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Memorandum

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From Anthony A. Hudgins, M.A.S., Public Health Analyst, Program Evaluation Branch (PEB), Division of Reproductive Health (DRH), Center for Health Promotion and Education (CHPE)

Subject Foreign Trip Report (AID/RSSA): September 16-October 5, 1986, Rio de Janeiro, Brazil--Technical Assistance in Computerized Patient Flow Analysis and Logistics Management

To

James O. Mason, M.D., Dr.P.H.
Director, CDC

Through: Assistant Director for Science, CHPE

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SUMMARY

From September 16 until October 5, 1986, Anthony A. Hudgins travelled to Rio de Janeiro, Brazil, to provide technical assistance to two different Brazilian family planning organizations:

1. Technical assistance was provided to the Brazilian Association of Family Planning Entities (ABEPF) in the application of computerized Patient Flow Analysis (PFA). After expanding the memory of the ABEPF microcomputer, the PFA programs were installed and tested. The ABEPF PFA coordinator was trained in data collection and output interpreta-

tion. As part of the training, two data sets were collected in local clinics, processed, and the results analyzed. ABEPF plans to make PFA assistance available to its affiliates upon request. After a number of data sets are collected and processed, they plan to request followup technical assistance in output interpretation and implementation of solutions to problems discovered.

2. Technical assistance was provided to the Sociedade Civil Bem-Estar Familiar no Brasil (BEMFAM) in contraceptive logistics management. This consultation was provided jointly with Christina Barros of Development Associates. Although originally the request from BEMFAM was for assistance in planning logistics workshops, it was determined that the current logistics system needed to be redesigned before any workshops could be planned. Major recommendations included:
 - a. A requisition/issue/report form should be introduced for use at all levels of the system.
 - b. The system should operate on a regular reorder interval--initially--monthly--and eventually quarterly.
 - c. The system should operate with prescribed maximum and minimum stock levels at all locations.
 - d. BEMFAM needs to obtain sufficient funds to purchase enough commodities to create a safety stock.
 - e. Two sets of microcomputer software should be used to manage the logistics system: one to manage the operation of the Central Warehouse, and another to monitor stock level, issues, and quantities dispensed to users at all levels of the system.
 - f. Although BEMFAM managers want to remove supervisors as a level in the logistics system, it was recommended they should continue to assist in the system (although their function should be more limited than current practice).
 - g. Implementation of the new system should be phased.

A followup TDY is tentatively planned for April 1987 to assist with the implementation of the new system.

I. PLACES, DATES AND PURPOSE OF TRAVEL

Rio de Janeiro, Brazil, September 16--October 5, 1986, to assist the Brazilian Association of Family Planning Entities (ABEPEF) in implementation of computerized Patient Flow Analysis (PFA) within its member agencies, and to provide consultation to the Family Welfare Society of Brazil (BEMFAM) in contraceptive logistics management. This travel was in accordance with the Resource Support Services Agreement between AID/S&T/POP and CDC/CHPE/DRH.

II. PRINCIPAL CONTACTS

A. USAID/Brasil

1. Sonia Bloomfield, Health and Population Office (by phone)

B. Brazilian Association of Family Planning Entities(ABEPF)

1. Denise Leite Chagas, Executive Director
2. Mesias Santos, Programmer and PFA Coordinator

C. Sociedade Civil Bem-Estar Familiar no Brasil(BEMFAM)

1. Mr. Marcio Schiavo, Executive Director
2. Mr. Jose Milare, Coordinator, Administration Department
3. Mr. Jose Maria Arruda, Coordinator, Survey Department
4. Ms. Eliane Reis, Coordinator, Evaluation Department

D. Centro De Pesquisas e Assistencia Integrada a Mulher e a Crianca (CPAIMC)

1. Dr. Helio Aguinaga, President
2. Lic. Lia Aguinaga Kropsch, Executive Director

III. PATIENT FLOW ANALYSIS (ABEPF)

A. Background

Patient Flow Analysis (PFA) is a system which documents personnel utilization and patient flow in health service clinics. Its use enables management to obtain data for statistical documentation and graphical representation of a clinic session, which can be used to identify problems in patient flow, determine personnel and space needs, and document personnel costs per patient visit.

Health service organizations using PFA can measure the performance of individual clinics, design new clinics, initiate improvements in the clinic pattern, and review personnel needs to increase overall clinic efficiency. Specific anticipated benefits to be derived from the use of PFA may include reduction of patient waiting time (and frustration) in the clinic, more equitable distribution of workload for each staff member during the work day, and reduction of personnel costs in the clinic. Also, additional patients may also be served for the same or even reduced costs.

Five forms are used for data collection, only one of which is used during the conduct of the clinic session, so that data collection does not interrupt the clinic session to such a degree that clinic operations are affected. Data processing has been computerized to handle large data sets and to insure rapid turnaround of results. Proper interpretation of the results, however, requires substantial training.

In order to comprehensively interpret the output, it is important to understand the clinic situation. In addition, interpretation of the output should be done together with the clinic personnel who worked during the clinic session that was studied.

Two types of output are produced by the computer programs written for PFA. One is a graphical representation of the clinic session. The upper part of this graph illustrates the type, number, and length of each contact that the patient makes as the patient moves through the clinic. The lower part of the graph displays the staff time occupied with patients and the time spent otherwise for each staff member. The second output is a statistical report containing a summary and six detailed tables. The tables include data on: (1) patient arrival as related to appointment time; (2) patient service time as related to patient's time in the clinic by visit type; (3) number of patients and mean personnel cost per patient by visit type and subclass; (4) personnel utilization in the clinic by task; (5) time and cost for each clinic station by visit type and total visits; and (6) each person who worked in the clinic on an individual basis.

In addition to measuring actual clinic situations, PFA has a modeling capability, as well. A simulation program has been written to manipulate PFA data and reproduce virtually all changes possible within the clinic. The basic function of the program is to eliminate all wasted time spent by patients waiting to receive services and by staff members waiting to provide services. Using the simulation program, data from an actual clinic could be altered to show the effects of such operational changes as more or less staff time, more or fewer patients, and changes in the appointment system. The data can be repeatedly altered until an optimal design for the clinic is reached. This program is not yet available for microcomputers but should be in the latter half of 1987.

Another use of the simulation program is to create totally hypothetical clinics based upon real data and planned changes in the amount of service that the patients will receive. This is particularly useful when a major change in provision of services is planned, such as the addition of a new procedure or service to the clinic.

B. Installation of the Programs in ABEPF Microcomputer

The PFA programs designed for operation on IBM-compatible microcomputers were brought to Brazil for use by ABEPF. Before using the programs, the memory of the Brazilian-made computers owned by ABEPF needed to be expanded through the addition of memory chips. After I added these chips, the programs were tested and procedures slightly modified to operate on the Brazilian microcomputers. Although the agency had been supplied with supplementary American-made hard disk drives, they had experienced compatibility problems in installing them. At the time of the visit, they were not functioning. Although the PFA programs can operate using two diskette drives (A and B), it is more difficult to process the data, and the capacity of the system is limited to somewhat less than 199 patients per study.

C. Training in Data Collection and Processing

I met with the PFA coordinator for ABEPF and provided one-on-one training in PFA data collection. We then conducted two studies in local clinics to learn practical aspects of data collection. The first clinic was in a suburban clinic (Vila Kennedy) with only about 25 patients for the day. Although we did not visit the clinic previous to the study, the staff knew that we were coming, the patient load early in the morning was negligible, and the data collection process proceeded without problems. A second study was done at a very large clinic, with over 160 patients per day at the central CPAIMC clinic. Although

the clinic was visited on the previous day, a breakdown in communications resulted in our not being able to meet with the staff previous to the study session. Therefore, as at Vila Kennedy, the study started without previous instruction to staff. However, because of the size and complexity of the clinic, this caused problems, and one physician refused to cooperate. For this reason, the data was flawed and not completely satisfactory for analysis of problems in the clinic. However, from a didactic point of view, the experience was valuable to show problems that can occur when planning for a study is not carefully carried out. The ABEPF PFA coordinator said, "Now I really understand why you need to do a visit ahead of time to set up the study."

After collecting the data, the studies were processed, providing hands-on experience in processing and editing. Then, the ABEPF coordinator was taught the basics of interpretation of the results.

D. Future Activities

The agency plans to send out letters announcing the availability of PFA assistance to all its more than 100 affiliates. The assistance will be provided upon request. After a number of studies are done, ABEPF will request followup technical assistance in interpretation of results. When the microcomputerized version of PFA simulation programs are available, ABEPF will also want the capability to use them.

IV. LOGISTICS MANAGEMENT CONSULTATION (BEMFAM)

A. Background

In January 1986, a regional workshop on contraceptive logistics management was held in Bogota, Colombia, through the joint coordination of Development Associates, the Centers for Disease Control, and PROFAMILIA (Colombia). As a result of this workshop, Jose Milaré, Administrative Coordinator of BEMFAM, requested assistance in development of in-country workshops for Brazil. This consultation was to assess the current logistics system, determine changes to the logistics system necessary before workshop design, and to begin preliminary planning for the workshops. This consultation was carried out in cooperation with Christina Barros of Development Associates.

B. Description of The Current Logistics System

The Sociedade Civil Bem-Estar Familiar no Brasil (BEMFAM) supplies contraceptives through approximately 2,400 health posts in 9 States of Brazil. These posts are in a variety of locations--some in large general clinics or hospitals, and some in locations with very limited health care services, such as neighborhood association headquarters. There are approximately 270,000 documented users served by the system. The majority of the clients use oral contraceptives (240,000), while there are about 15,000 reported condom users, and 6,500 IUD users. The quantity of condoms reportedly dispensed implies that there are substantially more condom users; however, these may be males who obtain supplies from the military and group sessions and are not actually registered as users.

Exhibit 1 documents the current operation of most of the logistics system, although it varies from State to State. The entire BEMFAM service delivery system depends on the work of the "Agentes de Saude" who work at the health posts. Most of these people are employed either by the health system of the State or by the community center where their distribution post is located. They are considered to be "volunteers" to the BEMFAM distribution system. These agents distribute contraceptives to their clients and keep a daily log of quantities dispensed. Since the form they use has only one column for the two brands of oral contraceptives they distribute, most agents simply provide an aggregate total for the two. Supervisors pick up the daily logs once a month and total the quantities dispensed in their regions. They then deliver this data to the Evaluation Department of their State program during monthly meetings. At the same time, they make requests for supplies for the following month. There is no set procedure for them to calculate the amount needed for the following month. The evaluation person at the State office reviews the data and passes the totals on to the warehouse manager. The warehouse manager then resupplies each supervisor, based on what they dispensed in the previous month and the amount of stock on hand. The evaluation person at the State also sends aggregate totals of quantities dispensed by posts to the Evaluation Department at BEMFAM's headquarters in Rio. Through this channel, central level managers are informed of quantities dispensed in the field.

Data for quantities issued from State warehouses travel along another route. The warehouses send monthly reports to the Department of Administration, where the information is used to maintain an Inventory Control Card.

It is important to highlight here that these two types of logistics data--quantities issued and quantities dispensed--flow through the system separately and through distinct paths. When they arrive at their final destination, the central management level, the totals are significantly different. Some of this difference can be attributed to a normal dephasing of data collection; most of it, however, is due to currently unreported changes in quantities on hand at lower levels of the system.

The central warehouse, located in Rio de Janeiro, receives commodities and sends supplies to State-level warehouses. In the case of pills, the Administration Department orders supplies from commercial laboratories and has the laboratories send them directly to the States. For the purposes of this report, funds that have been allocated to purchase pills that are still physically at commercial labs are considered to be at the central warehouse.

The central warehouse in Rio is an excellent facility and supplies were well stored. The only problem seemed to be that manufacture or expiration dates were missing from the domestically-manufactured oral contraceptives. The warehouse personnel, though, understood the need for FIFO and were managing it by using batch numbers. With the small amounts of supplies existing now at lower levels, expiration of supplies should not be a problem.

In general, there is no requisition form used by the State-level warehouses; requests are made at irregular intervals by letter to the program coordinator. These requests are sent forward to the Setor de Control de Materiais (SECOM) where a "Requisição" is prepared. This form functions as an instruction to the central warehouse to ship the commodities. In other words, the "Requisicao" is a shipping list, not a true requisition form used by lower levels to request supplies.

In the case of contraceptives, Inventory Control Cards are maintained at SECOM with the current balance-on-hand at the central warehouse and at State warehouses. The central warehouse acts upon the "Requisição" with little apparent delay. It also maintains Inventory Control Cards for all items. In addition to contraceptive commodities, the central warehouse carries approximately 1,000 other items, largely consisting of educational materials (for clients) and office supplies.

Some State-level warehouses supply only the BEMFAM program, whereas in other States the warehouse function is integrated into the State Health Department operation. Consequently, logistics procedures vary. In general, however, the State warehouses deal directly with Supervisors who are responsible for about 30 health posts each. Supervisors request supplies on an irregular basis (usually informally) to supply the needs of the posts under their supervision. The supervisors carry supplies to the posts using whatever means of transportation is available to them: car, bus, bicycle, foot, etc. In one State, Pernambuco, the Federal mail system is being used in some areas. There is some concern that most of the supervisors' time is spent in the logistics function competing with other promotional and supervisory functions. Determination of issue quantities varies according to the supervisor, and although some kept fairly detailed records of use, there were no formal policies concerning issue quantities or safety stocks.

A visit was also made by Cristina Barros of Development Associates to the Northeast part of the country to observe the operation of the logistics system away from the capital. The two States visited represented examples of both an integrated Secretary of Health warehouse and an independent BEMFAM warehouse.

In Rio Grande do Norte, the BEMFAM program is integrated with the Secretaria de Saude (the State Health Department). The State warehouse in Natal (CEME), the State capital, houses all medical products, including contraceptives, for 305 State-run health posts and several clinics. They receive their contraceptives from the BEMFAM warehouse twice a year, which receives them from Rio or manufacturing labs at the same interval. The warehouse manager at CEME is a retired army captain with many years' experience in logistics. The "Capitão" (as he is freely called by everyone) keeps excellent records of all commodities movement into and out of his warehouse. Distribution within the CEME network is done on a push system from the central warehouse, through five miniwarehouses in different regions of the State, and finally to the health posts and clinics. Resupply is done monthly at all levels. On a quarterly basis, the "Capitão" receives use data from each of the clinics and posts and compares this data with monthly reports he has received from the miniwarehouses.

Contraceptives at CEME were well protected and stacked appropriately, although cartons were not marked with expiration or manufacture dates. The "Capitão" said he knew the sequence that stocks must move out under a FIFO system by their location in the warehouse. In terms of months of supply, there was great variation. There was a stockout of one type of pill, Neovlar, and 9 months' supply of another, Microvlar. There were 7 months' supply of condoms. The "Capitão" claimed that stockouts do not occur in the field. Only one post that is within the CEME distribution system was visited during this study. There, the warehouse manager reported that pills usually do not stock out, although they are reduced to nearly zero every month, but that condoms run out by the 15th of every month, reflecting a policy of replacing past use without any allowance for expansion. The stockouts make it difficult to assess potential demand.

Aside from the health posts stocked with contraceptives through the State health system, BEMFAM's Rio Grande do Norte State office also stocks 40 posts which are not covered by the public health system. It maintains a small warehouse next to their administrative offices. Contraceptives in this warehouse received adequate protection, although no cartons were labelled with expiration or manufacture dates. Distribution of contraceptives to the posts is done on a push system by one supervisor who visits each post monthly. The supervisor determines issue quantity by looking at monthly dispensed data and projecting 1 month's supply based on that data. She physically takes contraceptives to the post and leaves them with the agent.

The recordkeeping procedure at BEMFAM/Natal was cumbersome and of questionable accuracy. The warehouse manager adapted a form currently used by BEMFAM to better meet his data needs. Additionally, the BEMFAM office has trouble aggregating data because issue data from CEME comes 3 to 6 months late. Consequently, they often have to make assumptions when ordering more supplies.

The other State visited was Ceará where BEMFAM operates independently from the State health system. This is the first State within BEMFAM where the distribution cycle is changing from monthly to quarterly. They have run through only one cycle so far (i.e., they are in their fourth month of quarterly ordering), so it is unclear what the impact on supplies will be. Of particular note and concern is that each of the seven regions in the State has been subdivided into three smaller areas (A,B,C), and resupply is based on these smaller areas. In other words, each small area receives supplies quarterly, but each region receives supplies to some part of it every month.

The central warehouse in Fortaleza, the State capital, was spread over three rooms, including what was previously a garage, in the BEMFAM building. The contraceptives seemed to be in good condition, even though they were not properly stored—piled on the floor, at risk of exposure to moisture, and not dated. Recordkeeping on the part of the warehouse manager was accurate and up-to-date. Past supply data showed frequent stockouts of pills. Condom supply was extremely volatile, so the data was difficult to analyze.

C. Specific Requests from BEMFAM Department Heads

Although the logistics system of BEMFAM works reasonably well, given the informality of the system and the lack of operating stock, department heads within the institution expressed several concerns. Prime among them was their need to have more oral contraceptives on hand to provide their services and to create a safety stock. Currently they work at a barely operational level. They pointed out that last year they received funds for only three quarters of the orals they needed. Consequently, they entered into a crisis situation in November of this year. They predict the same situation will happen FY 87 unless they are able to buy more commodities.

The following is an itemized list of changes in the logistics system requested by BEMFAM managers:

- o To have enough commodities in the pipeline to create a safety stock that will prevent stockouts in the field.
- o To be able to know the quantity of each type of contraceptive that is in each State at any given moment.
- o To be able to reconcile the discrepancy between reports on amounts issued from the warehouses and the amounts dispensed to users.
- o To take the super isors out of the logistics cycle, i.e., to have them perform only their duties which are not related to commodity supply.
- o To change the order cycle from a monthly one to a quarterly one.
- o To have the entire logistics system work on a "push" system.
- o To plan and conduct the following logistics training workshops:
 1. One for personnel involved in pretesting a new system,
 2. One for personnel of nonintegrated programs (Ceará, Pernambuco, Paraíba, Alagoas, Bahía),
 3. One for personnel of integrated programs (Rio Grande do Norte, Piauí, Alagoas), and
 4. One for personnel working in the southern States (Rio de Janeiro, Santa Catarina).

In the long-run, BEMFAM wants all of their programs to be integrated with the State health programs. The entire system could eventually become one similar to that currently operating in Rio Grande do Norte where health services and commodities are integrated but BEMFAM provides contraceptives and some advising personnel.

Note that in January of 1987, BEMFAM will expand to two new States: Sergipe and Maranhao. It might be advantageous to begin these programs on the new logistics system.

D. Major Problems

The major problems of the BEMFAM logistics system are uneven and inappropriate stock levels at different points (stockouts) and low supply predictability.

These problems seem to stem from three weaknesses in the logistics system:

- o There is no policy for determining issue quantities, or related requirements for safety stock or maximum/minimum limits.
- o There is no consistent form for requesting supplies. They are requested by letter, by telephone, in-person, or by using forms developed within the individual States.
- o Although the system generally is perceived to resupply monthly, there is no required ordering frequency or deadline. Resupply in practice is often done several times a month.

The lack of formal guidelines places a heavy burden on supervisors and agents (in the posts). The problem is further compounded by high turnover and low literacy among the agents.

Another major cause of problems is the general low inventories within the system. Exhibit 2 shows the variation in supply status in the central and State warehouses. In general, the system has been plagued by low reserve stocks, especially of oral contraceptives which are funded by donors for local purchase. The relatively "healthy" status of condom supply at the central level is recent, reflecting the receipt of a large supply of condoms after several months of scarcity. The imbalance problems in the logistics system are exemplified by the existence of only 0.5 months of supply of Neovlar oral contraceptives in Piauí State while Paraíba had over 7 months' supply. Since most posts have less than 1 month of supplies, there is no margin for supply disruptions, mistakes, or substantial increases in demand. It would be impossible to change to a quarterly system without increasing the amount of stock at every level in the system.

The lack of consistent data from the system for making need projections is also a problem. The Evaluation Department collects data from the posts regarding supplies actually dispensed to clients, while the Administration Department collects data on quantities issued from the State warehouses. Without knowing what is happening to stocks on-hand at the lower levels of the system, it is impossible to reconcile client data with issue data, causing insecurity in making commodity need projections.

E. Recommendations

The most important aspects of the following recommendations are the following:

1. An increased volume of contraceptives must be put into the system for effective flow.
2. The process of reordering supplies must be formalized, both in terms of forms used and in terms of the time intervals.
3. Two distinct software programs should be used to control materials movement.

Exhibit 3 shows a flow chart of how the recommended logistics system should work. As in the current system, all data analysis begins with the daily logs of the agents working at the health posts. Once a month this data will be aggregated and entered into a new form. The "Requisition/Issue/Report form (RIR), which is discussed in greater detail below, is sent in triplicate from the post to the State warehouse. Using data reported on the RIR, the State warehouse manager will determine how much of each commodity to send back to the post. He will use maximum/minimum guidelines to make his calculations. The system will therefore operate on a "push" basis at the lower levels.

One copy of the RIR is returned to the post as an issue voucher, one is retained for the warehouse records, and the third is collected by the State evaluation coordinator to be sent to the central office for data processing.

In order to resupply the State warehouse, the State warehouse manager also uses a RIR to report his issue data to BEMFAM headquarters in Rio. At this level, though, the system is a "pull" system. The warehouse manager determines request quantities, again using a maximum/minimum system, and sends the request to the national headquarters. The RIR passes through the Program Department and on to SECOM, the branch of the Administration Department that controls commodities. Note that a copy of the State RIR is also sent to the Evaluation Department for data processing. SECOM also prepares an "Invoice" which is a legal document required for shipping (Nota Fiscal).

Note also that supervisors have been taken out of the logistics cycle. This was in response to a specific request from managers at BEMFAM. As discussed below, I feel that supervisors should still be used in the procurement process, even if their duties are reduced. It is too big a step to take them out of the process altogether.

Specific steps to achieve a smooth flowing, efficient logistics system include the following:

1. Create a Safety Stock--BEMFAM should be given sufficient funds to purchase enough commodities to meet almost twice its use projections. This will put about 1 year's extra supply into the system as a whole. (N.B: At no single point, however, will there ever be more than 5 months' supply. See page 12.) This extra supply will serve as a buffer stock and will prevent stockouts. It is very important to note that this is a one time only investment. Once a safety stock is created, it needs only to be maintained with the purchase of exact operating quantities.
2. Introduce a new Requisition Form--A new Requisition/Issue/Report (RIR) form will be introduced into the logistics system (Exhibit 4 shows a sample RIR form):
 - a. This form will introduce more structure into the system by functioning as a formal requisition where before requests were rather informal.
 - b. The form will be used by all levels within the system, from post level up to the central warehouse level.
 - c. The form will fulfill two purposes--a formal request for supplies to the next level, and a report of past activities and current stock levels. This will be the first time that stock level data will be passed up through the system.
 - d. The form provides the information necessary to implement a "push" system. Since amounts on-hand and current usage are reported to the next higher level, proper issue quantities can be easily determined.
 - e. The form will eventually replace several management and reporting forms currently in use: "Controle Mensal de Anticoncepcionais nos Postos de Distribuicao;" "Informe de Almoxarifados Estaduais a SECOM;" from the Clinics--"Relatorio Tecnico Mensal (RTA), Seccao II;" and "Relatorio Tecnico Mensal/Unidade por Metodo (por Regiao)."

3. Order at Regular Intervals--Since the system now operates on approximately a monthly basis, the forms will be initially introduced for monthly use. However, the date that they are to be completed should be prescribed. Eventually, the system should operate on a quarterly basis. Changing to a quarterly resupply will save transportation and handling costs.
4. The System Should Operate on a System of Maximum and Minimum Stocks--Each level of the logistics system should operate such that issue quantities will be determined to bring stock levels up to a predetermined number of months of supply (based upon usage levels for the last 6 months). Appropriate maximum and related minimum levels for a quarterly resupply system would be: Posts--5 months maximum and 2 months minimum, State Warehouses--5 and 2, and central warehouse--6 and 3 months. Operating on this basis means that larger operating stocks will need to be in-country.
5. Establish Two Microcomputer Systems--Microcomputer software should be obtained and implemented to accomplish two different tasks within the system:

The Central Warehouse handles promotional material and office supplies in addition to contraceptives--amounting to approximately 1,000 items. These items are currently managed, using a paper system. In order to ease the management of this warehouse and maintain better control, locally available microcomputer software should be purchased to do the following tasks: Enter contraceptive order data from the RIR voucher and order data for other items from a standard requisition form; create packing lists and the "nota fiscal" for shipping purposes; maintain a constant inventory of all items; and produce necessary management reports.

- b. In order to monitor contraceptive use and supply status at all levels, the Contraceptive Commodity Monitoring System (CCMS), developed by the Centers for Disease Control, should be modified and implemented. This system accepts data directly from the first four columns of the RIR voucher. The system will produce management reports on all levels of the system, in aggregate or by individual location. These reports include data on commodity usage, amount on hand, months of supply on hand, a suggested issue amount, and an estimate of the number of active users in each location. Adoption of the CCMS will mean that several reporting forms can be deleted from the evaluation process, such as the "Controle de Movimento/Unidade por Metodo," and "Mapa Estadistico-Metodos Distribuidos."
6. Continue to Utilize Supervisors in the System--Even though the supervisors will no longer actually be a level within the logistics system or directly deliver commodities to the posts, their function needs to be carefully considered. Post-level staff are frequently very limited in their literacy and sophistication, and there seems to be considerable turnover. It is recommended that the supervisors continue to have some function in the logistics system, such as training and assisting post-level staff in completing the RIR voucher and functioning as a liaison with the State warehouse when problems arise.

7. Phase implementation--It is recommended that implementation of the system be phased, with a test and evaluation in one State before implementation in the entire system. Even during the testing phase, new States who join the system should probably be started using the new forms.

F. Implications

Given the size and reach of BEMFAM, the changes to the logistics system cited above have several serious implications. These will affect BEMFAM both internally in its day-to-day operations and externally in its requirements of outside donors. Here are some of the more salient considerations in converting the BEMFAM logistics system, and in the next section we discuss implementation steps.

1. Internal Implications

The transition from the old system to the new will consume a great deal of staff time. New reporting forms imply retraining of thousands of employees, and retraining implies many months of preparation time on the part of trainers. Additionally, if the role of the supervisors is changed, this will also involve a great deal of training. Supervisors will have to be redirected within their jobs, and agents and warehouse managers will have to take on logistics responsibilities that previously fell to the supervisor. We note here that during the course of retraining, it must be acknowledged that warehouse managers who previously handled 7 or 10 discrete requests from supervisors will now receive approximately 200 direct requests from agents. They will be in a position of much greater responsibility; they must receive support from the system as a whole. One way to reduce the pressure on these warehouse managers will be to set protocols and give them good training in determining issue quantities.

Another important implication of installing the new logistics system is computerization. BEMFAM will have to look at its current inventory of computers and determine which pieces of hardware can be used for logistics. It may be recommended that one personal computer be dedicated solely to the logistics system. If so, BEMFAM needs to analyze the implications that this decision would have on other programs.

New software will have to be purchased to run the central warehouse in Rio. BEMFAM has already contacted a local firm and is in the process of contracting them to adapt standard commodities management software to BEMFAM's needs. Software to oversee the system as a whole will be donated by the Centers for Disease Control. This software will be located within the offices of BEMFAM's Rio headquarters, probably under the direction of SECOM. All department managers will have access to the data amassed within the computer for use in their different reports. Although there will be an easy marriage between forms used and the logistics monitoring software, central level managers will need to be trained in the software.

2. External Implications

- a. Increased Inventory Stock--As noted before, the current system is operating with a very low supply. This causes low safety stock at all levels, resulting in both stockouts and a scarcity mentality. (Supplies are given out to clients in small quantities, meaning that they have to return frequently to the posts in order to continue using contraceptives.) There is an increased need for supplies, even under the current monthly system. When the system changes to a quarterly resupply, the inventory needs will increase dramatically. The table below demonstrates the need for at least a 1-year's supply within the country.

IN-COUNTRY INVENTORY NEEDS

<u>LEVEL</u>	<u>MAXIMUM</u>	<u>MINIMUM</u>	<u>AVERAGE</u> (months)
Post	5	2	3.5
State Warehouse	5	2	3.5
Central Warehouse	6	3	4.5
			<u>11.5</u>

The needs for this stock must be made apparent to donor agencies upon which BEMFAM is dependent for funding. It should be noted that stocking up the system ("filling the pipeline") will only need to be done once. Afterwards, resupply will only be related to use and any increase-related needs.

- b. A budget will need to be developed for training needs. It is envisioned that the pretest will create needs for funding for a short workshop and some funding of travel expenses for evaluation of the pretest. These funds may be available through the centrally-funded USAID logistics contract.
- c. The CDC developed Contraceptive Commodity Monitoring System (CCMS) will need to be modified for use in the BEMFAM system and translated into Portuguese. This can be done through the existing centrally-funded CDC agreement with USAID.

G. Implementation Phases

The recommendations should be implemented in four interrelated phases:

Phase 1: Form Design

Design pretest, including selection of State
Train personnel for pretest
Evaluate pretest

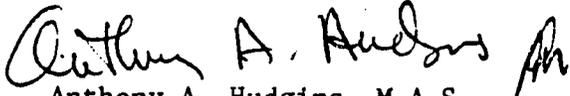
Phase 2: Implement in Other States. (This phase may extend for some time, requiring several training sessions.)

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Phase 3: Computerize management of the Central Warehouse. (This phase may be concurrent with earlier phases.)

Phase 4: Install CDC-developed Contraceptive Commodity Monitoring System (CCMS). The logistics system will need to be operating on a quarterly basis before this can be accomplished.

The next trip to continue with Phase 1 is tentatively scheduled for April 1987.


Anthony A. Hudgins, M.A.S.

Current System Supply Flow BEMFAM 1986

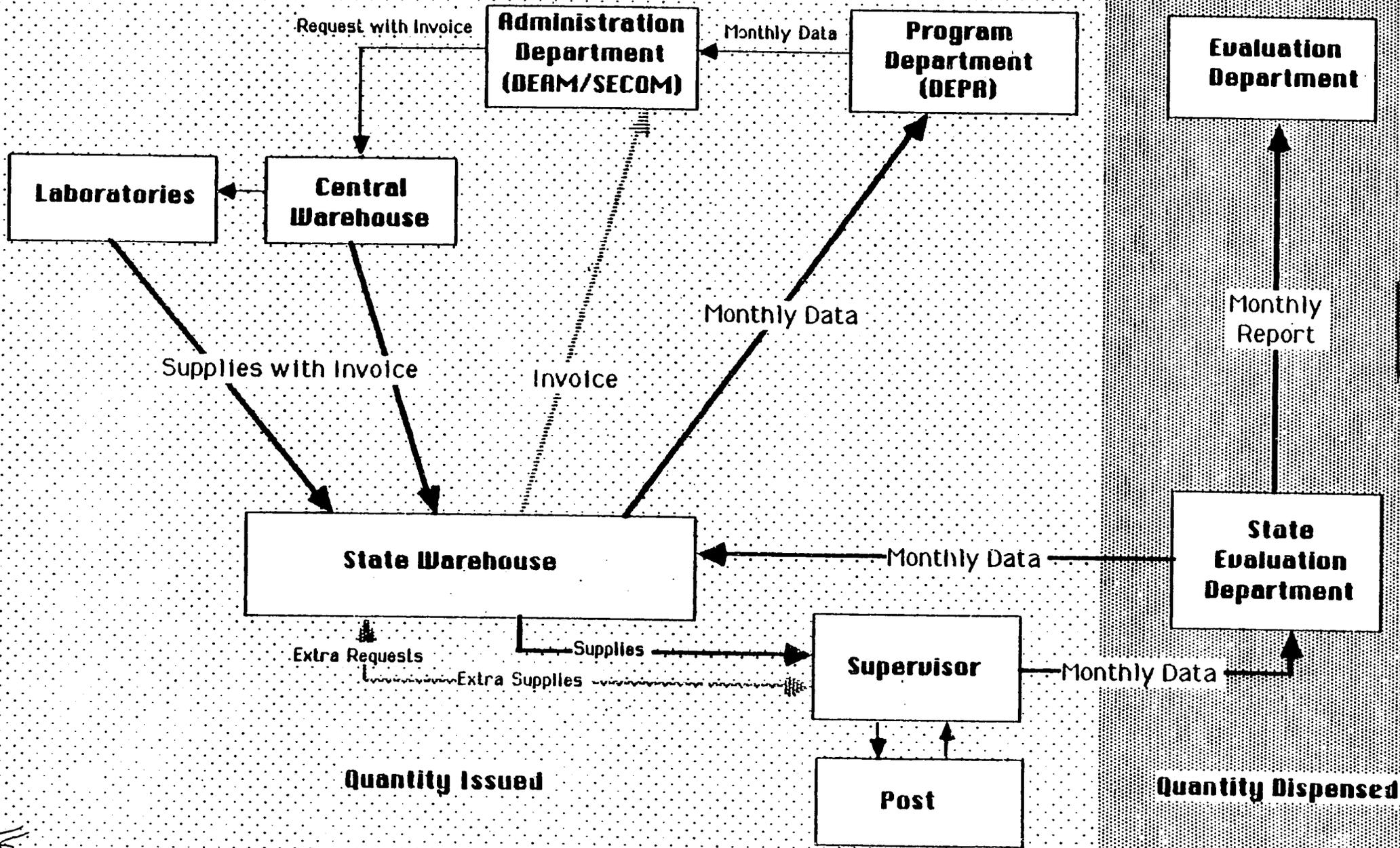


EXHIBIT 1

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Supply Status at Warehouses--Neovlar

<u>STATE</u>	<u>ON-HAND</u>	<u>MONTHLY ISSUES*</u>	<u>MONTH'S SUPPLIES</u>
Pernambuco	28,200	26,100	1.1
Paraiba	155,200	20,200	7.7
Rio Grande Do Norte	23,000	16,300	1.4
Ceara	15,933	15,200	1.0
Alagoas	51,600	27,100	1.9
Piaui	2,700	5,900	0.5
Santa Catarina	7,800	4,200	1.9
Central Warehouse	113,777	153,500**	0.7

*Average of June, July, August 1986

**Total of State Warehouses Plus Rio De Janerio Usage of 38,500

Supply Status at Warehouses--Microvlar

<u>STATE</u>	<u>ON-HAND</u>	<u>MONTHLY ISSUES*</u>	<u>MONTH'S SUPPLIES</u>
Pernambuco	175,836	44,000	4.0
Paraiba	33,600	26,200	1.3
Rio Grande Do Norte	112,800	14,200	8.0
Ceara	79,143	51,900	1.5
Alagoas	40,100	18,500	2.2
Piaui	29,565	5,900	5.0
Santa Catarina	41,692	5,200	8.0
Central Warehouse	155,328	197,500**	0.8

*Average of June, July, August 1986

**Total of State Warehouses Plus Rio De Janerio Usage of 31,600

Supply Status at Warehouses--Condoms

<u>STATE</u>	<u>ON-HAND</u>	<u>MONTHLY ISSUES*</u>	<u>MONTH'S SUPPLIES</u>
Pernambuco	552,685	122,270	4.5
Paraiba	4,000	32,600	0.1
Rio Grande Do Norte	85,800	138,300	0.6
Ceara	135,391	82,000	1.7
Alagoas	277,700	69,800	4.0
Piaui	97,900	37,600	2.6
Santa Catarina	34,261	26,700	1.3
Central Warehouse	3,033,780	535,370**	5.7

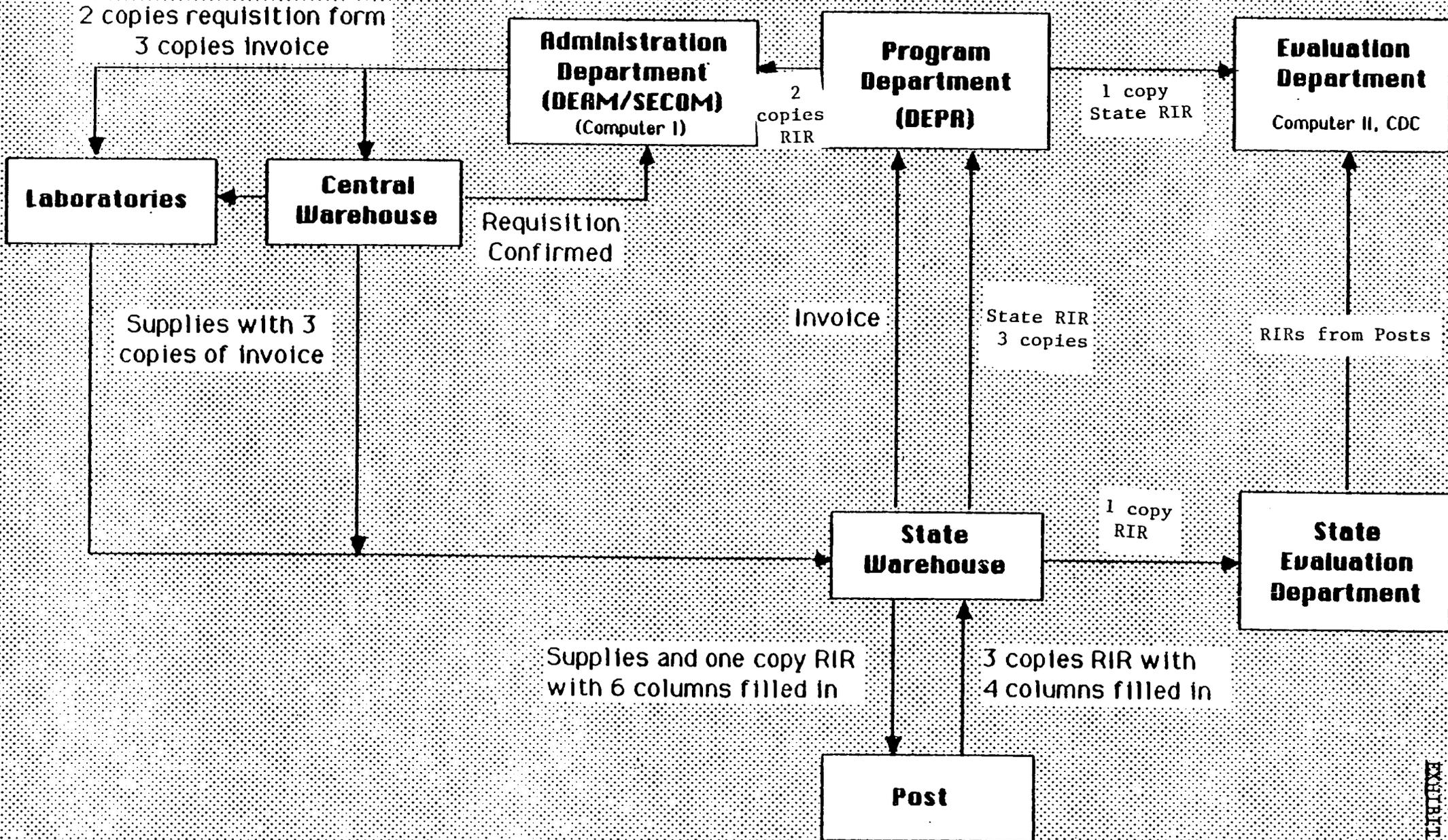
*Average of June, July, August 1986

**Total of State Warehouses Plus Rio De Janerio Usage of 26,100

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SUGGESTED SYSTEM

Supply Flow



CONTRACEPTIVE SUPPLY STATUS

EXHIBIT 4

LOCATION CODE

--	--	--	--	--	--

DATE OF REPORT _____

19 _____

NAME OF LOCATION _____

REGION _____

DISTRICT _____

REPORTING PERIOD: FROM (MONTH) _____

TO (MONTH) _____

19 _____

CONTRACEPTIVE METHOD	BEGINNING BALANCE	RECEIVED	DISPENSED, ISSUED	ENDING BALANCE	REQUESTED	ISSUED
FEMENAL						
NORIDAY						
NEOGYNON						
EUGYNON						
OTHER ORAL						
LIPPES C						
LIPPES D						
Cu T						
OTHER IUD						
COLORED CONDOMS						
PLAIN CONDOMS						
FOAMING TABLETS						
INJECTION						
CREAM, JELLY, FOAM						
STERILIZATION						
DIAPHRAGM						
NFP KIT						
OTHER						
OTHER						
OTHER						

THE COMPUTERIZED COMMODITY MONITORING SYSTEM (CCMS)

The CCMS was developed by the Division of Reproductive Health, Centers for Disease Control, for use in family planning programs. The system was designed for IBM-compatible microcomputers with 640K of memory and at least a 10 Megabyte hard disk.

The programs are in modules so they can be easily modified for each individual application. However, the basic system is designed for quarterly resupply within a logistics system with four levels of entities, nominally called: Central Warehouse, Regional Warehouses, District Warehouses, and Outlets (which may include both clinics and community-based distribution outlets).

The system is driven by one form--the Requisition/Issue/Report voucher (RIR), on which the first four columns report the past quarter's activity and are entered into the computer. The same form is used by all levels of the logistics system. These four columns are self-balancing (beginning balance + receipts--distributed = ending balance). If the operator enters figures that do not balance, the computer beeps, and an error message is printed by the data. This error checking should maximize data-entry accuracy.

The system can produce a wide variety of management reports. Reports can be produced for each level of the logistics system, either by individual entity or in aggregate. In general the reports contain data on distribution, amount on hand, months of supply on hand (based on 6 months of dispensing within the geographic area covered), a suggested issue quantity, and an estimate of active users.

The entire system is menu-driven (computer program prompts user on next step), and requires very little training to learn to use. However, some computer literacy is a prerequisite for its use.

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