at their next meeting.
• Oxalic acid, glycolic acid and glyceric acid in one survey	• These analytes are all included in 2018 Special Assays in Urine samples.
2.15. Urine MPS	
• We would like clinical information also for the MPS scheme	• The SAB has decided not to include clinical information for the UMPS scheme as this is a method oriented scheme.

Participant Comment	ERNDIM Response
3. Suggestions for future schemes	We do welcome suggestions for future schemes but unfortunately it is not possible to cater for every request.
• Lysosomal Enzymes in DBS pilot scheme.	• Unfortunately, it will not be possible to reintroduce this pilot scheme unless sufficient samples to run the scheme are donated by participating labs as there is a lack of suitable clinical materials to use as the EQA materials. Please contact the Administration office if you would be interested in donating a sample.
• A pterins in CSF scheme would be very helpful • I would like a VEQ Scheme for urinary steroid profile and PUFA	• These suggestions will be raised at the next SAB meeting.

Question 19 Please complete your name and institute address details.

- Number of individual responses = 162 (= 83% of all responses).