

## Pre-Course Questionnaire

Write the letter of the example (right column) in the space next to the dimension of quality it matches (left column). More than one answer may be correct

- |                               |       |   |
|-------------------------------|-------|---|
| 1. Technical performance      | _____ | a) A nurse pays respectful attention to a patient   |
| 2. Access to service          | _____ | b) A health worker washes her hands between patients  |
| 3. Effectiveness of standards | _____ | c) The clinic is affordable to patients   |
| 4. Interpersonal relations    | _____ | d) A child brought in for a cough also receives his immunization  |
| 5. Efficiency                 | _____ | e) The provider presents a patient with alternatives for dealing with a condition                                     |
| 6. Continuity                 | _____ | f) The clinic has a clean and comfortable waiting area  |
| 7. Safety                     | _____ | g) A health worker properly classifies a sick child   |
| 8. Infrastructure and comfort | _____ | h) A high-risk patient receives a needed cesarean section   |
| 9. Choice of services         | _____ | i) The clinic implements a cost-effective measure by immunizing a maximum number of patients with one vial of vaccine |

Write the letter of the example (right column) in the space next to the cost type it matches (left column). More than one answer may be correct

- |                                  |       |   |
|----------------------------------|-------|---|
| 10. Monetary cost                | _____ | a) value of employee's time engaged in work outside of primary job duties |
| 11. Economic or opportunity cost | _____ | b) donated time and equipment   |
| 12. "Accounting" cost            | _____ | c) wage rate of employees   |
| 13. Shadow price                 | _____ | d) depreciation allowance   |

*Circle the letter of the single best answer:*

14. Direct costs are costs:
- which do not vary with quantity or volume of output provided in the short run
  - that can be explicitly identified with a particular service or area
  - that differ among alternative courses of action
  - that are artificially applied to reflect the real value of a product/service at a given time
15. Indirect costs are costs:
- generally, that are most easily and directly seen as being incurred
  - that are calculated by dividing cost by a quantity of product/service) or a denominator
  - that cannot be easily identified in the product or service
  - Cost incurred to prevent 'defective' units of service from being produced
16. Unit cost is:
- cost incurred when services are identified as being defective after they reach the client
  - the cost of resources used and replaced within one year's time
  - the cost of producing one unit of output (e.g., cost per product or service)
  - the cost of resources expended one time initially to launch a specific intervention or program
17. Average cost is....
- total cost divided by output (quantity of product produced) or a denominator
  - cost that varies with changes in output volume
  - cost that cannot be easily identified in the product or service
  - cost of an activity that meets internal or external customer requirements
18. What are the two major components of the cost of quality:

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Write the letters of at least two examples (right column) in the space next to the type of cost of quality it matches (left column). More than two answers per cost type may be correct

- |  |       |                                      |
|--|-------|--------------------------------------|
| 19. Prevention cost  | _____ | a) Excessive overtime                |
|  |       | b) Unnecessary or inaccurate testing |
| 20. Appraisal cost   | _____ | c) Immunization                      |
|  |       | d) Medical and prescriptive errors   |
| 21. External failure   | _____ | e) Staff credentialing               |
|  |       | f) Quality audits                    |
| 22. Internal failure cost  | _____ | g) Color-coded folders               |
|  |       | h) Calibration of lab material       |
| 23. Other (i.e., not cost of quality but cost of doing business) | _____ | i) Inaccurate or missing charts      |
|  |       | j) Administering medication          |

Circle the letter of the single best answer:

	Always false	Sometimes true	Always true
24. Improved quality always requires additional resources	a	b	c
25. Cost of poor quality are easily seen and fixed	a	b	c
26. Increased resources do not guarantee improved quality	a	b	c
27. Cost can be reduced by improving quality	a	b	c
28. Cost of correcting problems are diminished when actions are taken as close to the problem as possible	a	b	c

Write the letters of at least two examples (right column) in the space next to the type of cost of quality it matches (left column). More than two answers may be correct.

<i>This methodology...</i>		<i>...is best used when:</i>
29. Cost-effectiveness analysis	_____	a) Comparing alternatives with different effects which are not expressed monetarily
30. Cost benefit analysis	_____	b) Analyzing organizational or system cost information viewed by activities
31. Cost of quality analysis	_____	c) Analyzing organizational or system cost information related to quality/quality assurance only
32. Activity-based costing	_____	d) Analyzing an alternative that has an effect that is monetarily quantifiable
33. Cost-utility analysis	_____	e) Comparing alternatives with same measure of effect (that is not measured in monetary terms)
34. Cost management	_____	f) Analyzing all organizational or system cost information

## Daily Feedback

Please help us make improvements for the next day by giving your opinion, and writing comments on any item you rate with a score less than 3.

*On a scale from 1 to 5, with 1 being the lowest, please circle the number that best represents your agreement with these statements.*

	<b>Strongly Disagree</b>				<b>Strongly Agree</b>
1. My questions were answered to my satisfaction	1	2	3	4	5
2. There is enough time to participate in discussions	1	2	3	4	5
3. There is enough time to understand the material that has been presented	1	2	3	4	5

<b>Please rate the following items using this scale</b>	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Very Good</b>	<b>Excellent</b>
1. Visibility and clarity of visuals (flipcharts, overheads)	1	2	3	4	5
2. Detail and clarity of participant materials	1	2	3	4	5
3. Ability to hear presenters	1	2	3	4	5
4. Ability to understand presenters	1	2	3	4	5

*Comments:*

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What questions do you need answered about today's sessions? (What is not clear?)

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Please give us your advice about changes to improve the workshop.

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## Post-Course Questionnaire

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- |                               |       |   |
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*This methodology...*

*...is best used when:*

- |                                 |       |  |
|---------------------------------|-------|--|
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| 33. Cost-utility analysis       | _____ | e) Comparing alternatives with same measure of effect (that is not measured in monetary terms)   |
| 34. Cost management             | _____ | f) Analyzing all organizational or system cost information                                       |

## Final Course Evaluation

We would be very grateful if you share your opinion about the following issues using the following scoring scale:

<i>On a scale of 1 to 5, 1 being the lowest, please circle the number that best represents your agreement with these statements</i>	<b>Strongly disagree</b>				<b>Strongly agree</b>
1. The training lived up to my expectations	1	2	3	4	5
2. The training is related to my work	1	2	3	4	5
<b>At the end of the seminar, I am able to:</b>					
3. Define and discuss cost	1	2	3	4	5
4. Define quality in cost terms	1	2	3	4	5
5. Discuss Taguchi's Loss Function	1	2	3	4	5
6. Recognize various terms to describe cost (e.g., monetary cost, opportunity cost, shadow prices)	1	2	3	4	5
7. Distinguish three main types of quality costs: preventive costs, appraisal costs, failure costs	1	2	3	4	5
8. Discuss personal experiences with attempting to measure the relationship between cost and quality	1	2	3	4	5
9. Discuss cost-effectiveness analysis	1	2	3	4	5
10. Design a cost-analysis approach	1	2	3	4	5
11. Explain how to analyze the cost and quality relationship	1	2	3	4	5

<i>Please rate the following items using this scale</i>	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Very Good</b>	<b>Excellent</b>
12. Speed of content delivery	1	2	3	4	5
13. Clarity of language	1	2	3	4	5
14. Organization of the course	1	2	3	4	5
15. Methods used for sessions (lecture, discussion, practical training)	1	2	3	4	5
16. Use of examples and demonstrations	1	2	3	4	5
17. Course materials	1	2	3	4	5

18. Which exercises, activities, discussions promoted better understanding of the course material?

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19. Based on your previous experience, please evaluate the **level** of the course:  
\_\_\_\_ too basic                      \_\_\_\_ just right                      \_\_\_\_ too advanced

20. What did you **like** and **dislike** about the course?

**Like:** \_\_\_\_\_  
\_\_\_\_\_

**Dislike:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

21. What suggestions do you have for **improving** the course or course material?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

22. What other topics would you like to see **included** in future Cost and Quality seminars?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

23. Would you recommend this training course to those who might be interested in the topic?  
Yes \_\_\_\_\_                      No \_\_\_\_\_

What would be your comments or **recommendations** for someone interested in taking the course?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

24. Any other comments?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Thank you for taking the time to fill out this questionnaire.

## What is Quality?

In your small group, please discuss and be prepared to summarize your group's answers to the following questions:

1a. What is your definition of quality in healthcare?

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1b. What do you think is the definition of quality from a patient's perspective?

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1c. What is quality assurance?

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2. These are the four principles of QA – which one do you think is the most important in your QA work, and why?

- Focus on systems and processes, not bad performers
- Consider clients' views
- Work in teams
- Rely on using scientific methods – rely on data

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## What is Cost?

In your small group, please discuss and be prepared to summarize your group's answers to the following questions:

1. What is your definition of cost?

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2. Which of the following would you classify as a cost? Briefly discuss why or why not.

- |  |  |
|--|--|
| a) Price paid for medical supplies                                     | f) Food provided by patient's family for hospital stay |
| b) Dissatisfied patient tells neighbor not to use your health facility | g) Maintenance cost for equipment                      |
| c) Repeating a lab test performed incorrectly                          | h) Medical staff time for attending QA meetings        |
| d) Volunteer staff time  | i) Patient does not return for scheduled follow-up     |
| e) Depreciation of medical equipment over time                         | j) Price charged for a service                         |

## Cost of Quality

Categorize the list of cost and activities as prevention (**P**), appraisal (**A**), internal failure (**IF**), external failure (**EF**) or cost of “doing business” (**CDB**). *Note: There may be different opinions about categorization. Several right answers exist.*

- |       |                                  |       |                               |
|-------|----------------------------------|-------|-------------------------------|
| _____ | complaints handling              | _____ | expired drugs                 |
| _____ | customer surveys                 | _____ | wrong drug prescribed         |
| _____ | quality assurance training       | _____ | adverse reaction              |
| _____ | supervision                      | _____ | lack of time for counseling   |
| _____ | inspection                       | _____ | senior nurse                  |
| _____ | loss of reputation               | _____ | improper counseling           |
| _____ | regular equipment maintenance    | _____ | mis-filed record              |
| _____ | management training              | _____ | child weighing omitted        |
| _____ | on-site continuing education     | _____ | missed appointment            |
| _____ | pricing error                    | _____ | stock of essential drugs      |
| _____ | wrong fee collected              | _____ | dirty treatment rooms         |
| _____ | breakdown in cold chain          | _____ | record books                  |
| _____ | inadequately sterilized needles  | _____ | thermometer, stethoscope      |
| _____ | stock our of essentials drugs    | _____ | lack of fuel                  |
| _____ | inaccurate diagnosis             | _____ | incompetent HW(health worker) |
| _____ | poor patient compliance          | _____ | sterilization protocol        |
| _____ | excess waiting time for patients | _____ | job aids                      |
| _____ | incomplete patient records       | _____ | nurse gowns                   |

## Cost-effectiveness Analysis: A Case Exercise

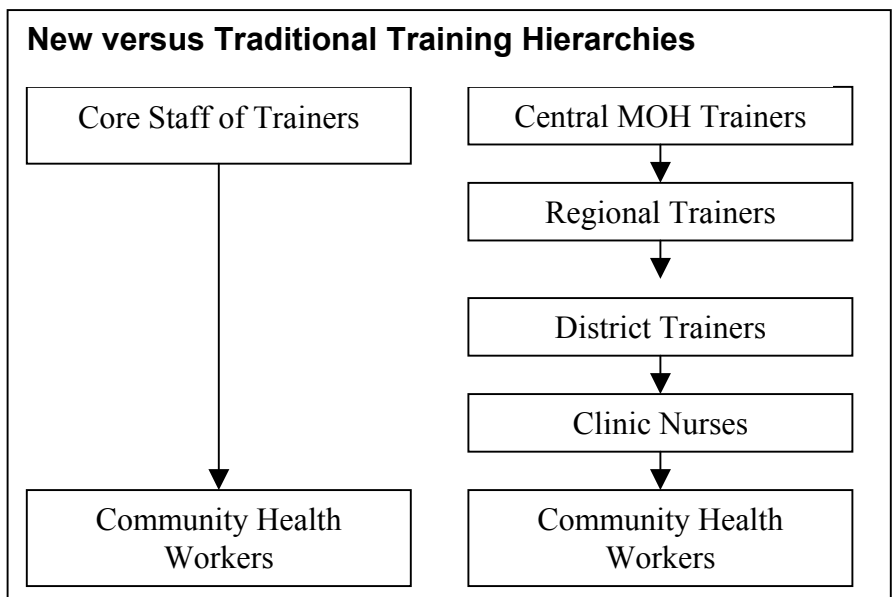
The following exercise is intended to give participants an opportunity to practice working with cost-effectiveness analysis. This exercise does not include a step-by-step calculation of cost or effectiveness but rather intends to challenge participants to assess how these would be calculated if the need were real.

*This case exercise was inspired by a case example in Reynolds and Gaspari (1986).*

### Background

Imagine that you are a health economist that was recently invited to be part of a research team by the Ministry of Health (MOH). The team is trying to evaluate the cost-effectiveness of a proposed new training approach to train community health workers as health promoters in primary healthcare. The new training approach that the MOH is interested in trying involves using a core staff of trainers and audiovisual materials. The MOH thinks that this approach, pioneered by the Census Bureau to train census workers, will be fast and effective.

In contrast, the existing training program relies on a Train the Trainer approach where central MOH trainers train regional trainers who in turn train district supervisors. District supervisors in turn train rural clinic nurses who then train CHWs. To date, the program has not been completed to standard and more than 60% or 700 of the CHW have not yet received their training. CHWs were *supposed* to receive 3 weeks of basic health training in groups of 15 to 30 in rural health clinics close to their home, as well as an additional week of training at a regional center. In actuality, CHWs only receive 2 weeks of basic and the quality of the training is considered of poor quality.



You are being brought on to determine the “cost-effectiveness” of the new training approach relative to the traditional approach in order to determine whether the new approach should be used.



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## Cost-benefit Analysis: A Case Exercise

### *Evaluating a Resource Utilization Question (Teams)*

The purpose of this case exercise is to facilitate the understanding of the application of cost-benefit analysis methodology. It is an opportunity to apply the methodology to a real life scenario. The exercise does not provide a step-by-step calculation of cost or benefit. However, it provides some basis for assessing issues of cost and benefits in a healthcare setting.

#### **Background**

You are a director at a district hospital and you have been concerned about the high turn over rate of staff, particularly in areas of critical care—emergency and delivery rooms. This has overburdened the hospital budget since money had to be averted from other services and used to provide training to the new staff.

As a result of a training you attended on quality improvement, you decided to form a quality improvement (QI) team that would investigate the problem. The team consisted of doctors, nurses, office administrators, lab personnel, and cleaning staff. The purpose of the team was to critically examine the issues from all angles and to present solutions as well as monitoring their implementation.

After a number of weeks, the team presented you with a report detailing the issues and actions to be taken to resolve the problems. The report pointed out that the high turn over rate is affecting all staff, including medical and administrative staff.

The report indicated that physicians were overwhelmed by their workload and lack of support from senior management. Nurses were frustrated because of shortage of drugs and crowded conditions in the emergency room area during peak hours. Cleaning staff felt they were underpaid and mistreated by other hospital staff.

The quality improvement team suggested a number of solutions, including better scheduling of staff time, rewarding outstanding employees, and the need to conduct interpersonal communication training for all staff.

As a director, you decided to keep the QI team active for a year so that they can monitor the implementation of the solutions and improve on them as needed.

The regional medical officer was making a routine visit to the hospital and she learned about your QI team. She felt that this process is wasting time and adding more work to the already overburdened staff schedule. However you felt that in the long run this process would save the hospital money and improve staff's morale, which would then reduce the turn over rate. You decided to use a cost-benefit analysis to make your case.





## Case Example 1 – Analysis of Inefficiency – Simplified

### Use of Laboratory Tests and Resources in A Public Hospital<sup>1</sup>

#### Background

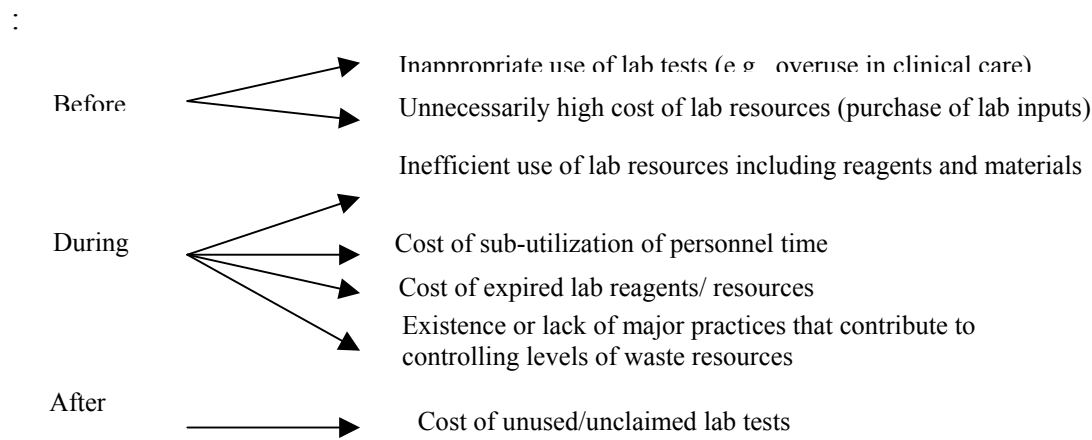
A hospital manager wanted to evaluate the cost of the hospital's laboratory testing services as part of an on-going quality improvement program to improve the efficiency of its operations. The manager wanted to start with the laboratory department because she remembered a study that showed laboratory services, along with radiology services and drugs, accounted for the largest share of resources in a hospital. The high cost of laboratory services was also often the result of waste or wasteful practices.

The manager decided that she needed first to understand the magnitude of the inefficiency problem. She set out to identify the major sources of inefficiency in the laboratory, and then develop the tools and approaches to measure them. Based on this information, she would determine the priority areas where further quality improvement work could be done – applying simple solutions where appropriate or engaging more analytical techniques to further analyze problems and develop solutions.

#### Definition of the Problem

The manager began by reviewing some available literature, discussing her objectives with laboratory management experts. She located more than 90 different types of indicators and aspects of laboratory efficiency. Upon critical review and continued discussions, she narrowed down the list of potential areas of investigation to seven, particularly focusing on those that were relevant to the non-automated type of laboratory department operated by her hospital. She divided the areas into three parts: before a test is produced (**Before**), while a test is produced (**During**), and after a test is produced (**After**).

#### **INEFFICIENT USE OF LAB RESOURCES**



<sup>1</sup> The case is a simulation based on an operations research study being completed by the Operations Research Division of the Quality Assurance Project on the Cost of Inefficient and Ineffective Use of Laboratory Resources, to be completed June 2001.

**Approach Used to Measure the Size of the Problem**

Next, the manager needed to determine relatively simple approaches to measure the magnitude of the waste problem. For each of the above indicators, she identified the following approaches

• <b>Potential Area of Inefficiency</b>	• <b>Approaches Used to Assess Inefficiency</b>
1. Cost of inappropriate use of lab tests	<ul style="list-style-type: none"> <li>• Review sample of medical records for using explicit criteria for "appropriate use of lab test", and evaluation of the number of tests completed inappropriately; sample selected for four pathologies that account for most of the hospitalized patients seen by the hospital, and generate a relatively high volume of tests (e.g., hospitalization for pneumonia)</li> <li>• Calculation of high-level indicators using information obtained from existing statistical and lab records (e.g., average number of tests per outpatient) to be used to detect red flag conditions</li> </ul>
2. Unnecessarily high cost of lab resources (purchase of lab inputs)	<ul style="list-style-type: none"> <li>• Review of purchasing and financial records to compare actual paid price for purchased inputs (e.g., for reagents, materials and supplies) relative to the lowest available price for a given quality of input (e.g., based on available pro-rata forms)</li> </ul>
3. Cost of inefficient use of lab resources including reagents and materials	<ul style="list-style-type: none"> <li>• Observation of test processing practices to evaluate use of reagents and general processes; evaluation of processes for compliance with standard for test processing, and existence of significant variations in processing of individual types of tests</li> </ul>
4. Cost of sub-utilization of personnel time	<ul style="list-style-type: none"> <li>• Analysis of productivity indicators based on information obtained from staffing records and lab production records (e.g., number of lab tests actually producing vs. number that could be produced based on number of workers available and average time required to produce a test)</li> </ul>
5. Cost of expired lab reagents/ resources	<ul style="list-style-type: none"> <li>• Observation and review of available inventory of reagents, noting amount of reagents that are expired or amount of reagent with only 3 more months of shelf-life remaining; calculation of proportional value (cost) of these reagents (amount (in units) of reagent that has expired x cost per unit of reagent)</li> </ul>
6. Cost of unused/unclaimed lab tests	<ul style="list-style-type: none"> <li>• Observation and review of lab reports that have not been claimed for more than one or two weeks, particularly emergency department requests; calculation of the cost of these tests (i.e., multiplying the number of tests by the unit cost of each test)</li> </ul>
7. Existence or lack of major practices that contribute to controlling levels of waste	<ul style="list-style-type: none"> <li>• Qualitative assessment based on interviews with the head of the laboratory division and the head of the hospital on major quality control practices, to guide assessment of causes of waste and hence potential QI efforts to address them (e.g., existence of procedures for worker safety, procedures for calibration)</li> <li>• Measurement of turn-around time of tests using a self-reporting sheet used by personnel processing a test request to record time when major steps are begun and completed (e.g., taking of sample, preparation of test, reporting results), and number of tests completed</li> </ul>

## Analysis of Cost and Quality Related Problems: A Case Exercise

### PART I:

*Imagine the following hypothetical scenario:* You are a cost scientist working in a hospital that is implementing a quality assurance program to enhance the cost-effectiveness of its services. One specific intervention that is going on is the use of clinical guidelines to enhance the care to pregnant women suffering from pregnancy-induced hypertension (PIH).

One day, the Director of Maternity Services in your hospital calls you in to her office to discuss an important situation. You are just sitting down when in a serious tone she reveals to you that she has just received the latest report of hospital revenue and was surprised by the findings regarding their services for PIH. Looking at the (simplified) table below, she observes to you that admission rates to the hospital for the treatment of PIH have been declining. She observes that the decline is significant because admission rates are lower relative to rates for the same period last year. She says she thinks that the decline is in large part due to the clinical guidelines that were implemented for PIH at the end of 1998. Since women with PIH are being better managed in the outpatient setting, fewer are being referred for inpatient care. Your hospital and its health system are the main care center for the population of women of childbearing age in the area.

She indicates to you that she worries about the potential loss in net revenue (net revenue = revenue – cost) that this decline means for the hospital and wonders if they should be looking at their costs, though she does not have an idea yet of what to look at specifically. She asks you if you could look into the matter and get back to her soon about what plan of action to take. You agree and tell her that you will get back to her in a day.

*Appendix 1 is a brief description of the clinical guidelines.*

Table 1: **Revenue for Treatment of PIH (Roubles)**

	Outpatient Department			Inpatient Admissions			Total Revenue
	# of patients	Price per patient	Total	# of patients	Price per patient	Total	
<b>1998</b>	300	1,500	450,000	300	2,500	750,000	1,200,000
<b>1999</b>	300	1,500	450,000	100	2,500	250,000	700,000

NOTE: **Revenue** = Price x Volume (or number of patients)

**Cost** = Cost per patient x Volume (or number of patients)

**Net Revenue** = Revenue – Cost

**Questions:**

Please discuss the following questions in small groups. *Note:* there are several possible answers to the questions below.

1. What is the impact of clinical guidelines for PIH on the **cost** of clinical care?
  - a. What information do you need in order to investigate the question?
  - b. List the items that you need to measure. Discuss which are direct and indirect costs?
  - c. How would you measure the costs of these items? What information sources would you access? Use the table in the Appendix 2 to guide you, if useful.

**PART II:**

After listening to the presentation of your preliminary analysis, the Director realizes that the problem is in good hands. You reinforce that the question of cost is an important one and also suggest that you consider evaluating the impact on patient care quality of the clinical guidelines that were instituted at the end of 1998. The Director concurs but stresses that she wants something 'simple' since she does not have many resources to spend on this evaluation. She encourages you to move ahead.

After completing your data collection, your results show the following regarding costs and quality (hypothetical):

**Table 2: Cost of care Related to PIH (Roubles)**

	Average <b>outpatient cost</b> per patient	Average <b>inpatient cost</b> per patient admission
1998	1,000	2,000
1999	1,100	500

**Table 3: Sample indicators of Health Outcome Associated with Management of PIH**

	# of women with severe pre-eclampsia	# of neo-natal and fetal losses after 20 weeks gestation*	# of cases with protocol implemented for PIH	Total # of women with PIH
1998	50	10	0	300
1999	25	5	100	300

\* Assume average of 1 child per woman both years. Related to children of women with PIH.

2. Using the provided information on cost:
  - a. What is the effect of clinical guidelines on outpatient cost per patient? Discuss what might explain the change, if any, in the cost per outpatient visit.
  - b. What is the effect of clinical guidelines on inpatient cost per patient admission? Discuss what might explain the change, if any, in the cost per inpatient admission?
  - c. What is the effect of clinical guidelines on inpatient *net* revenues for PIH? Hint:  
 $\text{net revenue} = \text{revenue} - \text{cost}$
  - d. What is the effect of clinical guidelines on outpatient *net* revenues for PIH?
  - e. What is the effect of clinical guidelines on overall *net* revenues for PIH, together for outpatient and inpatient? Discuss findings.
  - f. From your analysis, what factors do you think drive the increase or decrease in net revenue?
  
3. What can you say about the relationship between cost and quality as a result of using clinical guidelines for PIH?
  - a. Describe the trends in cost and in quality.
  - b. Given what you know in this hypothetical case example, would you use clinical guidelines? Why or why not?
  
4. Discuss the long-term effects/benefits to society of using the clinical guidelines.
  - a. What would be the impact of the clinical guidelines on the long-term cost of care?
  - b. What would be the long term to benefits mothers, children, or society of the clinical guidelines?