QI-Charts

Welcome to QI-Charts, a Shewhart control chart application for Microsoft Excel. Please read carefully the terms of the license agreement below.

Contents

License Agreement Summary

The license fees from this product enable further development and enhancements. Please support the continuing development of QI-Charts by only using licensed copies. Thank you.

The full text of the license agreement is shown in the installation routine. Here are the main points:

- By using this software, you accept the terms of the license agreement.

- The software is the property of Scoville Associates. Participants in the Institute for Healthcare Improvement's Improvement Advisor course have a free perpetual license to use this application, but are prohibited from circulating it to others. You will are entitled to free upgrades as they become available.

- This is not free software. You may not circulate this application to third parties. You may not duplicate this software except as indicated in the license agreement.

- You may install the application on multiple computers, as long as you use only one copy at a time.

- The software is provided AS-IS. No end-user support is provided. SCOVILLE ASSOCIATES IS NOT LIABLE TO YOU FOR ANY DAMAGES, INCLUDING COMPENSATORY, SPECIAL, INCIDENTAL, EXEMPLARY, PUNITIVE, OR CONSEQUENTIAL DAMAGES, CONNECTED WITH OR RESULTING FROM THIS LICENSE AGREEMENT OR YOUR USE OF THIS SOFTWARE.

Installation

Program requirements: QI-Charts requires a Microsoft Windows operating system (VISTA or later) and Microsoft Excel 2003 or later. If you are using a Mac PC, you will need to have some type of parallel operating system (like Parallels Desktop, VMware Fusion, or VirtualBox) which lets you run Windows as if it were just another Mac application.

Follow these steps to install QI-Charts on your computer:

1. Exit from Excel if it is active.
2. Copy the installation file, QIChartsSetup.exe, to a folder on your computer.
3. Double-click the file to begin setup, follow the steps in the wizard to complete the installation.
4. Start Excel. Notice the QI-Charts toolbar. In Excel 2003 it looks like this:

In Excel 2007 or later, click the 'Add-In' tab in the Excel ribbon to view the toolbar.

QI-Charts v. 1.0.39

A Note for all Windows Users:

Anyone using a Windows Operating System released later than Vista will most likely have to adjust their user control settings. Windows' security apparatus can block installation of QI-Charts. There is a workaround:

1. Open up Control Panel and type "UAC" into the search box. You will get a link for "Turn User Account Control (UAC) on or off". Click this link.

2. On the next screen, uncheck the box called "Use User Account Control (UAC)", then click the OK button.

3. Restart your computer and proceed with QI-Charts installation.

Data Orientation

Your data may be arranged either vertically (column oriented) or horizontally (row oriented). For example, here are some column-oriented data for a typical p-chart:

Optional column headings

Data arranged in columns

Index values are unique

Date	X-Values	N-Values
2/1/2008	43	85
2/15/2008	36	64
2/29/2008	33	57
3/14/2008	61	98
3/28/2008	93	166
4/11/2008	6	27
4/25/2008	31	85
5/9/2008	69	73
5/23/2008	48	82
6/6/2008	40	128
6/20/2008	2	88
7/4/2008	53	79
7/18/2008	99	146
8/1/2008	97	192
8/15/2008	90	93
8/29/2008	66	124
9/12/2008	90	137
9/26/2008	43	129
10/10/2008	38	116
10/24/2008	72	125
11/7/2008	121	155
11/21/2008	143	161

QI-Charts v. 1.0.39

In this example, the first column, the index, contains values that will appear on the X-axis of the control chart. These may be dates or times, labels, or a numbered series. Index values should be unique, if possible. Column headings are optional.

A row-oriented version of the above data would look like this:

| Date	2/1/2008	2/15/2008	2/29/2008	3/14/2008	3/28/2008	4/11/2008	4/25/2008	5/9/2008	5/23/2008
X-Values	43	36	33	61	93	6	31	69	48
N-Values	85	64	57	98	166	27	85	73	82

etc.

Creating a Control Chart

This example provides the steps for creating a p-chart using the data shown in the previous figure. The procedure for other chart types is similar.

NOTE: X-BAR/S charts require that some calculations be performed before you create the chart. They are described in a later section.

1. Open the Excel workbook that contains your data, or enter data into a new worksheet.

2. In the QI-Charts toolbar, click 'New Control Chart'

3. Complete the New Control Chart dialog of the wizard as shown below. Note that the Data Range spans all of the data including the field headers.
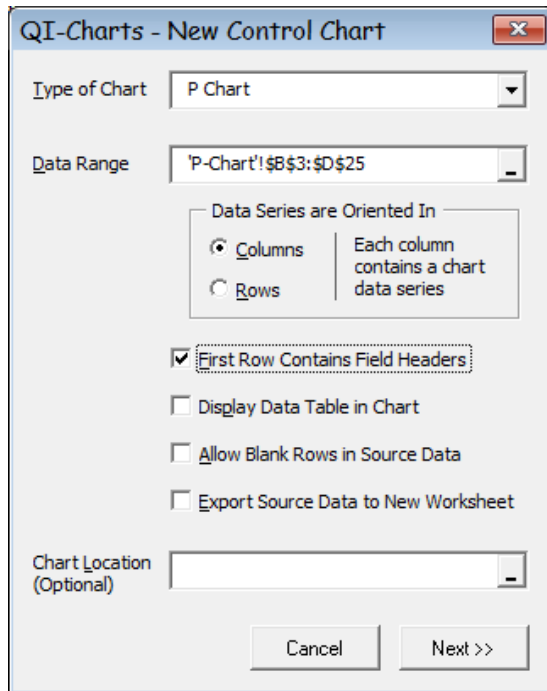
4. Optionally, you can specify the location where you want the chart to appear. If you leave this option blank, the chart will appear just to the right of your data range.

5. Click 'Next>>'.
6. In the Create P-Chart dialog, indicate the location of the columns required for a p-chart. The index column contains the X-axis values, the X-values Column contains the numerators, and the N-Values Column the denominators. Click 'Next>>'.
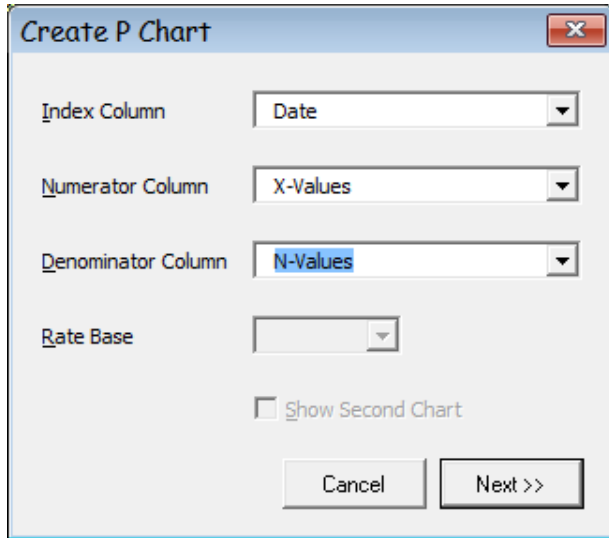
7. In the Select Phases dialog, indicate the phase boundaries. See below for more information about phases. In this case, we select a single phase that comprises all of the data. Click 'Done.'
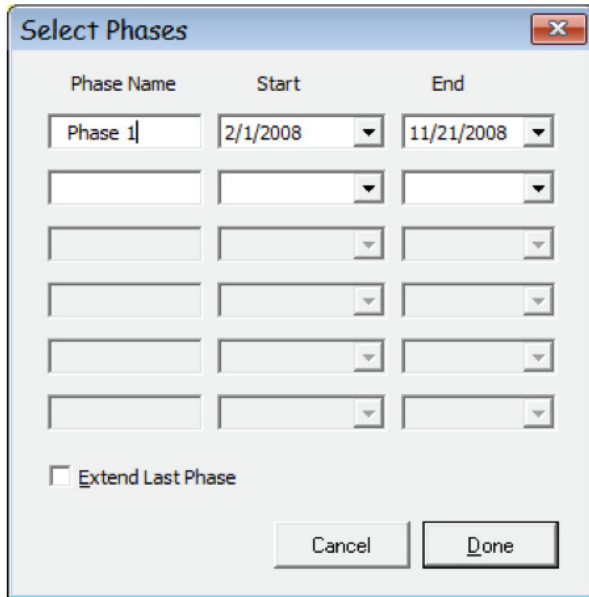
8. QI-Charts places the new control chart just to the right of your data range:
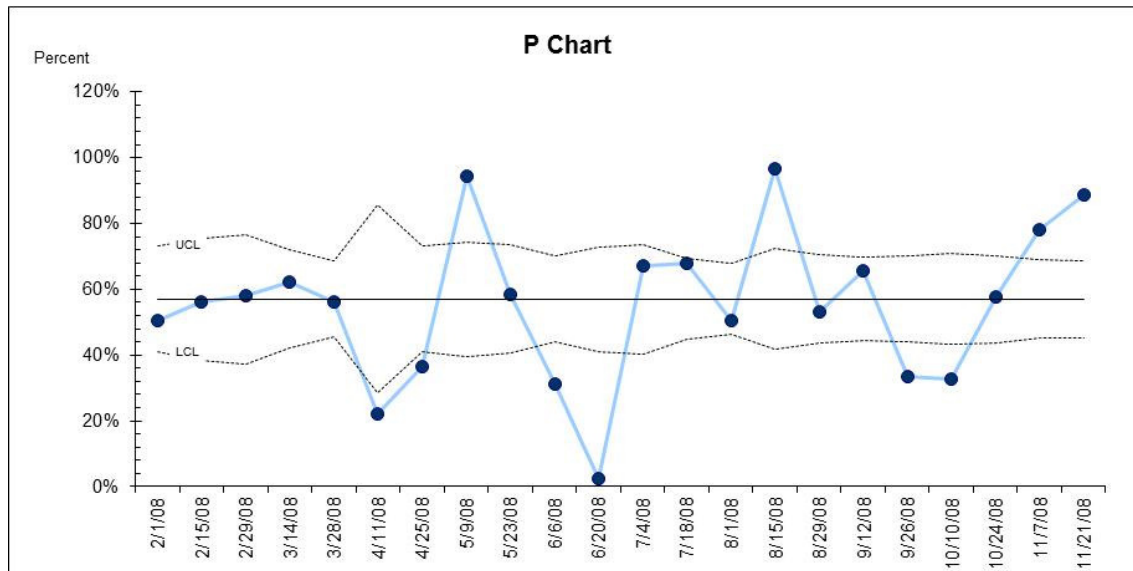
9. You may adjust the chart titles, axis scaling and overall appearance of the chart using the regular Excel chart menus:

a. To modify the chart titles, select the chart, click 'Layout' in the main Chart Tools menu. Click 'Chart Title' or 'Axis Titles', enter your text.

b. To adjust the axis scale or select the chart, click 'Layout' in the main Chart Tools menu. Click 'Axes', select the horizontal or vertical axis, and make changes in the dialog.

c. Many other formatting changes may be made by right-clicking on a chart feature and choosing the 'Format...' command in the pop-up menu.

About Phases

When creating Shewhart control charts, a new center line and new control limits should be calculated when it has been determined that the underlying process has changed, often as the result of a planned improvement. In QI-Charts, a set of limits based on a portion of the chart data is called a phase.

The following p-chart has two phases, the second beginning with a successful process change that begins with the 8/1/08 value:
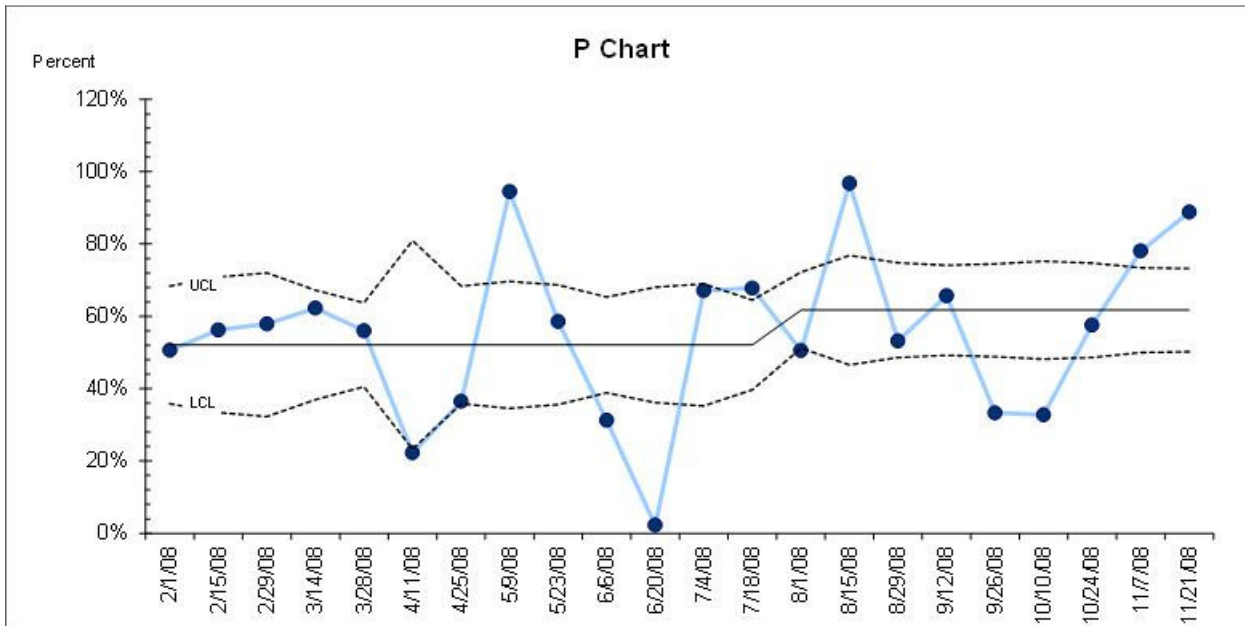
To create the above chart in the QI-Charts wizard, the Select Phases dialog was configured like this:

QI-Charts v. 1.0.39
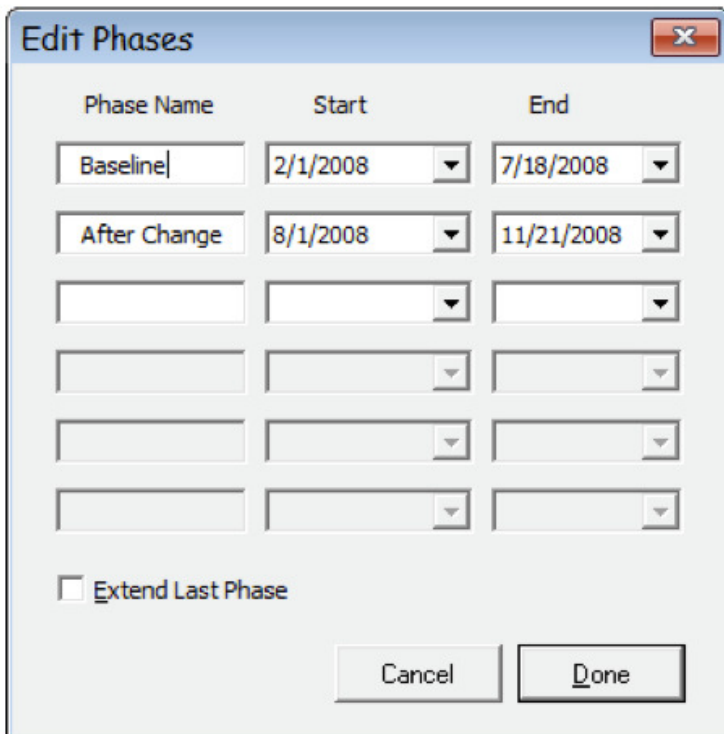
A QI-Charts control chart may have up to six separate Phases.
To modify the phases of an existing chart, select the chart and click 'Edit Chart Phases' in the QI-Charts toolbar.

Testing Process Changes by Extending the Last Phase

Let's begin with data organized as follows. A successful change was initiated on 8/1/2008. A second test was begun on 12/5/2008, and the new post-change data have yet to be entered:

Date	X-Values	N-Values	
2/1/2008	43	85	
2/15/2008	36	64	
2/29/2008	33	57	
3/14/2008	61	98	
3/28/2008	93	166	
4/11/2008	6	27	
4/25/2008	31	85	
5/9/2008	69	73	
5/23/2008	48	82	
6/6/2008	40	128	
6/20/2008	2	88	
7/4/2008	53	79	
7/18/2008	99	146	
8/1/2008	145	192	Successful Change
8/15/2008	90	93	
8/29/2008	91	124	
9/12/2008	110	137	
9/26/2008	100	129	
10/10/2008	91	116	
10/24/2008	106	125	
11/7/2008	138	155	
11/21/2008	143	161	
12/5/2008			New Change
12/19/2008			
1/2/2009			
1/16/2009			
1/30/2009			

We will now configure a control chart to test the change:

1. Click the 'New Control Chart' button on the QI-Charts menu bar.

2. Proceed as described above to the Select Phases dialog, and configure it as shown. The 'First Change' phase includes the data (8/1 through 11/21) that will determine the center line and limits to be used to test the post-PDSA data. The 'Extend Last Phase' option indicates that these limits and center line should extend to the end of the chart:
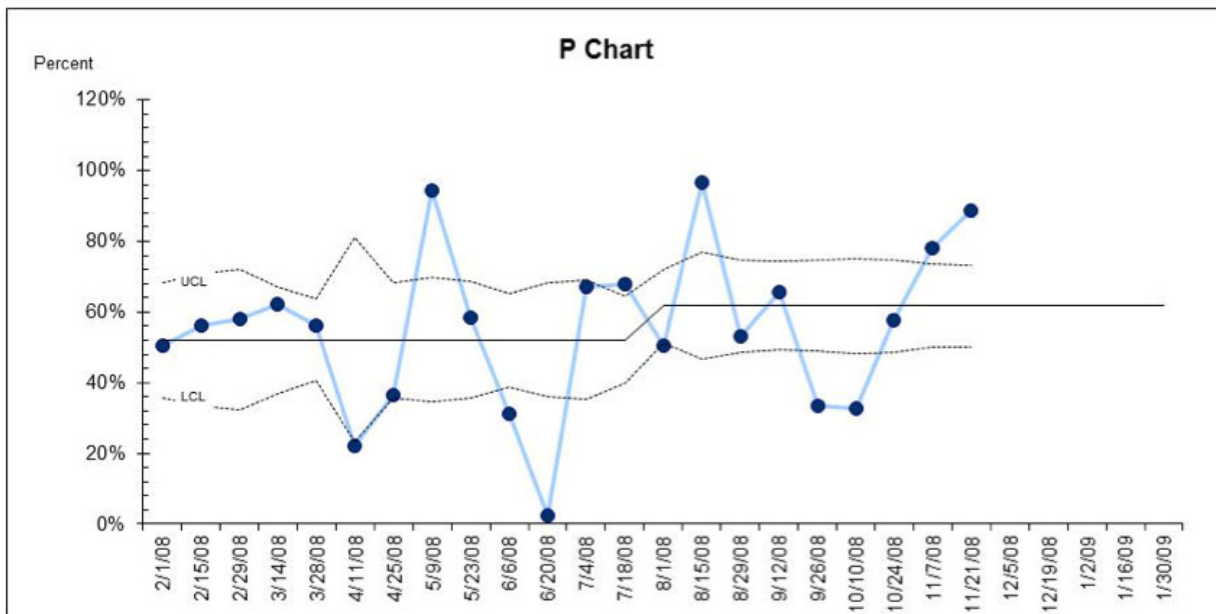
QI-Charts v. 1.0.39

The resulting chart looks like this:

3. Enter the data values from your new test into the table:

11/7/2008	138	155	
11/21/2008	143	161	
12/5/2008	170	175	New Change
12/19/2008	125	130	
1/2/2009	110	112	
1/16/2009	91	94	
1/30/2009	145	150	

4. Select the chart, and click the 'Refresh Chart Data' button on the QI-Charts toolbar. The new data points are added to the chart, while the center line from the second phase is maintained. The new values indicate a successful change:
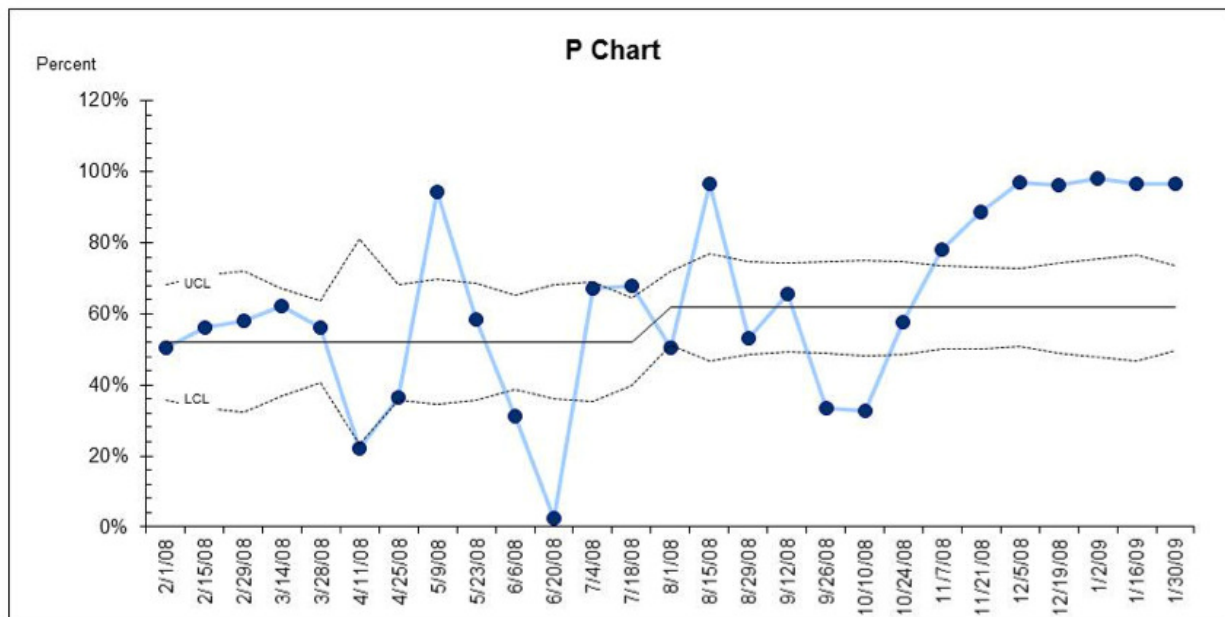
Given that the new PDSA was successful, we should create a new phase beginning with the 12/5/2008 value.

5. Select the chart, and click the 'Edit Chart Phases' button on the QI-Charts menu. Configure the dialog as shown, and click Done.
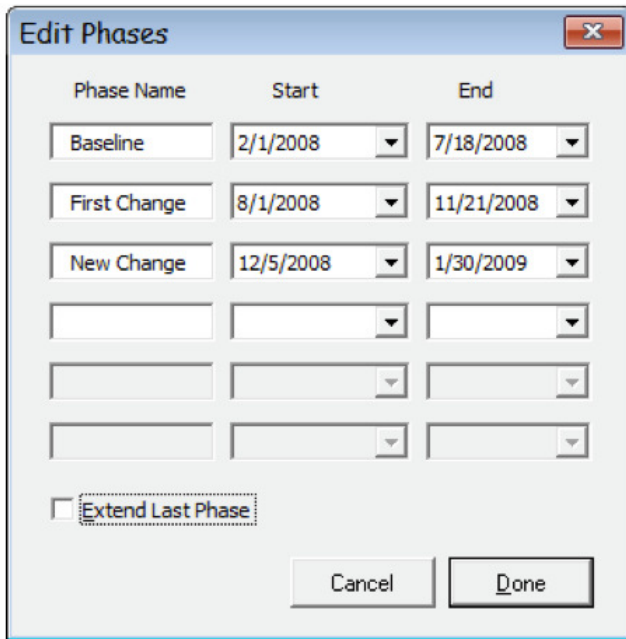
The resulting chart looks like this:
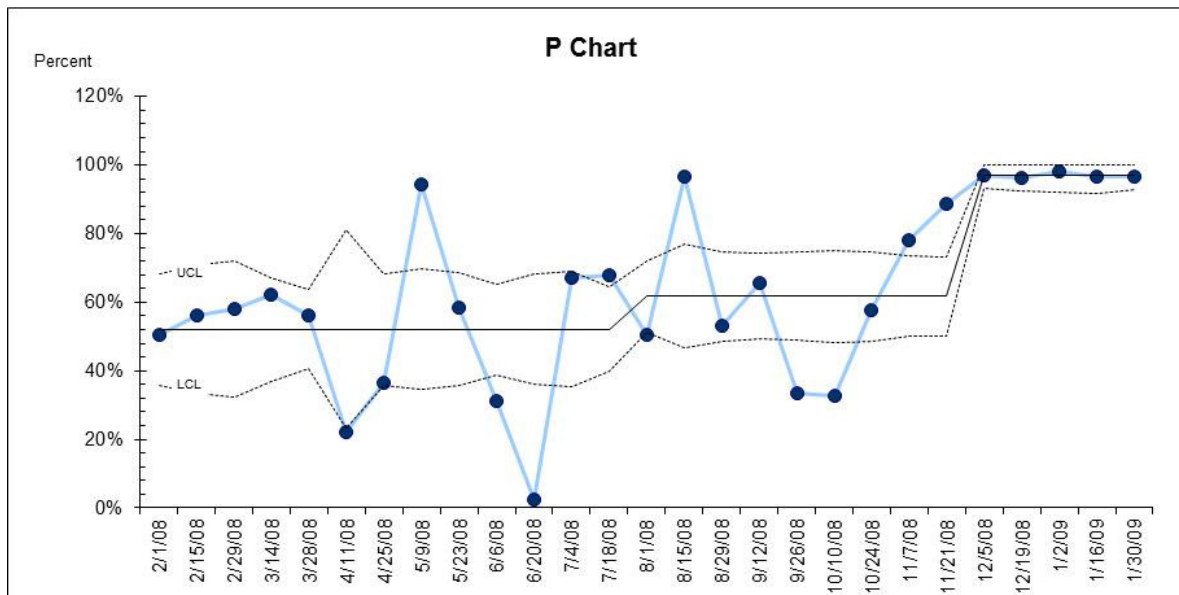
Other Chart Types

The procedures for creating other chart types are similar to the one described above for p-charts: click 'New Control Chart', select the chart types, select your data, indicated the columns that contain the values you will plot, and select phases.

See Appendix A for a summary of the chart types included in QI-Charts.

X-bar/S charts

X-bar/S charts require some special preparation. Consider the following data set, which shows the length of state (LOS) for up to 10 patients sampled on the first day of each month for 12 months:

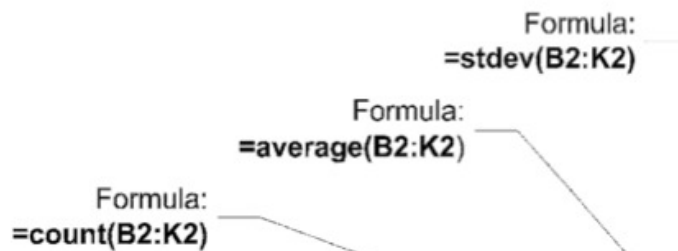|	A	B	C	D	E	F	G	H	I	J	K
1	Month	LOS Case1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case10
2	1/1/2007	4	1	3	2	3	4	5	5	5	4
3	2/1/2007	2	1	3	5	5	4	5	5	5	
4	3/1/2007	4	1	3	2	3	4	5			
5	4/1/2007	5	4	3	5	5	5	5	5	5	4
6	5/1/2007	4	1	3	2	3	4	5	5	5	4
7	6/1/2007	2	1	3	5	5	4				
8	7/1/2007	4	1	3	2	3	4	5	5	5	
9	8/1/2007	2	1	3	5	5	4	5	5		
10	9/1/2007	4	1	3	2	3	4	5	5	5	4
11	10/1/2007	2	1	3	5	5	4	5	5	5	4
12	11/1/2007	4	1	3	2	3	4	5	5	5	
13	12/1/2007	2	1	3	5	5	4	1	3	2	3
14	1/1/2008										
15	2/1/2008										

1. To create an X-Bar/S chart using QI-Charts, begin by calculating the N values, Mean, and Standard Deviation of each sample. Enter formulas as shown below into cells L2, M2, and N2, then copy them into rows 3-13 to calculate the values for each sample:

Formula:
=stdev(B2:K2)

Formula:
=average(B2:K2)

Formula:
=count(B2:K2)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Month	LOS Case	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case10	N	Mean	Std Dev
2	1/1/2007	4	1	3	2	3	4	5	5	5	4	10	3.60	1.349897
3	2/1/2007	2	1	3	5	5	4	5	5	5		9	3.89	1.536591
4	3/1/2007	4	1	3	2	3	4	5				7	3.14	1.345185
5	4/1/2007	5	4	3	5	5	5	5	5	5	4	10	4.60	0.699206
6	5/1/2007	4	1	3	2	3	4	5	5	5	4	10	3.60	1.349897
7	6/1/2007	2	1	3	5	5	4					6	3.33	1.632993
8	7/1/2007	4	1	3	2	3	4	5	5	5		9	3.56	1.424001
9	8/1/2007	2	1	3	5	5	4	5	5			8	3.75	1.581139
10	9/1/2007	4	1	3	2	3	4	5	5	5	4	10	3.60	1.349897
11	10/1/2007	2	1	3	5	5	4	5	5	5	4	10	3.90	1.449138
12	11/1/2007	4	1	3	2	3	4	5	5	5		9	3.56	1.424001
13	12/1/2007	2	1	3	5	5	4	1	3	2	3	10	2.90	1.449138
14	1/1/2008													

QI-Charts v. 1.0.39

2. Click the 'New Control Chart' button and configure the New Control Chart dialog as shown:
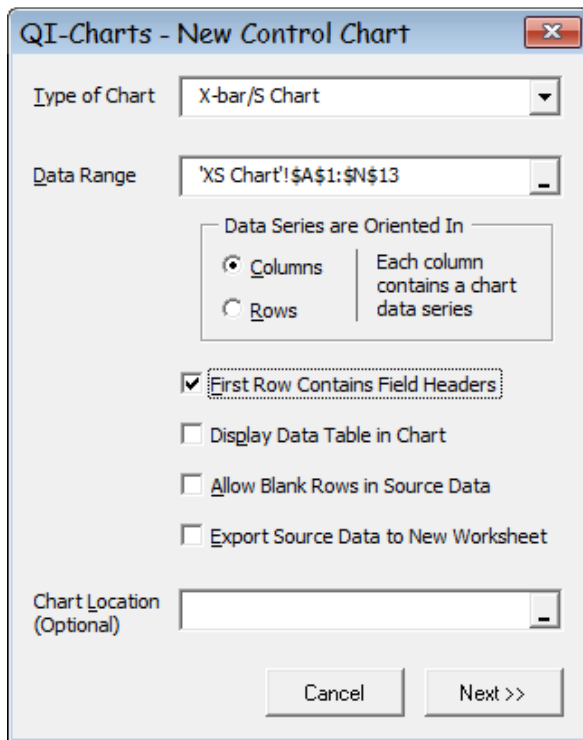

3. Configure the Create X-Bar/S Chart dialog as shown. Note that the dialog utilizes only the index column and the three columns of formulas you created.

Also note that, because LOS can never be negative, we have chosen to constrain the lower control limit to be greater than zero.
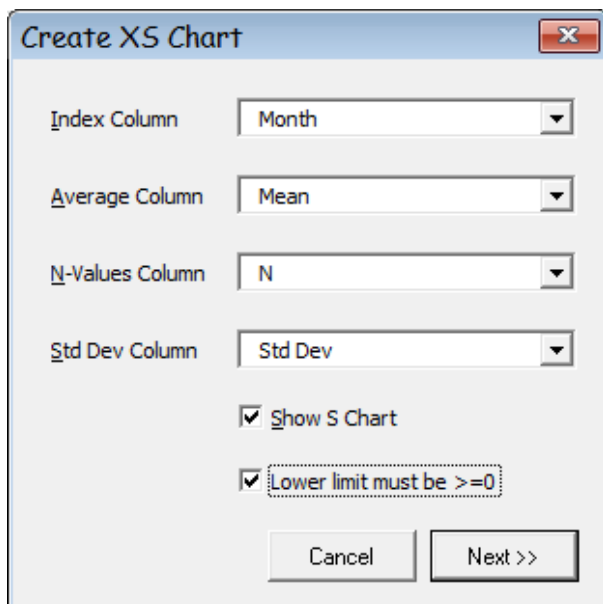
4. Select phases. In this example we have configured just one phase.

5. The resulting X and S charts looks like this:
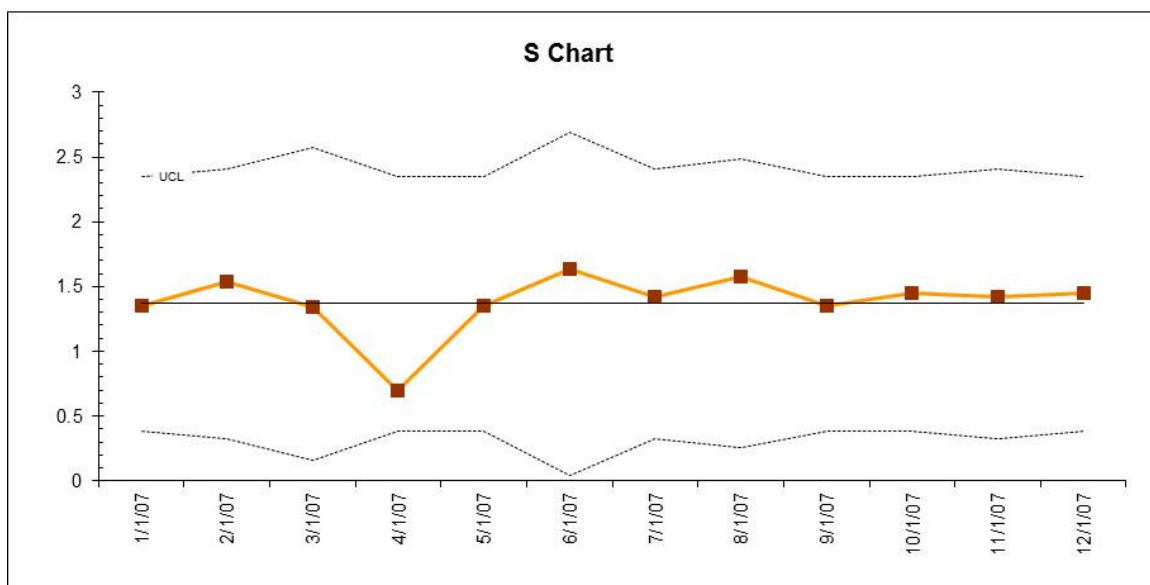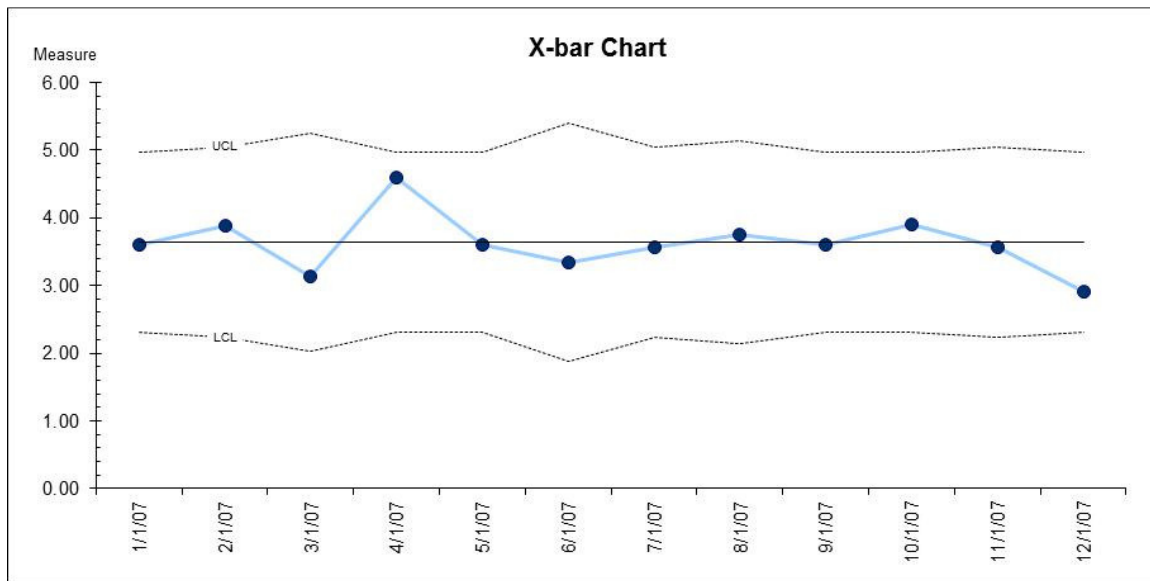
P-Prime and U-Prime Charts

The sigma calculation that determines the control limits for a regular P chart are based on the binomial distribution:

$$S_i = \sqrt{\frac{\overline{p}(1-\overline{p})}{n_i}}$$

Thus, when the subgroup size n_i is very large, the control limits are very close to the center line, resulting in many false positive signals. If your P-chart shows control limits close to the center line with many points outside the limits, consider using a P' chart instead.

In QI-Charts, the P' appears as a pair of charts: the top chart is the P'-chart, the bottom chart is a regular P-chart. The following data set and charts illustrate the use of the P' chart:

Month	Numerator	Denominator
Jan-07	3852	8755
Feb-07	4100	9800
Mar-07	7083	17000
Apr-07	7339	16400
May-07	9406	19500
Jun-07	9310	19800
Jul-07	7250	21200
Aug-07	10400	22300
Sep-07	9250	21600
Oct-07	9950	20500
Nov-07	9846	18700
Dec-07	9854	18900
Jan-08	8034	14300
Feb-08	8162	14800
Mar-08	8122	14500
Apr-08	8200	14600
May-08		
Jun-08		
Jul-08		
Aug-08		
Sep-08		
Oct-08		
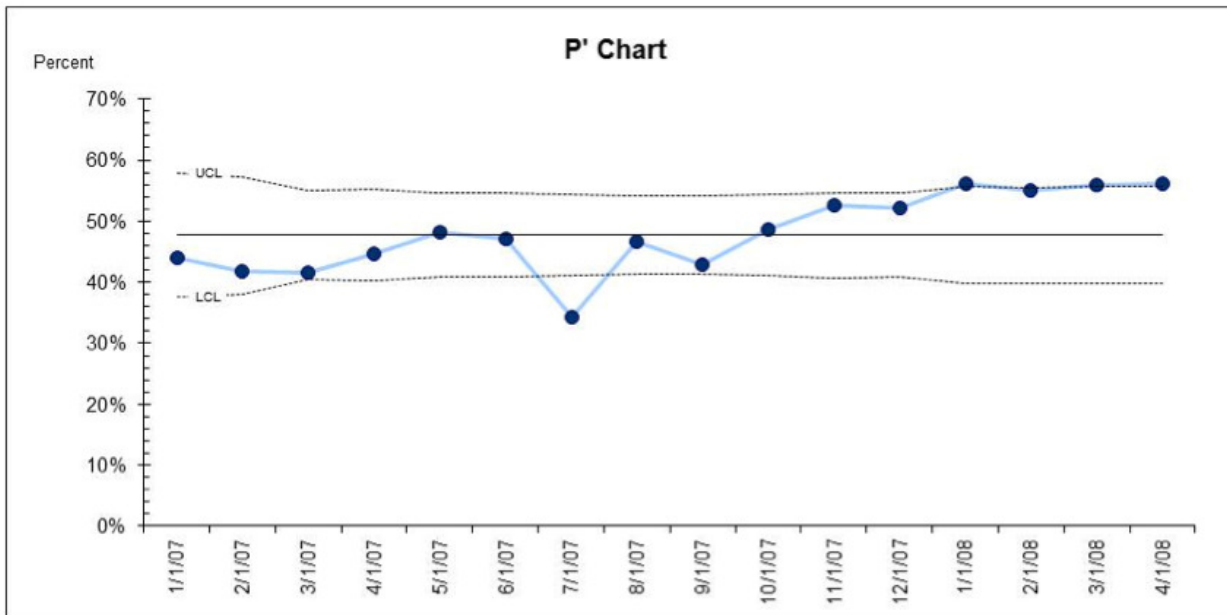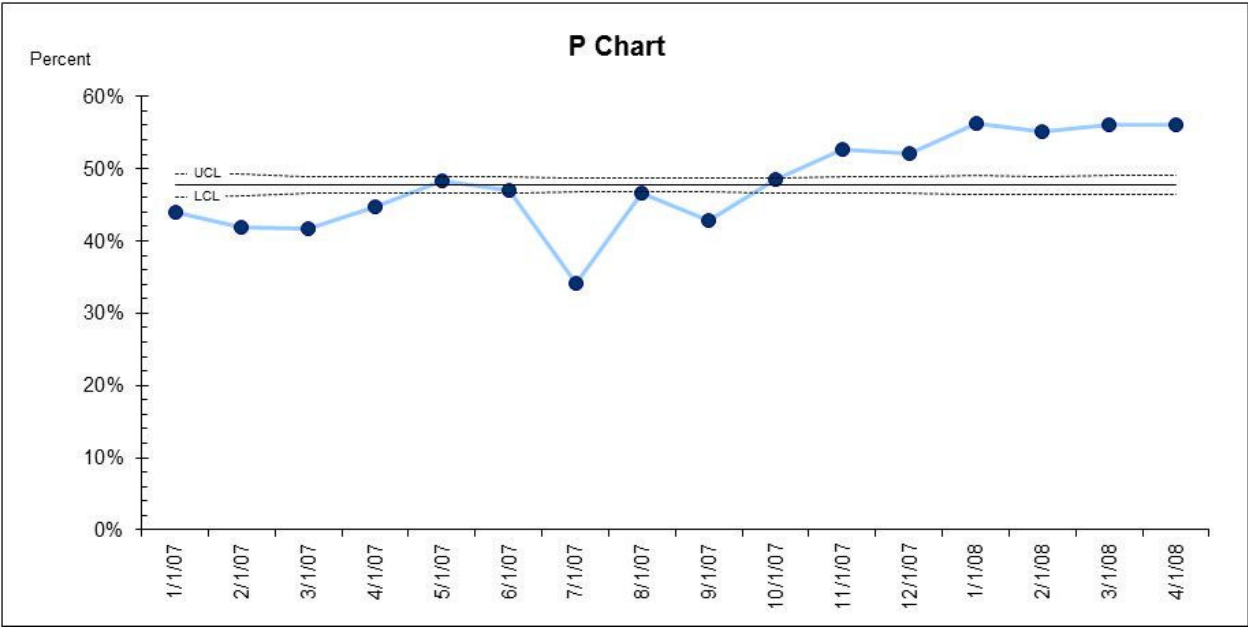
P Chart

The U-prime chart makes the analogous correction for rates.

T and G Charts

T and G charts are both useful for evaluating infrequent events. Use a G chart when you can count the number of cases, events, or items between the event of interest; for example, the number of patient discharges between VAP episodes. T charts track the time between events of interest, and are a useful alternative when the number of intervening events is not known. A G chart would be appropriate for plotting the number of days between MRSA infections or patient falls.

In QI-Charts, the data layout for A G chart includes the date and the number of events between events of interest – in this case, number of doses administered between adverse drug events. Like this:

Date	Doses Administered between ADEs
4/22/2007	1037
4/26/2007	3698
5/1/2007	3222
5/4/2007	2157
5/8/2007	3689
5/14/2007	5203
5/17/2007	3131
5/19/2007	2179
5/24/2007	5447
5/29/2007	4726
6/6/2007	6003
6/12/2007	6215
6/20/2007	7644
6/25/2007	3528
7/8/2007	7834
7/15/2007	8220
7/30/2007	12421
8/17/2007	11173
8/30/2007	15984
9/14/2007	12201
9/24/2007	17005

Number of events between events of interest

T-charts are unusual since they only require a single column of data, namely the date of each event of interest. In this case, the number of days between patient falls. In order to support the limits calculations, these values must be valid Excel date-time values, not text. If two events occur on the same day, you may include a time value, e.g. 3/15/2008 8:30 AM.

| Date of fall |
| --- |
| 3/2/2008 |
| 3/6/2008 |
| 3/7/2008 |
| 3/15/2008 |
| 3/22/2008 |
| 4/1/2008 |
| 4/11/2008 |
| 4/14/2008 |
| 4/26/2008 |
| 5/3/2008 |
| 5/4/2008 |
| 5/13/2008 |
| 5/19/2008 |
| 5/28/2008 |
| 6/4/2008 |
| 6/10/2008 |
| 6/14/2008 |
| 6/21/2008 |
| 6/30/2008 |
| 7/3/2008 |
| 7/7/2008 |
| 7/18/2008 |
| 7/23/2008 |
| 7/25/2008 |
| 8/2/2008 |
| 8/8/2008 |

These values must be valid Excel date/time values

Additional Chart Options

At the request of our users, release 2 of QI-Charts includes some new features.

Data Tables

In the 'New Control Chart' dialog, select 'Display Data Table in Chart' to display a table of values:
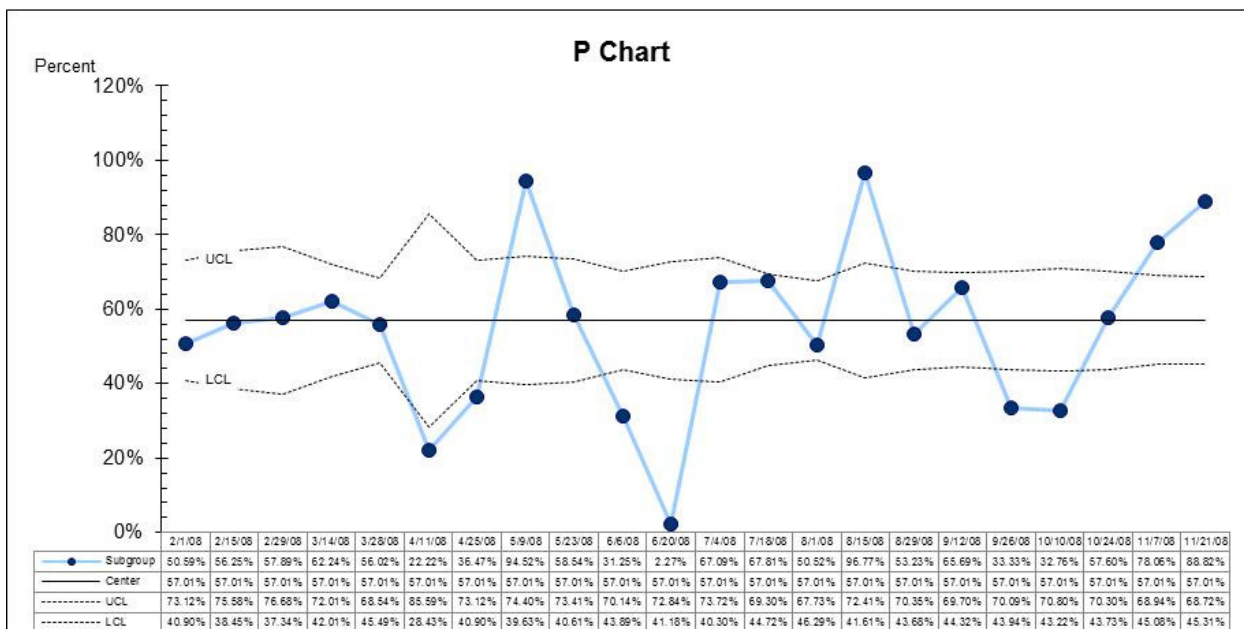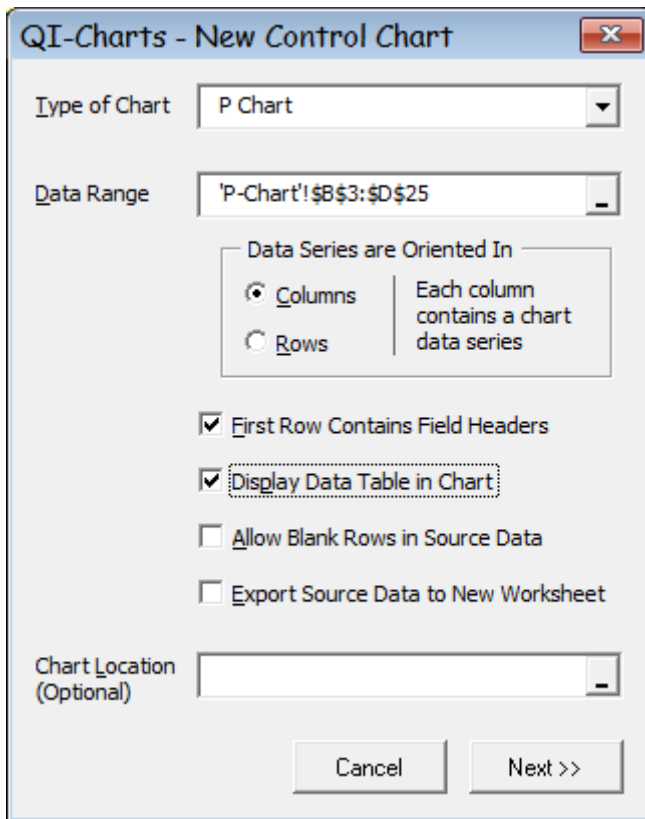
Export Source Data

It can be useful to have access to the values that generated a control chart, in order to support custom calculations, or for a close inspection of the control limit values or calculations. In the 'New Control Chart' dialog, select 'Export Source Data to New Worksheet'. Columns in the table contain formulas appropriate for the chart type selected. For example, here is the data table for the P-chart shown above.

	A	B	C	D	E	F	G	H	I
1									
2	1	2/1/2008	43	85	50.59%	54.74%	5.40%	70.93%	38.54%
3	2	2/15/2008	36	64	56.25%	54.74%	6.22%	73.40%	36.07%
4	3	2/29/2008	33	57	57.89%	54.74%	6.59%	74.51%	34.96%
5	4	3/14/2008	61	98	62.24%	54.74%	5.03%	69.82%	39.65%
6	5	3/28/2008	93	166	56.02%	54.74%	3.86%	66.33%	43.15%
7	6	4/11/2008	6	27	22.22%	54.74%	9.58%	83.47%	26.00%
8	7	4/25/2008	31	85	36.47%	54.74%	5.40%	70.93%	38.54%
9	8	5/9/2008	69	73	94.52%	54.74%	5.83%	72.21%	37.26%
10	9	5/23/2008	48	82	58.54%	54.74%	5.50%	71.23%	38.25%
11	10	6/6/2008	40	128	31.25%	54.74%	4.40%	67.93%	41.54%
12	11	6/20/2008	2	88	2.27%	54.74%	5.31%	70.65%	38.82%
13	12	7/4/2008	53	79	67.09%	54.74%	5.60%	71.54%	37.93%
14	13	7/18/2008	99	146	67.81%	54.74%	4.12%	67.09%	42.38%
15	14	8/1/2008	97	192	50.52%	54.74%	3.59%	65.51%	43.96%
16	15	8/15/2008	90	93	96.77%	54.74%	5.16%	70.22%	39.25%
17	16	8/29/2008	66	124	53.23%	54.74%	4.47%	68.15%	41.33%
18	17	9/12/2008	90	137	65.69%	54.74%	4.25%	67.49%	41.98%
19	18	9/26/2008	43	129	33.33%	54.74%	4.38%	67.88%	41.59%
20	19	10/10/2008	38	116	32.76%	54.74%	4.62%	68.60%	40.87%
21	20	10/24/2008	72	125	57.60%	54.74%	4.45%	68.09%	41.38%
22	21	11/7/2008	121	155	78.06%	54.74%	4.00%	66.73%	42.74%
23	22	11/21/2008	143	161	88.82%	54.74%	3.92%	66.50%	42.97%
24									

And here are the formulas that appear in row 2 of the table:

Column	Contents	Formula
B	Index value	User data value
C	Numerator	User data value
D	Denominator	User data value
E	Proportion	=IF(ISBLANK(D2),"",C2/D2)
F	Center line – mean of binomial distribution	=SUM($C$2:$C$22)/SUM($D$2:$D$22)
G	Standard deviation of binomial distribution	=((F2*(1-F2))/D2)^0.5
H	Upper control limit	=IF(D2=0,NA(),MIN(1,F2+3*G2))
I	Lower control limit	=IF(D2=0,NA(),MAX(0,F2-3*G2))

Changing the Appearance of Your Charts

To change the appearance of your charts, use the regular Excel commands and procedures. In general, you can right-click on a chart element and select menu options to change it.

Creating Multiple Charts with Consistent Appearance Using Chart Templates

In using QI-Charts you may find that you often need to create a new charts for the same or similar data, for instance when you need to re-organize chart phases. Or you may need a series of charts that are stylistically consistent. It would be tedious to have to apply the same formatting changes over and over to each new chart. Chart templates (in Excel 2003, they are known as 'user chart types') provide a convenient way around this problem: using a chart template, you can design a chart, save its format as a template, then apply the format to new charts.

To use a chart template in Excel 2007-2010:

1. Create a control chart using QI-Charts.

2. Apply formatting changes using Excel's chart formatting features.

3. Select the chart. In the Chart Tools tab, select Design.

4. Click Save as Template. Enter a name for your new template and click Save.

To apply the template to a new chart:

1. Create a new chart.

2. Select the chart. In the Chart Tools tab, select Design.

3. Click Change Chart Type. In list at the left of the dialog, click 'Templates'.

4. Select your template and click OK.

To use a chart template in Excel 2003:

1. Create a control chart using QI-Charts.

2. Apply formatting changes using Excel's chart formatting features.

3. Select the chart.

4. In the Excel menu select Chart, Chart Type

5. In the Select From box, click User Defined

6. In the Add Custom Chart Type dialog, click Add

7. Enter a name for your chart template and click OK

To apply the template to a new chart:

> 1. Create a new chart.
>
> 2. Select the chart.
>
> 3. In the Excel menu select Chart, Chart Type
>
> 4. In the Select From box, click User Defined
>
> 5. In the Chart Type list, select your chart template name and click OK.
>
> 6. Don't forget to edit your chart and axis labels, if necessary.

Decision Tree for Chart Selection

Click the 'Rules for Special Cause' button in the QI Charts toolbar to display a decision tree showing the types of control charts available in QI-Charts, and the type of data they are appropriate for:
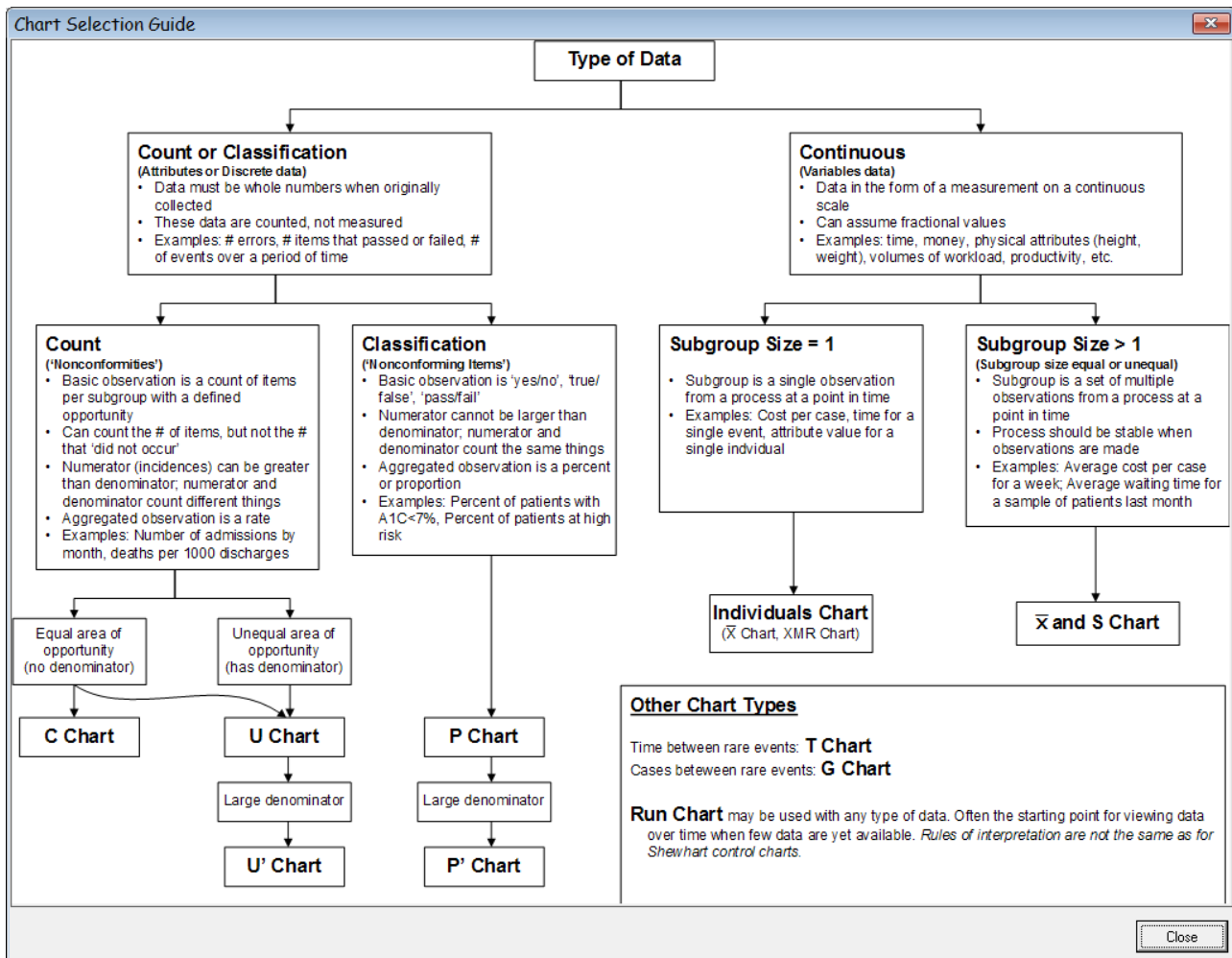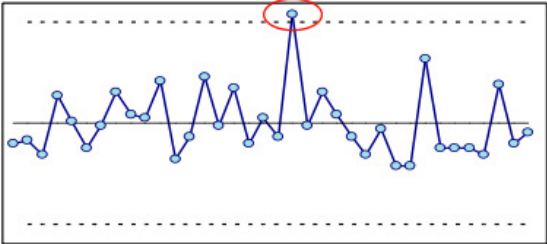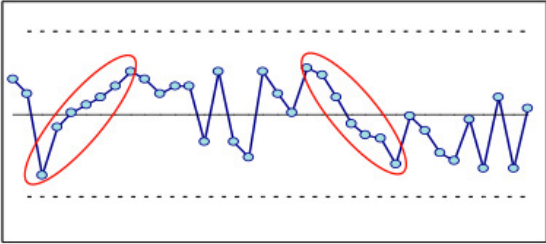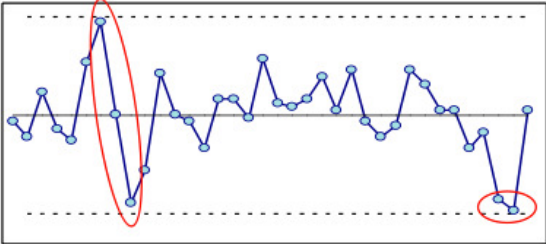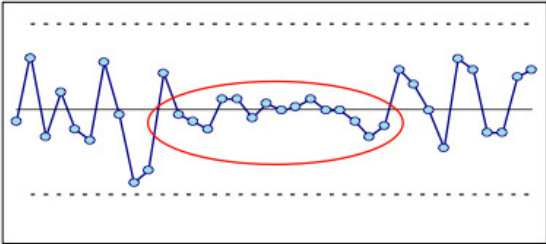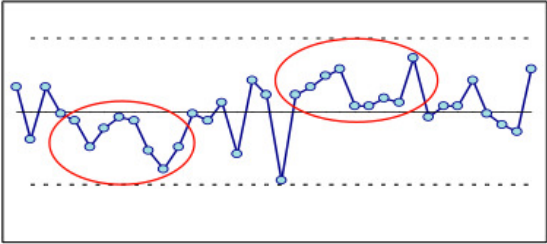
Rules for Special Cause

Click the 'Rules for Special Cause' button in the QI Charts toolbar to display the following dialog:

These rules are approved by Associates for Process Improvement (www.apiweb.org). Further discussion of these rules can be found in the resources described below.

Additional Resources

More about control charts and improvement tools

Extended discussion of the principles of control chart selection, construction, and interpretation can be found in the following resources, available at www.pipproducts.com:

▪ *Methods for Understanding Variation - Statistical Process Control (SPC)*

This book provides the reader and practitioner access to the necessary methods with which to apply control charts. Designed as a reference book, it provides examples of the tools that make up the SPC tool box and helpful worksheets to develop the necessary control charts. In addition to examples and worksheets, the book has case studies in which the practitioner can practice their skills in developing control charts and the other necessary tools for example, Pareto charts, frequency plots, and scatter plotsG in which to understand a situation.

▪ *The Data Guide*

The Data Guide is designed for those who want to improve health care. Specifically, this book focuses on developing skills in using data for improvement. Our goal is to help those working in health care to make improvements more readily and with greater confidence that their changes truly are improvements.

Annotating Your Control Charts with AppsPro's Chart Labeler

In improvement work, we often like to annotate a point on a chart to indicate a change in the process or other special cause. There is no ready way to accomplish this in Excel: if you simply add a text box or drawing object to a chart, you can create the desired effect, but the annotation is not linked to the point, and so will go out of position as you edit the chart.

However, using Data Labels, you can achieve a workable solution such as the following. 1 data label it attached to the point. The problem is that creating a single data label in Excel is very laborious.
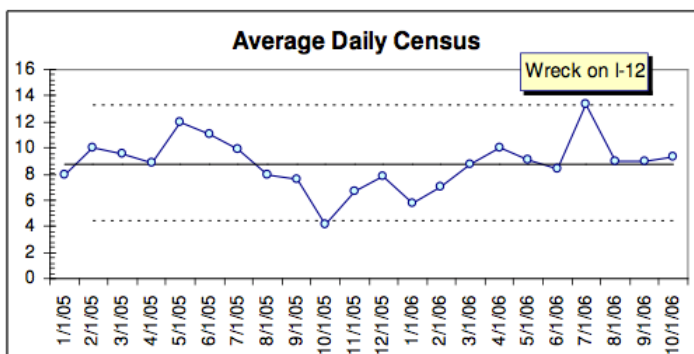

To make this technique truly manageable, you will need to download and install a free utility program, "XY Chart Labeler", available from 1pplications Professionals at:

http://www.appspro.com/Utilities/ChartLabeler.htm

QI-Charts v. 1.0.39

Here's how to create the above annotation using XY Chart Labeler:

    1. Download and install ChartLabeler at the above URL.

    2. Create a control chart. In the current example, the data were arranged in columns 1 and B of the worksheet shown below. The chart is an Individuals Chart.

    3. Enter the annotation text into a blank column for rowG that aligns with your data, as shown below.

    4. Select Tools, XY Chart Labels, Add Chart Labels.

    5. In the 1dd Labels dialog,

        a. Select 'Subgroup' as the Date Series to Label.

        b. Select the range that contains your labels as the Label Range as shown below. Click OK.

6. In your chart, click on the new data label twice, not too fast, to select it.

7. Select Format, Selected Data Labels, and use the dialogs to alter the formatting of the annotation.
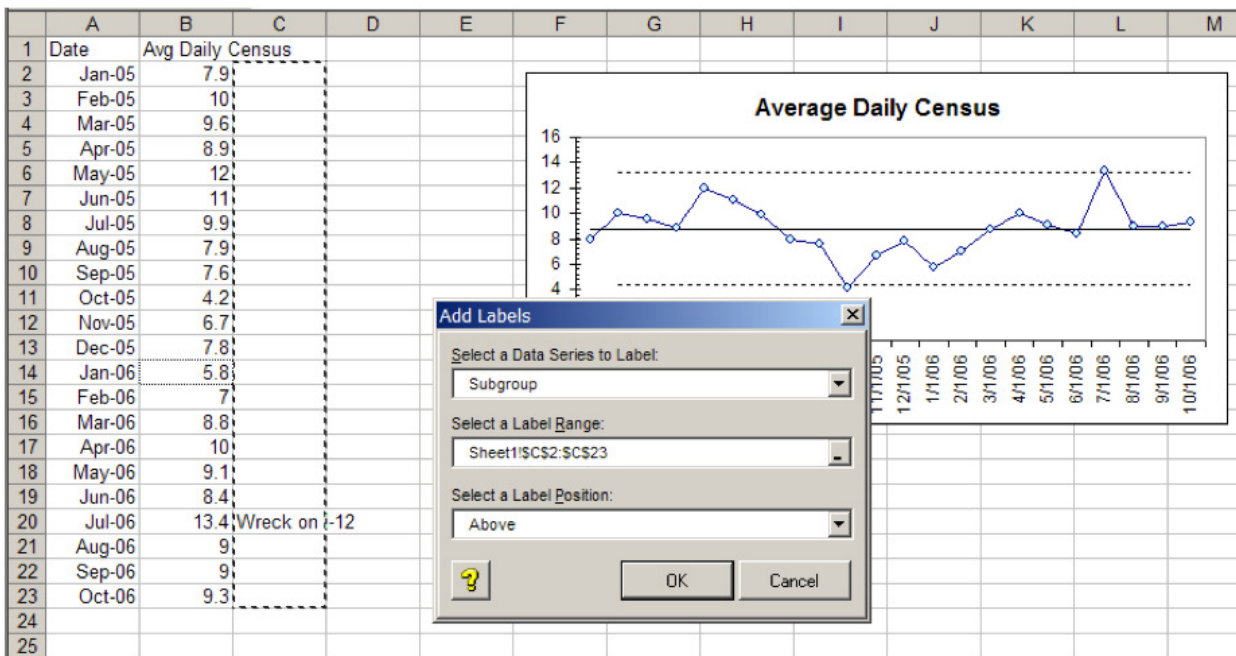
Providing Feedback

QI-Charts is a work in progress. We welcome feedback from you, our users, in order to make future releases of QI-Charts even easier and more useful. Please send your ideas for enhancements, suggestions for improving usability, or possible bugs to

> feedback@pipproducts.com

Thanks!

Acknowledgements

Software development is another one of those things that, along with sausages and laws, is better done out of sight. QI-Charts, on the other hand, has benefited from the capable and enthusiastic vision of many in the QI community who contributed ideas, suggestions, and testing time to the effort. Here they are, with apologies to any who were inadvertently omitted, and with the assurance that any flaws or shortcomings in the program are not of their doing:

> Lloyd Provost
> Sandy Murray
> Brandon Bennett
> Shannon Provost
> Bob Lloyd
> Bill Peters
> Kevin Little
> The Institute for Healthcare Improvement
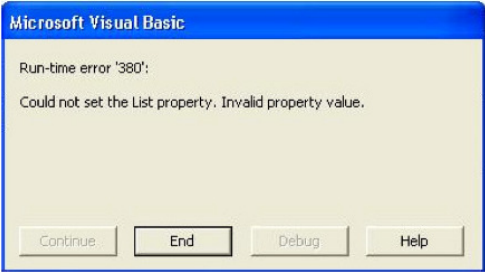> The students in IHI's Improvement Advisor program

Finally, immeasurable thanks and primary credit go to Rob Bovey of Applications Professionals. Rob's total knowledge of Excel, his programming skills and ingenuity, not to mention his thoroughgoing professionalism and good humor, made QI-Charts a reality.

- Richard Scoville

Appendix A: Chart Types in QI Charts

Name in QI-Charts	Full (or other) Name	Description
C Chart	C chart	A Shewhart C chart (or count chart) is used when actual counts of incidence (often called nonconformities) are made. A subgroup is defined as an area of opportunity, when working with count data and must be approximately constant for a C chart.
G Chart	G chart	The G chart (or Geometric chart) plots the number of units or cases between the incidence of interest. It is an alternative to the P chart or C chart when the incidence of interest is relatively rare and some discrete determination of opportunity (cases, patients, admits, etc) can be obtained.
Individuals Chart	XMR, I chart, or X chart	A Shewhart chart for continuous individual measurements. In the literature, this type of chart is also called as X-chart, Xmr chart, and Individuals chart.
P Chart	P chart	The Shewhart P chart (or percent chart) is appropriate whenever the data is based on classifications made in two categories. The number is the category of interest divided by the subgroup size (n) and multiplied by 100 to display as a percentage. The P chart can be used with either fixed or variable subgroup sizes.
P' Chart	P prime chart	An alternative to the P chart for very large (>3000) subgroup sizes. If the limits on an initial P chart appear very close to the center line with many points outside the limit, consider this alternative.
Run Chart	Run chart	A run chart is a graphical display of data plotted in some type of order, usually over time. The run chart is also called a trend chart or a time series chart. It does not have control limits, and so the decision rules for detecting special cause do not apply.
T Chart	T chart	The T chart (or time-between chart) is an alternative to a standard attribute chart when the incident of interest is relatively rare and the time between each occurrence of the incident can be obtained. The time (in minutes, hours, days, etc.) since the last incidence is plotted each time an incidence occurs.
U Chart	U chart	A Shewhart U chart (or rate chart) is used when counts of incidence (often called nonconformities) are made and the subgroup size , as defined an area of opportunity, is not constant. The counts are divided by the actual number of "standard areas of opportunities" to calculate the u statistic. A "rate base" of 100, 1000, or 10,000 are commonly used as the standard area of opportunity.
U' Chart	U prime chart	An alternative to the u chart for very large areas of opportunity. If the limits on an initial u chart appear very close to the center line with many points outside the limit, consider this alternative.
X-BAR/S Chart	Xbar and S chart	A set of two Shewhart charts used to study a process: the X-bar chart (or average chart) and the S chart (or standard deviation chart). The data for the construction of X-bar and S charts requires that the data be organized in subgroups. A subgroup for continuous data is a set of measurements which were obtained under similar conditions or during the same time period. The subgroup size may vary for the X bar and S chart. The X-bar chart contains the averages of each subgroup and the S chart the standard deviation) between the measurements within each subgroup. To construct the chart, need to calculate the average (x-bar), standard deviation (S), and subgroup size (n) for each index value.

QI-Charts v. 1.0.39

Appendix B: Troubleshooting FAQs

Issue	Resolution
The toolbar disappeared! Where did it go?	The QI-Charts add-in may be disabled. In Excel 2003, select Help / About Microsoft Excel from the Excel menus, and click the Disabled Items button. You should find QI-Charts in the list. Enable it. In Excel 2007, click the Office button (upper left corner), then select Excel Options / Add-Ins. Click Manage Excel Add-Ins, locate QI-charts, and enable it.
I work in the UK. When I try to adjust the phase boundaries for an existing chart, I get an error message that looks like this: **Microsoft Visual Basic** Run-time error '380': Could not set the List property. Invalid property value. Continue — End — Debug — Help	Due to peculiarities of the Visual Basic language, QI-Charts requires that you select the "United States" as your Region in windows. Click Start (the Windows start button); select Settings / Control Panel / Regional and Language Options; in the dialog, under Standards and Formats, select 'English (United States)'.