Calculating the Cost of Poor Quality: A Multi-Facility Study

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Abstract

The Cost of Poor Quality (COPQ) concept was first described by Joseph Juran in 1951. COPQ can be defined as the cost of not doing something right the first time or “the costs associated with providing poor-quality products or services.” Although it is widely accepted that poor-quality costs organizations significant amounts of money, published at 20% of sales for an average company, there is not much published work on COPQ in the context of the clinical laboratory. Another obstacle for application and adoption of the COPQ concept is that there is no standardized and widely accepted methodology to calculate COPQ. The concept can be useful in demonstrating the financial value provided to a clinical laboratory or hospital by its quality program through the cost avoidance and cost savings resulting through elimination of root causes of nonconforming events. The introduction provided through the nonconforming event management system and quality improvement initiatives provided by the quality program, the laboratory and hospital would continue to experience financial losses for these events, in addition to potential patient safety risks. Internal failure costs are incurred to remedy defects discovered before the product or service is delivered to the customer. External failure costs are incurred to remedy defects discovered by the customer. COPQ figures can be either hard or soft. COPQ data arises from cost accounting calculations related to an event resulting largely from rework (labor, supplies, reagent, QC materials, etc.). Hard costs directly impact the budget and Profit & Loss statements. Soft costs are those costs for which we know there is a financial implication, but it is not possible to calculate via cost accounting. Examples of soft costs include low morale and reputational damage. This study sought to develop a standardized tool incorporating feedback from leaders across multiple facilities in different geographical locations and across a variety of types and sizes of laboratories. The goals of this study are to provide a widely available, interactive tool for laboratory professionals to calculate COPQ as well as to provide COPQ figures for common event types that laboratory professionals can reference when calculating COPQ in their facilities.

Materials & Methods

A standardized COPQ worksheet, referred to as the COPQ Calculator, was developed utilizing Microsoft Excel and tested by seven leaders from multiple facilities across the USA. Both hard and soft cost were considered in the calculations. Feedback was incorporated and the resulting COPQ Calculator was then deployed at seven facilities for a study on seven types of nonconforming events commonly encountered in the clinical laboratory: Specimen Mislabel, Instrument Downtime, Test Return, Proficiency Testing Failures, Corrected Reports, Product Recalls, and Turnaround Time Delay. Refer to the COPQ Calculator in Figure 2 (note: version 1.4 was used for study, version 1.6 displayed). The group met August 16th, 2017 in Indianapolis, Indiana for a full day to discuss use of the COPQ calculator and to calibrate on COPQ calculations. Data was collected from 6/27/2017 to 10/6/2017. Microsoft Excel was utilized to analyze the data.

Results

COPQ data was collected by the contributors for the seven facilities for the seven nonconforming event types. Refer to figures 4 and 5 for a full summary of the results.

Discussion

Most participants expressed frustration with the use of the COPQ calculator initially, particularly when calculating or estimating soft costs. All facilities took a different approach to the calculation of soft costs largely based on availability of data and management’s tolerance for inclusion of estimated figures. All gathered that a few times after using the calculator, it became much easier and they were able to utilize it in a standardized, consistent, and reproducible manner. Hard costs were easier and more straightforward for participants to incorporate costs into the calculator, particularly those that were cost accounting calculated costs of the portions of the calculator were performed in a standardized manner. Contributors desired creative calculations for soft costs such as low morale. Examples include percentage of overall daily revenue or percentage of an employee’s wages. Most contributors expressed the inability to fill out COPQ calculators for all nonconforming events reported in their lab due to lack of resources. Considerable interfacility and interfacility variability costs for COPQ can come from the same event type. All participants agreed that capturing COPQ in a timely manner was crucial in recognizing the financial impact of quality issues in their laboratories. Ongoing use of the tool will vary among the participating facilities.

Introduction

The Cost of Poor Quality (COPQ) concept was first described by Joseph Juran in 1951. COPQ can be defined as the cost of not doing something right the first time or “the costs associated with providing poor-quality products or services.” Although it is widely accepted that poor-quality costs organizations significant amounts of money, published at 20% of sales for an average company, there is not much published work on COPQ in the context of the clinical laboratory. Another obstacle for application and adoption of the COPQ concept is that there is no standardized and widely accepted methodology to calculate COPQ. The concept can be useful in demonstrating the financial value provided to a clinical laboratory or hospital by its quality program through the cost avoidance and cost savings resulting through elimination of root causes of nonconforming events. The introduction provided through the nonconforming event management system and quality improvement initiatives provided by the quality program, the laboratory and hospital would continue to experience financial losses for these events, in addition to potential patient safety risks. Internal failure costs are incurred to remedy defects discovered before the product or service is delivered to the customer. External failure costs are incurred to remedy defects discovered by the customer. COPQ figures can be either hard or soft. COPQ data arises from cost accounting calculations related to an event resulting largely from rework (labor, supplies, reagent, QC materials, etc.). Hard costs directly impact the budget and Profit & Loss statements. Soft costs are those costs for which we know there is a financial implication, but it is not possible to calculate via cost accounting. Examples of soft costs include low morale and reputational damage. This study sought to develop a standardized tool incorporating feedback from leaders across multiple facilities in different geographical locations and across a variety of types and sizes of laboratories. The goals of this study are to provide a widely available, interactive tool for laboratory professionals to calculate COPQ as well as to provide COPQ figures for common event types that laboratory professionals can reference when calculating COPQ in their facilities.

Conclusion

The contributors to this study reached consensus on a standardized tool for COPQ calculation. All contributors to this study successfully utilized the tool to collect COPQ data for the seven types of nonconforming events as defined in the clinical laboratory. The tool has now been published and available for laboratories to reference in order to articulate the financial implications of nonconforming events and begin to manage them.

Key takeaways from this study include:

- The COPQ Calculator is a useful tool that aids laboratories in calculating COPQ in a standardized manner
- Calculating COPQ helps labs to understand the large amount of waste in their everyday operations
- Capturing COPQ allows labs to more effectively trigger nonconforming events for remediation
- Although difficult to collect data and gain buy-in for soft costs, it is a worthwhile exercise in order to fully understand the holistic impact events
- Demonstration of cost avoidance and/or cost savings can help justify additional investment in quality
- The variation within and among labs for the same event type was significant due the lack of a standardized tool. This is due to the variation surrounding each event and the unique laboratory environments in which they occur. For this reason, external benchmarking of COPQ data has limited value. Internally however, aggregating COPQ data can be useful for reasons listed above
- Different approaches to collection of COPQ data are taken based on availability of resources and amount of events. Some labs will choose to calculate COPQ data for few events, whilst others will take a few more events and calculate a COPQ average for the event, enabling application of an average number to their monthly and annual frequency of occurrence to obtain an understanding of the true COPQ event impact. Nevertheless, some may choose to only calculate COPQ for single issues that are particularly problematic or ongoing

Capturing the COPQ associated with each nonconforming event or root cause may allow laboratory leadership to determine the true cause of quality issues. Further, it will allow leadership to where the savings in the language of key executives in the organization that interest savings lie in the financial bottom line. Approaching executive and patient centered quality with only financial benefit will allow the lab to sell proposed quality initiatives effectively. Poor quality and rework create unnecessary costs for the laboratory, yet failing to capture COPQ was eye opening as it provided (might not have been appreciated) a true understanding of the financial impact of quality issues in their laboratories. Ongoing use of the tool will vary among the participating facilities.

References


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