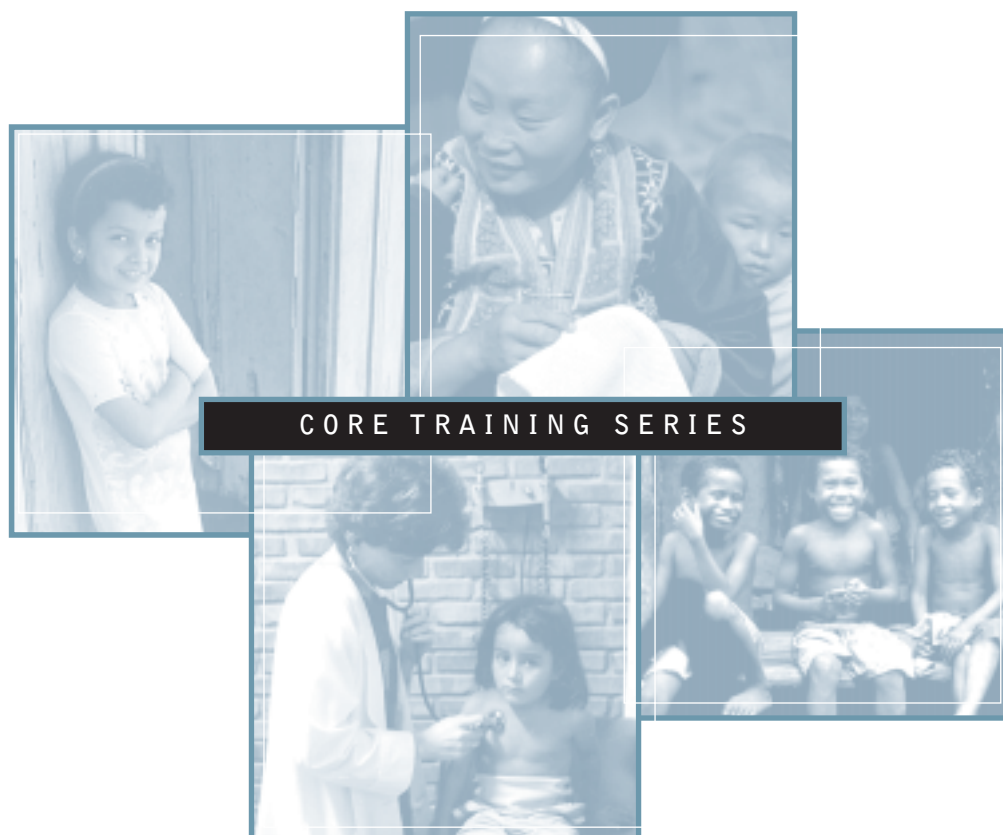


QUALITY

ASSURANCE

PROJECT



CORE TRAINING SERIES

Cost and Quality in Healthcare Instructor Manual



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COURSE SYLLABUS

Introduction

This course is designed to introduce clinical and health professionals, program managers, and other decision-makers within the health system to the concepts of cost and quality. The course will provide guidance on measuring the effect of interventions aimed at improving quality relative to their cost, quantifying the cost of poor quality.

The course will provide a basic overview of quality definitions, quality assurance framework, and cost analysis approaches. It does not intend to provide an in-depth review of cost analysis approaches. Where there is a need or interest for in-depth instruction in any of the topics covered, it is expected that the user would tailor the course to address participants' specific needs and interests. The course material provides additional reading and references to further explore topics covered.

Assumptions:

Trainer

The course assumes that the trainer has a strong background in quality assurance principles and methods, and an ability to construct and track spending for budgets that include costs of personnel, equipment, supplies, etc.

Participant

This course assumes that participants have at least a basic exposure to quality assurance principles (e.g., attendance in a quality assurance awareness training course). This course assumes that participants have had some exposure to basic cost terms and basic cost analyses, although a general overview of these topics will be covered in the course.

Course Goals

- Expose participants to concepts of cost and quality, enabling them to participate in cost analysis activities.
- Provide participants with analytical tools to solve cost and quality related problems.

Participants Learning Objectives

Participants will:

- Define quality.
- List the different dimensions of quality.
- List the perspectives on quality.
- Define quality assurance.
- Define cost in monetary, economic, and accounting terms.
- Define the three major cost categories: people, machine, and material.
- Describe the dimensions of cost: direct, indirect, unit, and average.
- Describe quality in cost terms.
- Identify the four components of the cost of quality: prevention, appraisal, internal failure, and external failure.
- Discuss common assumptions and beliefs about cost and quality.
- Describe the relationship between cost and quality.
- List the major levels of cost analysis: cost categories (general ledger items); activities; processes; programs/interventions; services; departments; organizations; health systems and subsystems.
- Describe the methodologies used to analyze cost and quality related problems.
- List general guidelines for selecting methodologies when trying to address a cost-quality problem.
- Analyze cost and quality related problems using the appropriate methodologies.

Format

This course includes four modules designed for a two-and-half-day workshop. However, the length of the course can be extended to expand on particular topics depending on the learners' background. The primary instructional methods for this course include illustrated lectures (using overheads or slides) and individual and group exercises, including case studies. The plenary and small group work is designed to help participants examine issues surrounding cost and quality, including analytical tools to solve cost and quality related problems.

Equipment and materials required

- Overhead and/or power point projector
- Easels with flipchart paper
- Markers and masking tape
- **Reference Manual** is designed to provide all the essential reading and reference information needed by the trainer to conduct the course. The text serves as reading material for the instructor and the participants. Copies of key articles and a bibliography are also included.
- **Instructor Manual** containing:
 - Day-by-day description of the two-and-half-day course, organized around modules;
 - Handouts containing pre- and post-course questionnaires, daily feedback, and final evaluation forms;
 - Exercises;
 - Appendix section containing answer keys for exercises and pre- and post-course questionnaires;
 - Overheads to accompany illustrated lectures throughout the course; and
 - A glossary of terms.
- **Participant Manual** containing:
 - Overview of the course;
 - Overheads; and
 - A glossary of terms.

Methods of Evaluation

Participant skill

- Evaluation of the participant achievement of objectives will be done by carrying out a pre- and post-course questionnaire and by the trainer's observation of participant involvement in discussions, exercises, and case studies.

Course

- At the end of each day, participants will be asked to provide feedback on the course. The instructor will use the feedback to modify course delivery.
- A formal course evaluation will be completed by each participant at the end of the last day.

Sample Agenda

Day 1	
8:00 – 8:10am	Welcome/Overview
8:10 – 8:30am	Introduction Activity
8:30 – 9:00am	Pre-Course Questionnaire
Module 1	
9:00 – 9:30am	Exercise #1: “What is Quality in Healthcare?”
9:30 – 10:00am	The Quality and Quality Assurance Movements
10:00– 10:30am	Break
Module 2	
10:30 – 11:00am	Exercise #2: “What is Cost?”
11:00am – 1:00pm	Define Cost, Cost Categories, Cost Dimensions, and Quality in Cost Terms
1:00 – 2:00pm	Lunch
2:00 – 2:15pm	Cost of (Poor) Quality
2:15 – 3:00pm	Exercise #3: “Cost of Quality”
3:00 – 4:00pm	Summary and Daily Feedback
Day 2	
8:00 – 8:20am	Review of Day 1 Materials Feedback on the Results of the Pre-Course Questionnaire
Module 3	
8:20 – 9:00am	Common Assumptions and Beliefs about Cost and Quality
9:00 – 10:00am	The Relationship between Cost and Quality
10:00 – 10:30am	Break

Module 4	
10:30 – 10:45am	Major Level of Cost Analysis
10:45 – 11:00am	Spectrum of Methodologies for Analyzing Cost and Quality Related Problems
11:00 – 11:20am	Cost-effectiveness Analysis
11:20am – 12:00pm	Exercise #4: “Cost-effectiveness Analysis”
12:00 – 1:00pm	Lunch
1:00 – 1:15am	Cost-benefit Analysis
1:15 – 2:00pm	Exercise #5: “Cost-benefit Analysis”
2:00 – 2:30pm	Cost-Utility Analysis, and Cost Management
2:30 – 3:00pm	Activity-based Costing, Cost of Quality, and Analysis of Inefficiency
3:00 – 3:15pm	Guidelines for Selecting the Appropriate Methodologies to Use
3:15 – 4:00pm	Summary and Daily Feedback
Day 3	
8:00 – 8:30am	Review of Day 2 Materials
8:30 – 10:00am	Exercise #7: “Analysis of Cost and Quality Related Problems”
10:00 – 10:15am	Break
10:15 – 12:00pm	Continue Exercise #7: “Analysis of Cost and Quality Related Problems”
12:00 – 1:00pm	Summary, Post-Course Questionnaire, Final Course Evaluation, and Close

Module 1- Defining Quality

Purpose

The purpose of this module is to give an overview on the concept of quality.

Objective

At the end of this module, participants will be able to:

- Define quality.
- List the different dimensions of quality.
- List the perspectives on quality.
- Define quality assurance.

Welcome/ Overview

10 minutes

Introduce yourself and provide a general welcome and opening remarks to the participants. Present the course purpose, objectives and an overview of the content, including a preview of the training methods to be used.

Provide general information regarding the facilities such as location of phones, bathrooms.

Introductions

20 minutes

Conduct an activity to introduce each participant. The objective is to develop a rapport with the group and “break the ice”. Preferably the activity is fun and is related to the topic. For instance, in this course, the subject is related cost and quality. The following activity is a suggestion:

Divide participants into small groups (preferably including participants who do not know each other). Ask each participant to introduce him or herself.

**Pre-Course
Questionnaire**

30 minutes

Introduction to Pre-Course Questionnaire (handout #1)

Explain to the participants that the purpose of the pre-course questionnaire is to assist the trainer and participants by assessing what the participants, individually and collectively know about the course topic.

This is not intended as a test, but participants may be anxious. Be sensitive to this attitude and administer the questionnaire in a neutral and non-threatening way.

Collect the pre-course questionnaires from the participants and analyze them later on. Tell participants that you will provide feedback on the results at the beginning of Day 2. Score results of the questionnaires at the end of the day.

30 minutes

Small group exercise #1 “What is Quality in Healthcare?”

If you have not done so yet, divide participants into small groups and give each group a copy of exercise #1.

Ask each group to assign a group leader who will report the results of the group exercise to the larger class.

The Quality Movement

15 minutes

Begin presenting formal definitions of quality by saying that there are no right or wrong answers to the questions provided in the exercise. Mention that the presentation is an overview of the QAP's understanding and view of quality and quality assurance.

When presenting the definitions on quality and quality assurance select about 2 or 3 slides from those provided to discuss the topic. Emphasize compliance with standards (technical accuracy) and client satisfaction.

During the discussion, guide comments with questions that probe into the various dimensions and perspectives of quality. Use scenarios to discuss the concepts. The goal is to discuss all the dimensions and perspectives in the context of a health example. For example, describe a scenario where a patient arrives at a clinic and waits for several hours before the provider could see him. At the point of consultation, the provider properly diagnoses and provides the appropriate treatment.

Ask the participants to consider "what quality is" from the point of view of the patient or patient's family; of the extended family or community; of the provider or the clinic. Discuss how seemingly opposite definitions of quality can operate at once and need to be reconciled (e.g.: provider's technical competency and patient's satisfaction).

Quality Assurance Movement

15 minutes

What is QA?

Give a general definition that anything you do to measure (assess) or improve quality is Quality Assurance. Use the QA triangle to emphasize the formal definition of QA consists of three dimensions, defining, measuring, and improving quality.

Ask participants what things could come under this definition. Help them to see that supervision, keeping medical and facility records, reminding each other of proper diagnostic techniques, doing patient education, training staff in standards of care, fixing problems, gathering monitoring (MIS) data and so on can be thought of within quality assurance.

Describe the 4 principles of QA as described in exercise #1.

Mention that quality assurance can consist of three different levels, from a QA tool (such as flowchart), and a QA approach (such as problem-solving teams) to a QA program (teams, an accreditation program, etc.)

Summarize the discussion by saying that QA looks for sources of problems in **systems and processes**, not bad performers. Give an example. For instance, giving the patient the incorrect medication from the dispensary might happen if the medicines are not properly labeled.

Module 2: Cost and Quality

Purpose

The purpose of this module is to describe costing terms as they relate to quality and quality assurance.

Objective

At the end of this module, participants will be able to:

- Define cost in monetary, economic, and accounting terms.
- Define the three major cost categories: people, machine, and material.
- Describe the dimensions of cost: direct, indirect, unit, and average.
- Describe quality in cost terms.
- Identify the four components of the cost of quality: prevention, appraisal, internal failure, and external failure.

30 minutes

In-class Exercise #2 “What is Cost?”

Tell the group that next you will be defining cost. Hand out a copy of the exercise to each participant and ask him or her to work individually to answer the questions.

Tell the participants that the exercise is not meant to drive to a particular “right” answer to the questions. It is meant, instead, as a tool to help them look critically at their own understanding and experience with cost and cost analysis.

Facilitate group review of answers to the questions. Use a flip chart to write participants’ responses.

Synthesize feedback from the group by stating that, as with the definition of quality – which varies based on the perspective we are looking from (i.e., whether it is from the perspective of the client, the provider, the healthcare facility or the community in general) – the same is applicable to the definition of cost. The answer may also vary slightly based on who incurs the cost.

Define Cost
15 minutes

Describe cost in non-technical terms by saying that the word “cost” connotes a loss or a sacrifice, that may or may not be quantifiable, but is usually incurred in the course of gaining something.

Describe that "cost" also implies the value of that something that is disbursed to obtain a benefit or is the quantity of one thing that is exchanged for a service or a product.

Referring to the second question in Exercise #2, lead group discussion to identify the different types of costs described above.

Emphasize that in healthcare quality assurance, some of the most important costs are those costs that are, as Deming described, "unknown and unknowable". These are costs that result from poor quality but may not be recognizable directly or immediately. For example the cost of a dissatisfied customer, the cost of a frustrated health worker or the cost of prolonged infection.

Cost Categories
5 minutes

State that the three major categories of cost are: costs related to people and their time (personnel), costs of equipment or capital (machine), and cost of resources that are frequently replenished (materials and supplies). These general categories of cost can be analyzed in different ways depending on the specific need.

Cost Dimensions
40 minutes

State that, when using cost terms (or dimensions), it is very important to clarify the specific meaning or definition of the terms. Point out that often the same or similar cost terms are used with different intended meanings. For instance, personnel labor costs are sometimes described as ‘indirect costs’ (e.g., part of general administration or overhead) and other times may be included in ‘direct costs’ – the specific definition will affect the interpretation of both direct and indirect costs. Note that, however, in economics or accounting, these terms are often linked with very specific meaning, for instance as defined in the Glossary of Terms.

Tell participants to refer to the Glossary of Terms available in the *Reference Manual* for some definitions of the more common dimensions of cost.

Quality in Cost Terms
1 hour and 15 minutes

Start by saying that one of the objectives in the field of cost and quality is to define and manage the cost of quality, requiring that the investments made in improving quality (e.g., through quality assurance) are justified by the rewards/benefits obtained by minimizing or eliminating poor quality.

Explain that the challenge is to quantify the cost of a quality assurance program or the value of resources saved by improving the quality of clinical service delivery.

45 minutes

Explain the “*Cost of Quality*” model, including its 4 major components: prevention costs, appraisal costs, external failure costs and internal failure costs.

Small group exercise #3 “Cost of Quality”

Ask the small groups to assemble again and give each group a copy of exercise 3. Allow at least 20 minutes for the group to work through the exercise and then collectively discuss answers, questions, and disagreements.

Summary, Daily Feedback, and Evaluation

60 minutes

Summarize the main points from the day’s session and answer any questions participants might have.

Then distribute handout #2 (**Daily Feedback Form**) to participants to obtain their feedback and evaluation of the course to this point.

Preparation for Next Day

At the end of the day, use the following questions to give your written comments about the progress of the course:

1. Was there enough time to complete the session?
2. Did the Reference Manual give you enough information to present the topic?
3. Were the instructions for the participants clear?
4. Were the overheads and other supporting materials adequate for the presentation?
5. Do you feel the participants gained the necessary knowledge and skills to use the information from this session?

If you answered “No” to any item, please give suggestions for improvement.

Review the comments from the daily feedback forms. Prepare a summary of your analysis to present during the next day’s review session.

Take time to correct and score the pre-course questionnaires. Also use the results of the questionnaire to identify topics that may need additional emphasis during the course.

Module 3: Relationship between Cost and Quality

Purpose

The purpose of this module is to discuss the relationship between cost and quality.

Objectives

At the end of this module, participants will be able to:

- Discuss common assumptions and beliefs about cost and quality.
- Describe the relationship between cost and quality.

20 minutes

Review Day 1 materials and provide feedback on the pre-course questionnaires.

Common Assumption and Beliefs about Cost and Quality

40 minutes

Now that you have tried to briefly define cost and quality in cost terms, tell the group that now you will discuss the relationship between cost and quality.

Lead a discussion on common assumptions about the relationship between cost and quality. Facilitate a class discussion by asking the questions: What is your experience or impression about the relationship between cost and quality? What are the possible ways in which cost and quality vary in relationship to each other?

Point out and explain that the prevailing assumption that improved quality requires additional resources is only partially true. Convey also that costs of poor quality are not easily seen and fixed. Point out as stated earlier that much of the costs of poor quality are hidden, "unknown and unknowable." Part of the reason for this is that the causes of poor quality are often complex and embedded in the health system.

**The
Relationship
between Cost
and Quality****1 hour**

Discuss the relationship between cost and quality, emphasize that the relationship is dynamic and complex depending on the level of quality within the system and the types of cost that are added to or removed from the system.

Point out that the relationship can be viewed from two different perspectives by:

- 1) changing quality (improving quality) and evaluating its impact on cost
- 2) changing cost (generally reducing cost) and evaluating its impact on quality

Summarize by saying that an increase in cost can have multiple effects on quality:

- 1) it can increase quality if a necessary element is added, (e.g., hiring a nurse to support an high patient load)
- 2) it can decrease quality if a harmful or unnecessary element is added (e.g., requesting a lab test that does not contribute to the diagnosis, treatment or monitoring of patient's condition)

Summarize by saying that in general the costs of correcting quality problems increase the further away the intervention is implemented from the problem. For example, the cost of an equipment breakdown owing to poor maintenance (a quality problem) will result in not only the cost of repair (often greater than maintenance costs) but also additional costs to the service provider and even the patient. For instance, the patient may be asked to return for a scheduled visit, adding potential lost productivity (time) costs and additional transportation). The provider will also incur the ("hidden") cost of lost productivity because of not being able to work without a functioning equipment.

Module 4: Analysis of Cost and Quality

Purpose

The purpose of this module is to present the different approaches for analyzing cost and linking cost to quality.

Objectives

At the end of this module, participants will be able to:

- List the major levels of cost analysis: cost categories (general ledger items); activities; processes; programs/interventions; services; departments; organizations; health systems and subsystems.
- Describe the methodologies used to analyze cost and quality related problems.
- List general guidelines for selecting methodologies when trying to address a cost-quality problem.
- Analyze cost and quality related problems using the appropriate methodologies.

When beginning a cost analysis, explain that it is important to define the relevant and important boundaries by asking: “What is cost?” (reviewed in Module 1) and “Whose cost are we talking about?” Answering the latter question helps guide decisions on what costs are important to consider and measure and which are outside the realm of interest.

Major Levels of Cost Analysis

15 minutes

Spectrum of Methodologies for Analyzing Cost and Quality Related Problems

15 minutes

Present the spectrum of methodologies for analyzing cost and quality.

Point out that these methodologies are used either to evaluate and compare the impact of a specific **intervention** on cost and quality **OR** to **evaluate** and **monitor** any costs as well as the cost of poor quality.

Cost-effectiveness analysis (CEA)

20 minutes

Convey that CEA is often used when comparing and selecting among various interventions and identifying the optimum alternative based on its cost and its level of effectiveness.

Refer to the reading by Reynolds and Gaspari in the Reference Manual for further discussion on the application of CEA guidelines and the limitation of the methodology.

Discuss the important limitations to bear in mind when using CEA.

40 minutes

Small group exercise #4 “Cost-effectiveness Analysis”

Tell participants to return to their smaller groups and ask each group to designate one member who will report their answers to the larger group. Distribute exercise #4 and allow enough time for answering the exercise questions. Ask each group to report their responses and facilitate discussion in the full group.

Indicate that the exercise is intended to reveal the complexity of CEA when applied to a real-life scenario. Emphasize that there are no right or wrong answers.

Cost-benefit analysis (CBA)/ Return on investment (ROI)

15 minutes

45 minutes

Describe that CBA is useful when comparing the cost of resources for a specific quality improvement intervention with the benefits of that intervention. In CBA, health benefits are expressed in monetary terms, i.e., in units common to those used to measure cost. In this respect, CBA is sometimes more difficult to use in healthcare settings where the benefits of “providing health” is often undervalued in monetary terms.

Small group exercise #5 “Cost-benefit Analysis”

Have participants return to their smaller groups and ask them to identify another member who will report the group’s answers. Give each group a copy of exercise #5 and allow enough time for working through the questions. Facilitate discussion of responses in the full group.

Discuss the challenges in defining which costs to measure and analyze when using CBA. Highlight that the tool is most useful when benefits can be identified and expressed in monetary terms.

Cost-utility analysis (CUA)

15 minutes

Tell participants that CUA is an extension of CEA and is used when trying to compare the CE of alternative projects that have different effect measurements. CUA therefore relies on a general index that measures outcomes in terms of “improved general health”, for instance gains in quality of life (e.g., QALYs or quality-adjusted life years) or gains in productive life years (e.g., DALYs or disability-adjusted life years).

Cost management

15 minutes

Mention that the cost management approach is part of any solid management practice. If done correctly, it can provide insight to guide quality improvement activity (e.g., by bringing focus to high cost areas of the organization). Refer to further reading by Reynolds and Gaspari (1993) for a general overview of this approach.

Activity-based costing (ABC)

10 minutes

Referring to the appropriate slide, work through the “blue car, red car” example with the class to describe activity-based costing. First present the scenario (cover the bottom part of the slide), and then ask the class how they would allocate overhead (or indirect) costs. Then reveal the traditional versus the ABC approaches.

Summarize by saying that one of the greatest advantages of ABC is that it allows you to look at the processes that your organization actually performs (something that is familiar to quality improvement and assurance efforts) and allows you to assess the financial importance of doing things as they are.

Cost of Quality

10 minutes

Tell participants that CoQ definitions were discussed in Module 2 and now you will describe how the CoQ measure can be used for analyzing cost and quality. Specifically, mention that health managers can generate a CoQ report card showing the distribution of costs of quality (prevention, appraisal, and failure). The aim of CoQ analysis is to identify and minimize failure costs, and maximize the cost-effectiveness of prevention and appraisal activities.

Analysis of inefficiency

10 minutes

Start by describing the term “efficiency” and discuss the example provided in the slide.

Point out examples of “sources of inefficiency”, e.g., high variation, poor productivity.

Hand out case example (exercise #6) of the operations research study conducted by QAP II in Ecuador, looking at the cost of inefficient and ineffective use of laboratory tests and resources in public hospitals. This case example is a useful illustration of the concept and is not meant to be an in-class exercise. Participants can review it in their leisure time.

Guidelines for Selecting the Appropriate Methodologies to Use

15 minutes

State that the selection of methodologies depends on the level of analysis that is required (e.g., analysis of program, clinic or health system, etc.), and the cost-quality related question being analyzed (e.g., comparison of alternative interventions, identification of opportunities of improvement, etc.). Other factors such as availability of information/data are also a factor though, where possible, should be considered once objectives of the analysis have been defined.

Walk through the slide that shows a “General Guideline for Selecting Methodologies.”

Summary, Daily Feedback, and Evaluation

45 minutes

Summarize the main points from the day’s session and answer any questions participants might have.

Then distribute handout #2 (**Daily Feedback Form**) to participants to obtain their feedback and evaluation of the course to this point.

Preparation for Next Day

Use the following questions to give your written comments about the progress of the course:

1. Was there enough time to complete the session?
2. Did the Reference Manual give you enough information to present the topic?
3. Were the instructions for the participants clear?
4. Were the overheads and other supporting materials adequate for the presentation?
5. Do you feel the participants gained the necessary knowledge and skills to use the information from this session?

If you answered “No” to any item, please give suggestions for improvement.

Review the comments from the daily feedback form. Prepare a summary of your analysis to present during the next day’s review session.

Take time to correct and score the pre-course questionnaires. Also use the results of the questionnaire to identify topics that may need additional emphasis during the course.

30 minutes

Review Day 2 materials and answer any questions participants might have.

3 hours & 15 minutes

Small group case exercise #7 “Analysis of Cost and Quality Related Problems”:

Tell participants to form smaller groups and hand out exercise #7. Explain that this exercise is based on a real-life example and aims to provide participants with practical experience in cost-quality analysis.

Tell participants to discuss answers to questions, including why select a specific methodology and how to begin applying the appropriate methodology to solve the cost-quality problem. Allow time for small groups to work through the exercise, pacing them along the different parts of the exercise. Facilitate discussion of responses in the full group.

Summary, Post-Course Questionnaire, Final Course Evaluation and Close

60 minutes

Close

Summarize the major points of the course and ask participants for final comments and questions regarding the course.

Then administer the post-course questionnaire. Finally, distribute course evaluation forms and ask participants to provide their candid responses. Close by thanking all for their participation in the course.

At the end of the day, use the following questions to give your written comments about the progress of the course:

1. Was there enough time to complete the session?
2. Did the Reference Manual give you enough information to present the topic?
3. Were the instructions for the participants clear?
4. Were the overheads and other supporting materials adequate for the presentation?
5. Do you feel the participants gained the necessary knowledge and skills to use the information from this session?

If you answered “No” to any item, please give suggestions for improvement.

Take time to correct and score the post-course questionnaires. Compare and analyze the pre- and post-test results.

Glossary of Terms

“Accounting” cost (e.g., depreciation allowance): Artificial costs applied to reflect the real value of a product or service at a given time; cost is not *actually incurred*.

Activity: Generally defined to include a verb and noun, an activity consumes human and financial resources of a department and feeds into the output of the department. Also classified are primary, secondary, value added and non-value added.

Activity-Based Costing (ABC): System of accounting that focuses on activities as the fundamental cost objects and uses the costs of these activities as building blocks for compiling the cost of other cost objects (such as a product, service or department).

Appraisal Cost: Cost incurred to detect defective units of services before they are given to clients (e.g., inspection of drug stocks).

Average Cost: Total cost divided by output (quantity of product produced) or a denominator.

Benefit: Advantage in dollar terms resulting from an (various) action(s).

Capital cost: Expenditure required for financing permanent or semi-permanent capital goods (e.g., buildings, machinery, equipment, transportation means). In questionable cases, capital goods are those goods that are utilized for more than a year.

Cost-effectiveness analysis: A technique for comparing the costs and the effectiveness of alternative ways of achieving the same objective.

Cost-benefit analysis: A technique for comparing the monetary cost and monetary outcome of alternatives. Unlike cost-effectiveness analysis, the effect is expressed in monetary terms.

Cost-utility analysis: A procedure that compares the cost of alternatives with subjectively derived ratings of those alternatives. It is used when comparing alternatives in different sectors (e.g., health versus education), hence when effectiveness can not be measured uniformly across alternatives.

Direct cost: Cost that is explicitly identifiable with a particular service or area. Examples of direct medical costs are hospital supplies, labor costs for medical personnel, and pharmaceuticals.

Economic or opportunity cost (e.g., value of employee’s time engaged in work outside of primary job duties): The value of benefits foregone by using resources to provide alternate products or services.

Effect: Change among individuals, families or communities as a result of an activity, project or program.

External Failure Cost: Cost incurred when services are identified as defective after they reach the client (e.g., adverse reaction to drugs).

Fixed cost: Cost which does not vary with quantity or volume of output provided in the short run (typically, one year). These costs usually vary with time, but not with quantity or volume of service provided, and may include rent, equipment, equipment lease payments, and some wages and salaries.

Hidden cost: Cost that is not directly incurred but occurs due to morbidity, premature mortality or loss of productivity. Morbidity costs include goods and services not produced by the patient because of illness. Mortality costs include goods and services the person could have produced had the illness not occurred and the person not die prematurely. Also refers to cost to society resulting from poor quality (see also *Indirect cost*).

Incremental cost: Cost that differs among alternative courses of action.

Indirect cost: Cost that can not be easily identified in the product or service (e.g., electricity, executive salaries, insurance). Also called overhead.

Internal Failure Cost: Cost incurred when services are identified as defective before they are given to clients (e.g., use of non-essential list of drugs).

Investment cost: Resources expended one time initially to launch a specific intervention or program.

Monetary or financial cost (e.g., wage rate of employees): Actual expenses incurred for an input or to provide a product or service, at a given time.

Non-value added activity: Activity that is not required to meet internal or external customer requirements. Usually a redundant activity (e.g., unnecessarily repeating a step in a process) or an unproductive activity not contributing to the output of a departmental or organization (e.g., unnecessary staff waiting time).

Obvious Cost: Generally, cost that is most easily and directly seen as being incurred. (see also *Direct cost*).

Prevention Cost: Cost incurred to prevent 'defective' units of service from being produced (e.g., sterilization protocol).

Primary activity: Activity that is directly involved with production of a product or service, contributing to the central mission of a department or organization.

Recurrent cost: Resources used and replaced within one year's time (e.g., personnel salaries, medicines, supplies, gasoline, drugs, electricity, food)

Return on Investment: Amount of cost benefits achieved by an intervention over the incremental cost of that intervention.

Secondary activity: Activity that supports a primary activity and is usually administrative in nature. Example, "supervise personnel".

Shadow prices, for non-monetary (e.g., donated time and equipment): Costs applied to subsidize goods and services whose true value is not the same as listed.

Unit Cost: Cost of one unit of output (e.g., cost per product or service)

Utility: (Perception of) satisfaction from consuming a specific bundle of goods and services (subjective).

Value-added activity: Activity that meets internal or external customer requirements. Example is "perform root canal" in a Dentistry Department. (Also *Primary activity*)

Variable cost: Cost that varies with changes in output volume, such as the direct labor required to provide a service.