

**External Quality Assurance (EQA) of G6PD Quantitative Test**

Survey No. : RH2015-01  
Sample sent : [21 set](#)

Sample sent on : 2015/01/26  
Results reported (%) : 20 (95%)

Reporting deadline : 2015/02/02

- |   |   |
|---|---|
| 1. <a href="#">Summary report on this EQA survey</a>                | 4. <a href="#">Long term observation of inter laboratory CV vs. surveys</a>         |
| 2. <a href="#">The distribution of G6PD reported in this survey</a> | 5. <a href="#">Long term observation of inter laboratory CV vs. G6PD activities</a> |
| 3. <a href="#">The distribution of Hb reported in this survey</a>   | 6. <a href="#">Deviation graph for individual laboratory</a>                        |

**Referral Hosp. 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			
F01	F01	7	13.3	92.8%	13.3	6.4	10.9	-6.0%	-0.9	-0.6	9.3	132.5%	18.9	10.8	0.1	0.2	0.2
F02	F02	3	9.0	30.4%	4.3	2.1	15.7	35.3%	5.0	2.8	4.6	15.0%	2.1	1.4	1.6	1.9	1.9
F03	F03	5	6.4	-7.2%	-1.0	-0.5	10.6	-8.6%	-1.2	-0.9	4.0	0.0%	0.0	0.2	2.0	2.2	2.2
F04	F04	7	7.2	4.3%	0.6	0.3	13.0	12.1%	1.7	0.9	4.2	5.0%	0.7	0.6	2.3	2.5	2.5
F05	F05	3	6.0	-13.0%	-1.9	-0.9	10.8	-6.9%	-1.0	-0.7	3.7	-7.5%	-1.1	-0.4	2.1	2.3	2.3
F06	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.
F07	F07	7	5.9	-14.5%	-2.1	-1.0	10.6	-8.6%	-1.2	-0.9	3.3	-17.5%	-2.5	-1.2	2.5	2.7	2.6
F08	F08	4	7.0	1.4%	0.2	0.1	12.7	9.5%	1.4	0.6	4.1	2.5%	0.4	0.4	2.4	2.1	2.4
F09	F09	7	7.3	5.8%	0.8	0.4	13.3	14.7%	2.1	1.1	4.3	7.5%	1.1	0.8	2.2	2.4	2.5
F10	F10	2	7.3	5.8%	0.8	0.4	12.5	7.8%	1.1	0.5	4.0	0.0%	0.0	0.2	2.2	2.5	2.6
F11	F11	2	6.0	-13.0%	-1.9	-0.9	10.6	-8.6%	-1.2	-0.9	3.4	-15.0%	-2.1	-1.0	2.1	2.3	2.4
F12	F12	7	7.4	7.2%	1.0	0.5	11.8	1.7%	0.2	0.0	4.1	2.5%	0.4	0.4	2.4	2.6	2.7
F13	F13	6	8.1	17.4%	2.5	1.2	14.8	27.6%	3.9	2.1	4.6	15.0%	2.1	1.4	2.0	2.1	2.3
F14	F14	5	5.7	-17.4%	-2.5	-1.2	10.2	-12.1%	-1.7	-1.1	3.4	-15.0%	-2.1	-1.0	2.2	2.4	2.5
F15	F15	3	6.1	-11.6%	-1.7	-0.8	11.3	-2.6%	-0.4	-0.4	3.7	-7.5%	-1.1	-0.4	2.3	2.5	2.5
F16	F16	7	6.8	-1.4%	-0.2	-0.1	12.3	6.0%	0.9	0.4	4.1	2.5%	0.4	0.4	2.1	2.4	2.5
F17	F17	2	7.4	7.2%	1.0	0.5	12.9	11.2%	1.6	0.8	4.1	2.5%	0.4	0.4	2.2	2.4	2.4
F18	F18	3	6.3	-8.7%	-1.2	-0.6	10.7	-7.8%	-1.1	-0.8	3.6	-10.0%	-1.4	-0.6	2.2	2.5	2.4
F19	F19	7	7.5	8.7%	1.2	0.6	11.0	-5.2%	-0.7	-0.6	3.7	-7.5%	-1.1	-0.4	2.2	2.4	2.3
F20	F20	7	5.7	-17.4%	-2.5	-1.2	10.1	-12.9%	-1.8	-1.2	3.2	-20.0%	-2.9	-1.4	2.2	2.5	2.5
F21	F21	8	6.6	-4.3%	-0.6	-0.3	12.6	8.6%	1.2	0.6	3.9	-2.5%	-0.4	0.0	2.1	2.4	2.4
Total participating laboratories = 21																	
Xa (Median)	-	5.5	6.9				11.6				4.0				2.2	2.4	2.4
σ <sub>p</sub>	-	-	0.483				0.812				0.28				-	-	-
Range	-	2-8	5.7-13.3				10.1-15.7				3.2-9.3				0.1-2.5	0.2-2.7	0.2-2.7
n	-	-	20				20				20				20	20	20
Mean	-	-	6.9				11.8				3.9				2.2	2.4	2.4
S.D.	-	-	1.0				1.4				0.5				0.2	0.2	0.2
C.V.	-	-	14.5%				11.9%				12.8%				9.1%	8.3%	8.3%

Note:

- $D\% = [(X - X_a) / X_a] \times 100\%$ ; X = Your Results, X<sub>a</sub> = Assigned value
- $z \text{ score} = D / \sigma_p$ ; D = X - X<sub>a</sub>,  $\sigma_p$  = SD for proficiency assessment
- $SDI = (X - \text{Mean}) / SD$ ; SD = standard deviation of peer group
- The assigned value (X<sub>a</sub>) is the **median** of all the results reported of this EQA sample
- SD for proficiency assessment ( $\sigma_p$ ) = 7% x X<sub>a</sub>; but while X<sub>a</sub> < 2.9 U/gHb,  $\sigma_p$  = 0.2
- Robust results (Mean and SD) were calculated by Algorithm A according to ISO 13528:2005
- Acceptable :  $|z| \leq 2$ ; Caution :  $2 < |z| \leq 3$ ; Unsatisfactory :  $|z| > 3$
- Maximum Allowable Deviation (MAD) =  $3 \times (\sigma_p / X_a) \times 100\%$

[Ordered by Referral Hosp.](#)



**Newborn Screening QA Program**  
[Preventive Medicine Foundation](#)



[Newborn Screening Reference Center](#)  
[National Institutes of Health](#)



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# Long Term Observation of Blood G6PD Quantitative Test QA Survey Results

Survey No : RH2015-01 (in green ●)

- Total participants' CV result plotted against surveys

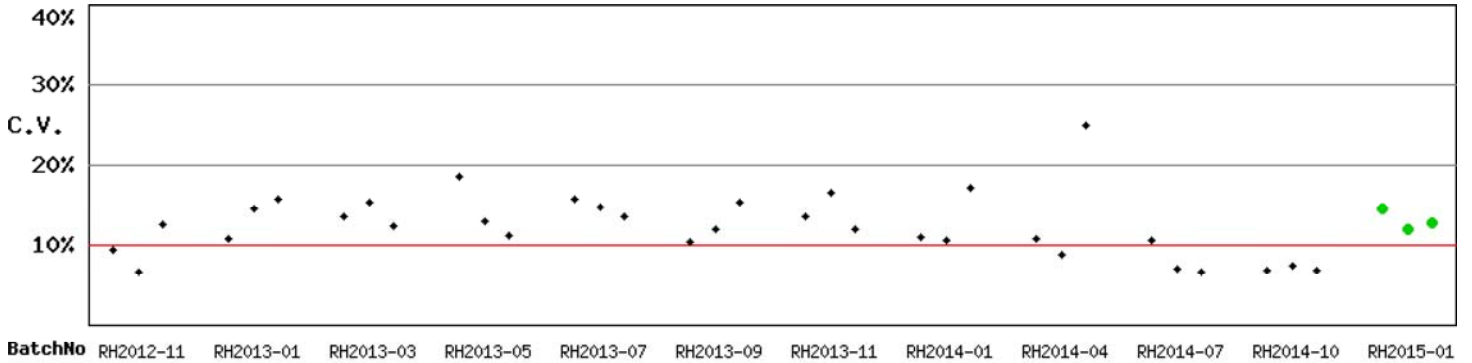
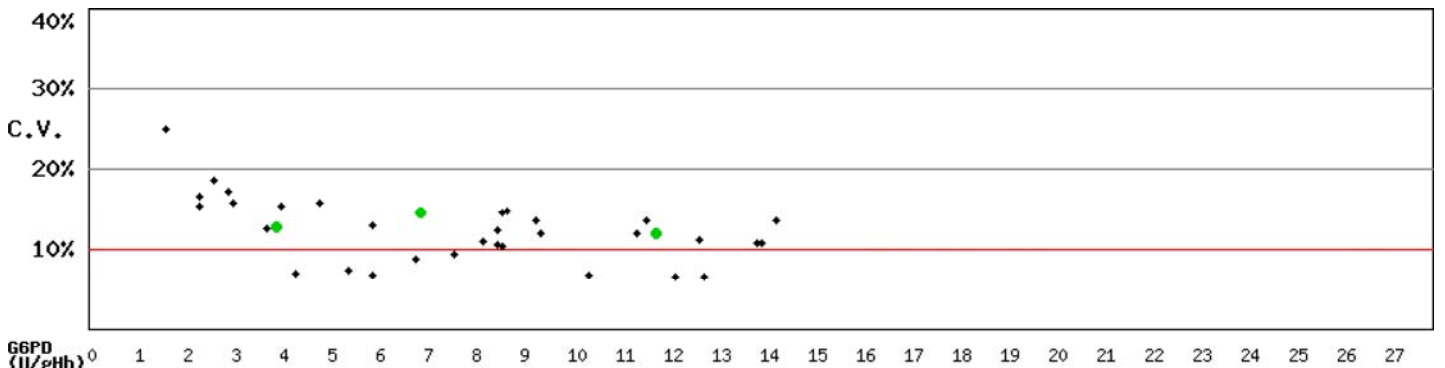


Fig RH-2.1

- Total participants' CV result plotted against G6PD activities



n: 36 Median of CV: 12.2% Mean of CV: 12.4% SD of CV: 3.9% Range of CV: 6.6%-25.0% (date: RH2012-11 to RH2015-01)

Fig RH-2.2

\* Mean and SD are calculated by Robust method according to ISO 13528:2005 since 2014

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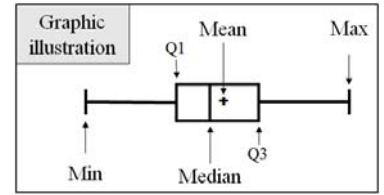
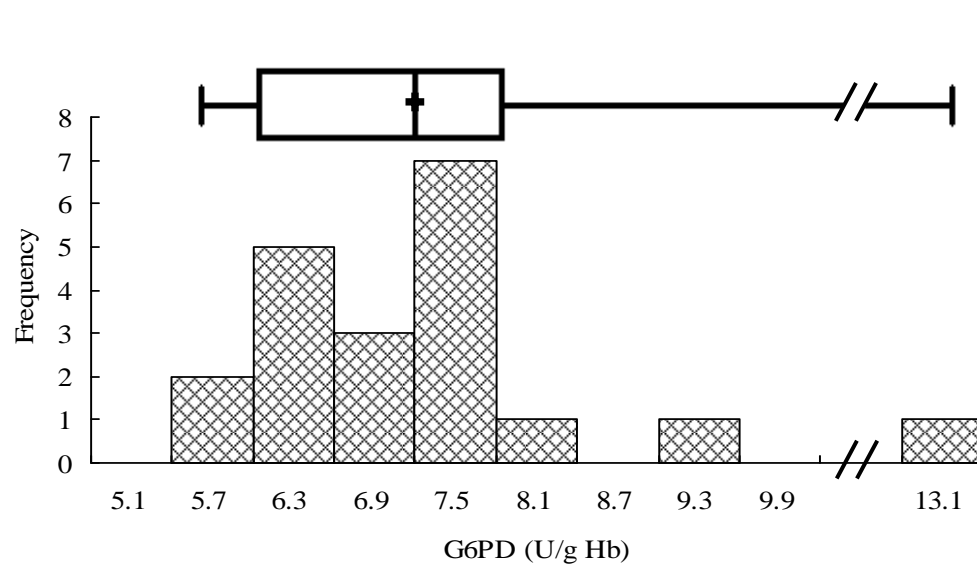
# RH2015-01 External Quality Assurance -G6PD

Survey No. : RH2015-01

Sample sent on : 2015/01/26

Reporting deadline : 2015/02/02

Results reported (%) : 95.2%



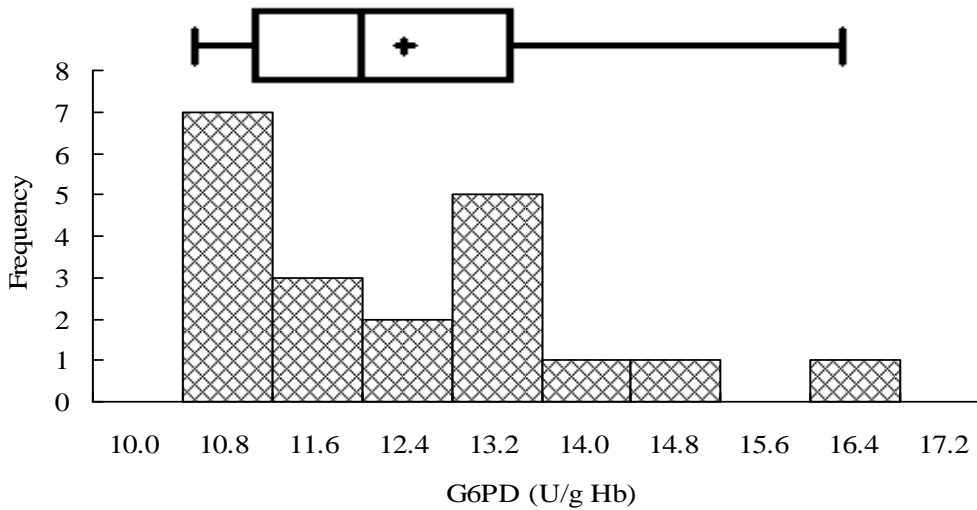
### Sample 1

**Median = 6.9 (n = 20)**

**Mean\* = 6.9 (n = 20)**

**SD\* = 1.0**

**CV = 14.5%**



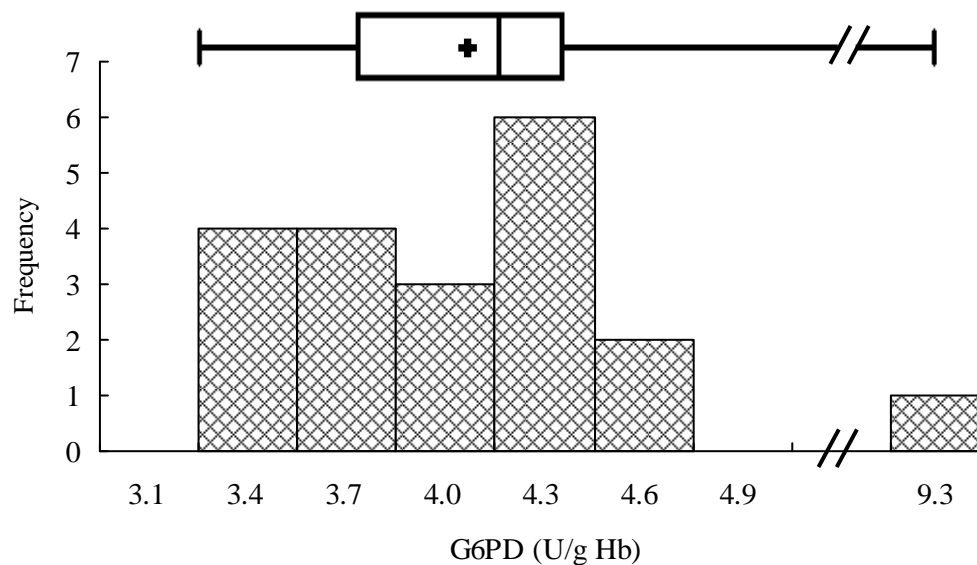
### Sample 2

**Median = 11.6 (n = 20)**

**Mean\* = 11.8 (n = 20)**

**SD\* = 1.4**

**CV = 14.8%**



### Sample 3

**Median = 4.0 (n = 20)**

**Mean\* = 3.9 (n = 20)**

**SD\* = 0.5**

**CV = 12.8%**

\*Robust results ( Mean and SD ) were calculated by Algorithm A according to ISO 13528:2005

Fig PHIQ-3

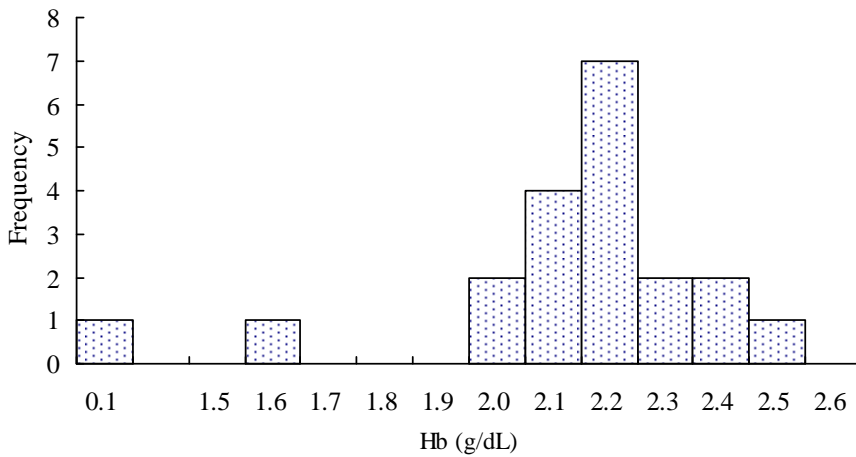
# RH2015-01 External Quality Assurance -Hb

Survey No. : RH2015-01

Sample sent on : 2015/01/26

Reporting deadline : 2015/02/02

Results reported (%) : 95.2%



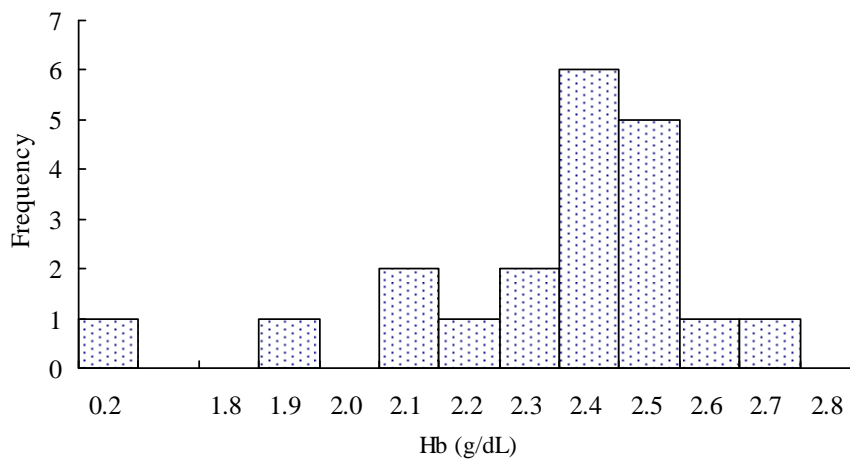
## Sample 1

**Median = 2.2 (n = 20)**

**Mean\* = 2.2 (n = 20)**

**SD\* = 0.2**

**CV = 9.1%**



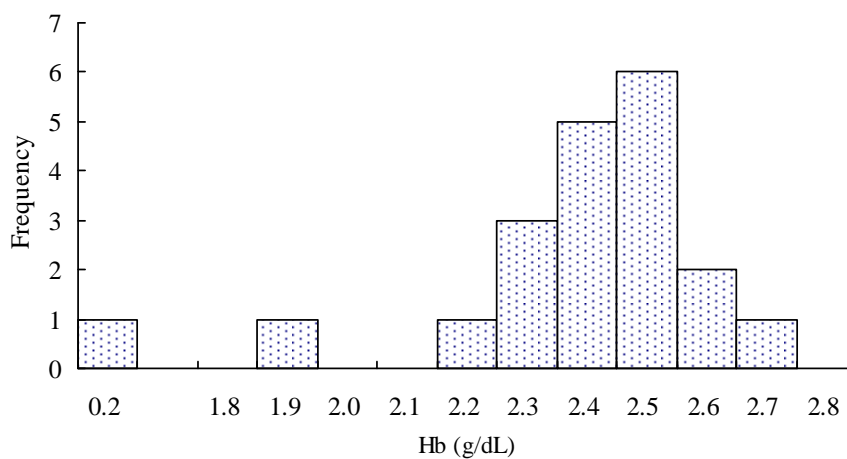
## Sample 2

**Median = 2.4 (n = 20)**

**Mean\* = 2.4 (n = 20)**

**SD\* = 0.2**

**CV = 8.3%**



## Sample 3

**Median = 2.4 (n = 20)**

**Mean\* = 2.4 (n = 20)**

**SD\* = 0.2**

**CV = 8.3%**

\*Robust results ( Mean and SD ) were calculated by Algorithm A according to ISO 13528:2005

Fig PHIQ-4

# External Quality Assurance (EQA) Program

## for

### G6PD Quantitative Test in Philippines

Survey No. : RH2015-01

Sample sent on : 2015 / 01 / 26

Reporting deadline : 2015 / 02 / 01

This Survey [S1](#) has been used in 2009-2014 (n = 7 ; Survey / Sample No.) :

[RH2009-11/S1](#) ; [RH2010-01/S2](#) ; [RH2011-03/S1](#) ; [RH2011-07/S1](#) ; [RH2012-09/S2](#) ; [RH2013-05/S2](#) ; [RH2014-04/S2](#) ; [RH2015-01/S1](#)

### Intermediate Measurement Precision of G6PD Quantitative Test

Lab	Survey : <a href="#">RH2015-01 / Sample 2</a>		Program period: <a href="#">2009 ~ 2015<sup>2</sup></a>			
	U/gHb	SDI <sup>1</sup>	Mean	n	SD	CV
F01	13.3	3.8	6.9	7 <sup>3</sup>	1.7	24.6%
F02	9.0	2.1	7.5	8	0.7	9.3%
F03	6.4	-0.6	7.9	8	2.4	30.4%
F04	7.2	0.3	7.1	7 <sup>4</sup>	0.4	5.6%
F05	6.0	-1.2	7.5	8	1.3	17.3%
F06	-	-	7.4	6 <sup>5</sup>	0.8	10.8%
F07	5.9	-0.7	7.0	8	1.5	21.4%
F08	7.0	0.1	6.9	8	0.8	11.6%
F09	7.3	0.3	6.6	7 <sup>4</sup>	2.7	40.9%
F10	7.3	1.3	6.0	8	1.0	16.7%
F11	6.0	-0.6	6.7	4	1.1	16.4%
F12	7.4	0.6	6.7	4	1.2	17.9%
F13	8.1	1.0	6.7	3	1.4	20.9%
F14	5.7	-0.5	5.8	2	0.2	3.4%
F15	6.1	-0.8	6.4	2	0.4	6.3%
F16	6.8	—	—	1	—	—
F17	7.4	—	—	1	—	—
F18	6.3	—	—	1	—	—
F19	7.5	—	—	1	—	—
F20	5.7	—	—	1	—	—
F21	6.6	—	—	1	—	—
Total participating laboratories = 21						
Median	6.9	0.2	6.9	—	1.1	16.7%
Range	5.7 ~ 13.3	-1.2 ~ 3.8	5.8 ~ 7.9	—	0.2 ~ 2.7	3.4% ~ 40.9%

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

2). Survey / Sample No. : [RH2009-11/S1](#) ; [RH2010-01/S2](#) ; [RH2011-03/S1](#) ; [RH2011-07/S1](#) ; [RH2012-09/S2](#) ; [RH2013-05/S2](#) ; [RH2014-04/S2](#) ; [RH2015-01/S1](#);

3). Not participated in the [RH2009-11](#) survey.

4). Results not reported for the [RH2011-03](#) survey.

5). Results not reported for the [RH2010-01](#) and the [RH2015-01](#) survey.

\*. Intermediate Measurement Precision : ISO 3534-2:2006.

\*\* . Robust results ( Mean and SD ) were calculated by Algorithm A according to ISO 13528:2005