Quality is a habit of doing right thing when no one is monitoring

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- All the images in this presentation are taken from internet

Agenda

- Introduction
- What is Quality?
- Initiatives on quality
- Examples of Quality issues
- Impact
- Tools that I use towards assessing Quality
- Conclusion

Introduction (1 of 3)

Why PhUSE thought this topic?

WHY SPONSOR?

Why our company spending money for us?

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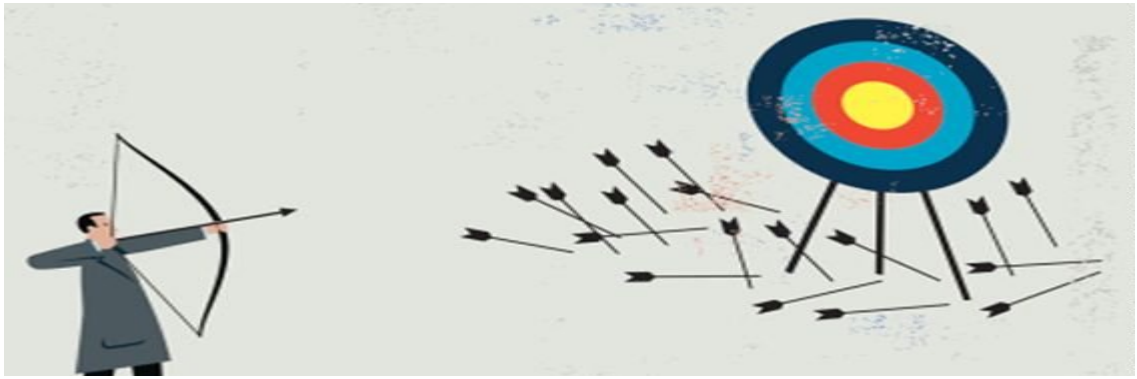
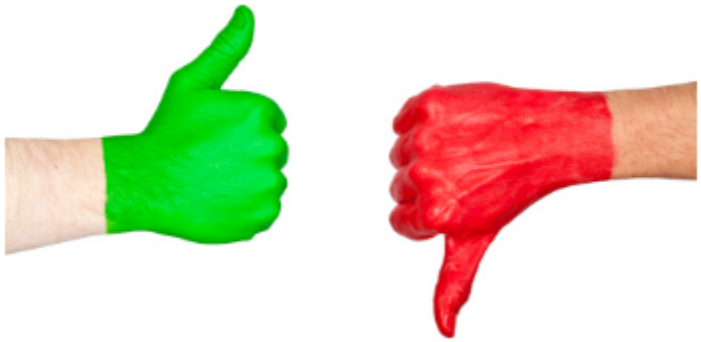
Introduction (2 of 3)



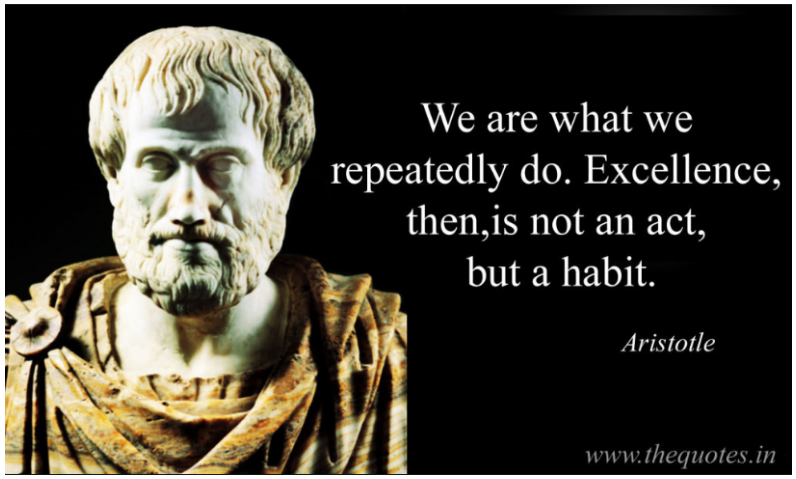
Did we succeed?

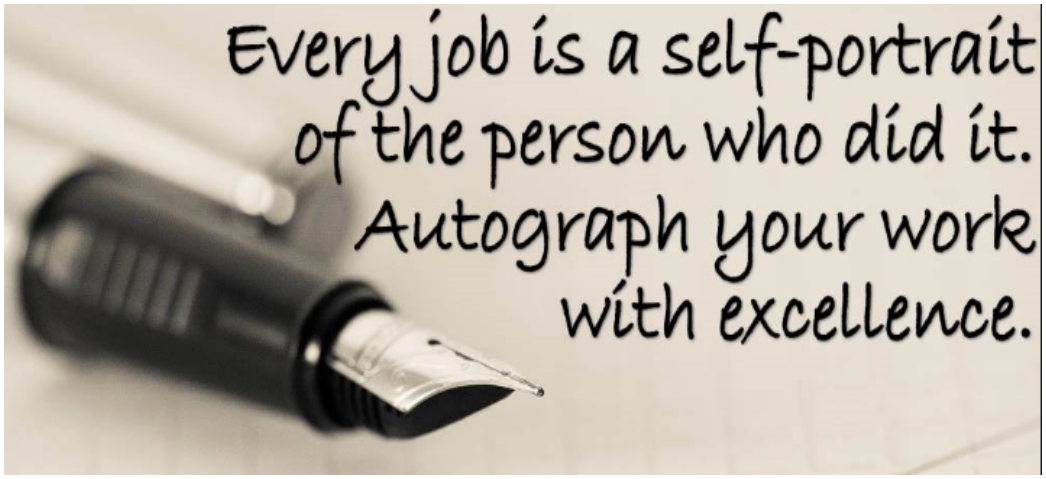


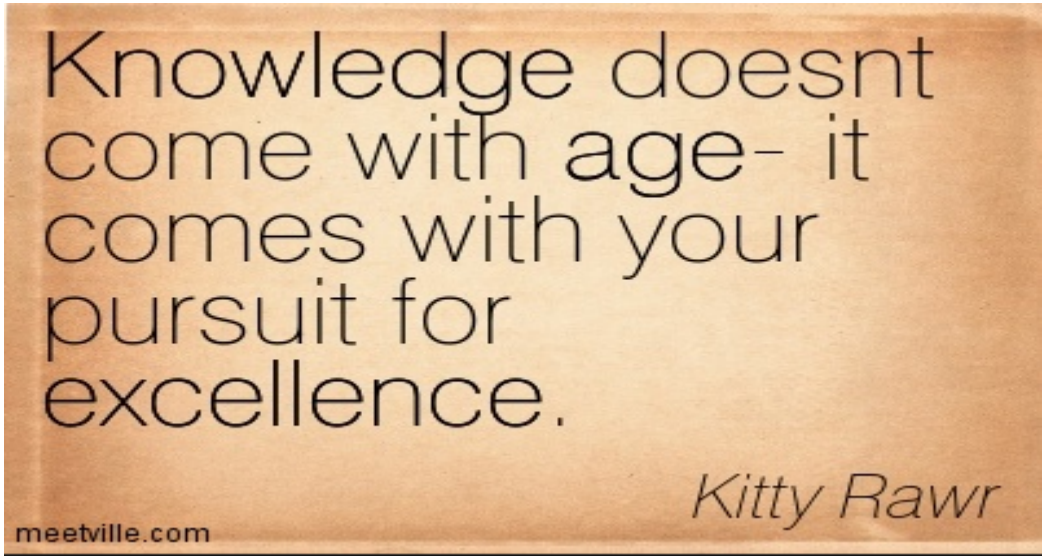
Introduction (3 of 3)

- We deal with patients data
- We work for patients to bring the drug to the market
- Committed to report patients data to Regulators

What is Quality? (1 of 2)







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What is Quality? (2 of 2)

Initiatives on quality (1 of 2)

1) “Measures of Excellence(MOE)” and “Programming Quality - Being right the first time! “

- **Main objectives:** improve the Quality of our deliverables and develop a mindset of being right the first time; in order to :
  - develop our associates (self-confidence)
  - increase ‘trust’/confidence with other line functions such as statisticians and clinicians; gain credibility
  - optimize resources (avoid lot of exchanges inside programmers team and between programmers and statisticians)

- **Targeted audience** : Open for all Statistical Programmers
  - Stream 1 : What is quality? What is validation?
  - Stream 2 : Where is the information?
  - Stream 3 : Our tools
  - Stream 4 : Understand your data
  - Stream 5 : Understand your TFL

Initiatives on quality (2 of 2)

2) Output Review Checklist

Goal : No quality issues in Statistical Programming outputs by developing experience in output review

3) Workshops on Programming Practices

Part 1: Awareness

Part 2: SAS Code Efficiency

Examples of Quality issues (1 of 3)

- Incorrectly derived variables in the Analysis Dataset
- Incorrect titles and footnotes
- No alignment among corresponding Tables/Listing/Figures
  - e.g. abnormality flags
- Incorrect statistical method applied
- Cosmetic comments
- Incorrect % calculation or exceeds 100%
- Title & Data presented are very different

Examples of Quality issues (2 of 3)

- Selecting wrong population
  - Safety data with ITT population
- Sorting Order issues
- Formatting issues
  - mixing of gender with age
- Truncation of text
- Issues with summary statistics
  - Mean/Median are out of Min and Max
  - Values swapped/incorrect variables used

Examples of Quality issues (3 of 3)

- Swap the treatment group data
- N < n
- Reuse of program, but not followed as per current requirement
- Incorrect duration of exposure

There are many such cases.....

Output Review

Example 1: What is the problem?

Table 14.3-4.1 (Page 1 of 1)
Summary of ECG
Safety population

Treatment	Visit	Statistics	PR Interval	QRS duration	QT Interval	RR Interval
Treatment A N=14	Baseline	n	15	15	15	15
		Mean	488	284.9	1214	2986
		SD	77.71	23.28	41.86	486.7
		Median	472	286	1209	2840
		Min	400	260	1168	2586
		Max	590	312	1272	3758
	Post	n	12	12	12	12
		Mean	483	287.1	1255	3211
		SD	75.53	24.45	53.45	493.6
		Median	475	288	1265	3252
		Min	408	262	1190	2660
		Max	568	310	1306	3762
Treatment B N=14	Baseline	n	14	14	14	14
		Mean	487	287.3	1236	2947
		SD	65.17	28.6	46.89	273.42
		Median	484	283	1235	2956
		Min	408	258	1178	2644
		Max	562	326	1292	3256
	Post	n	12	12	12	12
		Mean	496	280.5	1237	3098
		SD	40.06	23.7	56.19	413.6
		Median	493	277	1237	2974
		Min	452	258	1170	2772
		Max	544	310	1300	3666

Note: Baseline is measured prior to dosing (Day -1, Day 14, or Day 28) at each period.

Output Review

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Output Review

Example 1: The problem

- N is smaller than n.

- It turns out that safety population criterion was not used when calculating n values.

Output Review

Example 2: What is the problem?

Table 14.1-2.1 (Page 1 of 1)
Number (%) of patients in the analysis populations by treatment group

	Treatment A n (%)	Treatment B n (%)	Treatment C n (%)	Total n (%)
Run-in Phase	289 (100.0)	293 (100.0)	298 (100.0)	880 (100.0)
Randomized	289 (100.0)	293 (100.0)	298 (100.0)	880 (100.0)
Safety double-blind	288 (99.7)	293 (100.0)	298 (100.0)	879 (99.9)
Intent-to-treat	284 (98.3)	292 (99.7)	296 (99.3)	872 (99.1)
Per-protocol	260 (90.0)	273 (93.2)	272 (91.3)	805 (91.5)

Output Review

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Output Review

Example 2: The problem

Study “Run-in” phase is the period before randomization, no double-blind treatment information is available.

The following table is intended to combine all population information into one table. The first row should only have “total” value and should use “run-in” phase population.

The Total Number of patients in the run-in phase population should be higher than in the Randomized population

Output Review

Example 3: What is the problem?

Table 1.1-2 (Page 1 of 1)
Summary of demographics and background characteristics by treatment
(ITT population)

Variable	Treatment A N=203		Treatment B N=95		Total N=298	
Age (years)						
N	203		95		298	
Mean	9.1		9.1		9.1	
S.D.	1.59		1.60		1.59	
Median	5.0		6.0		5.0	
Minimum	9.0		9.0		9.0	
Maximum	11.0		11.0		11.0	
Age Category - n (%)						
6-9	105	(51.7)	49	(51.6)	154	(51.7)
10-11	97	(47.8)	46	(48.4)	143	(48.0)
Sex - n (%)						
Male	143	(70.4)	63	(66.3)	206	(69.1)
Female	60	(29.6)	32	(33.7)	92	(30.9)
Race - n (%)						
Caucasian	149	(73.4)	76	(80.0)	225	(75.5)
Black	36	(17.7)	12	(12.6)	48	(16.1)
Oriental	3	(1.5)	0	(0.0)	3	(1.0)
Other	15	(7.4)	7	(7.4)	22	(7.4)

Output Review

Example 3: The problem

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Output Review

Example 3: The problem

Median do not lie between minimum and maximum

- It turned out that median and minimum were swapped around

Impact

Tools – How I track? (1 of 3)

- Setting severity of an issue (1,2,3,4 → low to high)
- To eliminate mistake and ensure first time right and set expectations to the programming team

Type of issue	Comments identified outside Programming	Comments identified by QC'r	Comments identified by Developer
Any comments	4	3	1
Title/footnote/ truncation/ cosmetic/N/ %values, etc.,	4	3	1
>2 times the outputs is updated due to comments	4	4	2

Tools – How I track? (2 of 3)

Type of issue	Comments identified outside Programming	Comments identified by QC'r	Comments identified by Developer
Process deviation	4	4	4
Inconsistencies against corresponding TFL	4	2	1
Etc.,			

Note: Overall severity set for each Individual outputs and dataset on quality issues

Tools – How I track? (3 of 3)

$$\% \text{ of Quality on Activity} = \frac{\#\text{ of outputs with (Mild (or) NO comments on outputs)}}{\text{Total Number of outputs/Dataset}} \times 100$$

Study Number	Activity	% of Quality Before it goes out of Programming	% of Quality to other Line Function	Reason for <100%
Study # 1	Japan HAQ	100%	100%	
Study # 2	Canada HAQ	85%	100%	
Study # 3	Abbreviated CSR	40%	85%	
Study # 4	Final CSR	70%	80%	
Study # 5	Spec	45%	60%	??
Study # 6	Biomarker- AIP Mutation	85%	95%	
Study # 7	Spec	35%	50%	??
Study # 8	Hyperclysemia request	50%	60%	??
Study # 9	Expanded Access	95%	100%	
Study # 10	Hyperclysemia request	50%	60%	
Study # 11	Secondary Manuscript	95%	100%	
Study # 12	analysis-1	85%	95%	
Study # 13	analysis-2	85%	90%	
Study # 14	ECE abstract	95%	100%	
Study # 15	ECE Poster	95%	100%	
Study # 16	60 months analysis	75%	95%	
Study # 17	24 months analysis	80%	95%	
Study # 18	33 months analysis	75%	95%	
Study # 19	US CPO request	70%	95%	
Study # 20	Tumor volume	70%	95%	
Study # 21	Salivary manuscript	70%	95%	
Study # 22	Final CSR			
etc.,	etc.,			
Average		74%	88%	

Set the NEW Benchmark based on the last year to every programmers
&
Set expectations

Conclusion (1 of 2)

Repeat:

- We deal with patient's data
- We work for patients to bring the drug to the market
- Committed to report patients data to Regulators

Conclusion (2 of 2)

- Understand data well
- Understand your Tables, Listings, Figures. They Talk each other.
- Understand Protocol to RAP
- Ask yourself whether reports make sense to you
- Always go beyond what is expected
- Feel the importance of dealing patients data
- Ask questions and do not assume
- Understand the requirements

References

- “Programming Quality - Being right the first time!” – Andrea, Celine, Varsha
- Output review checklist - Gwen de Borne de Grandpre

Thank you