

Shelf Life Projection

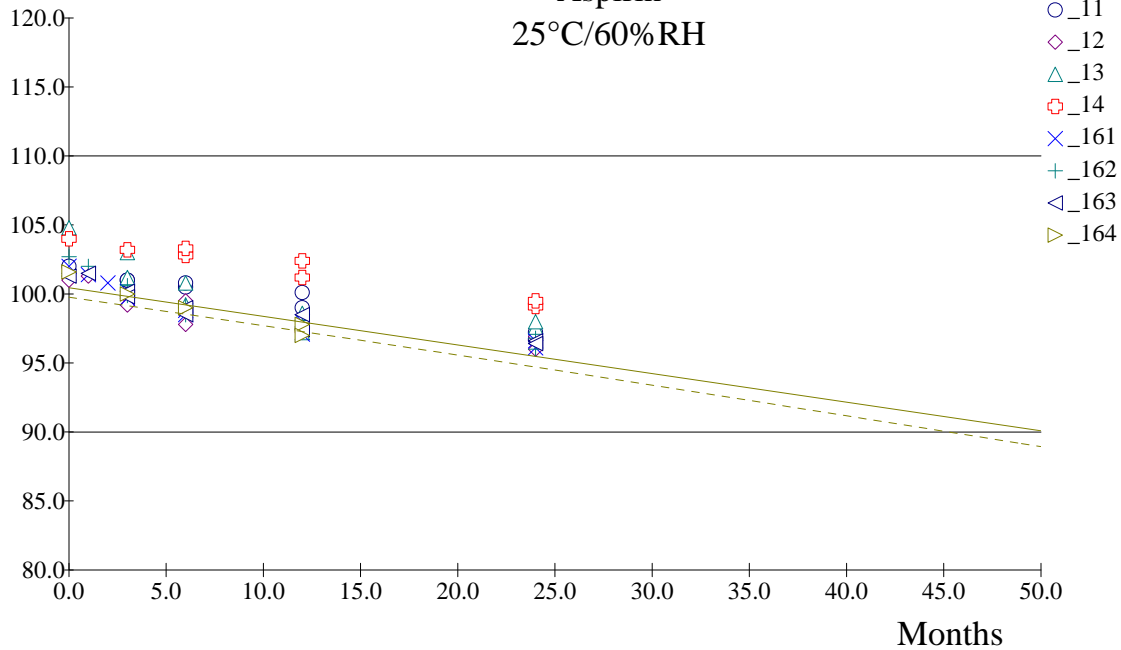
Kurital Tablets

Aspirin

25°C/60%RH

mg/tablet

Study



Model 2: Common Slope but Different Intercepts (95.0% CI)

Test Category: HPLC High Spec: 110.0 Low Spec: 90.0

Original FDA Data Set...

File: C:\Program Files\SLIM\Standard Conditions.SST User: Craig Hamilton

SLIMStat Regression Analysis and Pooling of Data.

Original Raw Data:

Study	Time	Results	Time	Results	Time	Results	Time	Results	
Study 1	_11								
	Time :	0.0	3.0	3.0	6.0	6.0	12.0	12.0	24.0
	Results:	102.00	101.00	101.00	100.50	100.80	100.10	99.00	96.70
	Time :	24.0							
	Results:	97.20							
Study 2	_12								
	Time :	0.0	1.0	3.0	3.0	6.0	6.0	12.0	12.0
	Results:	101.00	101.30	99.80	99.20	99.50	97.80	97.40	97.20
	Time :	24.0	24.0						
	Results:	96.90	96.00						
Study 3	_13								
	Time :	0.0	3.0	3.0	6.0	6.0	12.0	12.0	24.0
	Results:	104.80	103.00	101.20	100.80	99.20	98.60	97.20	97.60
	Time :	24.0							
	Results:	98.00							
Study 4	_14								
	Time :	0.0	3.0	6.0	6.0	12.0	12.0	24.0	24.0
	Results:	104.00	103.20	102.80	103.30	102.40	101.20	99.10	99.50
	Time :								
	Results:								
Study 5	_161								
	Time :	0.0	1.0	2.0	3.0	3.0	6.0	6.0	12.0
	Results:	102.00	101.40	100.80	100.20	99.70	98.80	98.50	98.00
	Time :	12.0	24.0	24.0					
	Results:	97.10	96.60	96.10					
Study 6	_162								
	Time :	0.0	1.0	3.0	3.0	6.0	6.0	12.0	12.0
	Results:	102.70	102.00	100.60	99.90	99.20	98.50	98.10	97.60
	Time :	24.0	24.0						
	Results:	96.80	96.00						
Study 7	_163								
	Time :	0.0	1.0	3.0	3.0	6.0	6.0	12.0	12.0
	Results:	101.30	101.50	100.20	99.80	99.00	98.50	98.50	97.40
	Time :								
	Results:								

Time : 24.0 24.0
Results: 96.60 96.40

Study 8 _164
Time : 0.0 3.0 6.0 12.0 12.0
Results: 101.60 100.00 99.00 97.80 97.00

Original Raw Data Treatment:

- a. Less than (<) results are ignored.
- b. Greater than (>) results are ignored.

Step 1. Fit each individual regression equation and compute the residual sum of squares.

1 Study: _11
Linear Least Squares: $Y = -0.20063492x + 101.81746032$ (n = 9)
Residual Sum of Squares (i = 1) = 0.94863492
Standard Deviation of Residuals = 0.36812943 mg/tablet
Standard Error of Slope = 0.01466663
P Value of Slope = 0.000002627871. Slope significant (user selected P = 0.25).

2 Study: _12
Linear Least Squares: $Y = -0.18012520x + 100.24913928$ (n = 10)
Residual Sum of Squares (i = 2) = 6.54334898
Standard Deviation of Residuals = 0.90438854 mg/tablet
Standard Error of Slope = 0.03411209
P Value of Slope = 0.000745852799. Slope significant (user selected P = 0.25).

3 Study: _13
Linear Least Squares: $Y = -0.23396825x + 102.38412698$ (n = 9)
Residual Sum of Squares (i = 3) = 19.81530159
Standard Deviation of Residuals = 1.68248547 mg/tablet
Standard Error of Slope = 0.06703183
P Value of Slope = 0.010123119806. Slope significant (user selected P = 0.25).

4 Study: _14
Linear Least Squares: $Y = -0.19615134x + 104.07064579$ (n = 8)
Residual Sum of Squares (i = 4) = 1.08023483
Standard Deviation of Residuals = 0.42431019 mg/tablet
Standard Error of Slope = 0.01769688
P Value of Slope = 0.000032117668. Slope significant (user selected P = 0.25).

5 Study: _161
Linear Least Squares: $Y = -0.20860855x + 100.78187227$ (n = 11)
Residual Sum of Squares (i = 5) = 6.41360491
Standard Deviation of Residuals = 0.84416987 mg/tablet
Standard Error of Slope = 0.03085091
P Value of Slope = 0.000082536238. Slope significant (user selected P = 0.25).

6 Study: _162
Linear Least Squares: $Y = -0.22256366x + 101.16532935$ (n = 10)
Residual Sum of Squares (i = 6) = 7.94614028
Standard Deviation of Residuals = 0.99662808 mg/tablet
Standard Error of Slope = 0.03759121
P Value of Slope = 0.000353441007. Slope significant (user selected P = 0.25).

7 Study: _163
Linear Least Squares: $Y = -0.18839095x + 100.63435766$ (n = 10)
Residual Sum of Squares (i = 7) = 4.18927017
Standard Deviation of Residuals = 0.72364271 mg/tablet
Standard Error of Slope = 0.02729464
P Value of Slope = 0.000124262163. Slope significant (user selected P = 0.25).

8 Study: _164
Linear Least Squares: $Y = -0.33020833x + 101.25937500$ (n = 5)
Residual Sum of Squares (i = 8) = 0.60687500
Standard Deviation of Residuals = 0.44976846 mg/tablet
Standard Error of Slope = 0.04190470
P Value of Slope = 0.004258652557. Slope significant (user selected P = 0.25).

Model using Different Slopes and Different Intercepts
Total residual Sum of Squares for this model = 47.54341067

Step 2. Fit each individual regression equation with different intercepts and a common slope.

1 Study: _11
Linear Least Squares: $Y = -0.20723098x + 101.88342091$ (n = 9)
Residual Sum of Squares (i = 1) = 0.97604496

2 Study: _12
Linear Least Squares: $Y = -0.20723098x + 100.49580192$ (n = 10)
Residual Sum of Squares (i = 2) = 7.05978618

3 Study: _13
Linear Least Squares: $Y = -0.20723098x + 102.11675425$ (n = 9)
Residual Sum of Squares (i = 3) = 20.26567712

4 Study: _14
Linear Least Squares: $Y = -0.20723098x + 104.19113691$ (n = 8)
Residual Sum of Squares (i = 4) = 1.15080562

5 Study: _161
Linear Least Squares: $Y = -0.20723098x + 100.77022556$ (n = 11)

Residual Sum of Squares (i = 5) = 6.41502576
 6 Study: _162
 Linear Least Squares: $Y = -0.20723098x + 101.02580192$ (n = 10)
 Residual Sum of Squares (i = 6) = 8.11138589
 7 Study: _163
 Linear Least Squares: $Y = -0.20723098x + 100.80580192$ (n = 10)
 Residual Sum of Squares (i = 7) = 4.43876219
 8 Study: _164
 Linear Least Squares: $Y = -0.20723098x + 100.44772447$ (n = 5)
 Residual Sum of Squares (i = 8) = 2.34909406
 Model using Common Slope and Different Intercepts
 Total residual Sum of Squares for this model = 50.76658178

Step 3. Fit a single regression line assuming identical degradation curves.
 Linear Least Squares: $Y = -0.19384923x + 101.31393868$ (n = 72)
 Model using Common Slope and Common Intercept
 Total residual Sum of Squares for this model = 140.84407303

Step 4. Partition the total sum of squares (SStot) into into sum of squares due to regression (SSreg) and residual sum of squares (SSres).
 Partition: $324.27875000(SStot) = 276.73533933(SSreg) + 47.54341067(SSres)$

STATISTICAL ANALYSIS

Standard Conditions Data Models

 Model 1: Common Slope and Common Intercept
 Model 2: Common Slope but Different Intercepts
 Model 3: Common Intercept but Different Slopes
 Model 4: Different Intercepts and Different Slopes

LOWER ONE-TAILED CONFIDENCE INTERVAL
 PROBABILITY LEVEL = 95.0% (equivalent to two-tail 90.0% probability)

Key to Sources of Variation

Source	Alternative hypothesis	Null hypothesis
A	Separate intercepts, separate slopes	Common intercept, common slope
B	Separate intercepts, common slope	Common intercept, common slope
C	Separate intercepts, separate slopes	Separate intercepts, common slope
D	Residual	
E	Full Model	

TABLE OF STATISTICAL ANALYSIS

Source	SS	DF	MS	F	P
A	93.301	14	6.664	7.8497	0.00000
B	90.077	7	12.868	15.1571	0.00000
C	3.223	7	0.460	0.5424	0.79865
D	47.543	56	0.849		
E	713393.267	16	44587.079		

DECISION RULES

If the p-value of test C < 0.25, then Model 3 or 4 is applicable.
 If the p-value of test C >= 0.25, then test for B.
 If the p-value of test B < 0.25, then Model 2 is applicable.
 If the p-value of test B >= 0.25, then Model 1 is applicable.

Final results based on the decision rules:
 Pooling Allowed (Model 2), Common Slope but Different Intercepts.

1 Study: _11
 One Sided Lower Confidence Interval (95.0% CI).
 The expiration date was determined when the low specification was exceeded.
 Expiration Date = 52 Months.

2 Study: _12
 One Sided Lower Confidence Interval (95.0% CI).
 The expiration date was determined when the low specification was exceeded.
 Expiration Date = 46 Months.

3 Study: _13
 One Sided Lower Confidence Interval (95.0% CI).
 The expiration date was determined when the low specification was exceeded.
 Expiration Date = 53 Months.

4 Study: _14
One Sided Lower Confidence Interval (95.0% CI).
The expiration date was determined when the low specification was exceeded.
Expiration Date = 62 Months.

5 Study: _161
One Sided Lower Confidence Interval (95.0% CI).
The expiration date was determined when the low specification was exceeded.
Expiration Date = 47 Months.

6 Study: _162
One Sided Lower Confidence Interval (95.0% CI).
The expiration date was determined when the low specification was exceeded.
Expiration Date = 48 Months.

7 Study: _163
One Sided Lower Confidence Interval (95.0% CI).
The expiration date was determined when the low specification was exceeded.
Expiration Date = 47 Months.

8 Study: _164
One Sided Lower Confidence Interval (95.0% CI).
The expiration date was determined when the low specification was exceeded.
Expiration Date = 45 Months.

Pooled expiration date based on _164

Analysis Complete.

HISTORY INFORMATION

File Version: 0
File Status : ACTIVE
File Name : C:\Program Files\SLIM\Standard Conditions.SST
Created : 18 January 2006 at 15:08:44 by Administrator (User ID = 1)
Last Saved : 18 January 2006 at 15:08:44 by Administrator (User ID = 1)