WORLD HEALTH ORGANIZATION

ORGANISATION MONDIALE DE LA SANTE

DISTR.: LIMITED

DAP/86.2
DRAFT

NATIONAL DRUG POLICY AND STRATEGY

TRAINERS' GUIDES

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TRAINERS' GUIDES [1]

ACTION PROGRAMME ON ESSENTIAL DRUGS AND VACCINES

PROGRAMME D'ACTION POUR LES MÉDICAMENTS ET VACCINS ESSENTIELS

[1] This document can be used in conjunction with DAP/86.3 - a series of nine session guides: (1) Introduction to a National Drug Policy, (2) Supply System Organization, (3) Selection of Drugs, (4) Planning Drug Requirements, (5) Procurement Strategies, (6) Systematic Cost Reduction, (7) Financing The Drug Supply, (8) Quality Assurance, (9) Introduction to Proper Drug Use.

INTRODUCTION TO A NATIONAL DRUG POLICY

DURATION: 2-3 hours

PREPARATION AND MATERIALS:

A. Read: 1. The Session Notes;
2. MDS, Chapter I.B., pp. 7-21.

B. Prepare the following Visual Aids:

VA 1: Goals for a national drug policy

VA 2: Activity areas of a pharmaceutical policy

VA 3: Policy and Impact Analysis Worksheet

VA 4: The Policy Circle

C. Obtain for use during the session either:

1. A blackboard with chalk

2. Flipcharts with markers (newsprint)

3. Overhead projector with transparencies and markers

NOTE: The session plan assumes that flipchart or newsprint is available.

Background (READING)

Activity & Time	Plan	Notes
Background	Prior to beginning this session, participants should have completed the Basic Reading listed in their notes. However, the introductory Trainer Presentation review most of the essential material and this unit can be taught without participants having completed the Basic reading.	
Introduction 30-45 minutes	1. Present the rationale for the unit: - National drug policies form the context and background for any public and private drug supply.	

Activity & Time	Plan	Notes
	- Drug policies involve many different government agencies and are often not clearly stated in a comprehensive way; therefore, it may take systematic effort on the part of a Minister of Health or other official to understand his or her country's policies - Drug policies arise from a complex combination of health-related, cultural, economic, and political factors; understanding of and sensitivity to these factors is essential in planning a successful program. - While few officials have control over the entire range of drug-related policies, all of them can still exert an important influence if they understand the various goals, the range of potential implementation activities, and the manner in which various arms of government cooperate or compete in issues of drug policy. - Summary: This unit is intended to help participants think systematically about national drug policies -- policies both within and outside their control -- in order to plan activities with a high likelihood of success and to implement a comprehensive national policy. 2. Goals for National Drug Policy Point out that there are three main areas in which national drug policies can have an impact: - Health-related Goals - Economic Goals - National Development Goals Lead a discussion on what specific goals might be cited under each of these three areas.	VA 1 Mark up on newsprint

Activity & Time	Plan	Notes
	3. Activities Areas for National Drug Policies Describe in brief the three main areas for implementation activities: (1) Supply of drugs. (2) Regulation of the Pharmaceutical Sector. (3) Promotion of Local Production Ask participants to suggest other possible activities in each area.	VA 2 May want to use newsprint to mark up additions to the list of activities
Individual Activity 30 minutes	4. Policy and Impact Analysis The purpose of this activity is to get participants to begin to apply the above terms and concepts to their own countries. Participants should have completed worksheets in their own Guides in preparation for this session. If they have not, allow twenty minutes at the beginning of this activity for participants to fill at least the first two columns (Policy Area and Current Policy) of their worksheets. The columns on the worksheet refer to the following: Policy Area - This simply refers to the issue or topic addressed by a specific policy, law, or piece of legislation. For example "drug patents", "import controls," "use of generic names". Current Policy - A brief (3-8 word) statement of the content of the current policy. For example, "generic names required for all public procurements".	Encl. 1 is an example from a country (for your own use) VA 3

Activity & Time	Plan	Notes
	Responsible Government or Private Agency - Who initiated and/or implements the policy? In compiling the list of policies, participants should try to include related policies from a range of government and private agencies. Impact - This should be a rough, qualitative indicator of whether the policy has a favorable (+), unfavorable (-), or neutral (o) effect on public health, the economy, and national development.	
Presentation of individual work 20 minutes	5. Once participants have completed their own Impact Analysis worksheets, one or two participants should be asked to present their worksheets. A newsprint worksheet should be completed as the participant describes his or her policies and their impact. The trainer may wish to limit the number of Policy Areas included on the newsprint worksheet. The aim is to demonstrate the variety of policy areas, responsible agencies, impacts involved.	Prepare double-side newsprint in advance to accommodate the content of one participant
Group Activity	6. <u>The Policy Circle</u> The purpose of this activity is to have participants think systematically about the way in which policies interact with each other. Two policies may be: - <u>Reinforcing</u> - both help to achieve the same purpose. - <u>Independent</u> - each aimed at unrelated objectives. - <u>Competing</u> - two policies are aimed at achieving opposite ends, at least have that effect.	VA 4

Activity & Time	Plan	Notes
	For this activity take the Policy Areas listed on the newsprint worksheet from the previous step and arrange them around a circle, preferably grouped by the major three activity areas listed in VA 2. After drawing the circle and entering the policies, lead a discussion of the major policy interactions. As the discussion proceeds, draw in the major policy interactions and mark them as <u>reinforcing</u> (+), <u>independent</u> (o) or <u>competing</u> (-). The group may realise from this that part of their frustration as executives and managers is that different government and private agencies seem to work at cross purposes.	
Summary	7. Recapitulate the main findings of the session and print out with examples based on the Policy and Impact Analysis worksheets: - the necessity of better understanding all the policies related to the drug sector; - the possibilities of improving the supply and use of drugs.	

GOALS FREQUENTLY CITED FOR NATIONAL DRUG POLICY

The major health-related, economic and national development goals which might be achieved through the formulation and enactment of a broad-based national drug policy are the following:

Health Related Goals

-- Make essential drugs available to the entire population.

-- Increase attendance at health clinics by increasing the credibility and acceptance of village health workers.

-- Assure the safety and efficacy of medicines provided to the public.

-- Improve dispensing conditions, including labeling, packaging, and instructions to patients.

-- Rationalize the prescribing of pharmaceuticals.

-- Promote correct use of medications by patients.

Economic Goals

-- Lower the cost of drugs to the government and the public.

-- Reduce foreign exchange drain for drug imports through wiser purchasing.

-- Provide jobs in areas such as dispensing, prepackaging of drugs,and supply management.

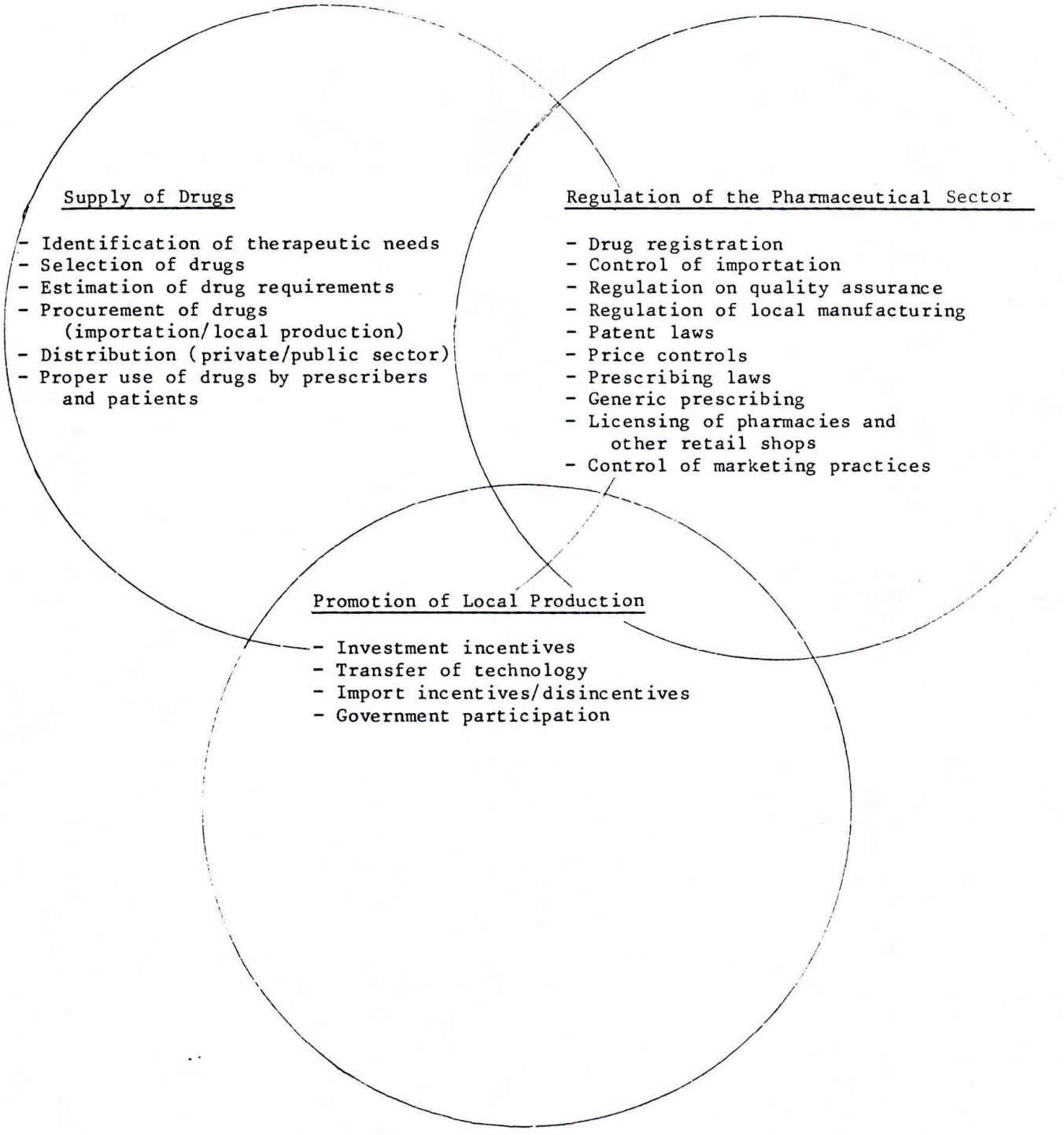
National Development Goals

-- Increase manpower skills in management, pharmacy, and medicine.

-- Improve internal transportation and communication systems.

-- Establish a starting place for the evolution of industrial competence in packaging, chemical processing, and other production areas.

Activity Areas for Comprehensive National Drug Policies



WORKSHEET: Policy and Impact Analysis

Policy Area	Current Policy	Responsible Government or Private Agency	Impact		
			Public Health	Economic	National Development

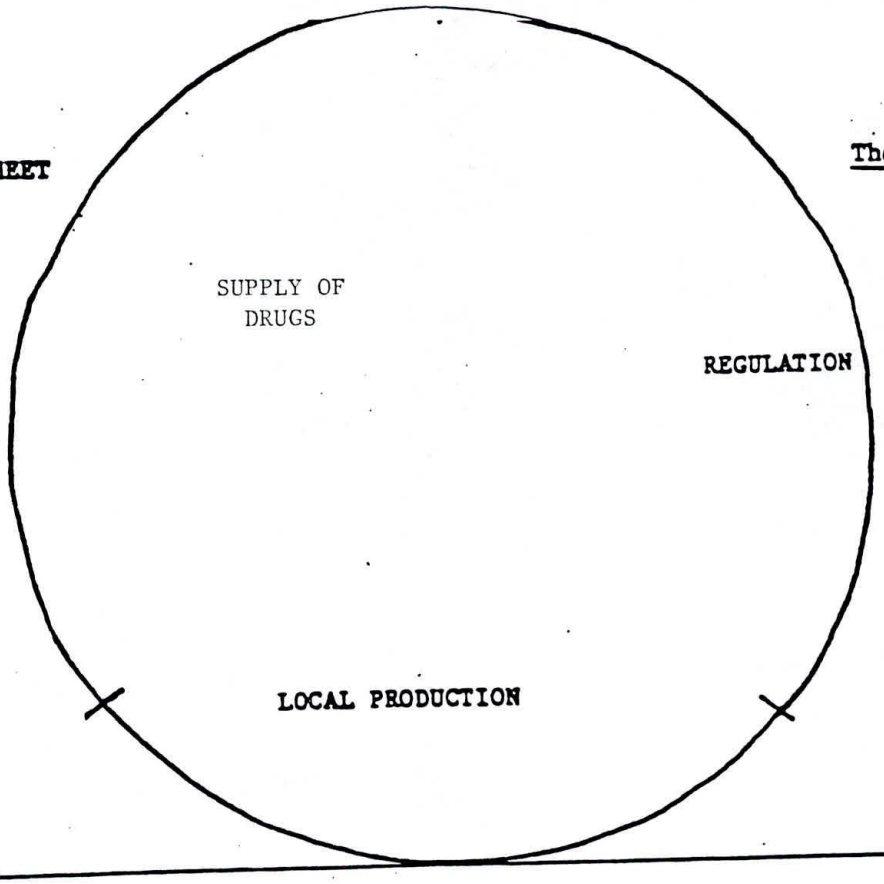
POLICY AND IMPACT ANALYSIS

Policy Area	Current Policy	Responsible Government or Private Agency	Impact		
			Public Health	Economic	National Development
Accessibility	Drugs available no charge pub. sector, minimal fee in vol. agencies	MOH	+	(+ for recipients)	+
Nat.drug list	Compliance with nat. drug list in public sector	MOH	0/+	+	0
Nomenclature	Drugs listed and procured under INN for public sector	MOH	0	+	0
Brand-names	Discouraged during training	MOH	+	+	+
Generic prescribing	General guidance in favour	MOH	+	+	+
Importation	Limited to MOH, NAPCO, donations to vol. agencies	MOH, Min.Trade, Min.Fin.	+	0	0/+
Registration	Every new drug (since 1979) must be registered	MOH	+	0	0
Registration of outlets	All wholesale and retail outlets must be registered	MOH	+	+	0
QC of drugs	Currently no policy	MOH	-	-	-
Local production	Production of essential drugs increase self-reliance	MOH/Min. of Ind.	0	+ (?)	+
QC of manufacturing	Factories inspected once a year and licenses issued	MOH	+	0	0
Patent laws	Patent rights 8-16 years	Min. of Ind. + Trade	-	-	-
Technology Transfer	Develop local production	MOH/Min. Trade+Planning	+	+	+
Import duties	Duties waived on ethicals + raw materials	Min. Finance	0	-	+
Sales of drugs	Regulated by Act	MOH	+	+	+
Marketing promotion	Discouraged	MOH	+	+	+

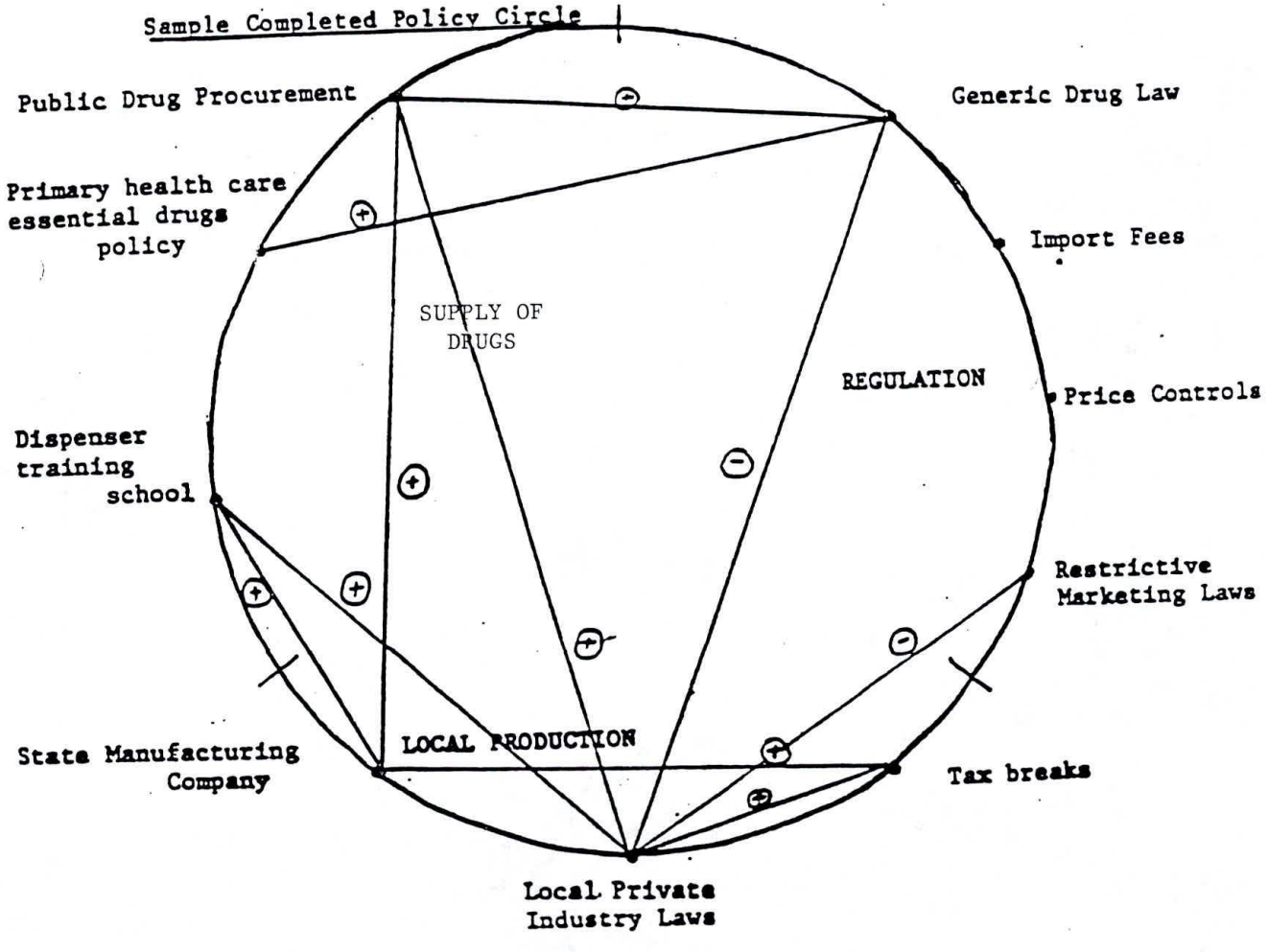
Drug Policies
Activity 2

The Policy Circle

WORKSHEET



Sample Completed Policy Circle



SUPPLY SYSTEM ORGANIZATION

DURATION: 2 hours

PREPARATION AND MATERIALS:

A. Read: Managing Drug Supply, Chapter I.B.

B. Prepare the following Visual Aids:

VA 1: Problems in Drug Supply and Potential for Improvements

VA 2: The Drug Supply Cycle

VA 3: The Dimensions of Pharmaceutical Supply

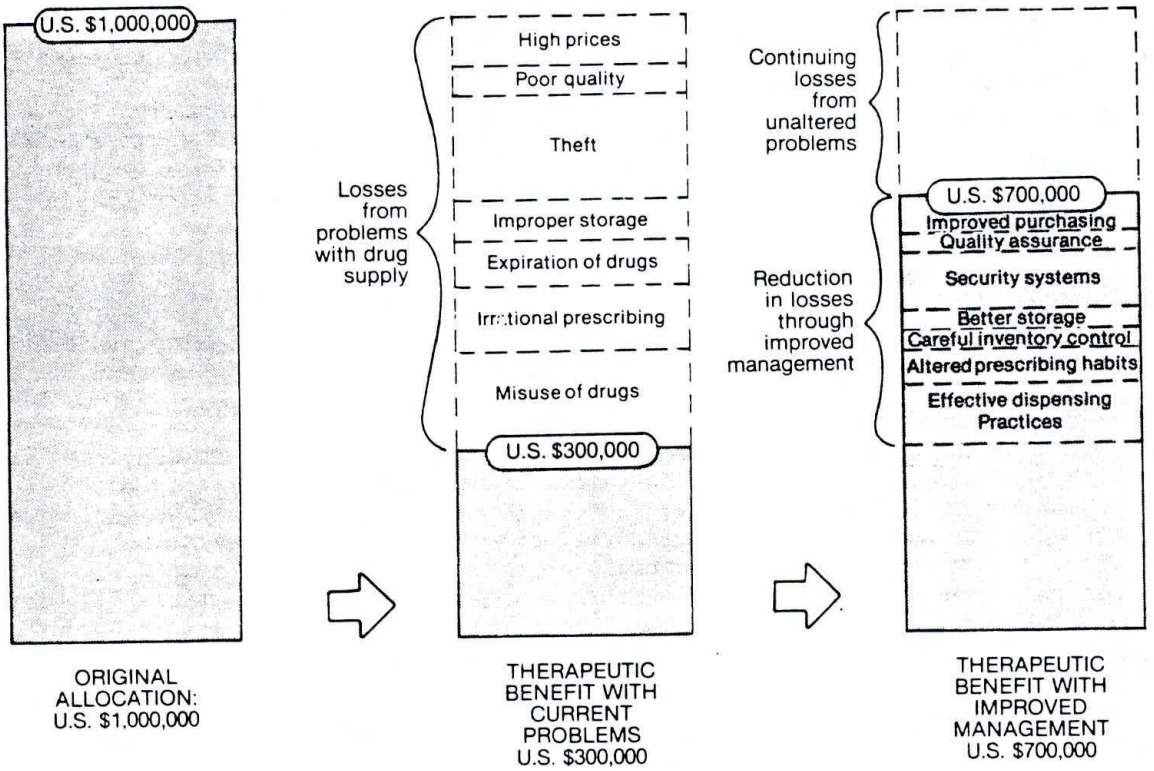
VA 4: Functional Analysis Matrix

VA 5: Problem Matrix

Activity & Time	Plan	Notes
Introduction 10 minutes	1. Give a short presentation to: - explain the rationale for this unit; - discuss what improvements are possible in the supply system; - describe the supply system.	 VA 1 VA 2
Discussion 20 minutes	2. For each function ask the participants what activities are needed to carry it out. Try to elicit the activities shown on the Functional Analysis Matrix. 3. Discuss the resources needed to carry out the activities 4. Discuss the relationship between functions (activities), resources and levels.	 VA 3

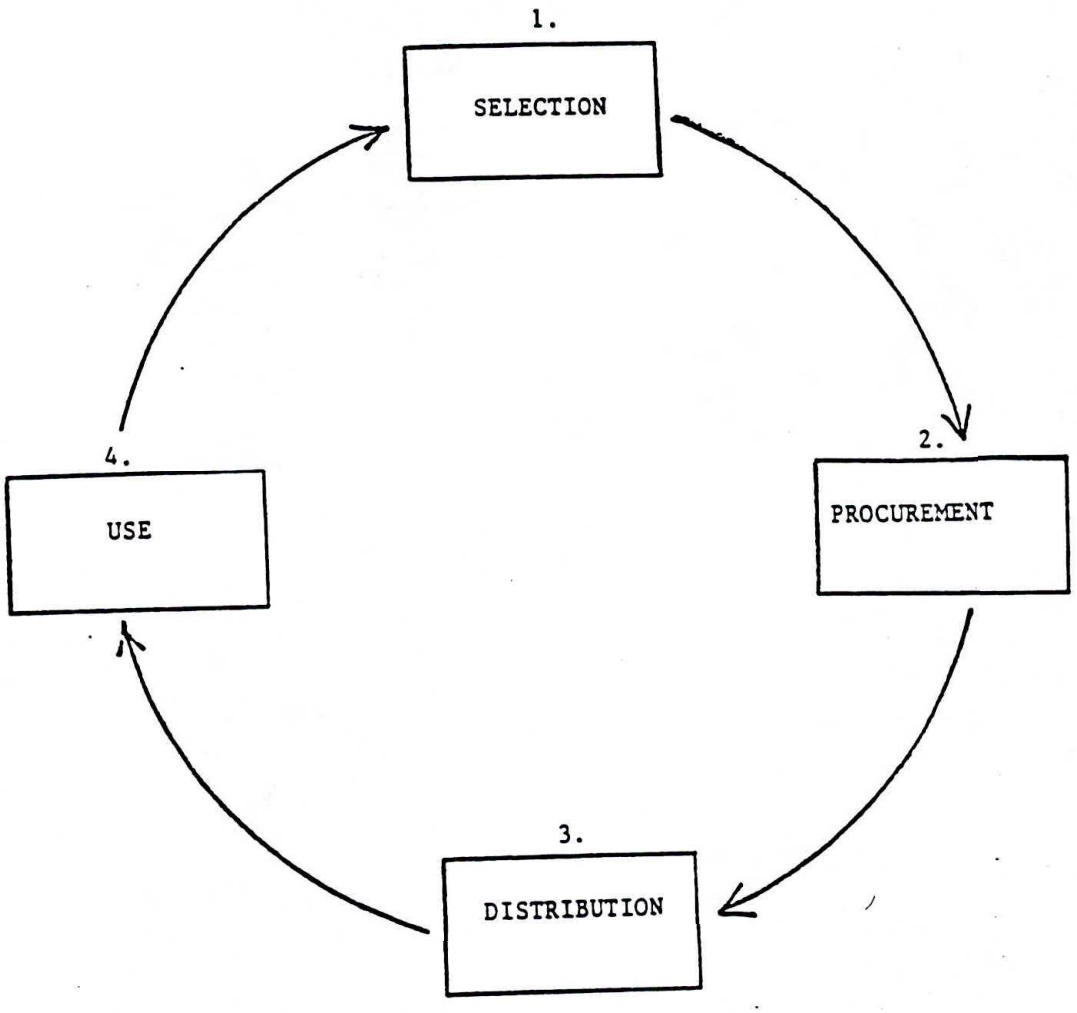
Activity & Time	Plan	Notes
Individual Activity 30 minutes	5. Introduce the Functional Analysis Matrix activity. Assist the participants as needed.	
Presentation of individual work 30 minutes	6. Ask each participant on a rotating basis to report on the activities. Let the other participants comment. Use an empty VA 4 to write the results on.	VA 4
Group Activity 40 minutes	7. Divide the participants into groups of four and explain the problem matrix. Assign each group a different function to work on. Break the activity after 40 minutes even if all the groups have not finished.	
Presentation of Group Work 30 minutes	8. Ask each group to present the results of their work and discuss the extent to which a specific problem affects the cost, availability, quality and proper use of drugs. Use an empty VA 5 to write results on.	VA 5
Summary 10 minutes	9. Review the activities during the session and point out with examples: - the necessity to know how the system functions; - the possibilities to contain costs by selective improvements in the supply system.	

Problems in Drug Supply and Potential for Improvement

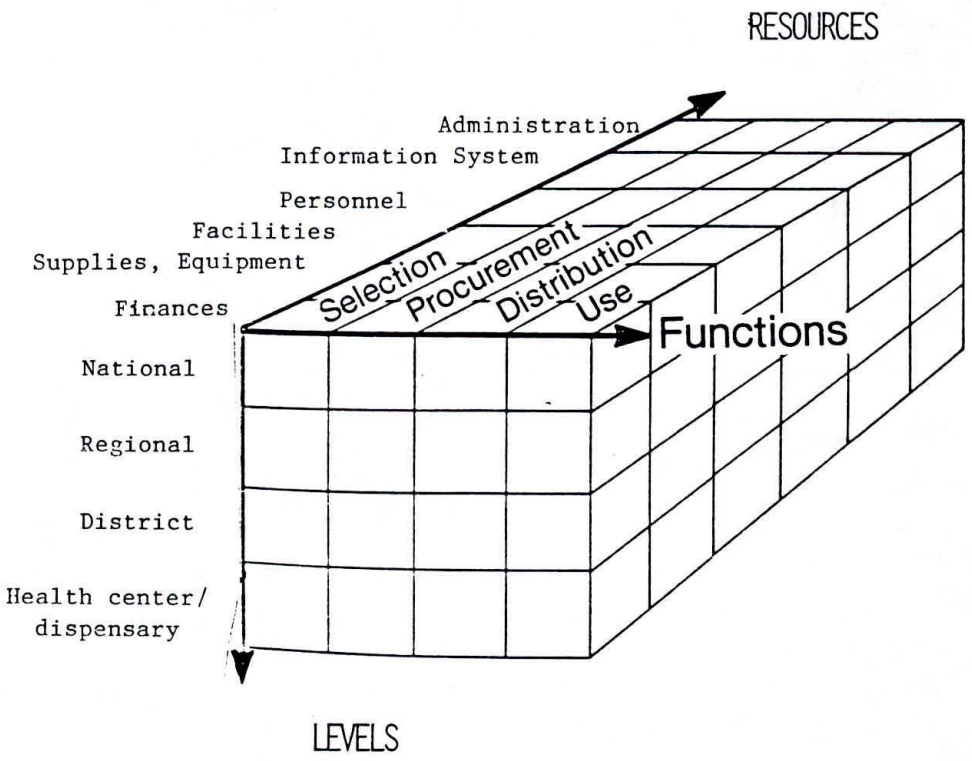


Source: Managing Drug Supply, page 17.

The Drug Supply Cycle



THE DIMENSIONS OF PHARMACEUTICAL SUPPLY



Source: Managing Drug Supply, page 19.

Supply System Organization VA 4

FUNCTIONAL ANALYSIS MATRIX

Function	Activity	Who is responsible?	When is it done?
Selection	Selection of drugs		
	Quantification		
Procurement	Budgeting		
	Financing		
	Purchasing		
	Quality assurance		
	Decision to produce drugs locally or import		
Distribution	Customs clearance		
	Storage		
	Inventory control		
	Delivery		
Use	Promoting rational drug prescribing		
	Establishing good dispensing practices		
	Encouraging patient education/compliance		

PROBLEM MATRIX

Function	Activity	Problem	Policies/ Procedures	Organizational Structure	Information System	Personnel	Facilities	Equipment	Finances
SELECTION	Selection of drugs								
	Quanti-fication								
PROCUREMENT	Budgeting								
	Financing								
	Purchasing								
	Quality Assurance								
	Local Production								

PROBLEM MATRIX

Function	Activity	Problem	Policies/ Procedures	Organizational Structure	Information System	Personnel	Facilities	Equipment	Finances
D I S T R I B U T I O N	Customs Clearance								
	Storage								
	Inventory Control								
	Delivery								
	Quality Assurance								
U S E	Prescribing Practices								
	Dispensing Practices								
	Patient Education/ Compliance								

SELECTION OF DRUGS

DURATION: 2-3 hours

PREPARATION AND MATERIALS:

A. Read:
1. The Session Notes.
2. Managing Drug Supply (chapter 11 B).
3. The Use of Essential Drugs (WHO TRS No. 722, 1985).

B. Ask the participants to read the session notes before the session.

C. Prepare the following Visual Aids:

VA 1: Worksheet 1: How are Drugs Selected for your Formulary/Drug List?

VA 2: Worksheet 2: Interest Group Support and Opposition and Actions to Gain Acceptance of a Drug List.

Activity & Time	Plan	Notes
Discussion 60 minutes	1. Start by asking the group why it is necessary to worry about drug selection. 2. Review the rationale for the unit presented in the session notes. Point out that selection offers: - therapeutic benefits - economic and - administrative benefits. Discuss the possible disadvantages of selection by asking the group its experience in this area. According to the country, include in the discussions the problems of selection related to the private sector. 3. Continue with a review and discussion of the use of generic names for drugs. Review terminology.	VA 1

Activity & Time	Plan	Notes
Discussion 45 minutes	4. Discuss the drug selection process. Use Worksheet 1 as a basis for your discussion. Allow the participants 15 minutes to complete the worksheet before the discussion.	
Discussion 45 minutes	5. Review the other sub-topics in the Session with appropriate input of participants including completion of Worksheet 2.	
Summary 15 minutes	6. Summarize the main activities and issues raised during the session stressing the advantages of a selective drug list organized according to generic names.	

Potential Benefits of Selective Drug Lists

THERAPEUTIC BENEFITS

- -- eliminate ineffective or unsafe drugs and thereby increase drugs with demonstrated efficacy and safety;
- -- with fewer drugs, it is easier to provide drug information to doctors and other health workers and easier for health workers to be informed about each drug they use;
- -- with fewer drugs, monitoring of drug utilization is more feasible;
- -- allows more uniform prescribing practices, which reduces confusion for patients, and dispensing and prescribing errors;
- -- quality assurance at all levels is easier with fewer items.

ECONOMIC AND ADMINISTRATIVE BENEFITS

- -- lower purchase prices through bulk discounts and wiser purchasing (with few drugs procurement staff can concentrate on locating the least expensive source for each item);
- -- reduced inventory costs;
- -- fewer items makes stock-keeping easier and stockouts less likely;
- -- fewer items facilitates paperwork of all types (ordering, stock records, etc.)
- -- stimulate local production.

Possible Arguments Against a Selective List

- -- restrict the freedom of choice of the doctors;
- -- quality of generic products less guaranteed than brand names;
- -- no funds generated for research;
- -- usefulness of some drugs as placebos.

WORKSHEET 1: How Are Drugs Selected for your Drug List?

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1. Who are the organizations and people involved in making drug selections? (List organizations and positions of the people involved.)

2. What are the criteria used by those making the drug selections? (List the major considerations involved in choosing individual drugs.)

How are Drugs Selected -- Options and Considerations

1. PEOPLE: Who should be involved in making drug selections?

   a. Consider representation from governmental and non-governmental agencies.

      - Ministry of Health senior official(s) - senior administrative physician.
      - Directors of primary health programs, maternal and child health programs, etc.
      - Professors from local medical schools or major hospitals.
      - Practicing physicians and auxiliary medical workers from government health programs.
      - Chief hospital pharmacist(s) of major general hospital(s).
      - Drug and Therapeutics Committee(s) of major hospital(s).
      - Medical Staff Committee(s) of major hospital(s).
      - Teachers from auxiliary medical worker training programs.
      - Practicing general practitioner nominated by Medical Association.
      - Practicing private pharmacist nominated by Pharmacists' Association.

   b. Consider the skills to be represented in the above drug selection committee, or whose particular expertise can be called upon:

      - medical: general and specialties;
      - clinical pharmacology;
      - legal;
      - economics and business administration;
      - local drug industry, importers and distributors;
      - aid program officials: WHO, UNICEF, USAID, CIDA, DANIDA, etc.

2. PROCESS: How are drugs selected?

   - Is there a standard list or formulary? If more than one, what are they?
   - Is there a formalized selection process or is it informal?
   - Are drugs selected by the individual practitioner, local health districts, hospital pharmacists or therapeutics committees, a procurement clerk at the national level, a national committee?
   - Are selections periodically reviewed?

- What forms should be used? (i.e., should there be an individual written application for each drug considered for purchase and/or inclusion in a standard formulary?)

- What time-frame should be used? Should selections be reviewed every six months? every year? every two years?

3. CRITERIA: What criteria should be used in making individual drug selections?

- What information should be used and where can it be obtained?

- Should there be a preference for locally produced products?

- Should cost be a consideration?

- Should drugs be selected or assigned by level-of-care categories?

- Should generic names be used?

- Should combination drugs be considered?

- Should local traditional remedies be considered?

- Are local disease patterns known and considered?

Groups with a Potential Special Interest in a Selective Drug List

- Ministry of Health officials
- Officials from other ministries and government agencies
- Practicing government doctors
- Private doctors
- Other government medical and health care practitioners
- Government pharmacists
- Private Pharmacies
- Donor Agencies (UNICEF, WHO, USAID, DANIDA, etc.)
- Multinational drug suppliers
- Local Manufacturers
- Importers and wholesalers
- Others:

  Drug Salesmen

  Consumer groups: General and specific (e.g. Diabetes Association)

  Politicians

WORKSHEET 2: Interest Group Support and Opposition

Individuals and Groups with a Special Interest in a Selective Drug List	Potential Points of Support	Potential Points of Opposition

PLANNING DRUG REQUIREMENTS

DURATION: 2 hours

PREPARATION AND MATERIALS:

A. Read the Session Notes and Managing Drug Supply, chapter II B.

B. Prepare the following visual aids:

VA 1: ABC analysis of large MOH supply system.

VA 2: Therapeutic alternative analysis.

VA 3: Epidemiology model for estimating drug requirements.

VA 4: Health problem profile

VA 5: Standard treatment

VA 6: Summary of drug requirements.

Activity & Time	Plan	Notes
Trainer presentation 10 minutes	1. What is meant by "planning drug requirements"	
Discussion 15 minutes	2. Participants' current methods	Group Discussion
Trainer presentation 30 minutes	3. Consumption Method a. Data Collection - sources of data - format - examples (Kojast consumption records could be used as an example)	Annex 1
	b. Data Analysis (Utilization Review) - ABC value analysis - therapeutic alternatives analysis - anticipating program growth	

Activity & Time	Plan	Notes
Trainer presentation 30 minutes	4. Epidemiologic Method a. Population Coverage b. Health Problem Profile c. Standard Treatments d. Calculation of Quantities Required	
Summary 15 minutes	5. Uses for Drug Estimates. Ask the participants for suggestions. The responses should include the following: - determining order quantities for existing programs; - determining order quantities for new or rapidly growing programs; - planning a budget; - promoting cost-effective drug utilization; - negotiating foreign exchange requirements; - seeking donor funding; - assessing the need for specific items which may have been offered as gifts.	

ABC Value Analysis Year: 1983

CODE	Rank Order	Drug Product Description	WHO Ess. List	VEN Cat.	Total Cost (LC)	% of Total Cost	Cumulative % of Total Cost
		TOTAL - 481 ITEMS			56,040,448	100.00%	100.00%
		CLASS "A" - 37 ITEMS			39,166,166	69.89%	69.89%
		CLASS "B" - 69 ITEMS			11,216,647	20.02%	89.91%
		CLASS "C" - 375 ITEMS			5,657,635	10.10%	100.00%
59111	1	Streptomycine Sulfate Poudre 1 gm.	Y	V	8,363,300	14.92%	14.92%
74060	2	Distilled Water 100%	Y	V	4,640,000	8.28%	23.20%
58162	3	Penicilline G 1M Unit Inj.	Y	V	3,726,250	6.65%	29.85%
58051	4	Chlortetracycline 1%	Y	V	3,333,080	5.95%	35.80%
33061	5	Glucose Perf. Isotonique	Y	V	1,639,078	2.92%	38.73%
68023	6	Insuline Retard I P I 40 U	Y	E	1,172,979	2.09%	40.82%
70114	7	Aspirine 500 mg	Y	V	1,161,200	2.07%	42.89%
58172	8	Penicilline G+Penicill.GPro 1M Unit	Y	V	1,143,5[illegible]	2.04%	44.93%
33072	9	Sodium Chlorure Perf. Isotonique	Y	V	1,052,[illegible]	1.88%	46.81%
59101	10	Rifampicine 150 mg.	Y	E	1,016,[illegible]	1.81%	48.62%
75117	11	Anti-Spasmodiques (2=Bara.3=Ava)	N	N	785,[illegible]	1.40%	50.03%
59050	12	Ethionamide 250 mg.	Y	E	763,[illegible]	1.36%	51.39%
58260	13	Sulfaguanidine 500 mg.	N	V	636,[illegible]	1.14%	52.52%
58040	14	Chloramphenicol 250 mg.	Y	V	626,327	1.12%	53.64%
58280	15	Sulfaethoxypyridazine	N	V	562,400	1.00%	54.64%
59090	16	Pyrazinamide 500 mg.	Y	E	552,316	0.99%	55.63%
31080	17	Carbazochrome	N	N	515,662	0.92%	56.55%
58163	18	Penicilline G 5 M Unit Inj.	Y	V	514,776	0.92%	57.47%
12091	19	Fluphenazine Retard Inject. 25 mg	Y	N	496,486	0.89%	58.36%
58140	20	Oxytetracycline 250 mg.	Y	V	489,546	0.87%	59.22%
33082	21	Potassium Chlorure 250 mg.	Y	E	489,100	0.87%	60.11%
68021	22	Insuline 40 U	Y	V	471,402	0.84%	60.95%
42050	23	Bromure Butyl d'Hyosine 20 mg.	N	E	453,076	0.81%	61.76%
74660	24	Anti-Infectieux Pulmonaire Enfant	N	N	413,562	0.74%	62.49%
33111	25	Sodium Bicarbonate 14%	Y	E	356,166	0.64%	63.13%
59040	26	Ethambutol 500 mg.	Y	E	353,250	0.63%	63.76%
46061	27	Vit. B/6 (Pyridox.Chlor.Inj.) 250 mg	Y	E	351,755	0.63%	64.39%
68033	28	Glybutamide 500 mg.	N	E	347,726	0.62%	65.01%
74670	29	Anti-Infectieux Pulmonaire Adulte	N	N	343,350	0.61%	65.62%
33024	30	Calcium Gluconate Inject. 10%	N	N	340,955	0.61%	66.23%
54066	31	Hydrocortisone Injectable 100 mg.	Y	V	324,228	0.58%	66.81%
58420	32	Trisulfamides Sulfadiaz./Sulfac./	N	V	301,974	0.54%	67.35%
58182	33	Benzathine Penicilline 600,000 U	Y	V	290,274	0.52%	67.87%
12013	34	Chlorpromazine+ 100 mg	Y	E	288,980	0.52%	68.38%
58431	35	Benzathine Benzyl Penicilline 1.2M	Y	V	287,820	0.51%	68.90%
40130	36	Vitamine K1 Injectable 10 mg.	Y	V	279,963	0.50%	69.40%
75879	37	Antiacide	Y	E	276,005	0.49%	69.89%

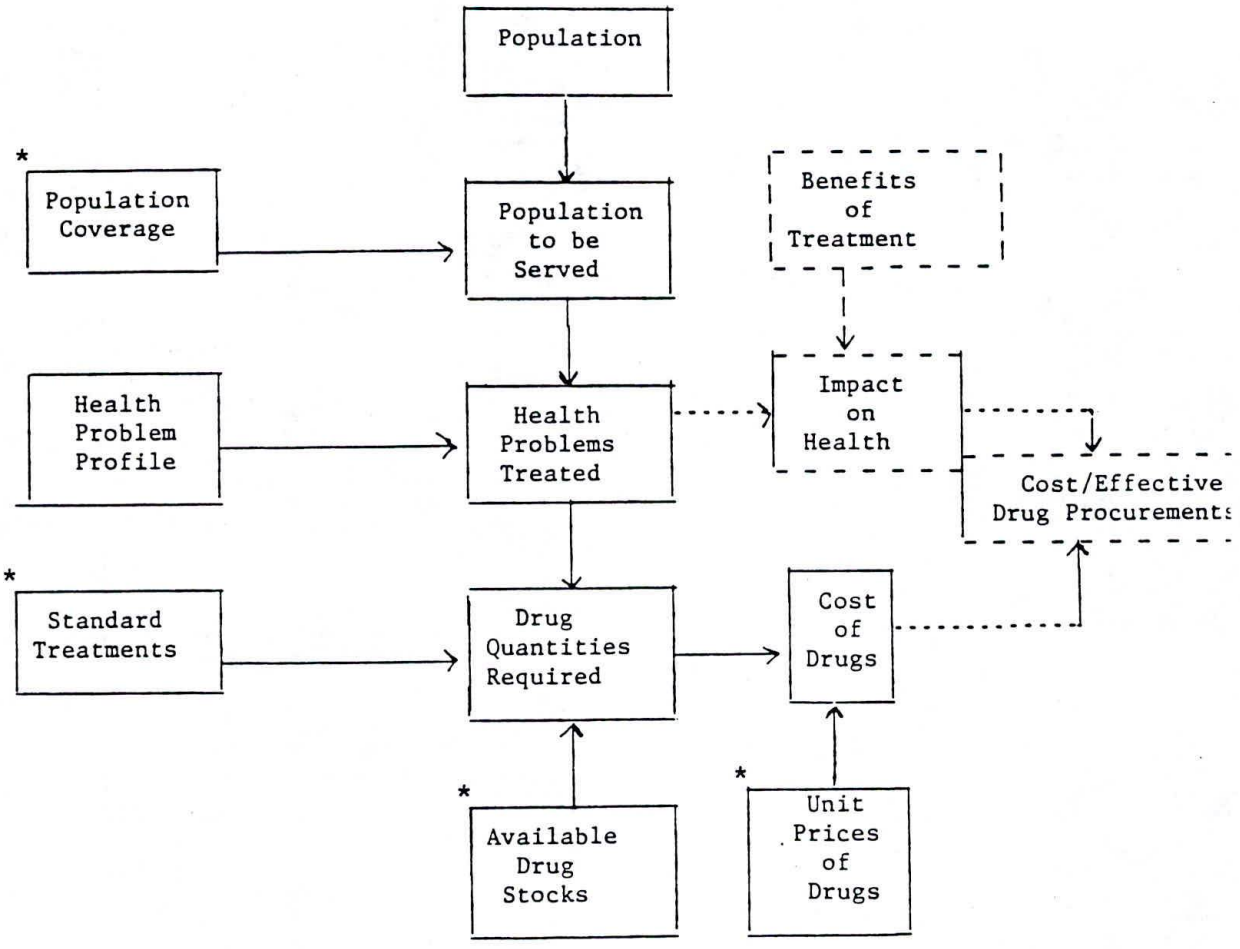
VA 2 Planning Drug Requirements

SAMPLE DATA ONLY

Therapeutics Alternatives Analysis Year: 1983

Product				Consumption 1984		
CODE	Drug Product Description	Route	VEN Cate.	Total Cost	Cost per Treatment Episode	Number of Treatment Episodes
	MAJOR TRANQUILIZERS					
	AVERAGE COST				7.24	
	TOTAL COST			1,855,374.94		
	PERCENT OF TOTAL EXPENDITURES			3.31%		
12091	Fluphenazine Retard Inject. 25 mg	IV	N	498,486.00	30.12	16,550
12100	Pipotiazine (Esthers) Inj.* 100 mg	IV	N	209,461.50	2.82	74,167
12015	Chlorpromazine Inject. 25 mg	IV	N	158,858.00	5.88	27,017
12092	Fluphenazine Decanoate Inj. 25 mg	IV	N	151,683.00	34.13	4,445
12033	Levomepromazine Inject.	IV	N	41,091.60	4.70	8,733
12073	Trifluoperazine 100 mg	IV	N	22,784.00	2.56	8,900
12022	Haloperidol Inject.	IV	N	14,869.14	6.24	2,383
12102	Pipotiazine (Estners) Inj. 100 mg	IV	N	14,544.[illegible]	2.91	5,000
12013	Chlorpromazine* 100 mg	PO	E	288,977.[illegible]	0.48	607,100
12034	Levomepromazine 100 mg	PO	N	199,790.[illegible]	1.82	109,775
12030	Levomepromazine 25 mg	PO	N	89,662.[illegible]	0.70	128,825
12062	Thioridazine 10 mg	PO	N	83,628.[illegible]	0.58	145,182
12065	Thioridazine 50 mg	PO	N	81,547.40	1.17	69,438
12010	Chlorpromazine 25 mg	PO	E	69,627.36	0.08	856,833
12050	Trifluoperazine 10 mg	PO	N	9,151.[illegible]	1.49	6,150
12090	Fluphenazine 25u mg	PO	N	8,464.50	1.98	4,275

EPIDEMIOLOGY MODEL FOR ESTIMATING DRUG REQUIREMENTS -- CONCEPTUAL FRAMEWORK



*Points of Medical, Pharmacy, or Management Decision or Influence

- - - - = Information and relationships which are difficult or impossible to measure at present.

Health Problem Profile

Year: 1985

SAMPLE DATA ONLY

Number of Patient Contacts Last Year: 3,123,408
Children Under Age 5 as % of Contacts: 20.00%

Health Problem			Treatment Episodes per 1000 Contacts		Number of Treatment Episodes Last Year		Expected Change (% adjustment)	Adjusted Number of Treatment Episodes	
Code	Name of Health Problem	Age Group	Medical	Paramedical	Medical	Paramedical		Medical	Paramedical
4.11	Acute diarrhea	<5	220.0	278.4	171,787	652,168			
		>=5	75.0	50.0	58,584	117,128			
14.12	Bacterial skin infections	<5	95.0	125.4	74,181	293,757			
		>=5	15.5	73.6	12,103	172,412			
9.11	Conjunctivitis	<5	30.4	22.6	23,738	52,942			
		>=5	24.0	14.6	18,740	34,201			
15.40	Low back pain	<5	2.5	0.0	1,952	0			
		>=5	36.0	19.4	28,111	45,446			
8.11	Headache	<5	21.0	16.9	16,398	39,589			
		>=5	55.4	62.0	43,259	145,238			
4.32	Heartburn, gastritis	<5	14.0	13.2	10,932	30,922			
		>=5	46.8	30.0	36,544	70,277			
10.12	Otitis media	<5	45.6	60.6	35,607	141,959			
		>=5	13.6	15.7	10,620	36,778			
5.21	Common cold,upper resp.infect.	<5	146.0	166.9	114,004	390,973			
		>=5	50.0	74.0	39,043	173,349			
5.22	Acute tonsillitis	<5	36.0	36.0	28,111	84,332			
		>=5	18.5	15.5	14,446	36,310			

Standard Treatments

SAMPLE DATA ONLY

Health Problem			Treatment Approach								
Code	Name Probleme	Age Group	Treat. No.	% of Cases Treated W/ this Trat.	Drug Code	Drug Product Description	Basic Unit (BU)	BU/ Dose	Dose/ Day	Days/ Episode	BU/ Episode	Cost/ Episode
4.11	Acute diarrhea	<5	1	90.0%	76999	ORAL REHYDRATION SALTS	SACHET	1	1	3	3	
			2	10.0%	76999	ORAL Rehydration salts	SACHET	1	1	3	3	
					58260	SULFAGUANIDINE	TAB	1	6	4	24	
4.11		>=5	1	100.0%		NO DRUG	NA	1	9	4	36	
9.11	Conjunctivities	<5	1	100.0%	58051	CHLORTETRACYCLINE 1% OPTH	TUBE	1	1	1	1	
9.11		>=5	1	100.0%	58051	CHLORTETRACYCLINE 1% OPTH	TUBE	1	1	1	1	
10.12	Otitis media	<5	1	100.0%	58173	PENI G+PENI PRO 400u	AMP	1	1	5	5	
					7013	ASPIRINE 125 MG SUPP	SUPP	1	4	3	12	
10.12		>=5	1	100.0%	58172	PENI G+PENI PRO 1MU	AMP	1	1	5	5	
					7012	ASPIRINE 500 MG	TAB	2	3	3	18	
5.22	Acute tonsillitis	<5	1	100.0%	58183	BENZATHINE PENI 1.2mu	AMP	1	1	1	1	
5.22		>=5	1	100.0%	58183	BENZATHINE PENI 1.2mu	AMP	1	1	1	1	
5.21	Common cold, upper resp.infect.	<5	1	100.0%	7012	ASPIRINE 500 MG TAB	TAB	1	3	3	9	
5.21		>=5	1	100.0%	7012	ASPIRINE 500 MG TAB	TAB	2	3	3	18	
4.32	Heartburn, gastritis	<5	1	100.0%	41888	MAALOX	TAB	1	4	7	28	
4.32		>=5	1	100.0%	41888	MAALOX	BTL					
14.12	Bacterial skin infections	<5	1	100.0%	58111	NEOMYCIN CREAM	TUBE	1	1	1	1	
14.12		>=5	1	100.0%	58111	NEOMYCIN CREAM	TUBE	1	1	1	1	
15.40	Low back pain	<5										
15.40		>=5	1	100.0%	7012	ASPIRINE 500 MG TAB	TAB	2	3	3	18	
8.11	Headache	<5	1	100.0%	7013	ASPIRINE 125 MG SUPP	SUPP	1	4	3	12	
8.11		>=5	1	100.0%	7012	ASPIRINE 500 MG TAB	TAB	2	3	3	18	

Summary of Drug Requirements Year: 1985

Drug Code	Drug Product Description	Purchase Package Size	Total Needs		Total Cost	Percent of Total Expenditures
			Basic Units	Purchase Units		
7012	ASPIRINE 500 mg tab	Bottle of 1000 tabs	184710	185	16,470.99	0.31%
7013	ASPIRINE 125 mg supp	Box of 12 supposítories	78184	6515	10,897.26	0.18%
58183	BENZATHINE PENI 1.2mu	Box of 50 5-ml amps	24125	483	56,452.91	0.94%
57240	NEOMYCIN CREAM	Box of 25 15-gm tubes	93227	3729	9,327.16	0.16%
58051	CHLORTETRACYCLINE 1 % ophthal	Box of 50 5-gm tubes	17426	349	31,018.89	0.52%
41888	MAALOX	Box of 24 120-ml bottles	20257	843	40,474.68	0.67%
58172	PENI G + PRO PENI 1a	Box of 100 5-ml amps	29419	294	61,545.72	1.03%
58173	PENI G+PENI PPO 400u	Box of 100 5-ml amps	23388	234	50,275.27	0.84%
76999	ORAL REHYDRATION SALTS	Box of 40 sachets	224106	5603	652,089.00	10.87%
58260	SULFAGUANIDINE	Box of 40 bottles of 1000 tabs	130416	3	25,083.30	0.43%
	TOTAL				976,850.00	16.28%

Kojast Consumption Records -- 1983-1984

GENERIC NAME	STRENGTH	FORM	UNIT COST	RECEIPTS 83/84	USAGE 83/84	MONTHLY CONSUMP	MONTHS ON HAND 30/6/84	MONTHS OF STOCKOUT (Est.)	TOTAL COST Consumption	TOTAL COST Receipts
TOTAL									$188,491.09	$165,318.02
acetazolamide	250 mg	tab	0.0510	0	3800	317	32.2	0.0	$193.80	$0.00
acetylsalicylic acid	300 mg	tab	0.0060	100000	206000	17167	5.9	0.0	$1,236.00	$600.00
acetylsalicylic acid soluble	75 mg	tab	0.0036	40000	43500	3625	13.8	0.0	$156.60	$144.00
acetylsalicylic acid/codeine	300/8 mg	tab	0.0320	12000	23750	1979	0.4	0.0	$760.00	$384.00
adrenaline	1 mg/ml	inj	0.1000	0	1273	106	29.2	0.0	$127.30	$0.00
allopurinol	100 mg	tab	0.1200	0	6000	500	4.2	0.0	$720.00	$0.00
aminophylline	100 mg	tab	0.0120	0	37900	3158	0.0	0.0	$454.80	$0.00
amitryptiline	25 mg	tab	0.0270	0	45000	3750	12.8	0.0	$1,215.00	$0.00
amobarbitone (2.5 ml)	10 mg/ml	inj	6.6700	0	55	5	15.3	0.0	$366.85	$0.00
amphotericin B	50 mg	inj	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
amphotericine B	250 mg	tab	0.4830	5000	0	0	ERR	10.5	$0.00	$2,415.00
ampicillin	125 mg/5ml	susp	1.6200	2721	734	61	32.6	3.0	$1,189.08	$4,408.02
ampicillin	500 mg	inj	0.5630	1400	3220	268	0.9	0.0	$1,812.96	$788.20
ampicillin	250 mg	cap	0.0810	165000	108500	9042	6.5	2.0	$8,788.50	$13,365.00
ascorbic acid	50 mg	tab	0.0082	36000	8000	667	42.0	4.5	$65.60	$295.20
atropine sulphate	500 mcg/ml	inj	0.0890	1800	8085	674	1.0	2.5	$719.57	$160.20
aurothiomalate sodium	50 mg/0.5ml	inj	47.0600	0	0	0	ERR	0.0	$0.00	$0.00
azathioprine	100 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
azathioprine	50 mg	tab	0.5300	200	1300	108	0.0	1.5	$689.00	$106.00
bendrofluazide	5 mg	tab	0.0067	20000	150500	12542	1.0	0.0	$1,008.35	$134.00
benzathine penicillin	1.2 MU	inj	0.6220	2000	1850	154	11.7	0.0	$1,150.70	$1,244.00
benzathine penicillin	2.4 MU	inj	0.6800	2628	3379	282	5.8	0.0	$2,297.72	$1,787.04
benzhexol	5 mg	tab	0.0120	0	0	0	ERR	12.0	$0.00	$0.00
benzhexol	2 mg	tab	0.0100	24000	29000	2417	4.6	0.0	$290.00	$240.00
benztropine	2 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
benztropine mesylate (2 ml)	1 mg/ml	inj	13.4400	0	282	24	2.0	0.0	$3,790.08	$0.00
benzylpenicillin	1.0 MU	inj	0.0500	50	2440	203	37.7	0.0	$122.00	$2.50
beonenium hydroxynaphthoate	500 mg	tab	0.0520	10000	1000	83	108.0	7.5	$52.00	$520.00
bicarbonate sodium 50 ml	7.5 %	inj	2.9600	0	18	2	302.0	0.0	$53.28	$0.00
busulphan	2 mg	tab	0.7300	0	0	0	ERR	0.0	$0.00	$0.00
busulphan	500 mcg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
calcium chloride (10 ml)	20 %	inj	1.3000	0	0	0	ERR	0.0	$0.00	$0.00
calcium chloride (10 ml)	10 %	inj	1.1060	0	0	0	ERR	0.0	$0.00	$0.00
calcium gluconate	300 mg	tab	0.0140	0	3500	292	20.6	0.0	$49.00	$0.00
calcium gluconate (10 ml)	10 %	inj	1.8200	0	150	13	130.0	0.0	$273.00	$0.00
calcium lactate	300 mg	tab	0.0065	0	3000	250	136.0	0.0	$19.50	$0.00
carbamazepine	200 mg	tab	0.4800	500	100	8	48.0	4.5	$48.00	$240.00
carbimazole	5 mg	tab	0.0090	4000	4400	367	0.0	4.5	$39.60	$36.00
cascara sagrada	300 mg	tab	0.0210	0	2000	167	96.0	0.0	$42.00	$0.00
chlorpromazine	25 mg	tab	0.0130	0	10900	908	0.0	3.0	$141.70	$0.00
chlorpromazine	100 mg	tab	0.0430	0	58600	4883	3.7	0.0	$2,519.80	$0.00
chlorambucil	2 mg	tab	0.6700	500	0	0	ERR	4.5	$0.00	$335.00
chloramphenicol	1 g	inj	6.7000	150	237	20	5.2	1.0	$1,587.90	$1,005.00
chloramphenicol	250 mg	cap	0.0300	2000	17700	1475	3.1	0.0	$531.00	$60.00
chloramphenicol		powd	0.0000	0	0	0	ERR	12.0	$0.00	$0.00

chloramphenicol	125 mg/5ml	susp	16.3000	0	12	1	10.0	0.0	$195.60	$0.00
chlordiazepoxide	10 mg	tab	0.0130	1000	14200	1183	48.0	0.0	$184.60	$13.00
chlordiazepoxide	25 mg	tab	0.0270	0	2500	208	64.8	0.0	$67.50	$0.00
chloroquine phosphate	150 mg	tab	0.3400	0	250	21	62.4	0.0	$85.00	$0.00
chlorpheniramine	10 mg	inj	0.2400	500	605	50	3.0	0.0	$145.20	$120.00
chlorpheniramine	4 mg	tab	0.0040	1950	32000	2667	18.5	0.0	$128.00	$7.80
chlorpromazine	50 mg/ml	inj	0.3700	898	3678	307	11.3	0.0	$1,360.86	$332.26
chlorpropamide	250 mg	tab	0.0260	83000	83000	6917	2.6	3.0	$2,158.00	$2,158.00
clinitest		stri	2.8500	0	8	1	0.0	11.0	$22.80	$0.00
clofazimine	100 mg	cap	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
cloxacillin	250 mg	cap	0.1030	6450	11750	979	1.0	0.0	$1,210.25	$664.35
cloxacillin	500 mg	inj	0.6200	300	705	59	0.0	4.0	$437.10	$186.00
cloxacillin	125 mg/5ml	susp	6.0100	300	178	15	14.7	0.0	$1,069.78	$1,803.00
co-trimoxazole	480 mg	tab	0.0510	14000	30000	2500	0.4	1.5	$1,530.00	$714.00
colchicine	500 mcg	tab	0.0150	0	0	0	ERR	12.0	$0.00	$0.00
corticotrophin	40 U/ml	inj	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
cortisone	25 mg	tab	0.1300	0	500	42	216.0	0.0	$65.00	$0.00
cortisone acetate	25 mg/ml	inj	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
cyclophosphamide	200 mg	inj	13.0660	25	34	3	9.5	0.0	$444.24	$326.65
cyclophosphamide	50 mg	tab	1.1400	3000	0	0	ERR	4.5	$0.00	$3,420.00
cyclophosphamide	25 mg	tab	0.8400	0	1800	150	1.3	0.0	$1,512.00	$0.00
dapsone	100 mg	tab	0.0082	5000	1000	83	156.0	0.0	$8.20	$41.00
dexamethasone	5 mg/ml	inj	0.3200	0	50	4	30.0	0.0	$16.00	$0.00
dextrose in water (20 ml)	50 %	inj	2.2320	280	100	8	21.6	8.5	$223.30	$625.24
dextrostix	25's	stri	21.0500	96	135	11	2.8	0.0	$2,841.75	$2,020.80
diazepam	2 mg	tab	0.0054	2000	37200	3100	25.0	0.0	$200.88	$10.80
diazepam	5 mg/ml	inj	0.1380	2455	2945	245	4.1	0.0	$406.41	$338.79
diazepam	5 mg	tab	0.0065	0	77500	6458	0.2	0.0	$503.75	$0.00
diethylcarbamazine	50 mg	tab	0.0076	0	21	2	1845.1	0.0	$0.16	$0.00
digoxin	250 mcg/ml	inj	3.3100	0	77	6	4.7	0.0	$254.87	$0.00
digoxin	250 mg	tab	0.0100	0	39000	3250	21.8	0.0	$390.00	$0.00
dimenhydrate	50 mg/ml	inj	6.5300	120	224	19	0.1	2.0	$1,462.72	$783.60
dimenhydrate	50 mg	tab	0.0250	0	6500	542	40.6	0.0	$162.50	$0.00
dipyridamole	25 mg	tab	0.3700	0	600	50	0.0	4.5	$222.00	$0.00
edrophonium	10 mg/ml	inj	1.0900	0	0	0	ERR	0.0	$0.00	$0.00
emetine Hcl	60 mg/ml	inj	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
ephedrine Hcl	30 mg	tab	0.0050	0	1900	158	107.4	0.0	$9.50	$0.00
ephedrine Hcl	60 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
ergometrine	250 mcg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
ergometrine	500 mcg/ml	inj	1.3700	0	2395	200	1.6	0.0	$3,281.15	$0.00
ergometrine	500 mcg	tab	0.0300	1000	13400	1117	44.3	0.0	$402.00	$30.00
ergometrine/oxytocin		inj	0.8000	651	766	64	0.0	2.0	$612.80	$520.60
erythromycin	250 mg	tab	0.2000	0	31500	2625	0.0	2.0	$6,300.00	$0.00
erythromycin estolate	125 mg/5ml	susp	34.3870	75	73	6	6.9	0.0	$2,510.25	$2,579.03
erythromycin ethylsuccinate	200 mg	susp	6.3e00	0	102	9	4.9	0.0	$648.72	$0.00
ethambutol	400 mg	tab	0.0600	0	6850	571	26.5	0.0	$616.50	$0.00
ethambutol	100 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
ethosuximide	250 mg	tab	0.3400	0	500	42	70.8	0.0	$170.00	$0.00
ferrous sulphate	200 mg	tab	0.0030	75000	0	0	ERR	7.5	$0.00	$225.00
ferrous sulphate	300 mg	tab	0.0140	300000	264000	22000	1.6	0.0	$3,696.00	$4,200.00
fibrinogene	1 g	inj	124.7800	0	0	0	ERR	0.0	$0.00	$0.00
fludrocortisone acetate	100 mcg	tab	0.1400	600	100	8	60.0	11.0	$14.00	$84.00
fluphenazine decanoate	25 mg/ml	inj	84.2200	300	231	19	3.8	0.8	$19,454.82	$25,266.00
folic acid	5 mg	tab	0.0030	60000	103250	8604	3.0	0.0	$309.75	$180.00

furosemide	40 mg	tab	0.0130	6000	98250	8188	0.6	0.0	$1,277.25	$78.00
furosemide	40 mg/ml	inj	0.1490	0	890	74	4.0	0.0	$132.61	$0.00
gentamycin	40 mg/ml	inj	0.5700	1200	335	28	31.5	8.0	$190.95	$684.00
glyceryl trinitrate	500 mg	tab	0.0450	0	4500	375	2.7	0.0	$202.50	$0.00
griseofulvin	500 mg	tab	0.2200	0	7500	625	50.4	0.0	$1,650.00	$0.00
griseofulvin	125 mg	tab	0.0630	0	1000	83	78.0	0.0	$63.00	$0.00
guanethidine	25 mg	tab	0.0500	0	56500	4708	0.1	0.0	$2,825.00	$0.00
haloperidol	5 mg	tab	0.0400	0	4400	367	0.0	1.5	$176.00	$0.00
heparin sodium	5000 U/ml	inj	5.7200	0	67	6	9.0	0.0	$383.24	$0.00
hydralazine	20 mg/ml	inj	1.2100	600	452	38	14.6	0.0	$546.92	$726.00
hydrallazine	25 mg	tab	0.0560	96000	103200	8600	1.5	0.0	$5,779.20	$5,376.00
hydrochlorothiazide	50 mg	tab	0.0140	0	17000	1417	38.8	0.0	$238.00	$0.00
hydrocortisone	100 mg/amp	inj	2.3500	0	970	81	14.8	0.0	$2,279.50	$0.00
hydroxycobalamine	1000 mcg/ml	inj	0.2240	0	200	17	150.0	0.0	$44.80	$0.00
hydroxyprogesterone	250 mcg	inj	11.6800	20	3	0	128.0	0.0	$35.04	$233.60
imipramine Hcl	25 mg	tab	0.0249	500	1000	83	54.0	0.0	$24.90	$12.45
indomethacine	25 mg	tab	0.0090	20000	8750	729	15.8	6.5	$78.75	$180.00
isoniazid	300 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
isoniazid	100 mg	tab	0.0075	5000	10700	892	21.3	0.0	$80.25	$37.50
isoniazid + P.aminosalicylate		tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
isoniazid/thiacetazone	100/50 mg	tab	0.0083	0	1500	125	200.0	0.0	$12.45	$0.00
isoprenaline sulphate	20 mg	tab	0.0140	0	0	0	ERR	0.0	$0.00	$0.00
ketamine hcl	50 mg/ml	inj	16.5100	10	26	2	15.7	0.0	$429.26	$165.10
ketostix	50's	stri	7.7120	60	0	0	ERR	8.5	$0.00	$462.72
konakion	1 mg/ml	inj	1.5000	0	290	24	0.4	0.0	$435.00	$0.00
lignocaine hcl	5% plain	inj	1.4500	10	50	4	45.6	0.0	$72.50	$14.50
lignocaine hcl	2% plain	inj	0.6034	0	484	40	10.8	0.0	$292.05	$0.00
lignocaine hcl	1% plain	inj	0.5135	21	676	56	1.3	0.0	$347.13	$10.78
lithium carbonate	250 mg	tab	0.0900	0	0	0	ERR	0.0	$0.00	$0.00
magnesium sulphate	10%/10 ml	inj	1.2700	100	100	8	0.0	8.0	$127.00	$127.00
magnesium trisilicate	250 mg	tab	0.0060	80000	131150	10929	0.9	0.0	$786.90	$480.00
mebendazole	100 mg	tab	0.0240	8000	41000	3417	4.4	0.0	$984.00	$192.00
mechlorethamine hcl	10 mg	inj	23.6400	0	0	0	ERR	0.0	$0.00	$0.00
melphalan	2 mg	tab	0.9000	0	0	0	ERR	0.0	$0.00	$0.00
mercaptopurine	50 mg	tab	0.0820	0	25	2	180.0	0.0	$2.05	$0.00
metformine	500 mg	tab	0.0970	36000	57500	4792	2.9	1.5	$5,577.50	$3,492.00
methotrexate	5 mg	inj	18.8500	0	9	1	0.0	1.0	$169.65	$0.00
methotrexate	25 mg	tab	0.9800	200	0	0	ERR	0.0	$0.00	$196.00
methotrexate	50 mg	inj	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
methyldopa	250 mg	tab	0.0750	254000	149350	12446	14.5	0.0	$11,201.25	$19,050.00
metoclooramide	10 mg	tab	0.2100	0	2000	167	0.0	2.0	$420.00	$0.00
metoprolol	50 mg	tab	0.4500	5000	0	0	ERR	4.5	$0.00	$2,250.00
metronidazole	200 mg	tab	0.0170	30000	68750	5729	2.2	0.0	$1,168.75	$510.00
multivitamins		tab	0.0056	0	53000	4417	34.3	0.0	$296.80	$0.00
nalidixic acid	500 mg	tab	0.2900	1800	0	0	ERR	0.0	$0.00	$522.00
naloxone	.4 mg/ml	inj	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
naloxone	.02 mg/ml	inj	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
neomycin sulphate	250 mg	tab	0.5140	10000	0	0	ERR	10.5	$0.00	$5,140.00
neostigmine bromide	15 mg	tab	0.0600	5500	4900	408	5.1	1.0	$294.00	$330.00
neostigmine methylsulphate	.5 mg/ml	inj	0.3700	151	471	39	0.0	1.0	$174.27	$55.87
nikethamide	250 mg/ml	inj	0.0000	0	177	15	14.6	0.0	$0.00	$0.00
nitrazepam	5 mg	tab	0.0185	0	10900	908	27.7	0.0	$201.65	$0.00
nitrofurantoin	50 mg	tab	0.0080	6000	3500	292	8.6	8.5	$28.00	$48.00
nitrofurantoin	100 mg	tab	0.0110	0	8000	667	2.3	0.0	$88.00	$0.00

norethisterone	5 mg	tab	0.5400	0	2400	200	3.0	0.0	$1,296.00	$0.00
nystatin	.1 MU	susp	6.2200	300	151	13	13.7	3.0	$939.22	$1,866.00
nystatin	.5 MU	tab	0.1920	5000	6700	558	9.1	0.0	$1,286.40	$960.00
oxytocin	100 ml	inj	0.1400	2550	2020	168	9.1	0.0	$282.80	$357.00
para-amino-salicylate	500 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
paracetamol	500 mg	tab	0.0110	83000	120000	10000	1.8	4.5	$1,320.00	$913.00
paraldehyde		inj	1.5000	0	373	31	0.0	2.0	$559.50	$0.00
penicillamine	250 mg	cap	0.8900	0	700	58	1.7	0.0	$623.00	$0.00
penicillin V	250 mg	tab	0.0400	36000	50000	4167	1.7	2.0	$2,000.00	$1,440.00
penicillin V	125 mg/5ml	susp	1.8100	0	1305	109	0.5	0.0	$2,362.05	$0.00
pentaerythritol	80 mg	tab	0.2800	0	1900	158	281.1	0.0	$532.00	$0.00
pethidine	50 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
phenindione	50 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
phenobarbitone	200 mg/ml	inj	0.9100	0	300	25	23.6	0.0	$273.00	$0.00
phenobarbitone	30 mg	tab	0.0030	50000	73500	6125	1.6	1.5	$220.50	$150.00
phenobarbitone	60 mg	tab	0.0070	10000	4000	333	18.0	7.5	$28.00	$70.00
phentolamine	10 mg/ml	inj	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
phenylalanine/nitrogen mustard	2 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
phenylbutazone	100 mg	tab	0.0080	90000	57750	4813	13.7	0.0	$462.00	$720.00
phenytoin sodium	100 mg	tab	0.0110	20000	54500	4542	0.4	0.0	$599.50	$220.00
phytomenadione	10 mg/ml	inj	0.2700	0	285	24	64.0	0.0	$76.95	$0.00
potassium chloride	20 mg/10 ml	inj	2.9400	0	175	15	0.0	3.0	$514.50	$0.00
potassium chloride	600 mg	tab	0.0270	50500	49500	4125	1.6	0.0	$1,336.50	$1,363.50
prednisolone	5 mg	tab	0.0240	20000	31500	2625	6.9	0.0	$756.00	$480.00
primaquine	75 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
primidone	250 mg	tab	0.1400	0	3100	258	0.0	8.0	$434.00	$0.00
probenecid	500 mg	tab	0.2200	0	3200	267	14.6	0.0	$704.00	$0.00
procainamide	250 mg	tab	0.1740	0	100	8	228.0	0.0	$17.40	$0.00
procaine penicillin	4.0 MU	inj	0.8400	0	3087	257	24.7	0.0	$2,593.08	$0.00
procarbazine	50 mg	tab	0.0550	0	0	0	ERR	0.0	$0.00	$0.00
prochlorperazine	25 mg	inj	1.4400	0	40	3	9.0	0.0	$57.60	$0.00
prochlorperazine	5 mg	tab	0.0130	0	10000	833	10.8	0.0	$130.00	$0.00
prochlorperazine	25 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
progesterone	10 mg/ml	inj	7.7000	0	3	0	36.0	0.0	$23.10	$0.00
promazine	50 mg	inj	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
promethazine	50 mg/2 ml	inj	0.0080	110	110	9	429.8	0.0	$0.88	$0.88
promethazine	25 mg/ml	inj	1.0500	0	665	55	2.7	0.0	$698.25	$0.00
propanolol	80 mg	tab	0.0067	15000	15000	1250	0.0	7.0	$101.10	$101.10
propanolol	40 mg	tab	0.0200	187000	101350	8446	11.7	1.5	$2,027.00	$3,740.00
propantheline	15 mg	tab	0.0120	5000	15500	1292	0.4	0.0	$186.00	$60.00
protamine	10 mg/ml	inj	11.2000	18	39	3	5.5	0.0	$436.80	$201.60
pyridostigmine	60 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
pyridoxine	50 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
quinidine sulphate	200 mg	tab	0.1550	0	500	42	52.8	0.0	$77.50	$0.00
reserpine	250 mg	inj	0.6100	50	25	2	12.0	4.8	$15.25	$30.50
reserpine	250 mcg	tab	0.0040	30500	51200	4267	4.3	0.0	$204.80	$122.00
rifampicin	150 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
rifampicin	300 mg	cap	0.4900	5000	11100	925	1.4	0.0	$5,439.00	$2,450.00
salazopyrine	500 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
salbutamol	4 mg	tab	0.1400	5000	18800	1567	0.0	3.0	$2,632.00	$700.00
spironolactone	25 mg	tab	0.0375	10000	6500	542	6.5	6.5	$243.75	$375.00
stilboestrol	500 mcg	tab	0.1300	0	9800	817	16.2	0.0	$1,274.00	$0.00
streptomycin	1 g	inj	0.3500	100	5840	487	88.6	0.0	$2,044.00	$35.00
sulphadiazidine	500 mg	tab	0.0200	0	1000	83	156.0	0.0	$20.00	$0.00

tetracycline Hcl	250 mg	cap	0.0280	142000	63400	5283	21.7	3.0	$1,775.20	$3,976.00
theophylline	250 mg/10 ml	inj	0.1630	0	790	66	14.6	0.0	$128.77	$0.00
theophylline/ephedrine	120/24 mg	tab	0.0160	50000	38000	3167	15.2	0.0	$608.00	$800.00
thiabendazole	500 mg	tab	0.0390	25000	8900	742	23.1	0.0	$347.10	$975.00
thiamine Hcl	50 mg	tab	0.0200	20000	0	0	ERR	7.5	$0.00	$400.00
thiamine hcl	100 mg/ml	inj	0.2030	100	10	1	108.0	7.8	$2.03	$20.30
thiopentone sodium	5 g/vial	inj	4.8300	0	0	0	ERR	0.0	$0.00	$0.00
thiopentone sodium	1 g/vial	inj	1.0800	1500	1290	108	10.7	0.0	$1,393.20	$1,620.00
thyroxine sodium	50 mcg	tab	0.0089	0	3500	292	5.1	0.0	$31.15	$0.00
trifluoperazine	1 mg/ml	inj	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
trifluoperazine	5 mg	tab	0.0260	0	9000	750	24.0	0.0	$234.00	$0.00
trimethadione	300 mg	tab	0.0000	0	0	0	ERR	12.0	$0.00	$0.00
uristix	50's	stri	13.7200	1304	808	67	10.5	0.5	$11,085.76	$17,890.88
vincristine sulphate	1 mg	inj	55.9800	50	12	1	59.0	0.0	$671.76	$2,799.00
vitamin b complex		tab	0.0040	0	74500	6208	9.4	0.0	$298.00	$0.00
warfarin	5 mg	tab	0.0810	0	0	0	ERR	12.0	$0.00	$0.00
warfarin	3 mg	tab	0.0800	0	1000	83	6.0	0.0	$80.00	$0.00
water pro injection	5 ml	inj	0.1086	6100	2800	233	19.7	0.0	$304.08	$662.46
water pro injection	10 ml	inj	0.1620	0	5630	469	4.3	0.0	$912.06	$0.00
water pro injection	100 ml	inj	0.7900	0	91	8	0.0	11.5	$71.89	$0.00
xylocaine + epinephrine 2%		inj	0.7300	6200	12000	1000	2.2	0.0	$8,760.00	$4,526.00

PROCUREMENT STRATEGIES

DURATION: 2-3 hours

PREPARATION AND MATERIALS:

A. Read the Session Notes and Managing Drug Supply, chapter III A.

B. Prepare the following visual aids:

VA 1: The supply cycle.

VA 2: The procurement cycle.

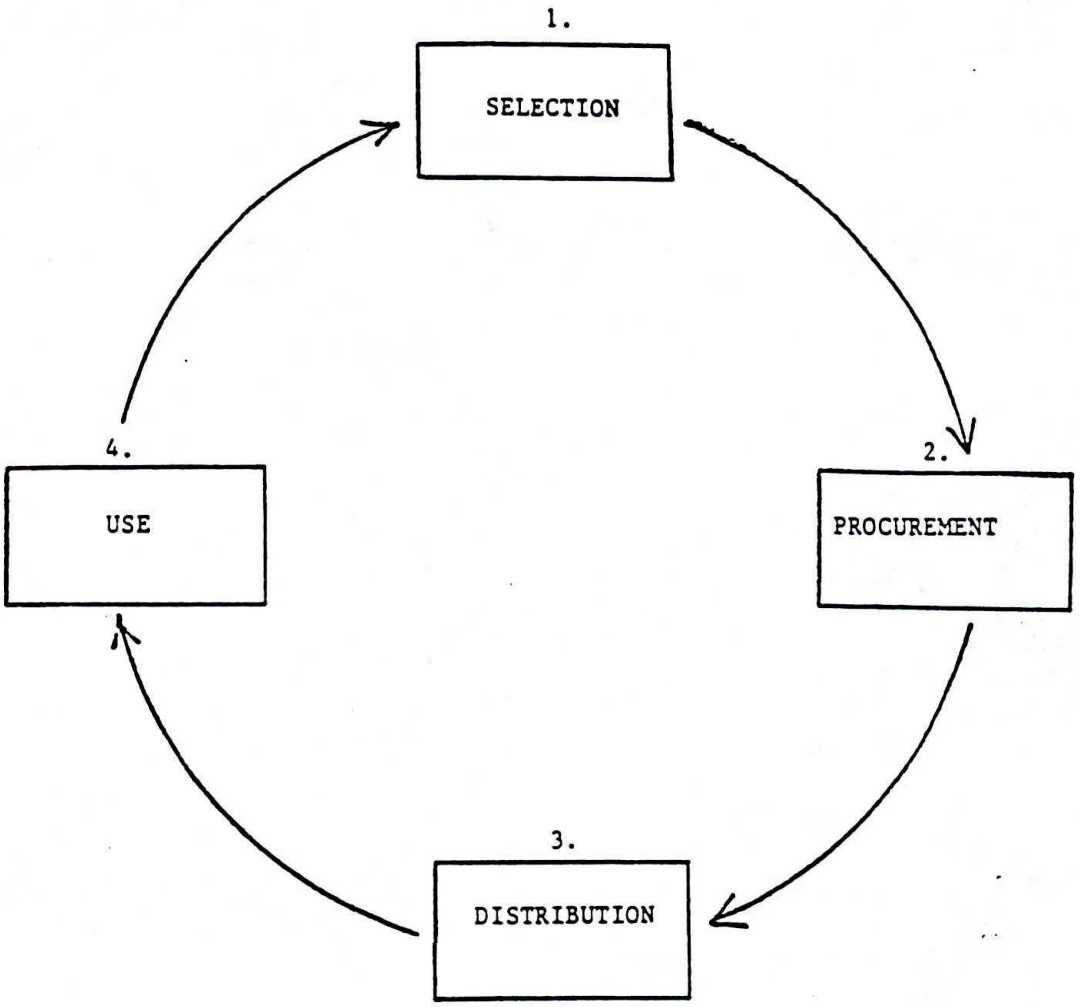
VA 3: Impact of hidden costs on total costs.

VA 4: Action alternatives for reducing lead time.

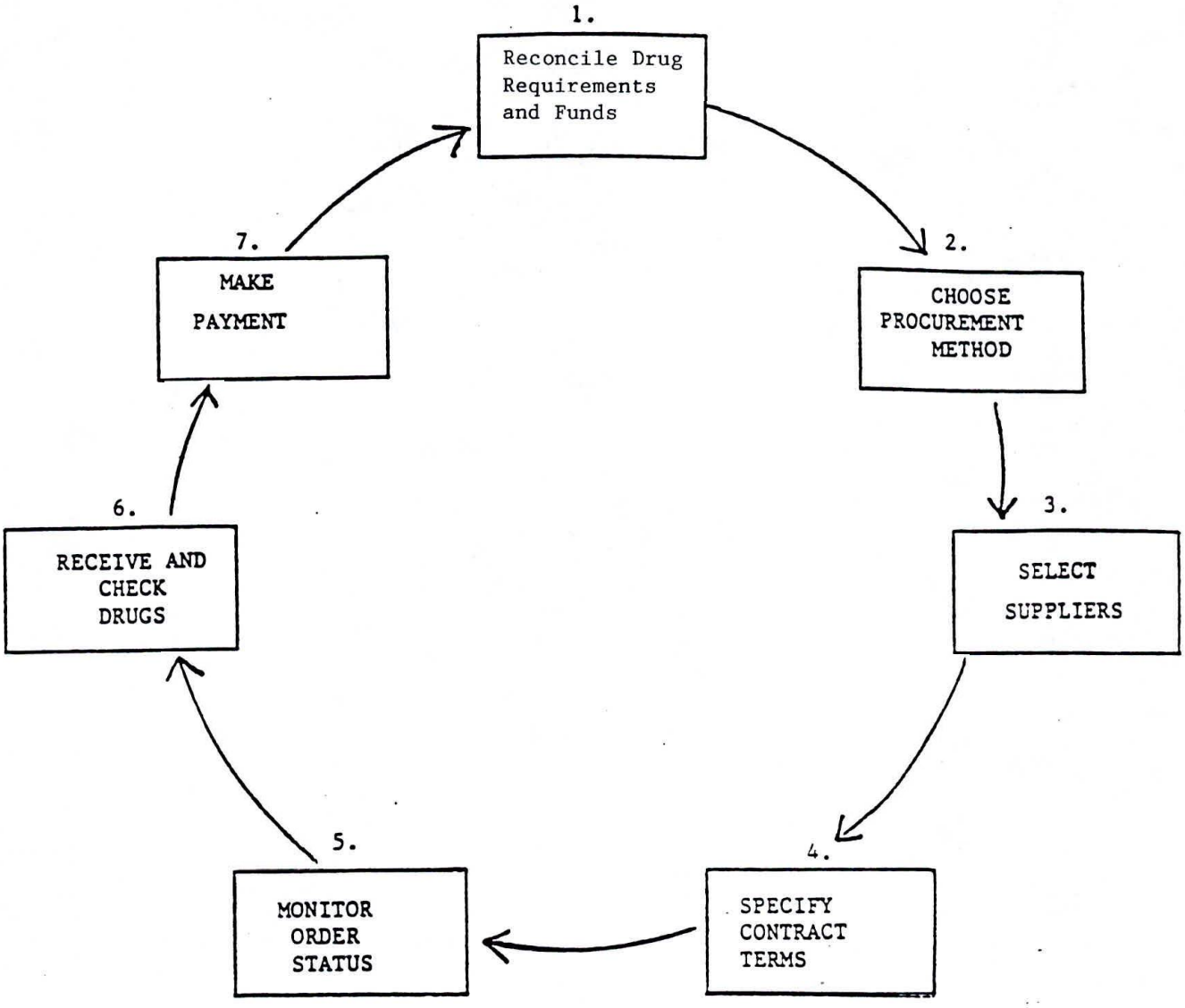
Activity & Time	Plan	Notes
Introduction/ Discussion 15 minutes	1. Review the supply cycle (VA 1) and introduce and discuss the procurement cycle (VA 2)	VA 1 VA 2
	2. Review: a. purchasing methods b. lead time analysis c. monitoring order status d. role of donations in drug supply e. local production	VA 3 VA 4
Group Activity One 20 minutes	Introduce activity one and divide the participants according to the number of purchasing agencies in the country.	
Discussion 30 minutes	Ask each group to report on their findings in order for everybody to share a common understanding of the present situation.	
Group Activity Two 60 minutes	Introduce activity two and ask the same groups as above to work on the 3 questions: A. Best procurement system B. Comparison of prices C. Local production	

Activity & Time	Plan	Notes
Discussion 60 minutes	- Ask one group to report on "Best Procurement System". Comments from the other groups. - Ask each group to report on "Comparison of Prices". Write down on a transparency (Prepared ahead). - Ask one group to report on "Local Production". Comments from the other groups.	

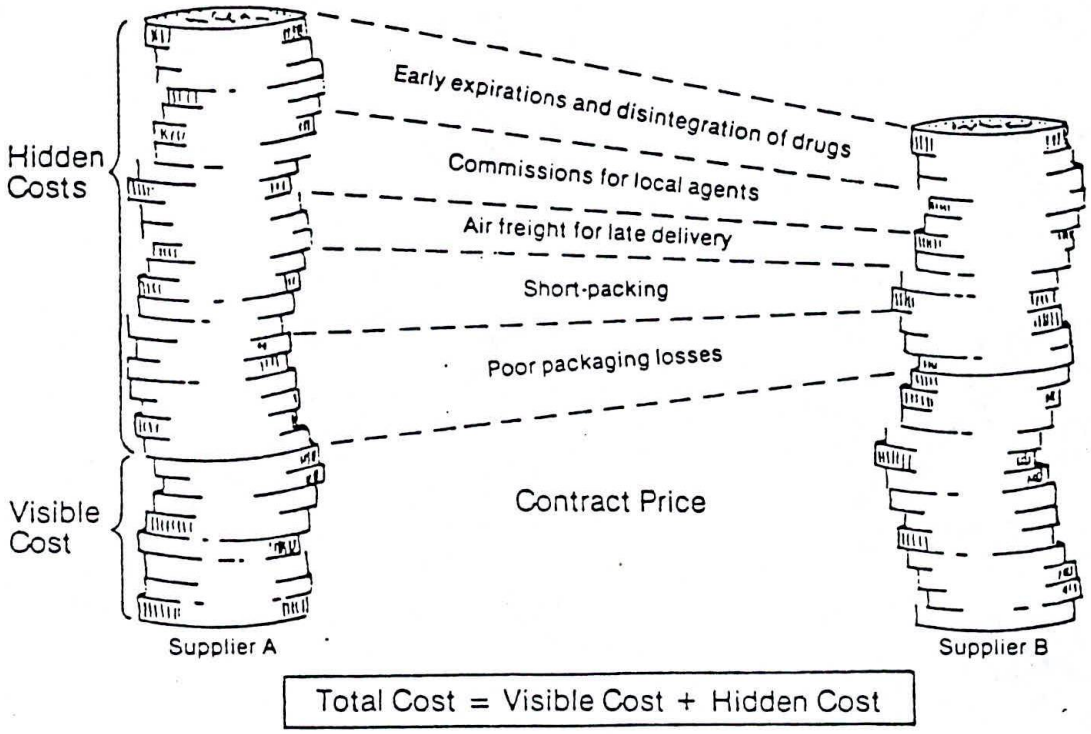
THE SUPPLY CYCLE



The Drug Procurement Cycle



Impact of Hidden Costs on Total Cost



Source: Managing Drug Supply, page 117.

ACTION ALTERNATIVES FOR REDUCING LEAD TIME

Procurement Activity	Time interval (weeks) Observed	Desired	Action Alternatives for Reducing Lead Time
Need to Order	6	2-3	- no vacations for procurement staff in July; - stop single annual purchasing and do perpetual purchasing; - obtain a computer to identify drugs needing to be ordered and their order quantities.
Call for Offers	4	4	(four weeks is a reasonable open period for a tender; should probably not be shortened).
Closing Date	3	2	- organize procurement office more efficiently; - use summary tables to facilitate price comparison; - use a computer to schedule world wide tenders and present results on a summary sheet to be evaluated by the Tender Board.
Contracts Awarded	4	2-3	- work with Finance to speed the credit process.
Letter of Credit Established	13	4-8	- monitor supplier performance; let suppliers know you expect prompt delivery; - drop suppliers who are habitually late.
Goods Shipped	9	4-8	- provide new suppliers with information on fastest shipping routes.
Goods Received in Port	4	1-2	- use order status system to keep informed of expected arrival dates; - assign several staff to port-clearing.
Goods Clear Customs	4	2	- obtain legislation which expedites drug clearance; - more warehouse staff; - improve supervision of warehouse staff.
Goods Received and Ready at Warehouse			
TOTAL	47	20-32	

SYSTEMATIC COST REDUCTION

DURATION: 3 hours

PREPARATION AND MATERIALS

A. Read: All materials listed in the Participant's Guide. In particular, read the study Managing Drug Supply, Chapter VI.B., pp. 493 - 512. In addition, you should be very familiar with Chapters III.A., III.B., and III.C. on various aspects of procurement, as well as Chapters IV.A., IV.B., and IV.C. on specific aspects of distribution and inventory control. Concepts in these six chapters are necessary background for applying the cost reduction techniques discussed in this unit.

B. Prepare: the following visual aids:

VA 1: Sample ABC Curve

VA 2: Worksheet One, Activity One (Blank)

VA 3: Worksheet Two, Activity One (Blank)

VA 4: Worksheet Three, Activity One (Blank)

VA 5: Worksheet One, Activity One (Complete)

VA 6: Worksheet Two, Activity One (Complete)

VA 7: Worksheet Three, Activity One (Complete)

VA 8: Typical ABC Analysis for Two Drug Supply Programs

VA 9: ABC Inventory Analysis, Country I

VA 10: ABC Inventory Analysis, Country II

VA 11: Procurement Patterns Based on ABC Analysis

VA 12: Examples of VEN Classifications, Sri Lanka

VA 13: Sample Guidelines for VEN Categories

Activity & Time	Plan	Notes
Trainer Presentation 15 minutes	1. Introduction Review the rationale for the unit presented in the Session Guide. Point out that: - Cost reduction can and should occur throughout the system by way of: . careful selection . wise procurement . efficient distribution . rational use . sound management of each step in the process. - In addition, there are some specific analytic techniques which come from the field of management science (or operations research) which can be extremely useful in realizing further savings. Among these techniques: . ABC Value Analysis . VEN System for Setting Priorities - Use of these techniques requires certain prerequisites, the most important of which are: . an information system capable of providing data on drug prices, consumption, supplies, etc.; . willingness and capability to make changes in procurement and distribution processes; . resources to do the calculations: clerks, adding machines, computers who can and will do the necessary calculations.	List: 1. Information System 2. Willingness to make change 3. Resources for calculations

Activity & Time	Plan	Notes
Trainer Presentation 15 minutes	2. ABC Value Analysis a. Basic Concept Present the basic concept of ABC analysis. It is a well-known observation in inventory management and procurement that the majority of funds (dollars, pesos, etc.) are spent on a relatively small number of items. This observation can be used to divide drugs into three categories: Class A -- 10-20% of items accounting for 70-80% of funds spent. Class B -- intermediate usage rates. Class C -- vast majority of low usage items which account for less than 20-25% of funds spent. Known as ABC Value Analysis OR the 80/20 Rule The basic concept is familiar: Pharmacists know that 80% of illness is due to a small number of conditions (colds, diarrhea, etc.). Accountants know that 80% of funds are spent in a small number of budget categories e.g., salary and benefits). Everyone knows that 80% of complaints come from the vocal minority. Present Visual Aid 1, sample ABC curve.	VA 1
Individual Activity One 30-45 minutes	b. Performing an ABC Analysis Talk through the worksheets for Activity 1, showing them on the overhead projector, or holding them up.	VA 2 VA 3 VA 4

Activity & Time	Plan	Notes
	Point out each term used: - Units consumed per year ("Annual Consumption") - Unit Cost - Annual Usage (value of annual usage or value of annual consumption) - Rank order of annual usage - Cumulative Value of Annual Usage - ABC Curve Ask for questions, then break discussion to allow each participant to complete the ABC analysis in Activity One When all participants have completed the analysis, ask one to present his or her results. Have several blank ABC curves available (Worksheet 3) for participant presenters to trace their own curves. Finally, present Visual Aid 7 as the final result if participants have not presented the correct curve. Keep Visual Aid 5 and 6 ready, if needed.	VA 7 VA 5 & 6
Trainer Presentation 15 minutes	c. Examples of ABC Curves from Asia and South America Present Visual Aid 8, Typical ABC Analysis for Two Drug Supply Programmes Country I: Central Asia, 20 million people Country II: South America, 16.6 million people (Further background details appear on p.43 of J. Quick, "Applying Management Science in Developing Countries" which is listed under Supplemental Reading.) Briefly present Visual Aid 9 and 10 and discuss how these illustrate the numbers of drugs and values involved in a typical ABC analysis.	VA 8 VA 9 VA 10

Activity & Time	Plan	Notes
Trainer presentation	3. VEN System for Setting Priorities a. Basic Concept Begin by asking participants how they decide what to buy when funds are short. (Most programmes have some form of unstated or implicit priority system.) Ask who decides and how they decide. Then comment that these "informal" priority systems have been formalized in the VEN system. VEN first applied to national pharmaceutical programme in Sri Lanka. Based on dividing drugs into 3 categories: Vital -- potentially life-saving, necessary for basic primary health (e.g., vaccines), or have significant withdrawal problems. Essential -- drugs effective against less severe, but nevertheless significant forms of illness. Non-essential -- or Normal usage -- drugs for minor, self-limited illness, drugs of questionable efficacy, drugs with high cost for marginal therapeutic advantage (example: newer antibiotics, newer beta-blocker heart drugs). VEN Examples from Sri Lanka: Visual Aid 12 Vital Tetracycline capsules; Aspirin tablets; Ampicillin capsules - 250 mgs; Chloroquine phosphate. Essential Vitamins A & D soft capsules; Ampicillin capsules - 125 mgs; Kaolin compound poultice; Indomethacin capsules.	List responses VA 12 (optional, depending on audience)

Activity & Time	Plan	Notes
	Non-essential Calcium lactate; Magnesium trisilicate; Vasaka compound syrup; Aspirin ethopheptazine tabs. Point out that in Sri Lanka, division of drugs into VEN categories was done by a physician, a Clinical Pharmacologist. Limited experience indicates that drug lists will be divided in proportions of 40:40:20 for V:E:N groups. Visual Aid 13 illustrates some sample guidelines which might be used to set VEN categories.	VA 13
Group Work	b. Ask each group to categorize the first 50 drugs in the pharmaceutical list of the Central Medical Store into the VEN system. Let this be followed by each group presenting a V, E and N drug.	
Group Activity Two 30 minutes	Ask each group to discuss activity two. Ask each group on a rotating basis for suggestions. Supply with answers from the other group.	
Summary	Summarize the session by asking the participants to suggest ways in which ABC analysis and VEN categories might be used to reduce costs while maintaining important services. List these as they are mentioned. The responses should include the suggestions mentioned on p.73-74.	

ABC VALUE ANALYSIS

SELECTION

(1) Lower Cost Alternatives -- Review of Class A drugs may uncover high usage items for which lower cost alternatives are available, e.g. substitution of brand with generic or a product with a similar therapeutic effect.

PROCUREMENT

(1) Order Quantities & Intervals -- order quantity influences supply activities in at least six ways:

- determine average inventory (higher order quantity means higher inventory levels);
- joint procurement might mean lower drug prices (economies of scale);
- determine procurement workload (higher order quantity means less frequent ordering and vice-versa);
- determine safety stock (less frequent ordering means inventory less often low and less safety stock);
- influence bulk prices (larger orders mean more bulk rates);
- affect storage capacity for drugs;
- affect shelf life of dated products.

Ordering A items more often and C items less often reduces workload and inventory costs. This is illustrated by Visual Aid 11, which is based on Country I. (Further details on this appear in the supplemental reading by J. Quick, "Applying Management Science in Developing Countries").

(2) Price Reduction Activities -- procurement office should concentrate on getting lower unit prices for A items by:

- looking for cheaper dosage forms;
- seeking cheaper suppliers (and testing samples of their products, if needed).

(3) Monitoring Order Status -- if orders of class A items are late, it usually means air freighting an expensive quantity of goods. Therefore A items should be monitored carefully to be sure shipments are not late.

(4) Monitoring Shelf Life -- Could minimize waste due to drugs exceeding their shelf lives by carefully monitoring shelf lives of Class A drugs.

DISTRIBUTION

(1) Delivery schedules -- even if all drugs are ordered only once a year, the inventory reductions shown in Visual Aid 12 can still be achieved by requiring divided deliveries for high usage (A) items. (Show Visual Aid 12 again).

(2) Stock-Taking -- it may be difficult to do a formal stock-take on all items every 6 to 12 months. However, A items should probably be reviewed regularly, since they account for the largest value.

(3) Storage -- improves control for issue and storage of Class A drugs at user points such as hospitals and health centres, etc., to minimize waste, pilferage, and organized theft of drugs.

USE

(1) Monitor drug use -- review of high usage items by health officials, practicing physicians, and other health workers may suggest areas of overuse and underuse.

VEN SYSTEM ANALYSIS

SELECTION

(1) Delete non-essential drugs from national drug formulary.

PROCUREMENT

(1) Order Quantities -- if funds are short during a particular period of time, VEN system should be used to assure that Vital and Essential drugs are bought first. Point out that once VEN categories are established, clerks can implement them. If used correctly, they can decrease the impact of "influence" on purchasing, since there is an official system of setting priorities.

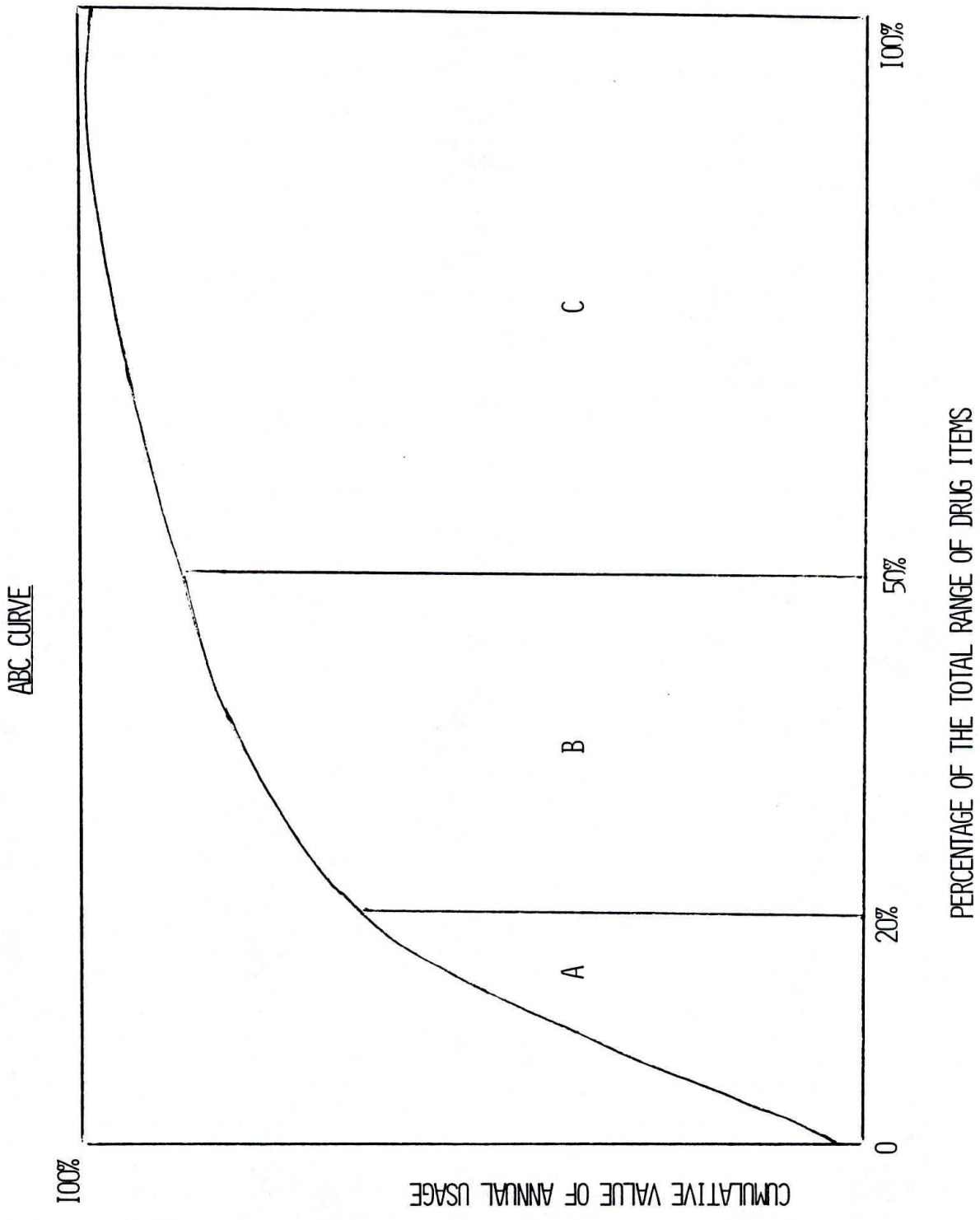
(2) Supplier Selection -- only reliable suppliers should be used for Vital and Essential drugs. Quality and service for new and unknown suppliers can more safely be tested by awarding them contracts for Non-essential drugs.

DISTRIBUTION

(1) Safety stock -- safety stocks should be high for vital and essential items. Inventory savings can be realized by reducing safety stocks of non-essential items.

USE

(1) Monitor Drug Use -- review of usage by VEN categories may suggest underuse or overuse.


ABC CURVE
100%
0
20%
50%
100%
A
B
C
CUMULATIVE VALUE OF ANNUAL USAGE
PERCENTAGE OF THE TOTAL RANGE OF DRUG ITEMS

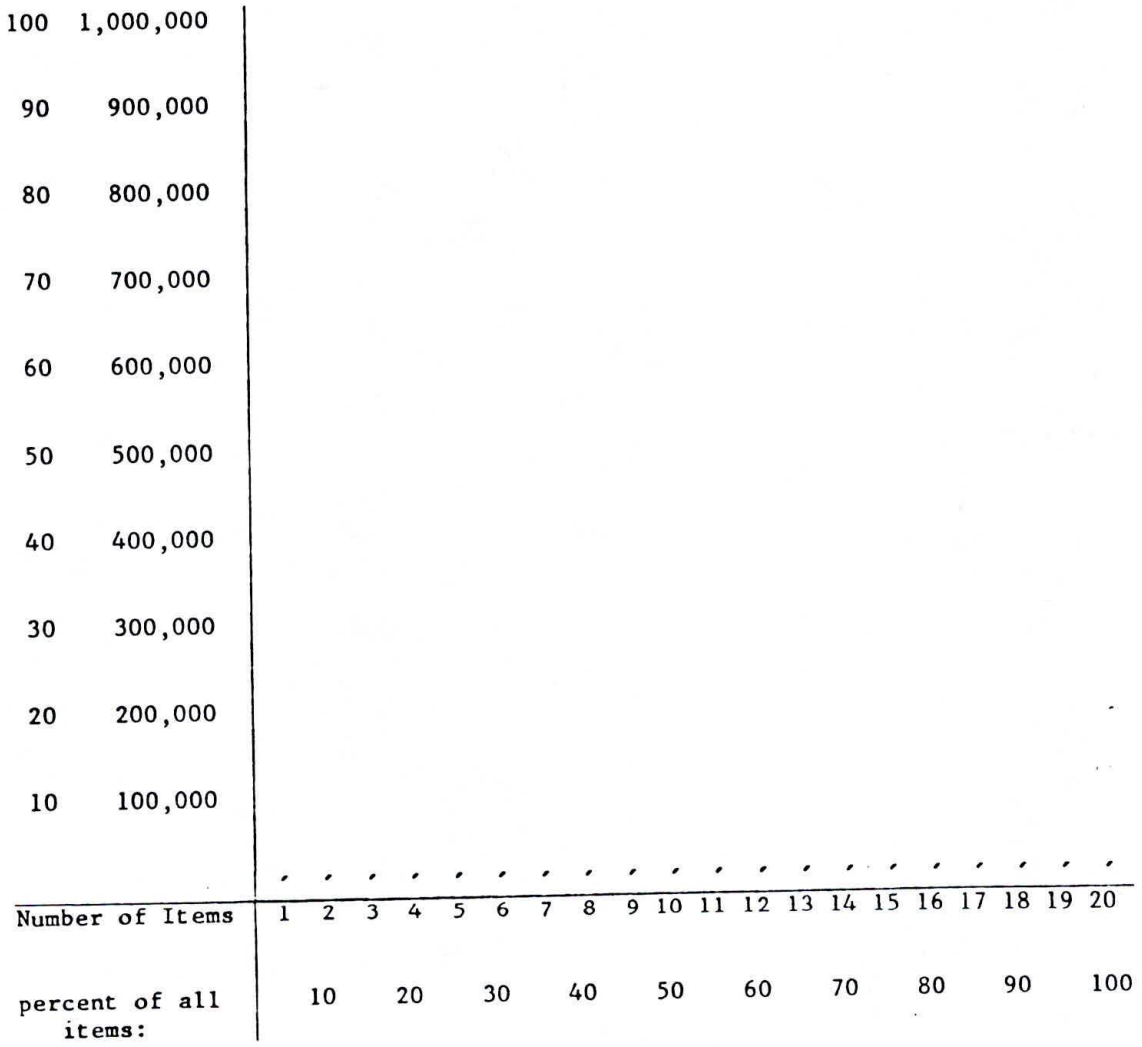
Worksheet One: Calculation of Annual Usage

Name of Drug (1)	Units Consumed per year (2)	Unit Cost (US $) (3)	Value of Annual Usage ($) (col.2 x col.3) (4)	Rank Order of Annual Usage (5)
A	400,000	0.50		
B	100,000	1.25		
C	500,000	0.10		
D	300,000	0.10		
E	10,000	1.90		
F	10,000	1.80		
G	20,000	0.84		
H	5,000	3.16		
I	500	29.60		
J	10,000	0.14		
K	10,000	1.30		
L	10,000	1.26		
M	1,000	13.20		
N	10,000	1.44		
O	3,000	5.00		
P	20,000	0.81		
Q	300,000	1.00		
R	10,000	7.50		
S	20,000	1.00		
T	10,000	1.72		

Worksheet Two: Rank Ordering of Drugs by Annual Usage

Rank Order of Annual Usage (1)	Name of Drug (2)	Value of Annual Usage (3)	Cumulative Value of Annual Usage (4)	Cumulative Value as % of total (5)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
Total Value				

Worksheet Three: ABC Curve



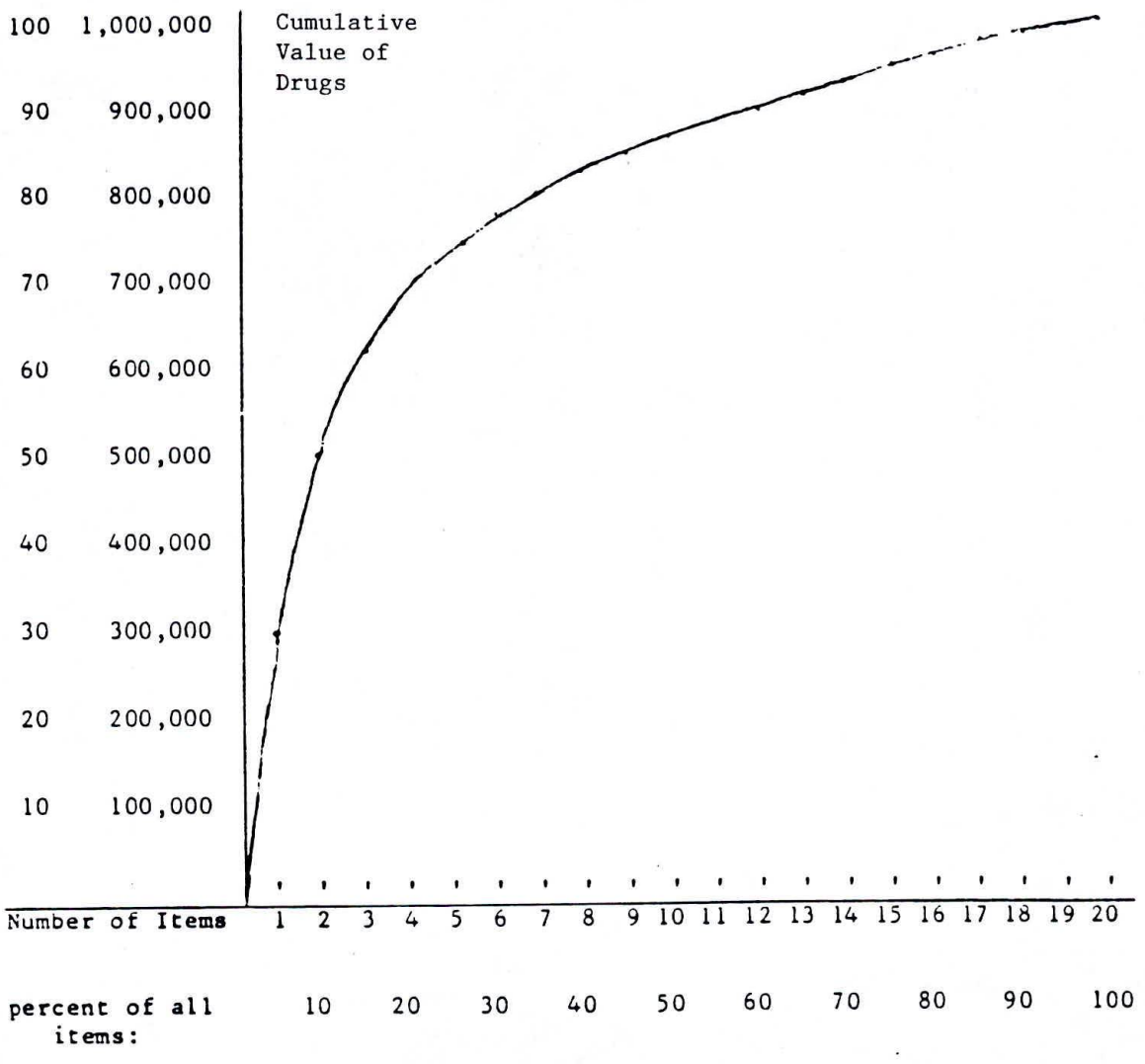
Worksheet One: Calculation of Annual Usage

Name of Drug (1)	Units Consumed per year (2)	Unit Cost (US $) (3)	Value of Annual Usage ($) (col.2 x col.3) (4)	Rank Order of Annual Usage (5)
A	400,000	0.50	200,000	2
B	100,000	1.25	125,000	3
C	500,000	0.10	50,000	5
D	300,000	0.10	30,000	6
E	10,000	1.90	19,000	8
F	10,000	1.80	18,000	9
G	20,000	0.84	16,800	11
H	5,000	3.16	15,800	13
I	500	29.60	14,800	15
J	10,000	1.40	14,000	17
K	10,000	1.30	13,000	19
L	10,000	1.26	12,600	20
M	1,000	13.20	13,200	18
N	10,000	1.44	14,400	16
O	3,000	5.00	15,000	14
P	20,000	0.81	16,200	12
Q	300,000	1.00	300,000	1
R	10,000	7.50	75,000	4
S	20,000	1.00	20,000	7
T	10,000	1.72	17,200	10

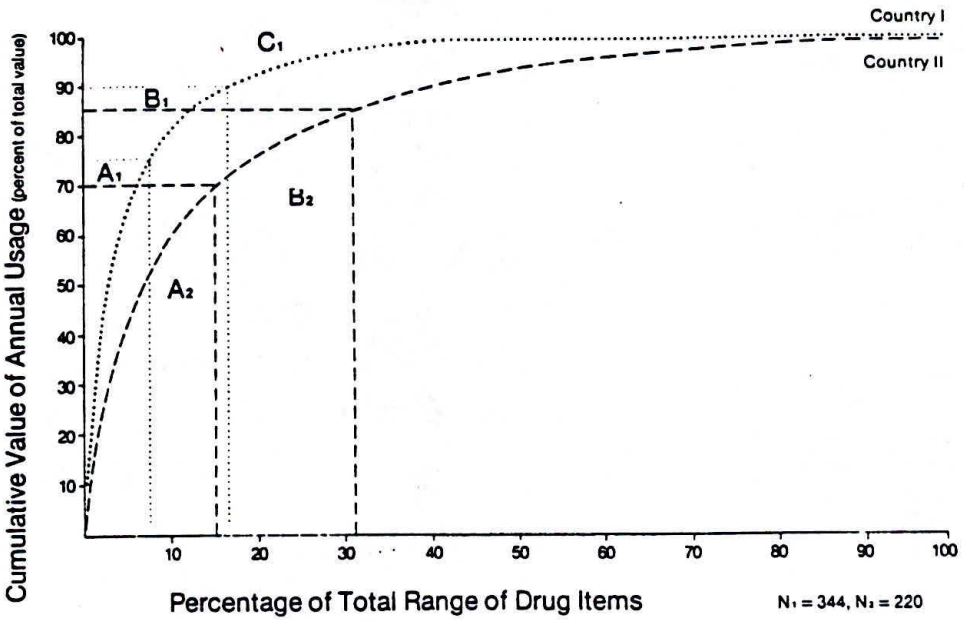
Worksheet Two: Rank Ordering of Drugs by Annual Usage

Rank Order of Annual Usage (1)	Name of Drug (2)	Value of Annual Usage (3)	Cumulative Value of Annual Usage (4)	Cumulative Value as % of total (5)
1	Q	300,000	300,000	30.
2	A	200,000	500,000	50.
3	B	125,000	625,000	62.5
4	R	75,000	700,000	70.
5	C	50,000	750,000	75.
6	D	30,000	780,000	78.
7	S	20,000	800,000	80.
8	E	19,000	819,000	81.9
9	F	18,000	837,000	83.7
10	T	17,200	854,200	85.4
11	G	16,800	871,000	87.1
12	P	16,200	887,200	88.7
13	H	15,800	903,000	90.3
14	O	15,000	918,000	91.8
15	I	14,800	932,800	93.3
16	N	14,400	947,200	94.7
17	J	14,000	961,200	96.1
18	M	13,200	974,400	97.4
19	K	13,000	987,400	98.7
20	L	12,600	1,000,000	100.0
Total Value				

Worksheet Three: ABC Curve



Typical ABC Analysis for Two Drug Supply Programs



Source: Managing Drug Supply, page 501.

ABC INVENTORY ANALYSIS, COUNTRY I

DRUG LIST CHARACTERISTIC	ABC Category			
	A	B	C	TOTAL
Number of Items	25	34	285	344
Percent of All Items	7.3	9.9	82.8	100.0
Value of Annual Consumption (US $)	$ 11,151,270	$ 2,197,600	$ 1,438,274	$14,787,144
Percent of Total Annual Consumption	75.4	14.9	9.7	100.0
Number of Units of Stock	275,844,000	97,990,000	148,678,725	522,512,725
Mean Number of Units per Item	11,033,760	2,882,058	521,680	1,518,932

Source: Managing Drug Supply, page 501.

ABC INVENTORY ANALYSIS, COUNTRY II

DRUG LIST CHARACTERISTIC	ABC Category			
	A	B	C	TOTAL
Number of Items	34	35	151	220
Percent of All Items	15.5	15.9	68.6	100.0
Value of Annual Consumption (US $)	$ 6,401,593	$ 1,415,641	$ 1,401,088	$ 9,218,122
Percent of Total Annual Consumption	69.4	15.4	15.2	100.0
Number of Units of Stock	1,103,858,000	70,511,250	89,063,088	263,432,330
Mean Number of Units per Item	33,054,647	2,014,607	589,822	1,197,420

Source: Managing Drug Supply, page 501.

PROCUREMENT PATTERNS BASED ON ABC ANALYSIS, COUNTRY I

Pattern	ABC Category	Order Quantity in Months	Orders per Year	Average Inventory Value* (000's of dollars)
I	A	12	334	9,730
	B	12		
	C	12		
II	A	6	369	7,750
	B	12		
	C	12		
III	A	4	428	6.882
	B	6		
	C	12		
IV	A	4	1032	6,471
	B	4		
	C	4		

*Assumes safety stock for 98% service level (2% stockout rate).

Source: Managing Drug Supply, page 501.

EXAMPLES OF VEN CLASSIFICATION, SRI LANKA

VITAL	TETRACYCLINE CAPSULES
	ASPIRIN TABLETS
	AMPICILLIN CAPSULES - 250 MGS.
	CHLOROQUINE PHOSPHATE
ESSENTIAL	VITAMINS A & D SOFT CAPSULES
	AMPICILLIN CAPSULES - 125 MGS.
	KAOLIN COMPOUND POULTICE
	INDOMETHACIN CAPSULES
NON-ESSENTIAL	CALCIUM LACTATE
	MAGNESIUM TRISILICATE
	VASAKA COMPOUND SYRUP
	ASPIRIN ETHOPHEPTAZINE TABLETS

SAMPLE GUIDELINES FOR VEN CATEGORIES

Characteristic of Individual Drug or Target Condition	Vital	Essential	Non-Essential
Persons Affected (% of pop.)	over 5%	1-5%	less than 1%
Persons Treated (number per day at average health center)	over 5	1-5	less than 1
Target Condition Life Threatening	yes	occasionally	rarely
Target Condition Disabling	yes	occasionally	rarely
Drug Prevents Serious Disease	yes	no	no
Drug Cures Serious Disease	yes	yes	no
Drug Treats Minor, Self-limited Symptoms and Conditions	no	possibly	yes
Drug has Proven Efficacy	always	usually	may or may not
Drug has Unproven Efficacy	never	rarely	may or may not

FINANCING THE DRUG SUPPLY

DURATION: 3 hours

PREPARATION AND MATERIALS:

A. Read: the Session Notes and further readings.

B. Prepare the following visual aids:

VA 1: Drug costs

VA 2: Operating Costs

VA 3: Development costs

VA 4: Funding alternatives matrix

VA 5: Alternative financing mechanism

Activity & Time	Plan	Notes
Discussion 30 minutes	1. Introduce the session and discuss the different types of costs: . drug costs . operating costs . development costs	VA 1 VA 2 VA 3
	2. Then discuss the differences between operating (recurring) and development (capital) costs. Ask the participants to provide examples of each one. Include a discussion of the relationship between the two types of costs.	
Group Activity One 45 minutes	3. Divide the participants into groups of 5-6 persons and ask each group to work on activity one.	
Presentation of Group Work 30 minutes	4. Ask each group on a rotating basis of the effect of the drug supply system of each funding source. Check the conclusions with the other groups.	VA 3
Group Activity Two 30 minutes	5. Same groups as before. Ask the groups to work on activity two.	

Activity & Time	Plan	Notes
Presentation of Group Work 30 minutes	6. Ask one group for their suggestions and supply with answers from the other groups.	
Discussion 10 minutes (optional)	7. Present alternative financing mechanisms introduced in other countries.	VA 5
Summary 10 minutes	8. Summarize the activities of the session and stress the following points: - there are three broad categories of costs; - development costs usually lead to an increase in operating costs; - there are many different funding alternatives, each with its own advantages and disadvantages.	

DRUG COSTS

MANUFACTURER'S PRICE

\+ FREIGHT

\+ INSURANCE

\+ DEMURRAGE FEES

\+ CUSTOMS

\+ PORT CHARGES

\+ TRANSPORT TO WAREHOUSE

\+ QUALITY ASSURANCE EXPENDITURES

TOTAL DRUG COSTS

DRUG SUPPLY SYSTEM OPERATING BUDGET			
BUDGET CATEGORY	LINE ITEM	AMOUNT BUDGETED	FOREIGN EXCHANGE REQUIRED?
Personnel	Salaries		
	Special Allowances		
	Insurance		
Services	Telephone/Telex		
	Water & Electricity		
	Rental of Land or Buildings		
	Building Maintenance		
	Vehicle Maintenance		yes
	Equipment Maintenance		yes
	Domestic Travel & Subsistence		
	Foreign travel & Subsistence		yes
	Freight & Handling Charges		yes
Materials	Packaging Supplies		yes
	Office Supplies		yes
	Forms Including Printing Costs		
	Technical Literature		yes
	Fuel & Lubricants		
	Building Materials		yes
	Vehicle Spare Parts		yes
	Equipment Spare Parts		

DEVELOPMENT BUDGET FOR DRUG SUPPLY SYSTEM					
			Annual Operating Cost Implication		
Budget Category	Line Item	Development Expenditure	% Development Cost Required	Amount	Foreign Exchange Requirement
Building Construction			5%		Small (*)
Vehicles			20%		Large
Furniture			5%		Nil
Office Equipment			10%		Small
Warehouse			10%		Small
Equipment					
Refrigeration Equipment			20%		Large
Packaging Equipment			20%		Large
Garage Equipment			10%		Large
Personnel Training			(**)		Large

Funding Alternative Matrix

FUNDING SOURCES	Yes/No	Equity	Efficiency	Stability	Flexibility	Impact	Feasibility
External Funding							
Non-governmental organizations							
MOH Budget							
Regional Budgets							
Local Budgets							
Community Contribution							
Insurance							
Individual Consumer Expenditure							

0 = Neutral effect
+ = Favourable effect
- = Unfavourable effect
+/- = Favourable and unfavourable effect

ALTERNATIVE FINANCING MECHANISMS

COMMUNITY FINANCING

- FUND-RAISING SPECIAL EVENTS (CULTURAL, ATHLETIC, HEALTH FAIRS).
- TAXATION AT VILLAGE LEVEL.
- INSURANCE (HEALTH BOOK).
- LOTTERIES.
- DONATIONS - FROM INDIVIDUALS, COOPERATIVES, OR LOCAL ORGANIZATIONS

FEE FOR SERVICE

- STANDARD FEE.
- VARIABLE - BY TYPE OF SERVICE OR POPULATION GROUP.
- DONATION.

FEE FOR DRUGS

- STANDARD FEE PER PRESCRIPTION
- VARIABLE - BY COST OR QUANTITY OF DRUG, TYPE OF DRUG, POPULATION GROUP.
- DONATION.

QUALITY ASSURANCE

DURATION: 2-3 hours

PREPARATION AND MATERIALS:

A. Read: all materials listed in the Participant's Guide, in particular, read and study Managing Drug Supply, Chapter III.D., pgs. 181-206.

B. Prepare the attached visual aids on poster board, newsprint, or transparencies.

VA 1: Determinants of Drug Quality

VA 2: Elements of Comprehensive Quality Assurance Program

VA 3: Procedures to assess Drug Quality

C. Obtain a blackboard with chalk, flipcharts, or newsprint with markers, or overhead projector with transparencies. Be sure to have enough newsprint or blank transparencies and appropriate markers for each group in Activity One.

D. Assure that all participants have the complete participant guide and review with them the reading assignment.

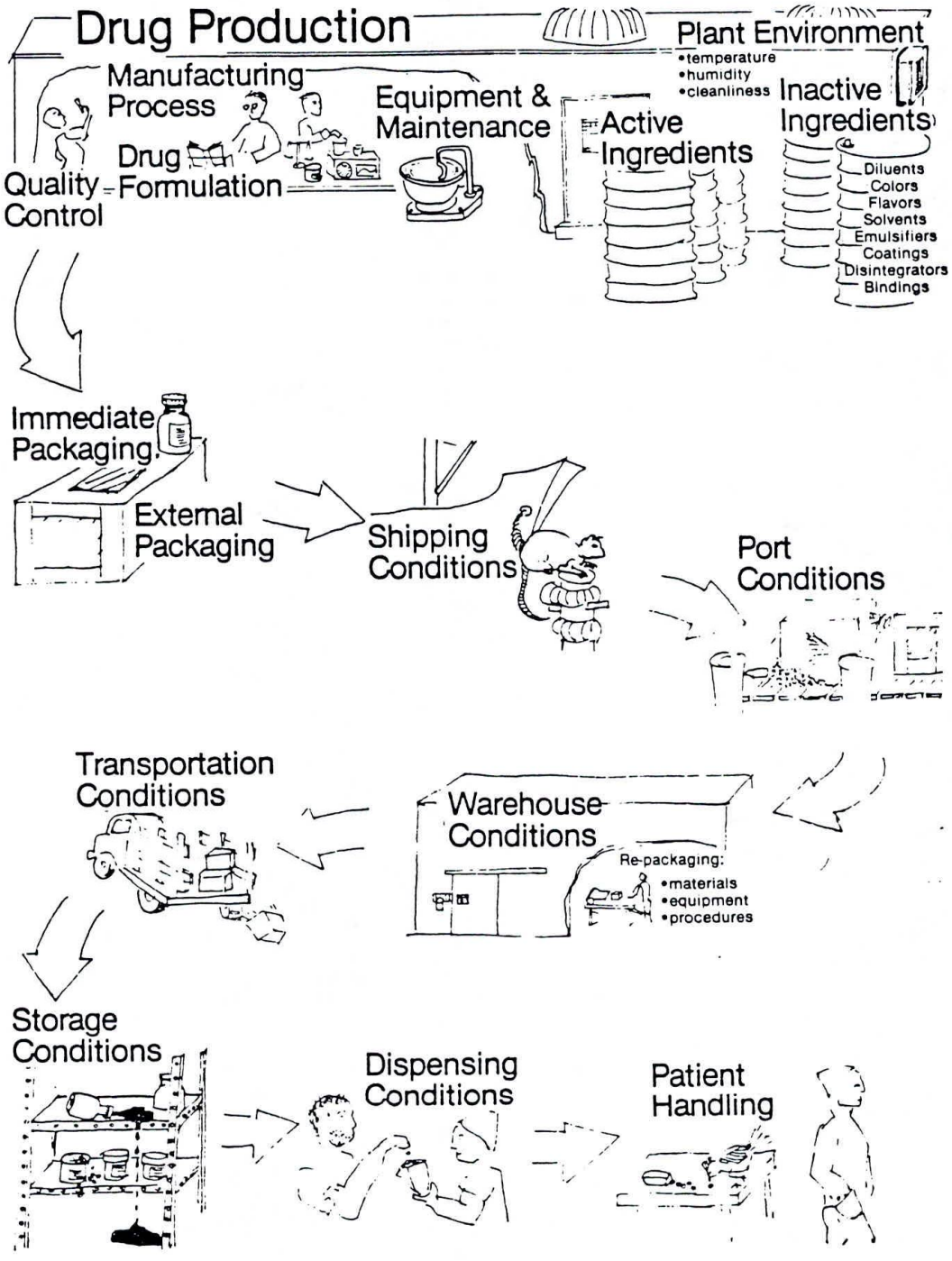
Activity & Time	Plan	Notes
Trainer Presentation 10 minutes	1. Review the rationale for the unit presented in the Participant's Guide. Emphasize that quality assurance has two primary functions: a) Assure safe, effective, acceptable drug products (including vaccines) for patients. b) Maintain credibility of the health program by maintaining an image of high quality.	
Group Task 20 minutes	2. What is "Drug Quality"? (NOTE: In this and the next steps, keep in mind who the pharmacists are in the group, if any. Call on their expertise to supplement your presentation, but do not neglect non-pharmacists or leave any basic questions unanswered).	

Activity & Time	Plan	Notes
	Ask the group to list the characteristics which define drug quality. These should include: - Identity - Purity - Potency - Uniformity - Bioavailability Be sure to clarify any questions participants might have about the meaning of these terms.	List responses on blackboard, newsprint, or transparency.
Trainer Presentation 20 minutes	3. What determines the quality of drugs reaching the patient? (NOTE: Much of the material in this step will be familiar to participants who are pharmacists and to some nurses and physicians. This material is really background material to help participants understand the reasons for considering quality assurance a comprehensive function, rather than simply a laboratory analysis function. Show the participants Visual Aid 1, Determinants of Drug Quality and slowly talk through each part of the diagram. Define terms as you go along. Bear in mind that the small terms in the figure cannot be seen from a distance.	VA 1
Group Task 10 minutes	4. Why worry about drug quality? Ask the group to list the reasons for being concerned about drug quality. These reasons fall under "health-related" and "program-related" categories. The health-related reasons are discussed in the Session Notes and Managing Drug Supply. The program-related reasons are largely common sense.	

Activity & Time	Plan	Notes
	The list should look something like this when complete: Health-Related Concerns - Loss of potency; - Medication errors; - Toxic degradation; - Contamination. Program-Related Concerns - Credibility with patients; - Credibility with health workers; - Cost (poor quality drugs or packaging leads to losses); - Credibility with donor groups.	List responses on blackboard, newsprint or transparency
Group Task 30 minutes Activity 1, part 1	5. Participants' Quality Assurance Issues and Concerns In this step, participants will be divided into two (or three) groups of six to eight people, depending upon the number of participants. Ask the groups to prepare a list of the quality assurance activities which are carried out in their country at each level and of the main problems encountered. As they mention their issues and concerns, list them under the following headings: - Sources Quality Issues (i.e., problems with the quality of drugs being supplied to them by commercial sources, government production, or donors) - Supply System Issues (i.e., problems with quality assurance at central warehouse, in transit, at local facilities, etc.). - Examples of Poor Quality (i.e., anecdotes which illustrate poor quality, but which do not clearly fit under the above headings).	Activity 1 to be prepared on a transparency List responses under three headings on blackboard, newsprint or transparency.

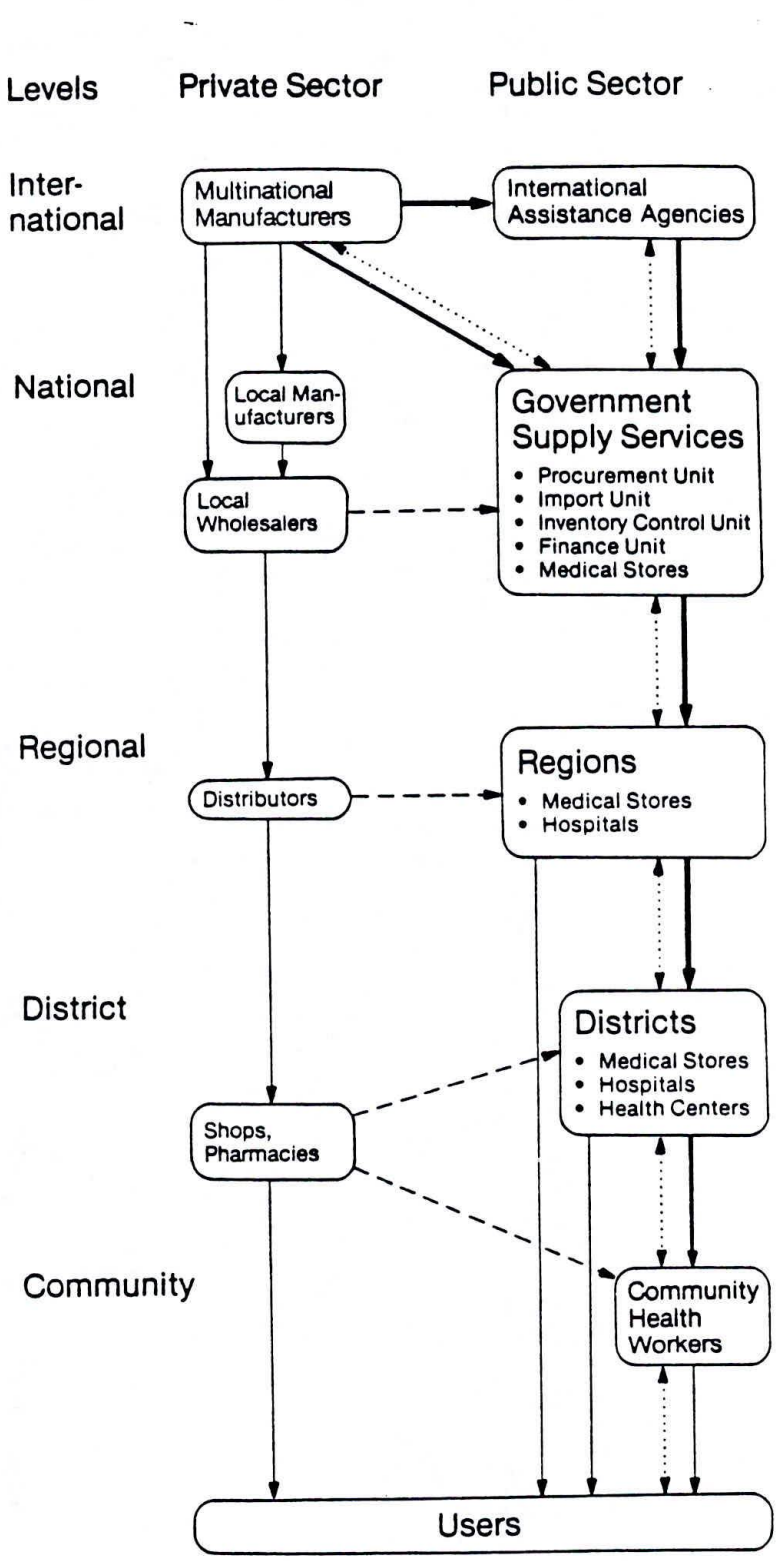
Activity & Time	Plan	Notes
	If the above discussion of participants quality assurance concerns is slow, you might ask: - Are you satisfied with the quality of the drugs you receive? - Is quality maintained throughout your distribution network? - Are there any complaints of poor quality by health workers, patients or other groups? - Does anyone have a particular quality assurance issue which he or she had wanted help with?	
Activity 1, part 2 30-45 minutes	6. <u>Design of a Quality Assurance System</u> Each group will then be responsible for developing a quality assurance plan for a country. Each plan will then be presented to the entire group and discussed.	
Discussion of Group Work 30-45 minutes	Try to have the group point out the strengths and weaknesses of each of the plans they present. Point out additional strengths and weaknesses yourself. Raise implementation issues which stem from: - cost factors; - feasibility questions; - manpower (availability, numbers, training); - local technology or lack thereof; - political constraints. Ask questions such as, - could you really establish such a program? - would it work? - is it worth the cost and effort? - what if drugs "go bad" at health centers? (How do you know about it?)	
Group Task 15 minutes	7. <u>Summary</u> Have the group list what they now consider to be the essential elements in a quality assurance system. The list should look something like Visual Aid 3	VA 2 - 3

Determinants of Drug Quality



Source: Managing Drug Supply, page 185.

Elements of a Comprehensive Quality Assurance Program



SUPPLIER SELECTION

- Gather accurate information about reliability of new suppliers.
- Maintain supplier file on past performance.
- Request and test samples from selected prospective suppliers.

PORT CLEARANCE

- Monitor storage conditions to assure that proper temperature, light, cleanliness, and humidity are maintained.
- Ensure that required Certificates of Quality are presented with import documents.

SHIPMENT ACCEPTANCE

- Inspect shipment contents to assure adherance to contract specifications.
- Test samples, either routinely or for suspect products.

REPACKAGING

- Participate in selection of repackaging systems to assure that they are suitable to the local environment.
- Monitor packaging equipment, materials, and techniques to assure that adequate enclosure is maintained.

STORAGE

- Monitor conditions to assure that acceptable storage environments are maintained.

TRANSPORTATION

- Review transportation modes, routes, and schedules to prevent serious lapses in cold chain or other storage requirements.

DISPENSING

- Assure adequacy of storage conditions at dispensing points.
- Review selections of bottles, envelopes, papers, and other dispensing materials.
- Maintain a system to verify quality of drugs at the final dispensing points.

Source: Managing Drug Supply, page 187.

PROCEDURES TO ASSESS DRUG QUALITY

A. Restricted Supplier Selection

1. International known firms only.
2. Certificate of Origin and Certificate of Free Sale required.
3. Lowest price suppliers omitted.

B. Inspection for Good Manufacturing Practices (GMP)

1. GMP report by manufacturer's drug regulatory authority.
2. GMP report from reliable procurement program or national drug regulatory agency outside country of manufacturer.
3. Purchaser performs GMP inspection.

C. Physical Inspection of Each Shipment

1. Inspection by independent agent in exporting country.
2. Inspection by purchaser's own port and/or warehouse inspectors.

D. Laboratory Analysis

1. Manufacturer's quality control batch testing report.
2. Independent laboratory batch analysis report.
3. Testing by manufacturer's national drug regulatory agency.
4. Pre-purchase sampling by purchaser.
5. Pre-acceptance sampling by purchaser.
6. Testing by exception.
7. Post-acceptance testing.
8. Local stability testing.

INTRODUCTION TO PROPER DRUG USE

DURATION: 2 hours

PREPARATION AND MATERIALS:

A. Read MDS, Chapter V.A., pp. 401-406
Chapter V.B., pp. 429-442
Chapter V.C., pp. 447-457

B. Review the Session Notes

C. Prepare the following visual aids:

VA 1: Elements in proper drug use.

VA 2: Types of irrational drug use
(From Managing Drug Supply, p. 403).

VA 3: Potential barriers to appropriate drug use.

VA 4: Options for promoting appropriate drug use.

D. Obtain examples of efforts to improve drug use:

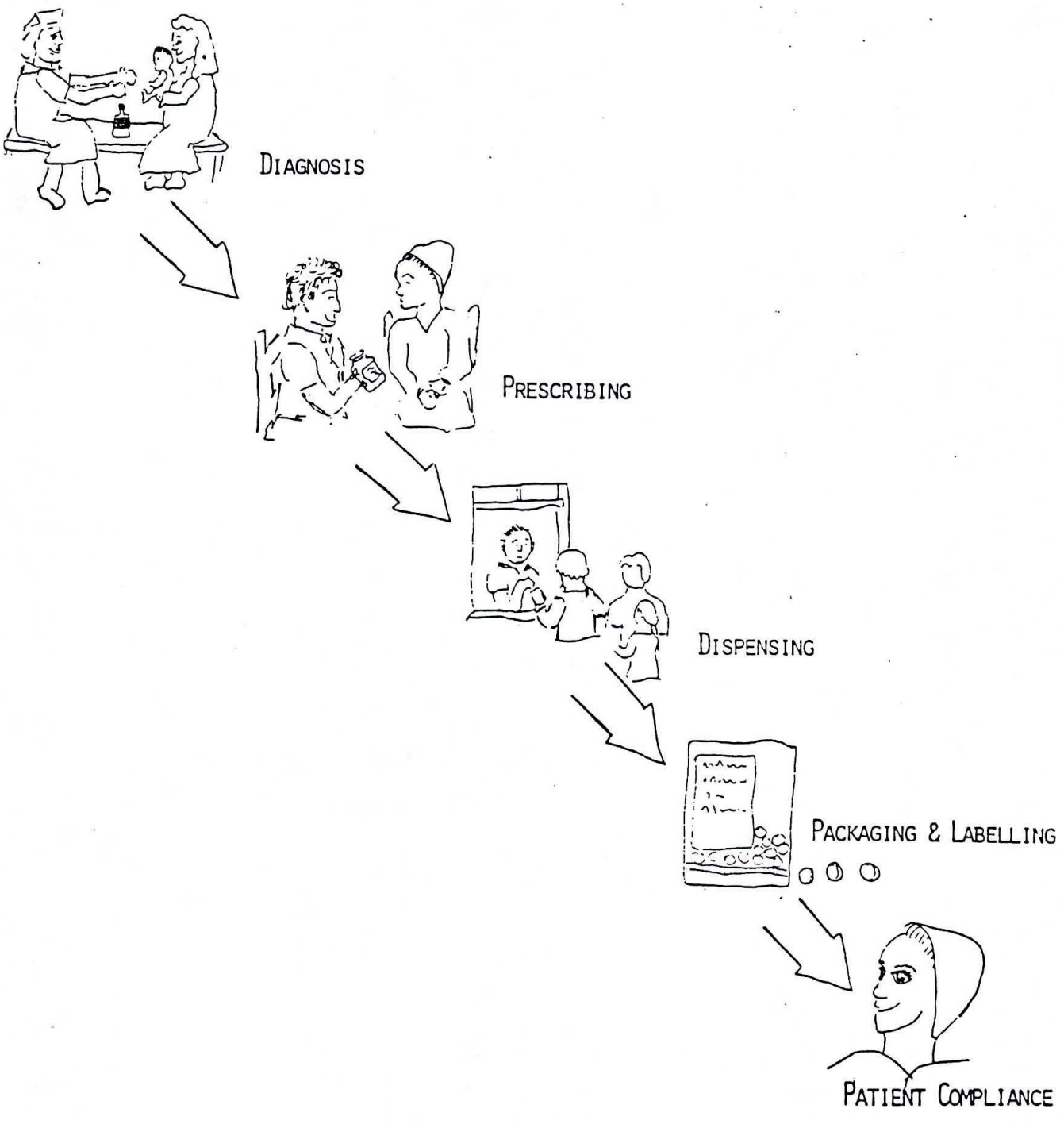
- copies of Sri Lanka's The Prescriber;
- copies of PNG manuals;
- essential drugs packagings in Kenya;
- Gambia symbolic labels.

Activity & Time	Plan	Notes
Introductory Presentation 15 minutes	1. Present the rationale for this unit and introduce the key elements in promoting rational drug use.	VA 1-2
15 minutes	2. Ask the participants to identify barriers to proper drug use in general.	
20 minutes	3. Divide the participants into groups and ask them to fill up worksheet 1.	
40 minutes	4. Continue with a discussion of the problems they listed and of available options for improving prescribing, dispensing, packaging or patient use. Encourage a discussion of options they may have tried in their countries.	VA 3-4

Activity & Time	Plan	Notes
Demonstration 15 minutes	5. Provide and discuss specific examples of efforts to improve drug use.	Prepare transparency with Speight's or other bar graphs.
Session Summary 15 minutes	6. Review the different problems and solutions which have been presented in the session. Discuss shortly what factors have to be considered when choosing between different options.	

PROPER DRUG USE

THE DRUG USE PROCESS



Types of Irrational Drug Use*

Type of Irrational Drug Use	Occurs if a drug is prescribed when:
Extravagant Prescribing	• a less expensive drug would provide comparable efficacy and safety
	• symptomatic treatment of mild conditions diverts funds from treating serious illness
	• a brand name is used where less expensive equivalents are available
Over-prescribing	• the drug is not needed
	• the dose is too large
	• the treatment period is too long
	• the quantity dispensed is too great for the current course of treatment
Incorrect Prescribing	• the drug is given for an incorrect diagnosis
	• the wrong drug is selected for the indication
	• the prescription is prepared improperly
	• adjustments are not made for co-existing medical, genetic, environmental, or other factors
Multiple Prescribing	• two or more medications are used when one or two would achieve virtually the same effect
	• several related conditions are treated when treatment of the primary condition will improve or cure the other conditions
Under-prescribing	• needed medications are not prescribed
	• dosage is inadequate
	• length of treatment is too brief

* Adapted from Working Party, Council of Europe, 1976.

Source: Managing Drug Supply, page 403.

POTENTIAL BARRIERS TO PROPER DRUG USE

Element	Potential Barrier or Pitfall
1. Accurate Diagnosis	- practitioners lack skill or conscientiousness - too few practitioners - practitioners overworked - laboratory and x-ray tests lacking - inadequate supervision of practitioners - diseases or problems too complex - unlicensed practitioners
2. Rational Prescribing	- inadequate pharmacology training - lack of continuing education - inappropriate "prestige overprescribing" - drug company influences - practitioner overworked - pressure from patients - fear-induced prescribing - incorrect generalization from experience - poor patient-doctor communication
3. Correct Dispensing	- inability to read or interpret prescription - inadequately training dispensers - too few dispensers - lack of equipment or facilities - overworked dispensers - poor attitude about dispensing
4. Suitable Packaging	- no packaging materials - adequate packaging thought to be too costly - poor attitude about packaging
5. Proper Use	- no labeling - labels patient cannot understand - inadequate verbal instructions - patients misunderstand drugs and their use - cultural values conflict with therapy - lack of patient trust

OPTIONS FOR PROMOTING PROPER DRUG USE

1. Improve Prescribing Habits

   - limit drugs to those which are truly needed
   - provide good pharmacology training at medical schools and medical auxiliary training schools
   - provide regulary supervision of medical auxiliaries which includes a review of their prescribing practices
   - institute a drug information newsletter or other means of providing regulary, unbiased information of drugs
   - place controls on drug company representatives to avoid misinformation
   - restrict prescribing by level-of-care categories

2. Improve Dispensing Practices

   - recruit and train competent dispensers
   - recruit a sufficient number of quality pharmacists to supervise the supply system
   - organize facilities appropriately (space should be organized efficiently and easily cleaned and secured)
   - provide adequate equipment in the form of measuring vials, counting trays, etc.

3. Provide Suitable Packaging

   - acceptable forms of bottles, plastic bags and other containers should be available for hand-dispensing of drugs
   - consider pre-packaging drugs by course-of-therapy quantities
   - be sure that dispensers, pharmacists and other health workers understand the importance of suitable packaging

4. Encourage Proper Use

   - effective labeling (written or symbolic)
   - patient education by doctors, auxiliary health workers, community health workers, and community health education activities
   - analyze and help health workers to understand local beliefs and customs which influence the use of medications