

External Quality Assurance (EQA) of G6PD Quantitative Test

Survey No. : RH2017-01
Sample sent : [24 set](#)

Sample sent on : 2017/02/13
Results reported (%) : 23 (96%)

Reporting deadline : 2017/02/20

- 1. [Summary report on this EQA survey](#)
- 2. [The distribution of G6PD reported in this survey](#)
- 3. [The distribution of Hb reported in this survey](#)
- 4. [Long term observation of inter laboratory CV vs. surveys](#)
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- 6. [Deviation graph for individual laboratory](#)

Summary Report of G6PD and Hemoglobin (Hb) Quantitative Test Results

Lab	Referral Hosp.	Report (day)	Sample 1				Sample 2				Sample 3				Hb 1 (g/dL)	Hb 2 (g/dL)	Hb 3 (g/dL)
			(U/gHb)	D%	z score	SDI	(U/gHb)	D%	z score	SDI	(U/gHb)	D%	z score	SDI			
F02	F02	5	5.2	20.9%	2.9	2.3	12.6	13.5%	1.9	1.5	13.2	21.1%	3.0	2.3	2.0	2.2	1.9
F03	F03	4	4.2	-2.3%	-0.3	-0.2	11.1	0.0%	0.0	-0.2	10.9	0.0%	0.0	-0.1	2.2	2.1	2.0
F04	F04	4	3.9	-9.3%	-1.3	-1.0	10.8	-2.7%	-0.4	-0.6	8.5	-22.0%	-3.1	-2.7	2.3	2.3	2.0
F05	F05	7	4.9	14.0%	1.9	1.5	12.5	12.6%	1.8	1.4	11.5	5.5%	0.8	0.5	2.0	1.9	1.9
F07	F07	7	4.1	-4.7%	-0.6	-0.5	10.7	-3.6%	-0.5	-0.7	10.3	-5.5%	-0.8	-0.7	2.3	2.3	2.2
F08	F08	4	4.0	-7.0%	-1.0	-0.8	10.6	-4.5%	-0.6	-0.8	10.7	-1.8%	-0.3	-0.3	2.9	2.9	2.3
F09	F09	5	4.3	0.0%	0.0	0.0	11.2	0.9%	0.1	-0.1	11.1	1.8%	0.3	0.1	2.1	2.1	2.0
F10	F10	7	4.2	-2.3%	-0.3	-0.2	11.1	0.0%	0.0	-0.2	10.7	-1.8%	-0.3	-0.3	2.3	2.4	2.1
F11	F11	7	3.2	-25.6%	-3.5	-2.8	8.2	-26.1%	-3.7	-3.6	7.9	-27.5%	-3.9	-3.3	3.0	3.2	2.9
F12	F12	7	4.8	11.6%	1.6	1.3	12.4	11.7%	1.7	1.3	12.1	11.0%	1.6	1.2	2.3	2.4	2.1
F13	F13	7	4.5	4.7%	0.6	0.5	11.7	5.4%	0.8	0.5	10.6	-2.8%	-0.4	-0.4	2.5	2.5	2.2
F14	F14	7	4.8	11.6%	1.6	1.3	11.8	6.3%	0.9	0.6	12.3	12.8%	1.8	1.4	2.5	2.4	2.0
F15	F15	4	4.7	9.3%	1.3	1.0	12.7	14.4%	2.1	1.6	12.2	11.9%	1.7	1.3	2.4	2.2	2.0
F16	F16	7	4.9	14.0%	1.9	1.5	12.3	10.8%	1.5	1.1	12.4	13.8%	2.0	1.5	2.3	2.3	2.0
F17	F17	4	4.2	-2.3%	-0.3	-0.2	11.7	5.4%	0.8	0.5	11.3	3.7%	0.5	0.3	2.2	2.2	2.1
F18	F18	4	4.1	-4.7%	-0.6	-0.5	11.1	0.0%	0.0	-0.2	10.3	-5.5%	-0.8	-0.7	2.3	2.3	2.1
F19	F19	4	4.1	-4.7%	-0.6	-0.5	10.7	-3.6%	-0.5	-0.7	10.3	-5.5%	-0.8	-0.7	2.3	2.2	2.0
F20	F20	2	4.3	0.0%	0.0	0.0	10.8	-2.7%	-0.4	-0.6	10.9	0.0%	0.0	-0.1	2.6	2.7	2.3
F21	F21	4	3.9	-9.3%	-1.3	-1.0	10.5	-5.4%	-0.8	-0.9	10.4	-4.6%	-0.7	-0.6	2.3	2.3	2.0
F22	F22	4	4.1	-4.7%	-0.6	-0.5	10.5	-5.4%	-0.8	-0.9	10.7	-1.8%	-0.3	-0.3	2.1	2.2	1.9
F23	None	N.R.	N.R.	N.R.%	N.R.	N.R.	N.R.	N.R.%	N.R.	N.R.	N.R.	N.R.%	N.R.	N.R.	N.R.	N.R.	N.R.
F24	F24	7	4.3	0.0%	0.0	0.0	10.7	-3.6%	-0.5	-0.7	10.6	-2.8%	-0.4	-0.4	2.2	2.3	2.0
F25	F25	7	4.3	0.0%	0.0	0.0	11.4	2.7%	0.4	0.1	11.2	2.8%	0.4	0.2	2.2	2.2	2.0
F26	F26	4	4.3	0.0%	0.0	0.0	11.0	-0.9%	-0.1	-0.3	11.0	0.9%	0.1	0.0	2.2	2.3	2.0
Total participating laboratories = 24																	
Xa (Median)	-	5	4.3				11.1				10.9				2.3	2.3	2.0
u _{Xa}	-	-	0.092				0.200				0.216				-	-	-
σ _p	-	-	-				0.777				0.763				-	-	-
σ _{p'}	-	-	0.315				-				-				-	-	-
Range	-	2-7	3.2-5.2				8.2-12.7				7.9-13.2				2.0-3.0	1.9-3.2	1.9-2.9
n	-	-	23				23				23				23	23	23
Mean	-	-	4.3				11.3				11.0				2.3	2.3	2.1
S.D.	-	-	0.40				0.87				0.94				0.19	0.16	0.12
C.V.	-	-	9.3%				7.7%				8.5%				8.3%	7.0%	5.7%

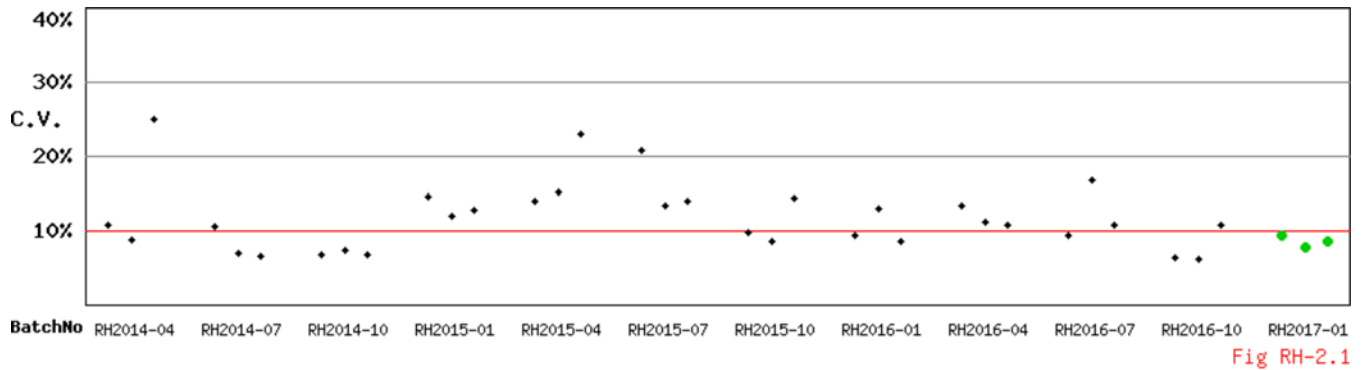
Note:

1. $D\% = [(X - X_a) / X_a] \times 100\%$; X = Your Results , X_a = Assigned value
2. u_{X_a} = uncertainty of the assigned value. $u_{X_a} = 1.1 \times SD / n^{1/2}$
3. SD for proficiency assessment (σ_p) = 7% x X_a ; but while X_a < 2.9 U/gHb, $\sigma_p = 0.2$ U/gHb
4. Adjusted SD for proficiency assessment ($\sigma_{p'}$) = $(\sigma_p^2 + u_{X_a}^2)^{1/2}$. $\sigma_{p'}$ is used for proficiency assessment when $u_{X_a} > 0.3\sigma_p$
5. z score = D / σ_p ; D = X - X_a, σ_p = SD for proficiency assessment
6. SDI = $(X - Mean) / SD$; SD = standard deviation of peer group ; SDI is not calculated when SD equals 0
7. The assigned value (X_a) is the **median** of all the results reported of this EQA sample
8. Robust results (Mean and SD) were calculated by Algorithm A according to ISO 13528
9. The evaluation criteria for measurement result of each specimen : Acceptable : $|z| \leq 2$; Caution : $2 < |z| \leq 3$; Unsatisfactory : $|z| > 3$
10. Maximum Allowable Deviation (MAD) = $3 \times (\sigma_p / X_a) \times 100\%$ or $3 \times (\sigma_{p'} / X_a) \times 100\%$ when $u_{X_a} > 0.3\sigma_p$

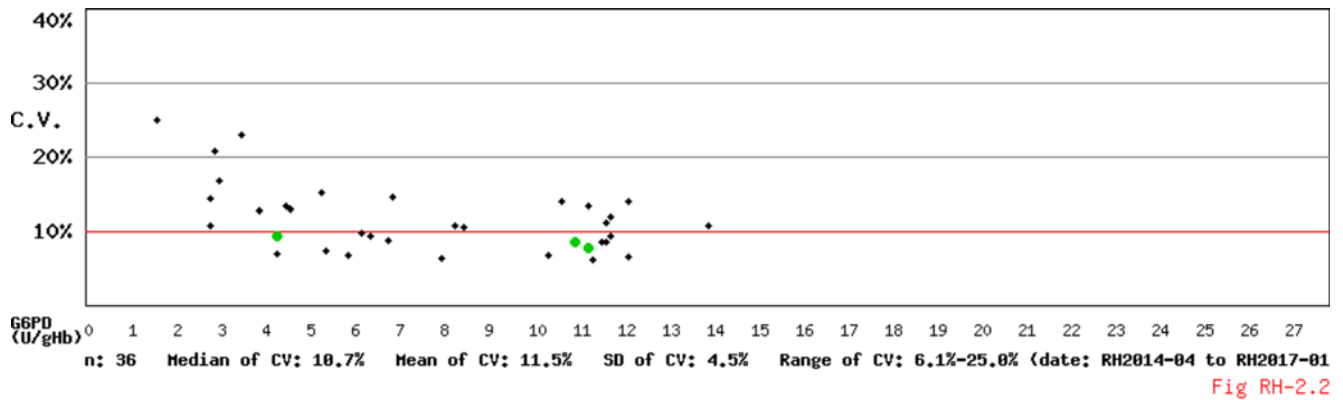
Long Term Observation of Blood G6PD Quantitative Test EQA Survey Results

Survey No : RH2017-01 (in green ●)

- Total participants' CV result plotted against surveys



- Total participants' CV result plotted against G6PD activities



* Mean and SD are calculated by Robust method according to ISO 13528 since 2014

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(Report generated at 2017-02-22 20:50:04)

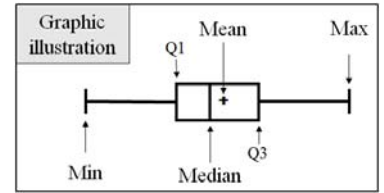
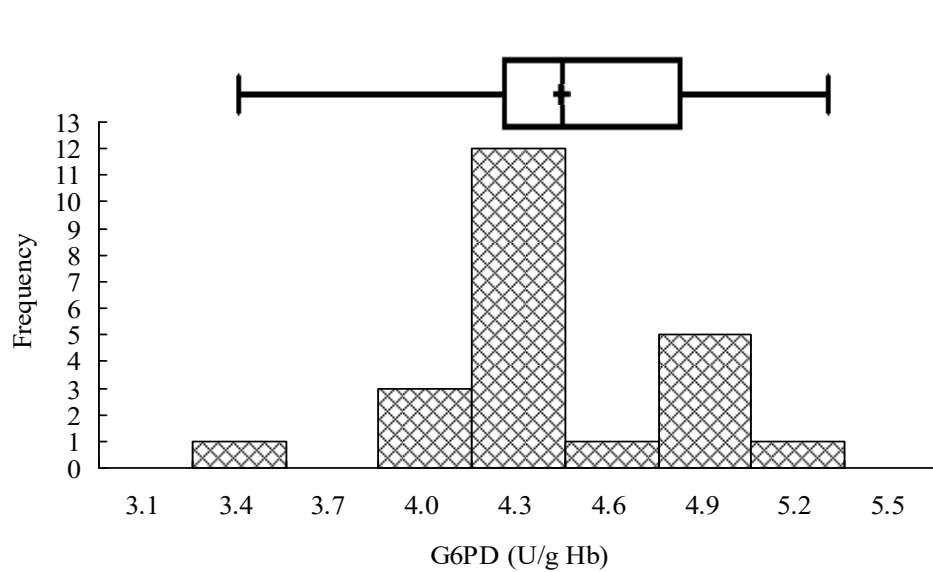
RH2017-01 Distribution of G6PD Test Results

Survey No. : RH2017-01

Sample sent on : 2017/02/13

Reporting deadline : 2017/02/20

Results reported (%) : 96%



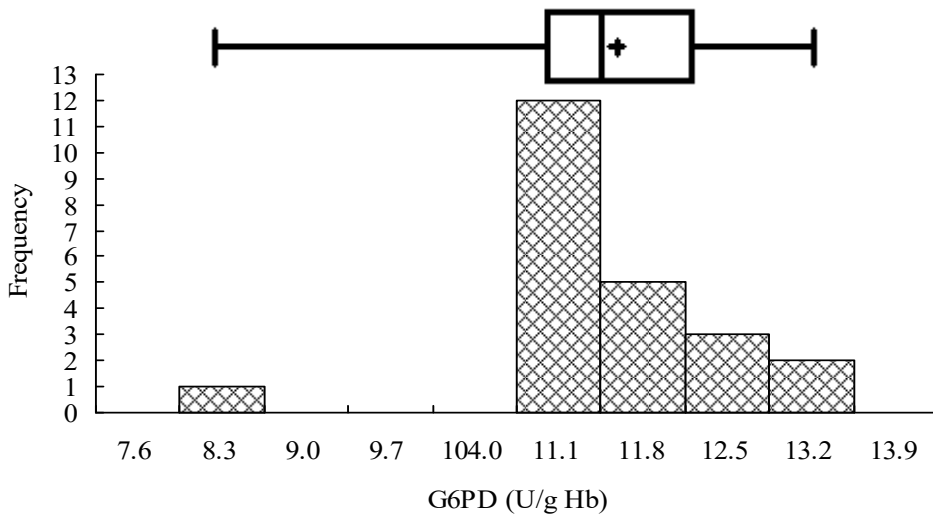
Sample 1

Median = 4.3 (n = 23)

Mean* = 4.3 (n = 23)

SD* = 0.40

CV = 9.3%



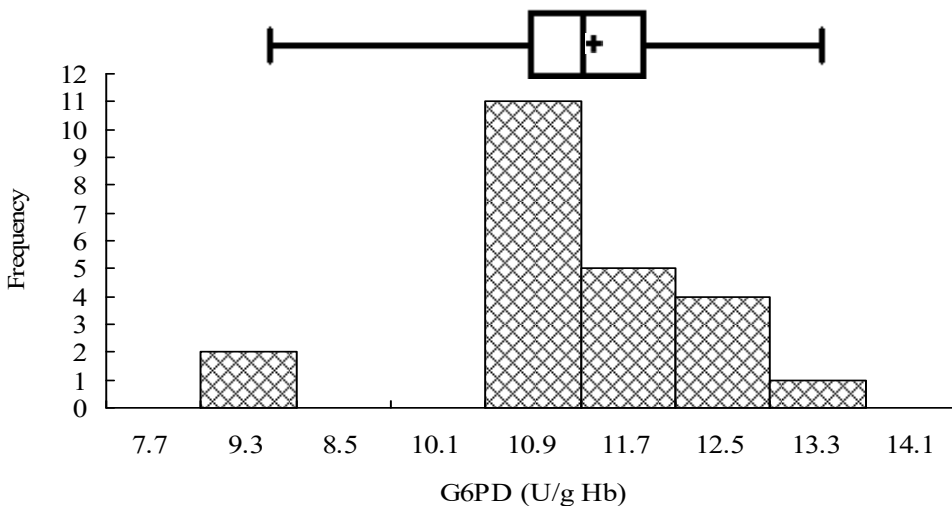
Sample 2

Median = 11.1 (n = 23)

Mean* = 11.3 (n = 23)

SD* = 0.87

CV = 7.7%



Sample 3

Median = 10.9 (n = 23)

Mean* = 11.0 (n = 23)

SD* = 0.94

CV = 8.5%

*Robust results (Mean and SD) were calculated by Algorithm A according to ISO 13528

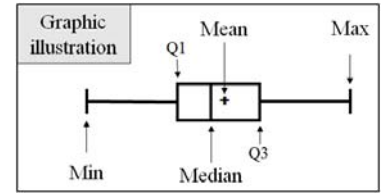
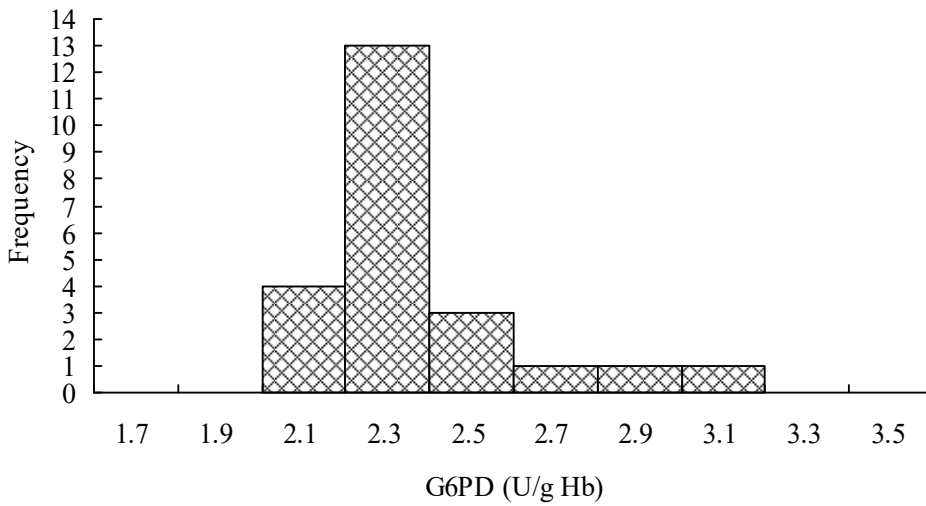
RH2017-01 Distribution of Hb Test Results

Survey No. : RH2017-01

Sample sent on : 2017/02/13

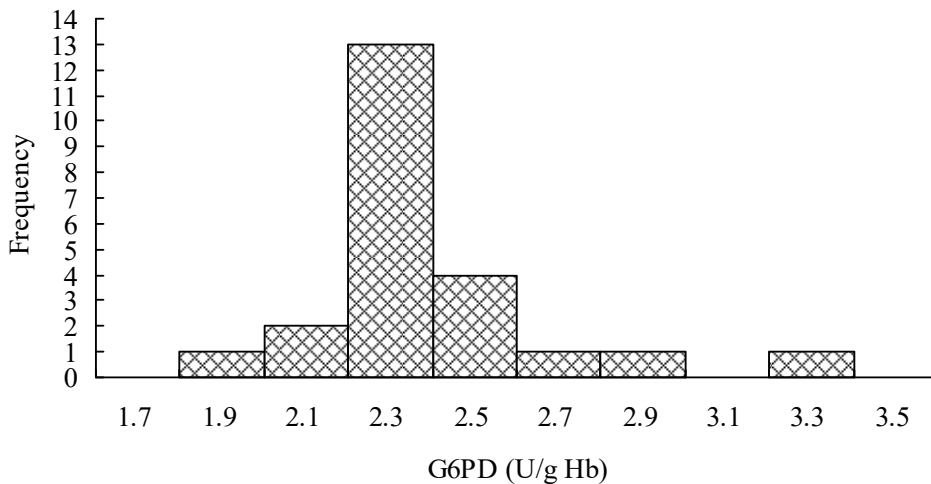
Reporting deadline : 2017/02/20

Results reported (%) : 96%



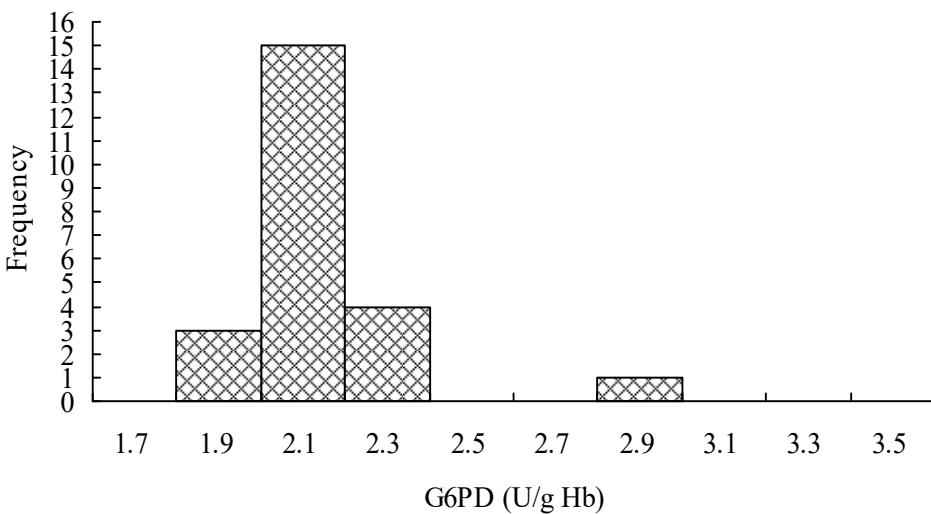
Sample 1

Median = 2.3 (n = 23)
Mean* = 2.3 (n = 23)
SD* = 0.19
CV = 8.3%



Sample 2

Median = 2.3 (n = 23)
Mean* = 2.3 (n = 23)
SD* = 0.16
CV = 7.0%



Sample 3

Median = 2.0 (n = 23)
Mean* = 2.1 (n = 23)
SD* = 0.12
CV = 5.7%

*Robust results (Mean and SD) were calculated by Algorithm A according to ISO 13528

External Quality Assurance (EQA) Program for G6PD Quantitative Test in Philippines

Survey No. : RH2017-01 Sample sent on : 2017 / 02 / 13

Reporting deadline : 2017 / 02 / 20

This Survey [S2](#) has been used in 2013-2017 (n = 6 ; Survey / Sample No.) :

[RH2013-11/S1](#) ; [RH2014-07/S3](#) ; [RH2015-10/S2](#) ; [RH2016-07/S1](#) ; [RH2016-10/S2](#) ; [RH2017-01/S2](#)

Intermediate Measurement Precision of G6PD Quantitative Test

Lab	Survey : RH2017-01 / Sample 2		Program period: 2013 ~ 2017²			
	U/gHb	SDI ¹	Mean	n	SD	CV
F02	12.6	0.1	12.4	6	1.47	11.9%
F03	11.1	0.2	11.0	6	0.52	4.7%
F04	10.8	0.0	11.6	6	1.16	10.0%
F05	12.5	-	12.7	6	0.87	-
F07	10.7	-1.4	11.3	6	0.44	3.9%
F08	10.6	-1.4	11.8	6	0.87	7.4%
F09	11.2	0.0	11.2	6	1.03	9.2%
F10	11.1	-0.5	11.8	6	1.54	13.1%
F11	8.2	-4.3	11.9	6	0.87	7.3%
F12	12.4	0.1	12.3	6	1.61	13.1%
F13	11.7	0.5	11.4	6	0.59	5.2%
F14	11.8	0.8	10.9	5	1.17	10.7%
F15	12.7	1.1	11.5	6	1.10	9.6%
F16	12.3	0.2	12.2	5	0.59	4.8%
F17	11.7	—	—	4	—	—
F18	11.1	—	—	4	—	—
F19	10.7	—	—	4	—	—
F20	10.8	—	—	4	—	—
F21	10.5	—	—	4	—	—
F22	10.5	—	—	4	—	—
F24	10.7	—	—	3	—	—
F25	11.4	—	—	3	—	—
F26	11.0	—	—	2	—	—
Total participating laboratories = 23						
Median	11.1	0.06	11.7	—	0.95	9.2%
Range	8.2 ~ 12.7	-4.25 ~ 1.09	10.9 ~ 12.7	—	0.44 ~ 1.61	3.9% ~ 13.1%

1). Standard Deviation Index (SDI) = (Individual Result - Individual Mean) / Individual SD

2). Survey / Sample No. : [RH2013-11/S1](#) ; [RH2014-07/S3](#) ; [RH2015-10/S2](#) ; [RH2016-07/S1](#) ; [RH2016-10/S2](#) ; [RH2017-01/S2](#)

* Intermediate Measurement Precision : ISO 3534-2:2006, JCGM 200:2012 (VIM, 3rd ed.) 2.23

** Mean and SD are calculated by Robust method according to ISO 13528

*** n < 5, NOT calculated Mean and SD