

External Quality Assurance (EQA) of G6PD Quantitative Test

Survey No. : RH2016-10
Sample sent : [24 set](#)

Sample sent on : 2016/10/17
Results reported (%) : 23 (96%)

Reporting deadline : 2016/10/24

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

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			
F02	F02	1	8.2	2.5%	0.4	0.4	12.0	4.3%	0.6	0.9	2.9	3.6%	0.5	0.3	2.4	2.2	2.0
F03	F03	7	8.3	3.8%	0.5	0.6	11.7	1.7%	0.2	0.4	2.6	-7.1%	-0.9	-0.7	2.1	2.3	2.2
F04	F04	7	8.0	0.0%	0.0	0.0	11.6	0.9%	0.1	0.3	2.6	-7.1%	-0.9	-0.7	2.1	2.2	2.2
F05	F05	7	8.8	10.0%	1.4	1.6	12.7	10.4%	1.5	1.9	3.2	14.3%	1.9	1.3	2.0	2.1	2.1
F07	F07	7	7.5	-6.3%	-0.9	-1.0	11.0	-4.3%	-0.6	-0.6	2.8	0.0%	0.0	0.0	2.2	2.3	2.3
F08	F08	5	8.1	1.3%	0.2	0.2	11.3	-1.7%	-0.2	-0.1	3.0	7.1%	0.9	0.7	2.5	2.6	2.3
F09	F09	7	7.1	-11.3%	-1.6	-1.8	10.0	-13.0%	-1.9	-2.0	2.4	-14.3%	-1.9	-1.3	2.1	2.3	2.3
F10	F10	5	7.0	-12.5%	-1.8	-2.0	10.2	-11.3%	-1.6	-1.7	2.1	-25.0%	-3.3	-2.3	2.2	2.3	2.2
F11	F11	7	8.5	6.3%	0.9	1.0	12.0	4.3%	0.6	0.9	2.9	3.6%	0.5	0.3	2.0	2.2	2.2
F12	F12	7	8.6	7.5%	1.1	1.2	12.2	6.1%	0.9	1.1	3.1	10.7%	1.4	1.0	2.2	2.4	2.4
F13	F13	7	7.0	-12.5%	-1.8	-2.0	10.3	-10.4%	-1.5	-1.6	1.9	-32.1%	-4.2	-3.0	2.1	2.4	2.3
F14	F14	7	8.0	0.0%	0.0	0.0	10.9	-5.2%	-0.7	-0.7	2.8	0.0%	0.0	0.0	2.3	2.6	2.4
F15	F15	4	7.7	-3.8%	-0.5	-0.6	11.0	-4.3%	-0.6	-0.6	2.6	-7.1%	-0.9	-0.7	2.2	2.4	2.3
F16	F16	7	8.7	8.7%	1.3	1.4	11.8	2.6%	0.4	0.6	3.1	10.7%	1.4	1.0	2.1	2.3	2.2
F17	F17	7	7.9	-1.3%	-0.2	-0.2	11.4	-0.9%	-0.1	0.0	2.7	-3.6%	-0.5	-0.3	2.2	2.2	2.2
F18	F18	4	8.1	1.3%	0.2	0.2	11.6	0.9%	0.1	0.3	3.0	7.1%	0.9	0.7	2.2	2.3	2.2
F19	F19	2	7.9	-1.3%	-0.2	-0.2	11.5	0.0%	0.0	0.1	2.8	0.0%	0.0	0.0	2.1	2.2	2.3
F20	F20	4	8.4	5.0%	0.7	0.8	11.9	3.5%	0.5	0.7	3.1	10.7%	1.4	1.0	2.0	2.2	2.1
F21	F21	7	7.9	-1.3%	-0.2	-0.2	10.9	-5.2%	-0.7	-0.7	2.6	-7.1%	-0.9	-0.7	2.2	2.4	2.2
F22	F22	2	8.3	3.8%	0.5	0.6	11.6	0.9%	0.1	0.3	3.0	7.1%	0.9	0.7	2.0	2.0	2.0
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	7.7	-3.8%	-0.5	-0.6	10.9	-5.2%	-0.7	-0.7	2.8	0.0%	0.0	0.0	2.1	2.2	2.2
F25	F25	7	7.7	-3.8%	-0.5	-0.6	10.8	-6.1%	-0.9	-0.9	2.7	-3.6%	-0.5	-0.3	2.2	2.3	2.1
F26	F26	11	8.2	2.5%	0.4	0.4	11.9	3.5%	0.5	0.7	2.9	3.6%	0.5	0.3	2.2	2.3	2.2

Total participating laboratories = 24

Xa (Median)	-	7	8.0				11.5				2.8				2.2	2.3	2.2
σ_p	-	-	0.56				0.805				-				-	-	-
σ_p'	-	-	-				-				0.212				-	-	-
Range	-	1-11	7.0-8.8				10.0-12.7				1.9-3.2				2.0-2.5	2.0-2.6	2.0-2.4
n	-	-	23				23				23				23	23	23
Mean	-	-	8.0				11.4				2.8				2.1	2.3	2.2
S.D.	-	-	0.5				0.7				0.3				0.1	0.1	0.1
C.V.	-	-	6.3%				6.1%				10.7%				4.8%	4.3%	4.5%

Note:

- $D\% = [(X - X_a) / X_a] \times 100\%$; X = Your Results, X_a = Assigned value
- $z \text{ score} = D / \sigma_p$; D = X - X_a, σ_p = SD for proficiency assessment
- $SDI = (X - \text{Mean}) / SD$; SD = standard deviation of peer group
- The assigned value (X_a) is the **median** of all the results reported of this EQA sample
- SD for proficiency assessment (σ_p) = 7% x X_a; but while X_a < 2.9 U/gHb, σ_p = 0.2
- Adjusted SD for proficiency assessment (σ_p') = $(\sigma_p^2 + u_{X_a}^2)^{1/2}$, u_{X_a} = uncertainty of the assigned value. σ_p' is used for proficiency assessment when $u_{X_a} > 0.3\sigma_p$
- Robust results (Mean and SD) were calculated by Algorithm A according to ISO 13528
- Maximum Allowable Deviation (MAD) = 3 x (σ_p / X_a) x 100%
- The evaluation criteria for measurement result of each specimen : Acceptable : $|z| \leq 2$; Caution : $2 < |z| \leq 3$; Unsatisfactory : $|z| > 3$

[Ordered by Referral Hosp.](#)



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



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



[University of the Philippines](#)



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Long Term Observation of Blood G6PD Quantitative Test EQA Survey Results

Survey No : RH2016-10 (in green ●)

- Total participants' CV result plotted against surveys

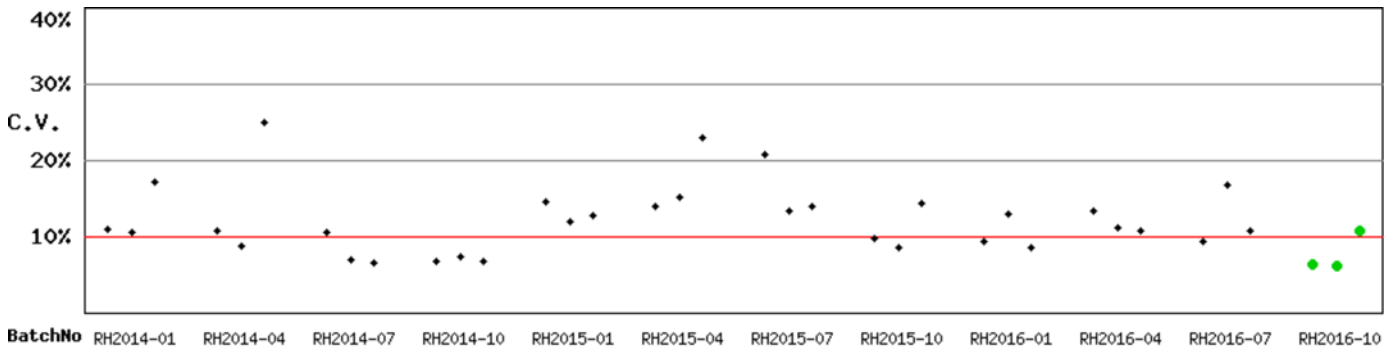


Fig RH-2.1

- Total participants' CV result plotted against G6PD activities

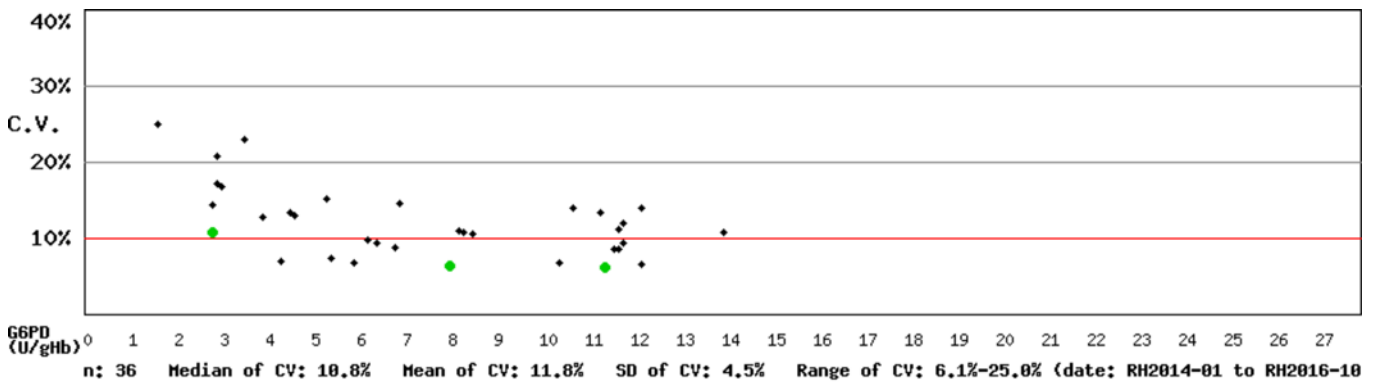


Fig RH-2.2

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

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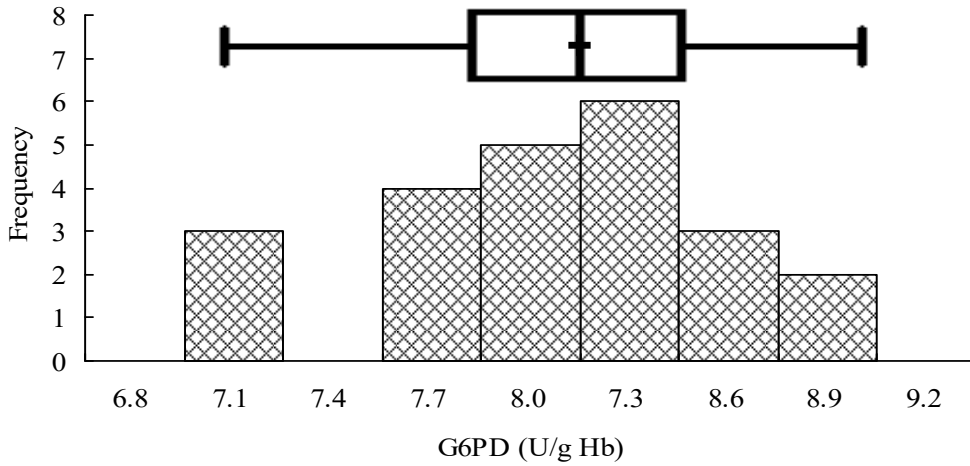
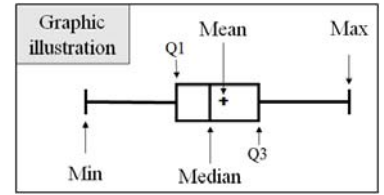
RH2016-10 External Quality Assurance -G6PD

Survey No. : RH2016-10

Sample sent on : 2016/10/17

Reporting deadline : 2016/10/24

Results reported (%) : 95.8%



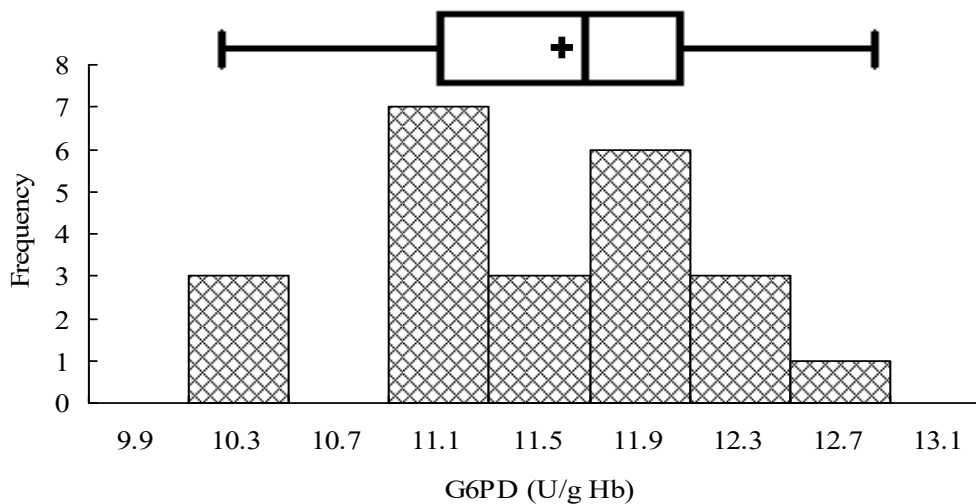
Sample 1

Median = 8.0 (n = 23)

Mean* = 8.0 (n = 23)

SD* = 0.5

CV = 6.3%



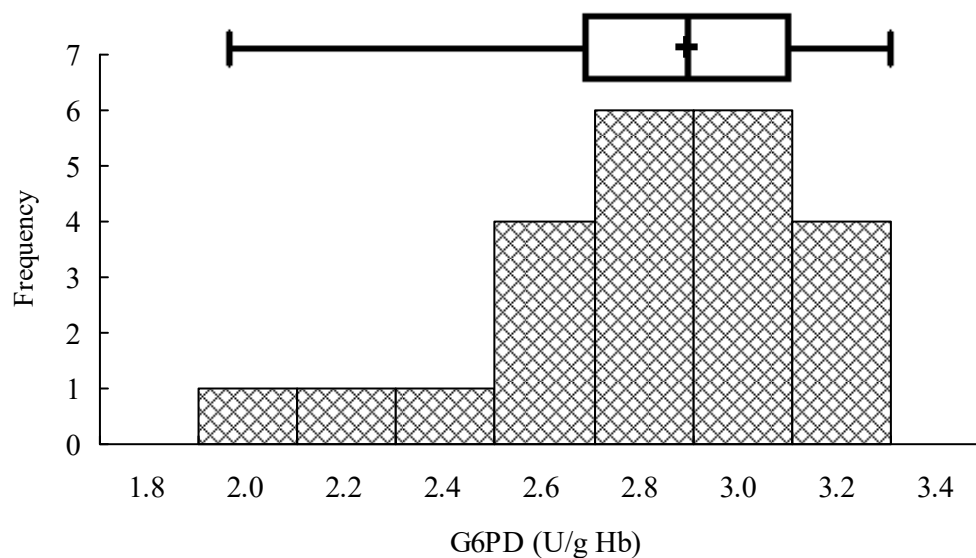
Sample 2

Median = 11.5 (n = 23)

Mean* = 11.4 (n = 23)

SD* = 0.7

CV = 6.1%



Sample 3

Median = 2.8 (n = 23)

Mean* = 2.8 (n = 23)

SD* = 0.3

CV = 10.7%

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

Fig PHIQ-3

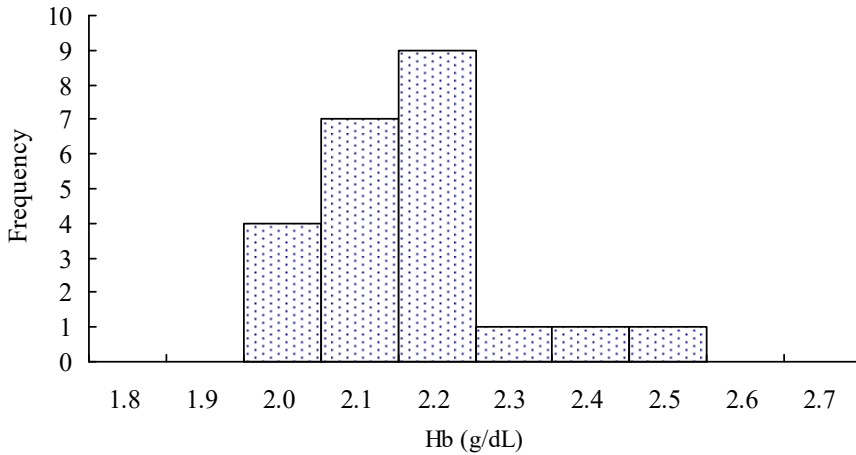
RH2016-10 External Quality Assurance -Hb

Survey No. : RH2016-10

Sample sent on : 2016/10/17

Reporting deadline : 2016/10/24

Results reported (%) : 95.8%



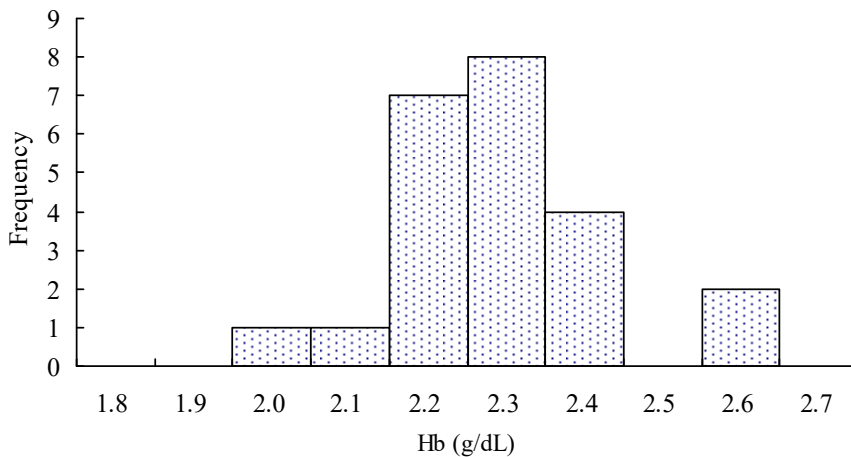
Sample 1

Median = 2.2 (n = 23)

Mean* = 2.1 (n = 23)

SD* = 0.1

CV = 4.8%



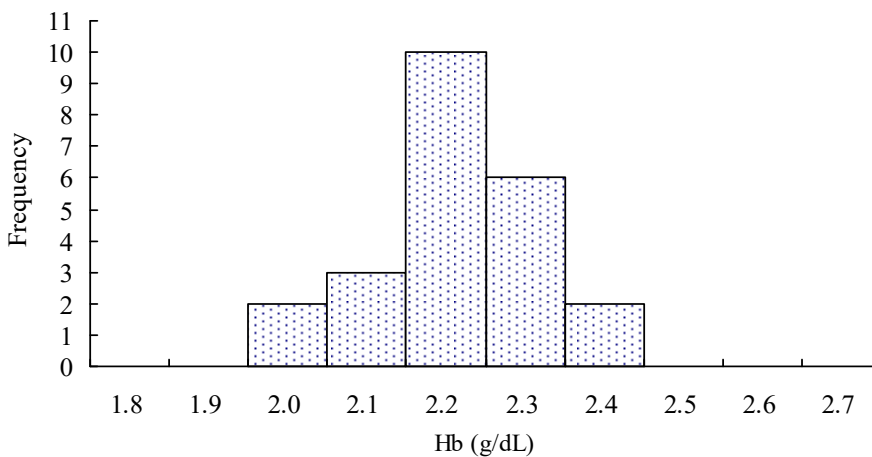
Sample 2

Median = 2.3 (n = 23)

Mean* = 2.3 (n = 23)

SD* = 0.1

CV = 4.3%



Sample 3

Median = 2.2 (n = 23)

Mean* = 2.2 (n = 23)

SD* = 0.1

CV = 4.5%

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

Fig PHIQ-4

External Quality Assurance (EQA) Program

for

G6PD Quantitative Test in Philippines

Survey No. : RH2016-10 Sample sent on : 2016 / 10 / 17

Reporting deadline : 2016 / 10 / 24

This Survey [S2](#) has been used in 2013-2016 (n = 5 ; Survey / Sample No.) :
[RH2013-11/S1](#) ; [RH2014-07/S3](#) ; [RH2015-10/S2](#) ; [RH2016-07/S1](#) ; [RH2016-10/S2](#)

Intermediate Measurement Precision of G6PD Quantitative Test

Lab	Survey : RH2016-04 / Sample 3		Program period: 2013 ~ 2016²			
	U/gHb	SDI ¹	Mean	n	SD	CV
F02	12.0	-0.2	12.4	5	1.6	13.2%
F03	11.7	1.2	11.0	5	0.6	5.3%
F04	11.6	-0.2	11.8	5	1.2	10.2%
F05	12.7	-0.1	12.8	5	1.0	7.5%
F07	11.0	-1.1	11.4	5	0.3	3.0%
F08	11.3	-1.3	12.1	5	0.6	4.9%
F09	10.0	-0.8	11.5	5	2.0	17.0%
F10	10.2	-1.0	11.9	5	1.7	14.0%
F11	12.0	-0.3	12.1	5	0.5	4.4%
F12	12.2	-0.1	12.3	5	1.8	14.6%
F13	10.3	-1.4	11.3	5	0.7	6.3%
F14	10.9	—	-	4	-	-
F15	11.0	-0.3	11.3	5	1.0	8.7%
F16	11.8	—	—	4	—	—
F17	11.4	—	—	3	—	—
F18	11.6	—	—	3	—	—
F19	11.5	—	—	3	—	—
F20	11.9	—	—	3	—	—
F21	10.9	—	—	3	—	—
F22	11.6	—	—	3	—	—
F24	10.9	—	—	2	—	—
F25	10.8	—	—	2	—	—
F26	11.9	—	—	1	—	—
Total participating laboratories = 23						
Median	11.5	-0.3	11.9	—	1.0	8.1%
Range	10.0 ~ 12.7	-1.4 ~ 1.2	11.0 ~ 12.8	—	0.3 ~ 2.0	3.0% ~ 17.0%

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](#)

* 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