

Single Day Event

Evolve, The Art of Science to The Science of Art
Anik Chatterjee & Supraja Gorre,
Merck KGaA

The opinions expressed in this presentation are solely those of the presenters and do not represent any views of the organization.

Introduction & Motivation

Instrument that record, analyze, summarize, organize, debate and explain information that are illustrative, non illustrative, hard bound paper bag jacketed, non jacketed, with forward introduction table of contents, index that are intended for the enlightenment, understanding, enrichment, enhancement and education of the human brain through sensory route of vision... sometimes touched

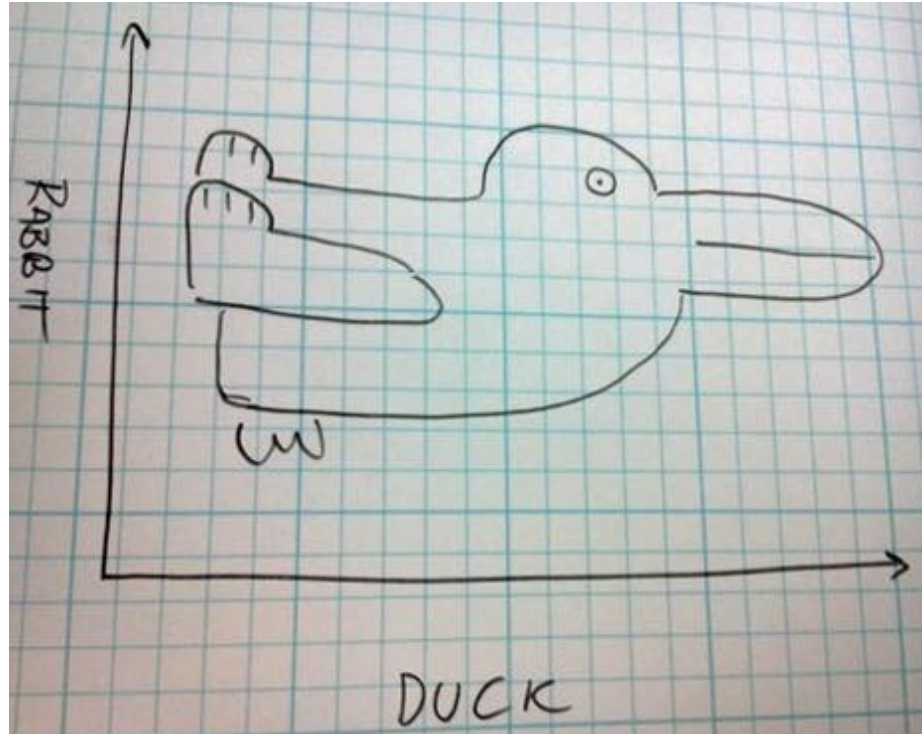




The Art of Better Science

- What Comparison / Trend / Regression ...
- Which Bar / Line / Histogram / Forest plot ...
- How Technology
 - Time
 - Quality
 - Reproducibility
 - Enhancement
 - End user purpose

Why it is important to think





Scenario

- Two treatments (x and y) from two different organizations (X & Y)
- Can we compare the treatments to find out which one is potentially better?
- What happens when we can not have complete visit specific information
- How to compare treatments in such situation

Work around:

Comparing EOT Change from Baseline(CHB) and Cumulative percentage($\leq$) of patients who achieved a certain amount of CHB for both treatment groups.



Treatments & Odds

	x from X	y from Y
Dosing Schedule	Daily	Weekly
Treatment Duration	6 months	1 year
Mechanism of action	Simple	Complex
Phase of Dev	IIA (Not enough data and confidentiality)	IV
Disease Regression	Very quick initially and standardized later	Slow rise but stable later
AE profile	Lower and better	Within limit but higher side
Estimated Application Cost	4 times more	Low



Data Structure

Comparing EOT Change from Baseline(CHB) and Cumulative percentage($\leq$) of patients achieved a certain amount of CHB for both treatment groups.

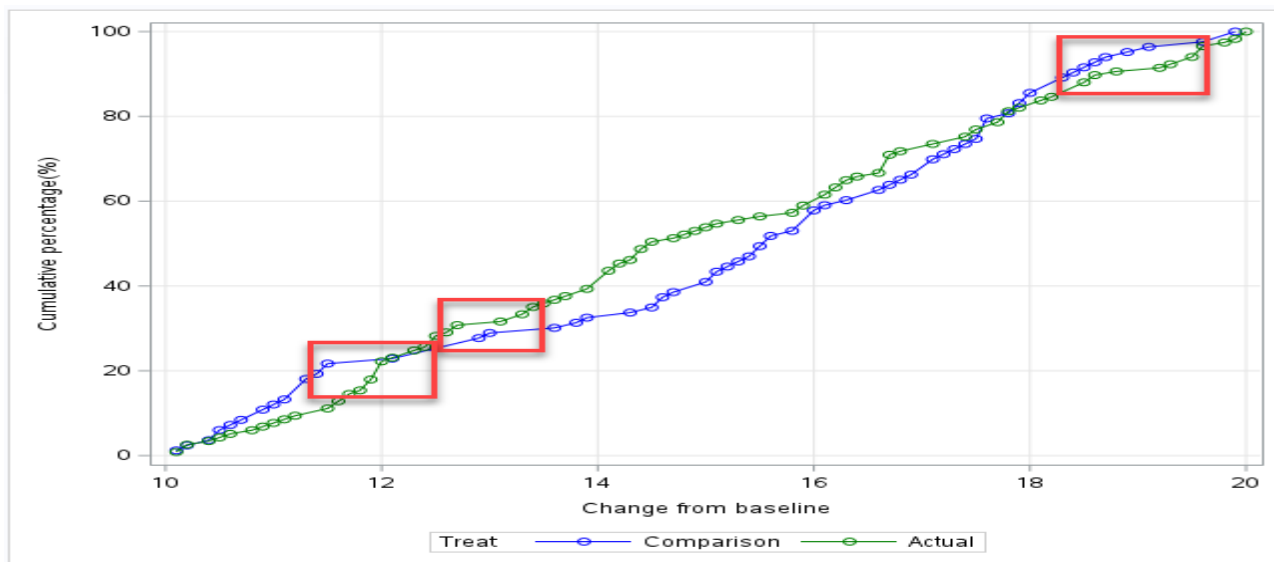
Treatment	subject	CHG ▲
Active	189	10.1
Comparison	271	10.1
Active	205	10.2
Comparison	255	10.2
Active	216	10.2
Active	101	10.4
Comparison	220	10.4
Active	110	10.5
Comparison	225	10.5
Comparison	273	10.5
Comparison	284	10.6
Active	108	10.6
Comparison	256	10.7
Active	197	10.8
Comparison	259	10.9
Comparison	218	10.9
Active	201	10.9

Treatment	N
Active	117
Comparison	83

Treatment	CHG ▲	CUM_pct
Comparison	10.1	1.2
Active	10.1	0.85
Comparison	10.2	2.41
Active	10.2	2.56
Active	10.4	3.42
Comparison	10.4	3.61
Comparison	10.5	6.02
Active	10.5	4.27
Comparison	10.6	7.23
Active	10.6	5.13
Comparison	10.7	8.43
Active	10.8	5.98
Comparison	10.9	10.84
Active	10.9	6.84

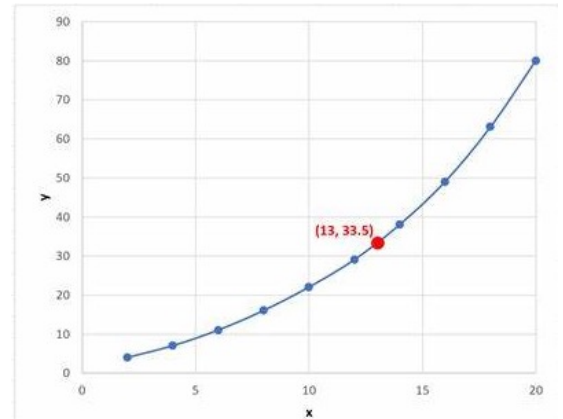
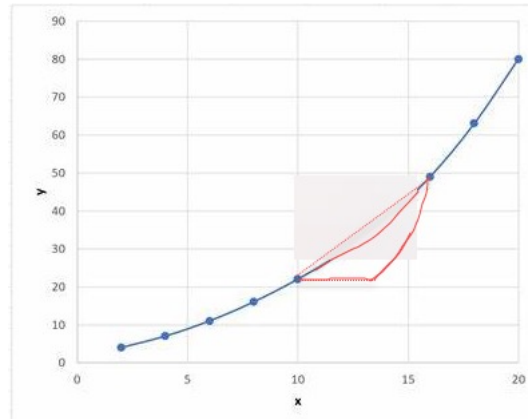
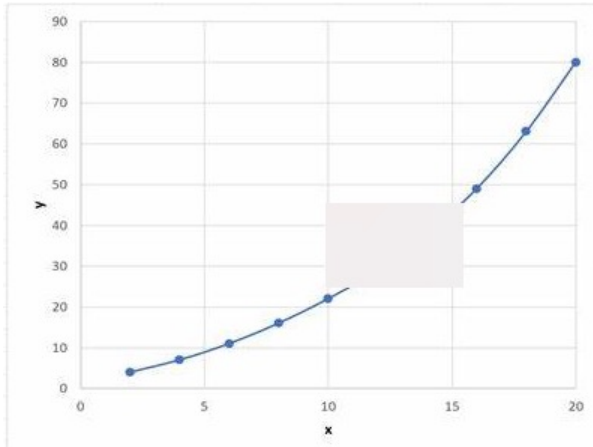
Steps to Compare

1. Create matching records for unobserved change from baseline.
2. Create matching records for unobserved cumulative percentage.
3. Interpolate values for unobserved matching data points using LOESS.



Interpolation

- Process of determining the unknown values that lie in between the known data points.
- Method of deriving a simple function from the given discrete data set such that the function passes through the provided data points.





SAS & R code

SAS

```
proc loess data=actual;  
model CUM_PCT=CHG/smooth=0.08;  
score data=actual_pct_pred / print;  
ods Output ScoreResults=ScoreOut_actual_pct;  
run;
```

[The LOESS Procedure \(sas.com\)](https://www.sas.com/doccenter/procinfo/default.htm?_topic=procinfo%2Fbase%2FLOESS)



loess.sas

R

```
library(stats)  
mod<- loess(CHG_actual ~FRE, fre_train_actual,span=0.1)  
fre_pred_actual$interp=predict(mod, fre_pred_actual)
```

[loess function - RDocumentation](https://stat.ethz.ch/R-manual/r-devel/library/stats/html/loess.html)



R_code.txt



shiny_video.mp4



Data before and after interpolation

Creating matching data points for unobserved cumulative percentage

treat	change	CUM_PCT ▲
Comparison	.	0.85
Active	10.1	0.85
Comparison	10.1	1.2
Active	.	1.2
Active	.	2.41
Comparison	10.2	2.41
Comparison	.	2.56
Active	10.2	2.56
Active	10.4	3.42
Comparison	.	3.42
Comparison	10.4	3.61

treat	CUM_PCT ▲	dchange
Comparison	0.85	.
Active	0.85	10.1
Comparison	1.2	10.1
Active	1.2	10.1
Active	2.41	10.2
Comparison	2.41	10.2
Comparison	2.56	10.3
Active	2.56	10.2
Active	3.42	10.4
Comparison	3.42	10.4
Comparison	3.61	10.4
Active	3.61	10.4



Data before and after interpolation

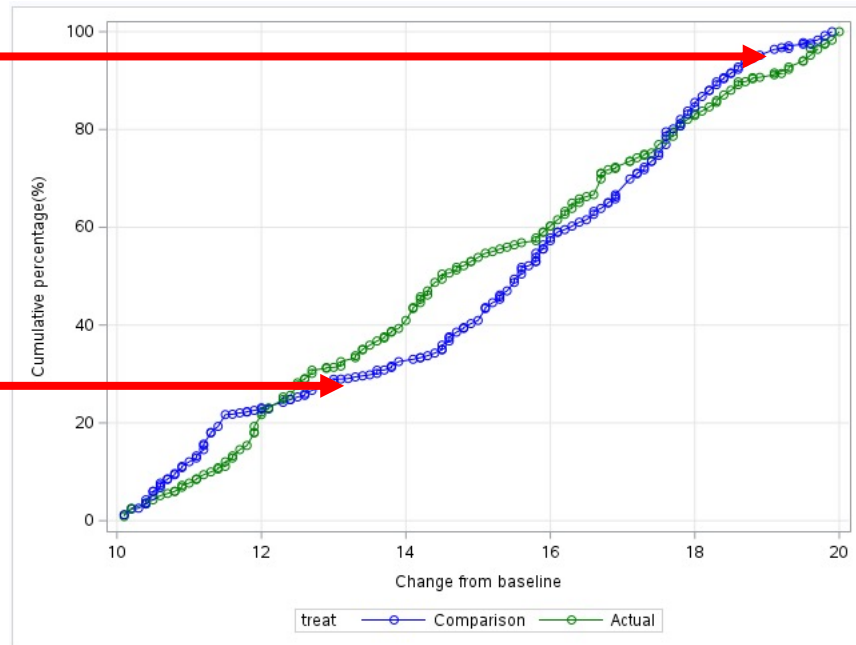
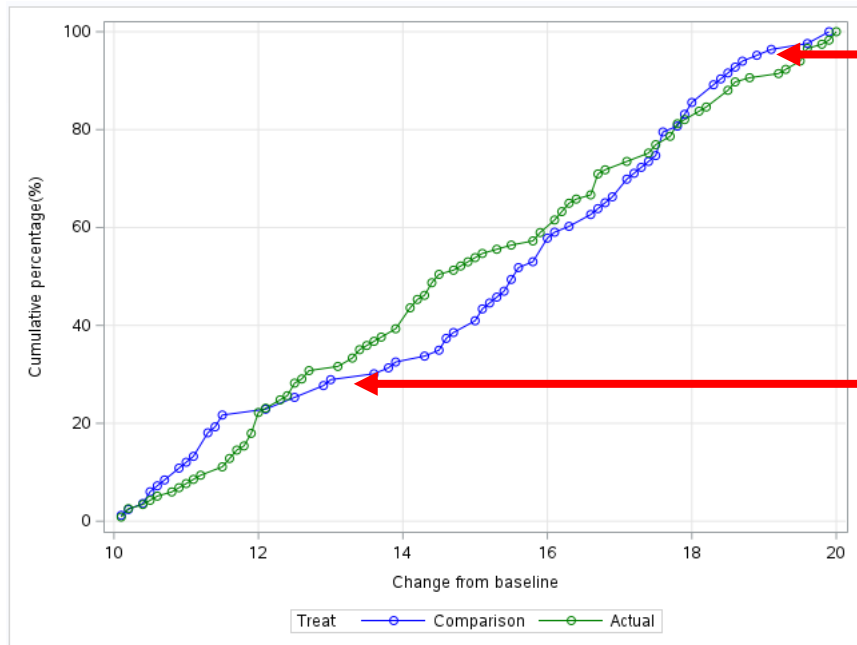
Creating matching data points for unobserved change from baseline

treat	change ▲	CUM_PCT
Comparison	10.7	8.43
Active	10.7	.
Comparison	10.8	.
Active	10.8	5.98
Active	10.9	6.84
Comparison	10.9	10.84
Comparison	11	12.05
Active	11	7.69
Active	11.1	8.55
Comparison	11.1	13.25
Comparison	11.2	.
Active	11.2	9.4
Comparison	11.3	18.07

treat	change ▲	dcum_pct
Comparison	10.7	8.43
Active	10.7	5.56
Comparison	10.8	9.64
Active	10.8	5.98
Active	10.9	6.84
Comparison	10.9	10.84
Comparison	11	12.05
Active	11	7.69
Active	11.1	8.55
Comparison	11.1	13.25
Comparison	11.2	15.66
Active	11.2	9.4
Comparison	11.3	18.07

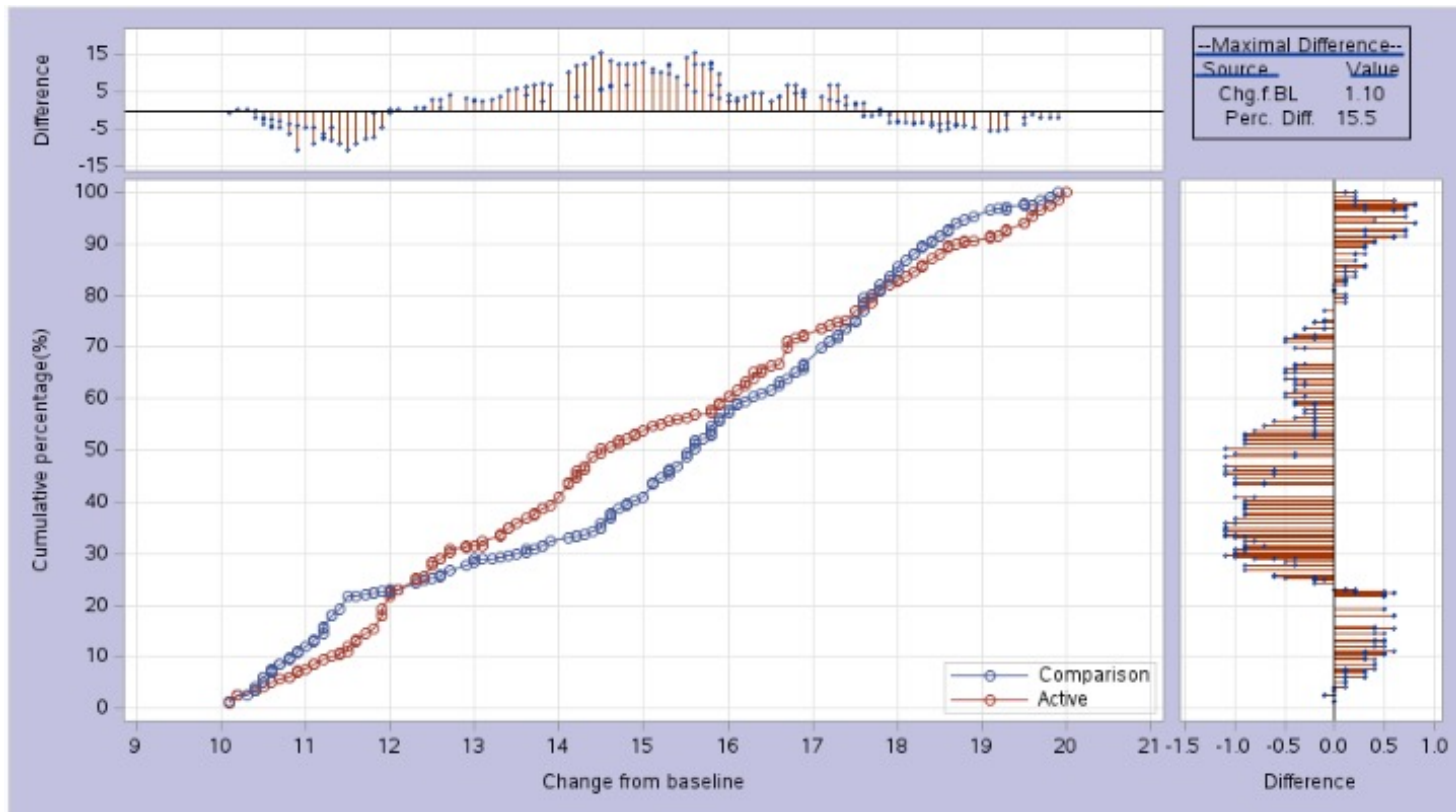


Plot before and after interpolation





Final Review and Presentation



Thank You

Questions and/or Suggestions

Alternatively, please drop us an email for comments and queries.



**The Global Healthcare
Data Science Community**

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📞 UK +44 1843 609600
✉ office@phuse.global
🌐 phuse.global

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