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UNIQUE COSTING IN REGIONAL BLOOD SERVICES

By

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Presented in partial fulfillment of the requirements for
the degree of

Master of Business Administration

UNIVERSITY OF MONTANA

1980

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Chairman, Board of Examiners


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July 31, 1980
Date

UMI Number: EP36781

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I. INTRODUCTION

Unique costs are those which can be determined by asking, "Which costs would not have been incurred had this product not been produced?" The only relevant costs for analyzing profitability of a certain product are those costs which can be uniquely attributed to the production and sale of the particular product or service.

Traditional cost accounting techniques are not useful to most service organizations, including regional blood services. However, adequate delivery of services depends on, among other things, reliable cost data. Attempts to apply product cost systems used in the manufacturing industries to service organizations have been disappointing. This is because traditional product cost accounting deals with valuations of inventories in various stages of completion, from raw materials to which direct labor is applied, to finished goods for which short-term sales plans are prepared.

For organizations in which service, rather than goods, is the product, inventory costs are not relevant. The challenge, then, is twofold: (1) to determine which costs are relevant in measuring the profitability of a particular service, and (2) to develop methods for assigning relevant costs to the service.

Profitability analysis is helpful in identifying relevant costs and their assignment to specific services. Profitability of a service may be defined as the increase in earnings that is the result of the service having been offered and accepted. Thus, the only relevant costs

for profitability analysis of a specific service are those that can be uniquely attributed to the offering of the particular service. All other costs are joint costs. Revenues minus uniquely attributable costs constitute the total profit contribution of a particular service. The total profit contribution provides the relevant information for service profitability analysis.¹

Admittedly, the concept of profitability becomes a bit fuzzy when specific services contribute to preservation of life or health of human beings. Values of service rendered or benefits received are not readily measurable in dollars, because our present knowledge does not enable us to determine the value of health, education and the like in accounting terms.² For a nonprofit organization, profitability analysis can provide a measure of proper management of varied resources.

In this study the author proposed to accurately identify the unique costs in a regional blood center, and to develop a system for assigning unique costs to services. The type of organization under study differs from other businesses in that it is nonprofit, and relies on volunteers for delivery of its services.

Persons responsible for management of blood banks and other service organizations should find use for improved cost information, whether for fiscal control, or for explanations to parties who provide resources or request compliance with guidelines for wage and price

¹John Dearden, "Cost Accounting Comes to Service Industries," Harvard Business Review, September-October 1978, p. 14.

²Emerson O. Henke, Accounting for Nonprofit Organizations, 2d ed., (Belmont, California: Wadsworth Publishing Company, Inc.), p. 173.

standards.³ Consumers are increasingly concerned with the costs of living. In the special case of blood banks, a voluntary (unpaid) blood donor can become quite interested in costs of services provided when and if, as a patient, he becomes the recipient of something donated that may cost in excess of \$100 per unit when he becomes a recipient.

The Financial Accounting Standards Board addressed the matter of users and user needs for financial reports made by nonbusiness organizations in a recent research report. In its study, the FASB's "Issue One" was:

Is the following list of primary users of financial report information adequate for the purpose of identifying needs for such information: governing bodies, investors and creditors, resource providers, oversight bodies, and constituents?⁴

"Issue Two" concerned user needs:

Is the following list of the types of financial report information needed by users adequate as a basis for deciding how best to meet these needs: financial viability, fiscal compliance, management performance, and cost of services provided?⁵

The FASB stated its first two issues in terms of broad questions "because of the highly subjective nature of any list of users," and resolution of the issue cannot be had by selection of what appears to be the best alternative. Although the study formally excluded internal users, the authors noted that often managers made even more use of financial reports than did the users identified in the Issue statements.

³Such as The Council on Wage and Price Stability, "Wage and Price Standards," Advance for Release at Noon EST Wednesday, December 13, 1978, Executive Office of the President, Washington, D.C.

⁴Robert N. Anthony, Financial Accounting in Nonbusiness Organizations, (Stamford, Connecticut: Financial Accounting Standards Boards 1978), p. 47.

⁵Ibid., p. 52.

II. BACKGROUND

The primary reference and basis for this study is Dearden's article "Cost Accounting Comes to Service Industries."⁶ A summary of his article, and related information follows.

Cost accounting techniques are most often used by manufacturing industries, for the purposes of (1) inventory valuation, (2) cost control, (3) short-term planning, and (4) product profitability analysis.

For inventory valuation purposes, accounting conventions call for "product costs" (costs that add inventory value to a manufactured product by changing the form of the product), and "period" costs (all other costs, since they are recorded as expenses in the period in which they are incurred). However, the distinction between product and period cost has little relevance to a service organization, because there are usually no finished goods inventories to be evaluated and all costs are basically period costs. Also, techniques for allocating administrative costs become economically meaningless if these costs do not change whether or not the product being costed is produced.

Most cost control systems utilize some system of standard costs. A cost standard is determined for each product, based on estimates of the amounts of direct material, direct labor, and factory overhead that go into it. Standard costs are more suited to mass production operations

⁶John Dearden, "Cost Accounting Comes to Service Industries," Harvard Business Review, September-October, 1978.

where uniform products are manufactured in large quantities. Since, in a service organization, direct materials and labor, the biggest targets for cost control efforts, tend to be minimal when compared to overhead costs, application of standard cost procedures is likely to give disappointing results.

Another approach to classification of costs, is to divide them into fixed and variable. This may be done to facilitate short term planning decisions with regard to volume and prices of products. Fixed costs are those which remain unchanged for the short term, with respect to production volume. Variable costs change directly and proportionately with volume, assuming the plant has adequate capacity and plans to stay in business. Since service organizations tend to plan for the long term, rather than the short, and have relatively low variable costs as just defined, calculation of variable costs is not very helpful.

Product profitability information, on the other hand, is useful to service organizations for directing management's attention to situations which involve problem diagnosis, long range planning, trend analysis and pricing decisions. Even where a price is not charged or cannot be changed, profitability analysis informs management of the extent to which a service is being subsidized.

Profitability is measured in terms of profits which are calculated by subtracting the costs of supplying the product or service from the revenue that results from the transaction. The accurate identification of revenues with specific products is not difficult, but calculating the cost of services is the unique problem for service organizations.

In order to use words compatible with most literature on the subject, and for the purpose of this study, the term "product" is used to

mean any identifiable service, or product such as a specific blood test. In some cases a service and a product may be inseparable. A product group means a group of related products, such as plasma products. A product line is used to mean a number of related product groups, such as whole blood and its components.

Analysis of product profitability is hierarchical; it starts with the broadest definition of a product and moves downward to a unique product that can no longer be subdivided.

The traditional income statement will provide a reliable indication of a blood center's profitability. Calculating the profitability of each product line is done by analyzing the costs of the line and separating joint costs from costs that are incurred uniquely for each product line. To determine unique costs, one asks, "Which costs would not have been incurred had product line "X" not been produced?" The question is asked of each cost center, General Operations, Collection, Recruitment, Distribution, Reference and Consultation, and Preparation. Joint cost is the difference between the total unique costs and the total cost center costs; joint cost is not assigned to the product line. Unique costs are assigned to the product line. In the case of the blood center, virtually the entire facility is used to produce the major product line; therefore, most costs are unique to the major product line.

Next, each product line is broken down into its next divisible unit, that is, its product groups. Each product group is analyzed by the same process as described for the product lines. However, at this point, some costs uniquely attributable to the product line, i.e., routine services with respect to whole blood and components, will become joint with respect to the product group. For instance, costs of routine tests done on whole

blood would be joint with respect to components. Additional costs to produce components from whole blood would be unique to the component group.

Finally, the profitability of each product is analyzed, and unique costs are assigned to the product on the basis of answers to the question, "which costs would not have occurred if this product had not been produced, but all other products in the group had been produced?"

Revenue for each product is readily identifiable, but is not necessarily proportional to the cost of the product. See Figure 1 for portrayal of product lines, product groups, and products.

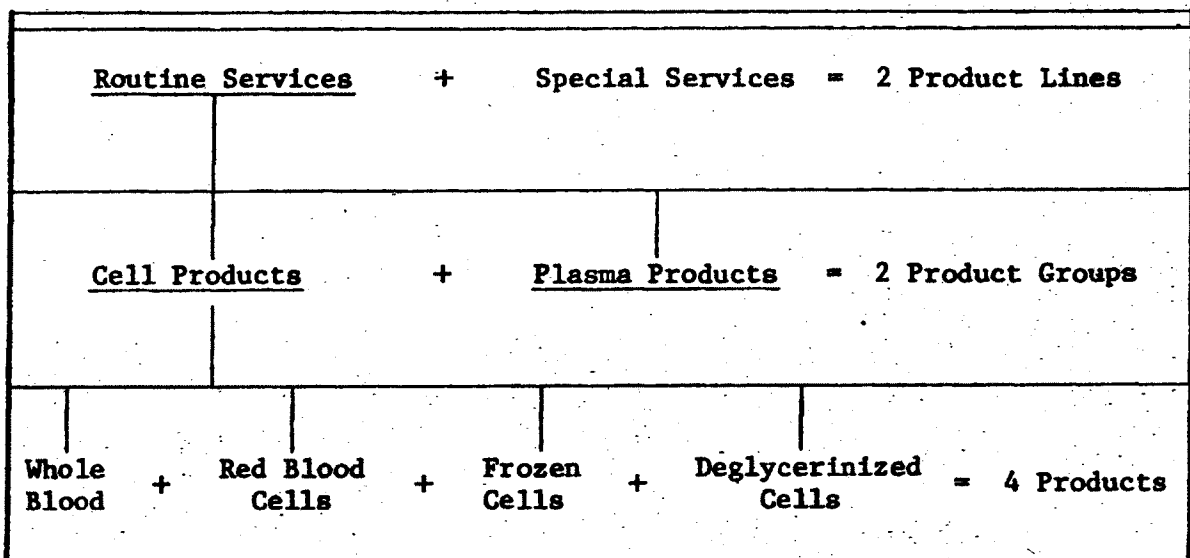


Fig. 1. Example of Product Lines, Product Groups and Products.

III. RESEARCH AND DEVELOPMENT OF A UNIQUE COST SYSTEM

A "Unique Costs Worksheet" and instructions for its use were developed. A separate worksheet was prepared for each product. Instructions and completed worksheets form Appendices A and B.

After the product worksheets were completed, information on them was summarized for product lines, product groups and products for one regional blood center. Unique costs were determined for each category, as estimated for the fiscal year ending June 30, 1981. Expected revenues for the same period were compared to unique costs, in order to measure the total profit contribution of each product, product group and product line. (Appendix E).

Information for this report was gathered from the detailed budget package of a regional blood center, from departmental cost reports, from observation and interviews in person and by telephone, from a mail survey regarding charges for specialized services, from the American Red Cross's "Blood Program Fiscal Manual," from year-end audited fiscal reports for the year ending June 30, 1979, from paid staff as well as volunteers and product users, and from individual invoices.

In a highly technical service such as a modern blood bank, timely investments in human assets are essential, and some are actually required by regulatory agencies such as the Federal Bureau of Biologics which licenses blood banks as drug manufacturing entities. From a managerial point of view it makes sense to regard training costs of paid and volunteer

staff as assets which can be depreciated similarly to capital assets, because the passage of time tends to bring about deterioration or obsolescence, or both.

As with the purchase of a new piece of capital equipment, the purchase of training and other start-up essentials associated with a new technical procedure can involve large expenditures of funds which are more reasonably allocated to the useful life span of the training than written off as current expenses. In this study, unique costs of training were handled the same way as unique costs of specific capital equipment, i.e., like depreciation expenses spread over several years.

In this unique service/manufacturing organization, all raw material is donated, and much labor is also donated, so many costs of production are simply not recorded in financial reports of any kind. Benefits to the donors are measured more in terms of personal satisfaction than monetary revenue.

IV. RESULTS AND DISCUSSION

The system currently in use utilizes product cost information which is developed in a process of allocation based more or less on unit volume (in milliliter/unit) and biological content of blood products. Although unit costs are thus established for each product, they are not necessarily closely related to actual costs as they occur or to processing fees which are subsequently computed.

The proposed cost system, in contrast, enables the user to identify and isolate costs which are uniquely attributable to each product. The system's value is not significantly decreased due to the interrelationship of blood services products, as one might expect would happen.

According to Dearden's qualifier:

Sometimes the basic products are so fundamental to the business and so interrelated that their separation into individual products with different profitability estimates may be meaningless. In such cases, it is usually desirable to calculate profitability for those individual products that are subject to management discretion with respect to discontinuance, expansion, or price change.⁷

To some extent, all blood services are subject to management discretion, particularly in terms of expansion of volume and pricing decisions. It is worthwhile, therefore, to spend the time and concentrated effort to evaluate each product. As a result of doing research for this project, for example, the unique cost approach uncovered the details of a quality control requirement which caused us to decide to make cryoprecipitate in one location rather than two.

⁷Ibid., p. 138.

Unique costs are much easier to develop for specialized services and tests than for routine blood services. Data were gathered on costs of materials, training, and time required for a six-month period, to identify these special costs which were not readily discernible using the current system. A decision was needed on whether to charge separately for each of these special tests and services, or to add their total cost to the fees for the more tangible products, i.e., whole blood and red cells. All hospital blood bank directors in the region were surveyed, asking which pricing approach they would prefer. A slight majority noted a preference for the higher processing fee for blood products, to include overall average costs of specialized tests and services.

It should be noted that the concept of service for a regional blood service includes the philosophy and practice of supplying all blood-related needs to the hospitals within the region. Whether or not delivery of a certain service or product generates revenue equal to its cost, or indeed, any revenue at all, is secondary in importance to the fact that needs are consistently met. In other words, it is the responsibility of the supplier to provide all blood services, regardless of costs of individual items or incidents, within the limits imposed by such uncontrollable elements as the weather. Secondly, it is the responsibility of the supplier to provide for the continuity of the operation, by planning for revenues to equal costs, which are kept as low as possible without compromising quality.

In short, the system of unique costing provided additional, useful information about the nature and size of costs in a regional blood services center. Unique costs were accurately identified for most products and services. In this study alone, important information that actually affected operating practices and pricing policy.

V. SUMMARY AND CONCLUSIONS

A new cost accounting system for identifying unique costs and analyzing profitability of products, product groups and product lines, as proposed by John Dearden, was tested, using data on regional blood services.

The unique costing system was found to be time consuming, but no more so than other systems. However, for the same amount of effort, one derives more useful management information than in other systems.

As in any costing system, good use of the system requires a thorough understanding of the numerous functions and interrelationships of an organization. Unless accountants or others who use the system are willing and able to absorb unwritten knowledge gleaned from observation of people and procedures in the organization studied, the system would not provide accurate results. It is probable, therefore, that managers could benefit from utilization of the unique costs approach to profitability analysis, but would need to be able to explain it very well in order to enlighten regulators, consumers and others who are familiar with more traditional systems.

The unique costing system offers service organizations such as the American Red Cross a managerial tool to generate cost information which is significantly more relevant than that provided by traditional approaches. Much time, effort and money is spent on budgets, audits, pricing, training, conferences, communication and so forth. It is appropriate that the best available methods be employed.

Improved accounting procedures utilizing the unique costing approach make possible better pricing decisions as well as better ways of describing investments in human assets, research and new technology, which provide modern blood services to the patient at the right cost. In other words, the unique costing system implies that a new accounting and pricing approach would be more useful to service organizations, including the American Red Cross.

Accounting systems for nonbusiness organizations are beginning to receive more attention in the literature, but there is still a dearth of material on the subject. Since the nonprofit sector, which includes governments, it apparently growing daily, and because people are increasingly concerned about personal expenditures and public accountability, it seems appropriate that more studies be made in the search for better methods of determining and describing costs of products, including services.

It is recommended that any person responsible for financial management of a service organization try this new method next time he or she must help evaluate the cost/benefits of a service, prepare or control a budget, explain periodic financial reports, or respond to the need for research in this area.

APPENDIX A

INSTRUCTIONS FOR USE OF THE UNIQUE COSTS WORKSHEET

INSTRUCTIONS FOR USE OF THE UNIQUE COSTS WORKSHEET

The Unique Costs Worksheet is designed as an aid in the identification of uniquely attributable costs of products, product groups, and product lines in six cost centers of a regional blood services program. The unique cost analysis is hierarchical; it starts with the broadest definition of a product and moves downward to the narrowest, i.e., a unique product or service that cannot be subdivided.

Before attempting to use the form, decide which are the major product lines, (e.g., (1) Whole Blood and Components, and (2) Specialized Services and Tests). Then define the product groups within each produce line. Then list the products which belong in each group. For example, a product group called "Red Cell Products," might include as products, Whole Blood, Red Cells, Frozen Red Cells, and Deglycerolized Red Cells.

Prepare a worksheet for each product. Write answers to the questions, in the spaces provided, giving names and amounts of unique costs, wherever possible. The information in the "product line," and "product group" spaces need not be repeated until the worksheet for the next line and group is started. However, unique cost data should be recorded in each "product" space along the bottom of the page.

APPENDIX B

UNIQUE COSTS WORKSHEETS COMPLETED

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
 Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: Whole Blood		Number Of Units: 9,000		Group: Cell Products		Line: Whole Blood and Components	
	COST CENTERS						TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?	\$170,526	\$49,626	\$96,444	-0-	\$271,252	\$276,179	\$864,027
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?	\$ 95,524	\$25,162	\$52,796	-0-	\$151,581	\$153,250	\$478,313
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	-0-	-0-	\$ 9,000 Shipping materials and charges	-0-	-0-	\$ 25,326 Collection Bags	\$ 34,326

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
 Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: Red Blood Cells (Human)		Number Of Units: 9,575		Group: Cell Products		Line: Whole Blood and Components	
	COST CENTERS						TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?		S A M E	A S W H O L E B L O O D				
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?		S A M E	A S W H O L E B L O O D				
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	-0-	-0-	\$ 9,575 Shipping Materials and Charges	-0-	-0-	\$ 34,300 Collection Bags	\$43,875

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: Red Blood Cells (Human) (Frozen)		Number Of Units: 300		Group: Cell Products		Line: Whole Blood and Components	
	COST CENTERS						TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?		S A M E	A S W H O L E	B L O O D			
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?		S A M E	A S W H O L E	B L O O D			
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	\$2,800 Special- ized, major equipment	-0-	\$3,008 Dry Ice; Shipping materials and charges	-0-	-0-	\$4,672 Supplies, Time Training	\$10,480

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
 Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: <u>Red Blood Cells (Human) Deglycerinized</u>		Number Of Units: 125		Group: Cell Products		Line: Whole Blood and Components	
	COST CENTERS						TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?		S A M E	A S W H O L E	B L O O D			
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?		S A M E	A S W H O L E	B L O O D			
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	\$ 4,100 Specialized Major Equipment	-0-	\$125 Shipping Materials and Charges	-0-	-0-	\$7,501 Supplies, Time, Training	\$11,726

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
 Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: Platelet Concentrate Number (Human) Of Units: 4,600 Group: Plasma Products Line: Whole Blood and Components							
	COST CENTERS						TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?		S A M E	A S	W H O L E	B L O O D		
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?	\$75,002	\$24,464	\$43,648	-0-	\$119,671	\$122,929	\$385,714
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	\$ 800 Specialized Major Equipment	\$ 4,600 Specialized Donor Recruitment Time	\$ 3,450 Shipping Materials and Charges	-0-	-0-	\$ 20,758 Collection Bags, Time, Quality Control	\$ 29,608

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: Single Donor Plasma Number (Human) Fresh Frozen Of Units: 4,600 Group: Plasma Products Line: Whole Blood and Components							
	COST CENTERS						TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?		S A M E	A S W H O L E	E B L O O D			
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?		S A M E	A S P L A T E	L E T C O N C E N T R A T E			
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	\$3,480 Specialized Major Equipment	-0-	\$6,785 Holders, Dry Ice, Shipping Materials and Charges	-0-	-0-	\$16,468 Collection Bags, Time	\$26,733

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
 Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: Cryoprecipitate		Number Of Units: 400	Group: Plasma Products		Line: Whole Blood and Components		
	COST CENTERS						TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?		S A M E	A S W H O L E	B L O O D			
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?		S A M E	A S P L A T E L E T	C O N C E N T R A T E			
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	-0-	-0-	\$2,600 Holders, Dry Ice, Shipping Materials and Charges	-0-	-0-	\$2,152 Collection Bag, Time	\$4,752

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
 Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: <u>Single Donor Plasma</u> Number Of Units: <u>5,400</u> Group: <u>Plasma Products</u> Line: <u>Whole Blood and Components</u> (Human), Liquid							
	COST CENTERS						TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?		S A M E	A S	W H O L E	B L O O D		
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?	S A M E	A S	P L A T E L E T	C O N C E N T R A T E			
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	-0-	-0-	\$5,324 Shipping Materials and Charges	-0-	-0-	\$17,626 Collection Bag, Time	\$22,950

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
 Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: Pooled Recovered Human Plasma		Number Of Units: 162		Group: Plasma Products		Line: Whole Blood and Components	
	COST CENTERS						TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?		S A M E	A S W H O I E B L O O D				
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?	S A M E	A S P L A T E L E T	C O N C E N T R A T E				
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	-0-	-0-	\$ 683 Shipping Materials and Charges	-0-	-0-	\$ 928 Pooling Bag, Time	\$1,611

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
 Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors
 Period: July 1, 1980 through June 30, 1981

Product: Donors Phenotyped		Number Of Units: 300		Group: Special Tests, Donors		Line: Specialized Services and Tests	
	COST CENTERS						TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?	\$24,207	-0-	-0-	\$76,045	\$17,040	-0-	\$117,292
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?	\$ 1,399	-0-	-0-	\$ 6,226	-0-	-0-	\$ 7,625
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	-0-	-0-	-0-	\$ 4,101 Supplies, Time	-0-	-0-	\$ 4,101

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
 Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: Platelet Concentrate Number (Human) by Automated Pheresis Of Units: 52 Group: Specialized Services, Patients Line: Specialized Services and Tests							
	COST CENTERS						TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?	S A M E A S D O N O R S P H E N O T Y P E D						
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?	\$22,808	-0-	-0-	\$69,819	\$17,040	-0-	\$109,667
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	\$ 4,000 Specialized Major Equipment	-0-	-0-	-0-	\$16,147 Training, Supplies, Time, Quality Control	-0-	\$ 20,147

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
 Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: Hepatitis Tests		Number Of Units: 500		Group: Specialized Services, Patients		Line: Specialized Services and Tests	
	COST CENTERS						TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?	S A M E A S D O N O R S P H E N O T Y P E D						
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?	S A M E A S P L A T E L E T C O N C E N T R A T E B Y P H E R E S I S						
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	-0-	-0-	-0-	\$ 2,055 Supplies, Time	-0-	-0-	\$2,055

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
 Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: Autologous Transfusions		Number Of Units: 30		Group: Specialized Services, Patients		Line: Specialized Services and Tests	
	COST CENTERS						TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?	S A M E A S D O N O R S P H E N O T Y P E D						
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?	S A M E A S P L A T E L E T C O N C E N T R A T E B Y P H E R E S I S						
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	-0-	-0-	-0-	\$990 Time only	-0-	-0-	\$990

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
 Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: Therapeutic Phlebotomy or Pheresis	Number Of Units: 30		Group: Specialized Services, Patients		Line: Specialized Services and Tests		TOTALS
	COST CENTERS						
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?	S A M E	A S	D O N O R S	P H E N O T Y P E D			
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?	S A M E	A S	P L A T E L E T	C O N C E N T R A T E			
	B Y		P H E R E S I S				
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	-0-	-0-	-0-	\$1,355	-0-	-0-	\$1,355
				Bag Pheresis Supplies Time			

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
 Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: Special Red Cell Typings for Patients		Number Of Units: 3,000		Group: Specialized Services, Patients		Line: Specialized Services and Tests	
	COST CENTERS						TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?	S A M E A S D O N O R S P H E N O T Y P E D						
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?	S A M E A S P L A T E L E T C O N C E N T R A T E B Y P H E R E S I S						
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	-0-	-0-	-0-	\$33,390 Supplies, Time	-0-	-0-	\$33,390

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
 Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: Compatibility Screen		Number Of Units: 300		Group: Specialized Services, Patients		Line: Specialized Services and Tests	
COST CENTERS							TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?		S A M E A S	D O N O R S	P H E N O T Y P E D			
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?		S A M E A S	P L A T E L E T	C O N C E N T R A T E			
			B Y P H E R E S I S				
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	-0-	-0-	-0-	\$ 1,596	-0-	-0-	\$1,596
				Supplies, Time			

UNIQUE COSTS WORKSHEET

American Red Cross Blood Services, Montana Region

Product Lines: (1) Whole Blood and Components; (2) Specialized Services and Tests
 Product Groups: (1A) Cell Products; (1B) Plasma Products
 (2A) Specialized Tests, Patients; (2B) Specialized Tests, Donors

Period: July 1, 1980 through June 30, 1981

Product: Patient Red Cell Problem Cases		Number Of Units: 120		Group: Specialized Services, Patients		Line: Specialized Services and Tests	
COST CENTERS							TOTALS
	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Which costs would <u>not</u> have been incurred had this <u>product line</u> not been produced?	S	A	M	E	A	S	
			D	O	N	O	
				R	S	P	
				H	E	N	
				O	T	Y	
				P	E	D	
Which costs would <u>not</u> have been incurred had this <u>product group</u> not been produced?	S	A	M	E	A	S	
			P	L	A	T	
			E	L	E	T	
				C	O	N	
				C	E	N	
				T	R	A	
				T	E	R	
				A	T	E	
				B	Y	P	
				H	E	R	
				E	S	I	
Which costs could have been avoided if this <u>product</u> had not been produced, assuming the other products in the group had been produced?	-0-	-0-	-0-	\$1,872	-0-	-0-	\$1,872
				Supplies, Time			

APPENDIX C

ALLOCATION OF JOINT COSTS

ALLOCATION OF JOINT COSTS

The problem of imperfect cost allocation methods of accounting for non-unique costs called overhead, joint, indirect and so forth, was recognized. In a non-profit, self-sufficient organization all costs must be covered, one way or another. In a regional blood service, most revenues derive from processing fees charged to participating hospitals. It is therefore important that prices be set as fairly and as low as possible, but accurately enough to ensure that total revenue will equal total costs.

Although the unique costing approach is very helpful, and although allocation of joint costs is not very helpful in pricing decisions, the need for thoughtful, simultaneous use of both approaches is inescapable. Exquisite accuracy is equally impossible.

Most cost allocation systems seem to employ mirror or circular thinking, "This product will fetch this many dollars, so we will assign this much cost to it." The ability to bear the cost, itself, determines the allocated cost. This practice is accepted, is not really logical, produces bizarre results, but will continue to occur until a better system is developed.

In this study, a cause-and-effect type of relationship was used as a basis for cost allocation. The question was asked, "Does the activity of this department (or Cost Center) contribute in an essential way, to the production and delivery of this product?" If the answer was "Yes," departmental costs were allocated evenly to each unit of product or service which

depended upon the specific activity of that department. By allocating in this fashion, recognition was given to the fact that every unit handled cost some amount of time, space, energy, paperwork, and other resources that could not be uniquely or quantifiably attributed to the unit. No attempt was made to account for differing amounts of activity associated with different products (much of this was already done in the unique costing process). No recognition of traditional values such as finished goods value, or value at split-off point was given, in order to focus on finding a method to measure costs independently from revenues.

Costs based on this cause-and-effect approach to cost allocation used together with the unique costing system were quite different from costs based more or less on the currently used "ability-to-bear" approach. Accurate identification of costs is important for pricing decisions, but even in cases where costs do not strongly influence prices, the extent to which a product is subsidizing or being subsidized is clarified.

Details of the allocation of joint costs in this study follow:

1. General Operations

Unique Costs = \$15,180

Joint Costs = Total Departmental Costs - Total Unique Departmental Costs

Joint Costs = (\$194,733 - \$15,180) = \$179,553

Allocate to all 38,494 products and tests:

$\$179,553 \div 38,494 = \4.6644412 per unit.

2. Donor Resources

Unique Costs = \$4,600

Joint Costs = (\$49,626 - \$4,600) = \$45,026

Allocate to all Cell and Plasma products, except pooled Plasma:

$19,000 + 4,600 + 4,600 + 400 + 5,400 = 34,000$ units

$\$45,026 \div 34,000 = \1.3242941 per unit

3. Distribution

Unique Costs = \$40,550

Joint Costs = $(\$96,444 - \$40,550) = \$55,894$

Allocate to all Cell and Plasma products = 34,162

$\$55,894 \div 34,162 = \1.6361454 per unit.

4. Reference and Consultation

Unique Costs = \$45,359

Joint Costs = $(\$76,045 - 45,359) = \$30,686$

Allocate to 4,332 Special Services and Tests:

$\$30,686 \div 4,332 = \7.0835641 per unit.

5. Collection

Unique Costs = \$16,147

Joint Costs = $(\$288,292 - \$16,147) = \$272,145$

Allocate to all Cell and Plasma products except Pooled Plasma = 34,000 units, plus 52 Pheresis Platelets, 30 Autologous transfusions, 30 therapeutic phlebotomies = 34,112 total units

$\$272,145 \div 34,112 = \7.9779842 per unit.

6. Preparation

Unique Costs = \$129,731

Joint Costs = $(\$276,179 - \$129,731) = \$146,448$

Allocate to all Cell and Plasma products = 34,162 units

$\$146,448 \div 34,162 = \4.2868684 per unit.

APPENDIX D

SUMMARY OF JOINT AND UNIQUE COSTS

SUMMARY OF JOINT AND UNIQUE COSTS

**American Red Cross Blood Services
Montana Region**

For the Period: July 1, 1980 through June 30, 1981

(NOTE: For each product allocated joint costs are listed on the first line, and unique costs are listed on the second line.)

Product	Departments (Cost Centers)							Total
	Number of Units	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Whole Blood	9,000	\$ 41,980	\$11,919	\$14,725	-0-	\$ 71,802	\$ 38,582	\$179,008
		-0-	-0-	9,000	-0-	-0-	25,326	34,326
Red Cells	9,575	44,662	12,680	15,666	-0-	76,389	41,047	190,444
		-0-	-0-	9,575	-0-	-0-	34,300	43,875
Frozen Cells	300	1,399	397	491	-0-	2,393	1,286	5,966
		2,800	-0-	3,008	-0-	-0-	4,672	10,480
Deglycernized Cells	125	583	166	206	-0-	997	536	2,488
		4,100	-0-	125	-0-	-0-	7,501	11,726
Platelets	4,600	21,456	6,092	7,526	-0-	36,699	19,720	91,493
		800	4,600	3,450	-0-	-0-	20,758	29,608
Frozen Plasma	4,600	21,456	6,092	7,526	-0-	36,699	19,720	91,493
		3,480	-0-	6,785	-0-	-0-	16,468	26,733
Cryoprecipitate	400	1,866	530	654	-0-	3,192	1,715	7,957
		-0-	-0-	2,600	-0-	-0-	2,152	4,752
Liquid Plasma	5,400	25,188	7,150	8,835	-0-	43,081	23,148	107,402
		-0-	-0-	5,324	-0-	-0-	17,626	22,950

SUMMARY OF JOINT AND UNIQUE COSTS (Continued)

Product	Departments (Cost Centers)							Total
	Number of Units	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
Pooled Plasma	162	\$ 756 -0-	-0- -0-	\$ 256 683	-0- -0-	-0- -0-	\$ 694 928	\$ 1,715 1,611
Donors Phenotyped	300	1,399 -0-	-0- -0-	-0- -0-	2,125 4,101	-0- -0-	-0- -0-	3,524 4,101
Pheresis Platelets	52	243 4,000	-0- -0-	-0- -0-	368 -0-	415 16,147	-0- -0-	1,026 20,147
Hepatitis Tests	500	2,332 -0-	-0- -0-	-0- -0-	3,542 2,055	-0- -0-	-0- -0-	5,874 2,055
Autologous Transfusions	30	140 -0-	-0- -0-	-0- -0-	213 990	239 -0-	-0- -0-	592 990
Therapeutic Phlebotomies	30	140 -0-	-0- -0-	-0- -0-	213 1,355	239 -0-	-0- -0-	592 1,355
Red Cell Tests on Patients	3,000	13,993 -0-	-0- -0-	-0- -0-	21,250 33,390	-0- -0-	-0- -0-	35,243 33,390
Compatibility Screens	300	1,399 -0-	-0- -0-	-0- -0-	2,125 1,596	-0- -0-	-0- -0-	3,524 1,596
Patient Red Cell Problem Cases	120	561 -0-	-0- -0-	-0- -0-	850 1,872	-0- -0-	-0- -0-	1,411 1,872

04

SUMMARY OF JOINT AND UNIQUE COSTS (Continued)

Products	Departments (Cost Centers)							Total
	Number of Units	General Operations	Donor Resources	Distribution	Reference, Consultation	Collection	Preparation	
<u>TOTALS</u>	38,494							
Joint Costs		\$179,553	\$45,026	\$ 55,894	\$ 30,686	\$272,145	\$146,448	\$729,752
Unique Costs		\$ 15,180	\$ 4,600	\$ 40,550	\$ 45,359	\$ 16,147	\$129,731	\$251,567
Combined Costs		\$194,733	\$49,626	\$ 96,444	\$ 76,045	\$288,292	\$276,179	\$981,319

APPENDIX E

SUMMARY OF UNIQUE COSTS, REVENUES AND PROFITS

SUMMARY OF UNIQUE COSTS, REVENUES AND PROFITS
American Red Cross Blood Services, Montana Region
For the Period: July 1, 1980 through June 30, 1981

PRODUCTS, GROUPS, LINES	REVENUE	UNIQUE COSTS	PROFITS OR (LOSS)
Whole Blood	\$ 390,894	\$ 34,326	\$356,568
Red Cells	418,213	43,875	374,338
Frozen Cells	17,700	10,480	7,220
Deglycerinized Cells	10,810	11,726	(916)
For the Cell Products <u>Group</u>	\$ 837,617	\$ 478,313*	\$359,304
Platelet Concentrate	\$ 50,600	\$ 29,608	\$ 20,992
Frozen Plasma	43,400	26,733	16,667
Cryoprecipitate	2,800	4,752	(1,952)
Liquid Plasma, Single	16,200	22,950	(6,750)
Pooled Plasma	4,440	1,611	2,829
For the Plasma Products <u>Group</u>	\$ 117,440	\$ 385,714*	(\$268,274)
For the Whole Blood and Component Product <u>Line</u>	\$ 955,057	\$ 864,027	\$ 91,030
Donors Phenotyped	-0-	\$ 4,101	\$ (4,101)
Pheresis Platelets	10,500	20,147	(9,647)
RIA Tests	1,000	2,055	(1,055)
Autologous Transfusions	-0-	990	(990)
Therapeutic Phlebotomies	-0-	1,355	(1,355)
Red Cell Tests on Patients	-0-	33,390	(33,390)
Compatibility Screens	-0-	1,596	(1,596)
Patient Red Cell Problems	-0-	1,872	(1,872)
For the Specialized Services and Tests Product <u>Line</u>	\$ 11,500	\$ 117,292	(\$105,792)
TOTALS, For Individual Products	\$ 966,557	\$ 251,567	\$714,990
TOTALS, For Both Product Lines	\$ 966,557	\$ 981,319*	(\$ 14,762)
TOTALS, For the Center as a Whole, Including "Other" Revenues and Expenses	\$1,000,319	\$1,000,319	-0-

*Includes costs which are joint with respect to individual products.

APPENDIX F

PRICING APPLICATIONS

PRICING APPLICATIONS

If prices are set so revenues for each product are equal to costs which have been determined by a unique costing system used together with a cause-and-effect-allocation-of-joint-costs system, then prices would resemble the following list (assuming the expected number of units are utilized, outdated, or spent for quality control). Prices set by current methods are listed for comparison.

<u>Product</u>	<u>Current Price</u>	<u>"New-Method" Price</u>
Whole Blood	\$ 49.75	\$ 26.34
Red Cells	49.75	30.36
Frozen Cells	59.00	54.82
Deglycerinized Cells	94.00	123.60
Platelets	22.00	52.65
Frozen Plasma for Transfusion	22.00	25.70
Frozen Plasma for Fractionation	5.00	25.70
Cryoprecipitate	8.00	36.31
Liquid Plasma	3.00	24.14
Pooled Plasma	3.00	20.53
Donors Phenotyped	-0-	25.42
Pheresis Platelets	300.00	604.94
Hepatitis Tests	10.00	15.86
Autologous Transfusions	-0-	52.73
Therapeutic Phlebotomies	-0-	64.90
Red Cell Tests on Patients	-0-	22.88
Compatibility Screens	-0-	17.07
Patient Red Cell Problems	-0-	27.36

It can readily be seen that the new costing system implies utilization of a pricing system so radically different, it would not be accepted in the near future. However, the new approach surely does point up the extent to which some products subsidize others.

Also, the unique costing approach identifies specific incremental costs which "should" be recovered, even though the particular product may not have the "ability to bear" its share of allocated costs. For example, single donor liquid plasma which could possibly be considered a by-product, "should" fetch \$4.25, ($\$22,950 \div 5,400$), per unit, minimum, to recover unique costs alone.

APPENDIX G

COMPARATIVE INCOME STATEMENTS

Comparative Income Statements

CURRENT METHOD

Income

Whole Blood and Components	\$928,900
Plasma for Further Manufacturing	37,640
Specialized Services and Tests	-0-
Other Income (Interest, etc.)	<u>14,779</u>
Total Income	\$981,319

Expense

Direct Materials	\$103,000
Indirect Expenses	849,474
Major Equipment	<u>28,845</u>
Total Expense	\$981,319

Increase (decrease) in Fund Balance -0-

NEW METHOD

Income

Whole Blood and Components	\$864,027
Specialized Services and Tests	<u>117,292</u>
Total Income	\$981,319

*Expense

Unique Costs	\$251,567
Joint Costs	<u>729,752</u>
Total Expense	\$981,319

Increase (decrease) in Fund Balance -0-

*Alternatively, expenses could be shown as:

Expense

Whole Blood and Components	\$864,027
Specialized Services and Tests	<u>117,292</u>
Total Expense	\$981,319

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