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Ministry of Health
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**INTEGRATED ANALYSIS
OF THE DRUG USE STUDY
AND
IMPLICATIONS FOR THE KAP STUDY**

Report No. 31

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LIST OF ACRONYMS/FOREIGN TERMS

ADSP-1	Review of Secondary Data and Literature
ARI	acute respiratory infection
CCS	Center for Child Survival
DMS	Drug Management Study
Dokabu	chief doctor of a kabupaten
DUS	Drug Use Study
FAs	focused assessment
FGD	focus group discussion
HSFP/P	Health Sector Financing Project/pharmaceutical component
ISTI	International Science and Technology Institute, Inc
kabupaten	district
KAP	Knowledge, Attitudes and Practices
kecamatan	sub-district
Kodya	capital city
MPS	Manpower Study
ORS	oral rehydration salts
POM	Pengawasan Obatan dan Minuman (Food and Drug Administration)
puskesmas	community health center
puskesmas induk	main health center
puskesmas pembantu	auxiliary health center
SMS	Social Marketing Study
SMA	high school
SRI	Survey Research Indonesia
YIS	Yayasan Indonesia Sejahtera

CHAPTER 1

SCOPE OF WORK AND ACTIVITIES ACCOMPLISHED

The consultant was part of a team to accomplish an integrated analysis of focused assessments (FAs) of drug management, manpower and use for the Health Sector Financing Project/pharmaceutical component (HSFP/P). The overall objective of the integrated analysis was to identify priority areas and integrate findings from the FAs for the design of intervention packages and for the identification of research questions to be addressed by the Knowledge, Attitudes and Practices (KAP) Study, the last FA before interventions are elaborated. Three FAs — the Manpower Study (MPS), the Drug Management Study (DMS) and the Review of Secondary Data and Literature (ADSP-1) — were completed at the beginning of the integrated analysis. The Drug Use Study (DUS) was analyzed concurrently.

More specifically, the objectives of the integrated analysis were to

- Summarize pertinent findings from the results of all FAs and prioritize these findings in relation to overall HSFP/P objectives,
- Elaborate ways in which findings from the DMS, MPS, ADSP-1, and DUS need to be linked for effective intervention, and
- Identify areas of exploration for the KAP Study based on the review of current findings with an emphasis on answering questions necessary for the development of effective and useful interventions

A. SCOPE OF WORK FOR PROGRAM ANALYST AND RESEARCH SPECIALIST

In order to accomplish the goals of the integrated analysis, the consultant was directly responsible for the following tasks

- Work directly with Yayasan Indonesia Sejahtera (YIS) in analysis of DUS data,
- Identify relevant DUS findings and other information on methodology and data management needed for the assessment of required data for the integrated analysis, and
- Complete additional analysis of DUS findings required as part of the integrated analysis

To fulfill the above scope of work, the consultant participated in the following activities

- Meet regularly with the integrated analysis team to create a matrix summarizing and prioritizing major findings from the FAs,
- Analyze DUS data at YIS with Dr Bimo, Dr Ratna Kurniawati, Dr Budiono and Dr Toety Ascobat,
- Review DUS findings with YIS team for English language report on preliminary findings,
- Present DUS findings to the integrated analysis team, Food and Drug Administration (Pengawasan Obat dan Minuman — POM) staff, and International Science and Technology Institute, Inc (ISTI) staff,

- Review DUS methods and findings with members of the HSFP hospital component in order to integrate DUS data on prescribing patterns in hospitals (particularly type C and D hospitals) with other data collected for the HSFP,
- Meet with the Center for Child Survival (CCS) staff, especially Dr Christine Costello and Dr Endang, to present DUS findings and their implications for the KAP Study,
- Meet with Dr Amal about preliminary findings from focus group discussions (FGDs) for integrated analysis and the KAP Study,
- Brief Dr Steven Fabricant, ISTI consultant, on DUS and integrated analysis. Review available data on supply of drugs and discussion of cost in relation to the DUS and the KAP Study,
- Meet with POM team to present the DUS with Pak Puruanto, who is in charge of the DUS and the KAP Study, and
- Conduct preliminary discussions concerning possible pilot intervention and evaluation design with members of the integrated analysis and others at POM and ISTI

B. OUTPUT

During the course of the consultancy, the integrated analysis team and ISTI specified several priority areas and desired outputs

The first desired output was the completion of the DUS analyses and report. Since YIS was involved in writing the draft of the final DUS report in Indonesia, the consultant produced a parallel report of preliminary findings in English. This report summarizes key findings and presents puskesmas data and some hospital data in more detail. This first report fulfills the preliminary task of summarizing major DUS findings for the integrated analysis.

This report, the second major output, covers activities directly related to the integrated analysis with a focus on the relevance of DUS findings to the KAP Study. Since the KAP Study will be based heavily on findings from the DUS, this aspect of the integrated analysis was considered a priority. This report reviews the major themes discussed over the consultancy and intends to present research questions from the integrated analysis as a guideline for the CCS as they design their survey methods and instruments.

CHAPTER 2 INTEGRATED ANALYSIS OF THE DRUG USE STUDY

The integrated analysis team reviewed DUS findings as they were generated and identified priority areas for intervention and further study in relation to overall HSFP/P project objectives. The evaluation of HSFP/P will measure the internal reallocative efficiency of public pharmaceutical expenditures in study districts to ascertain whether or not

- Pharmaceuticals are being more rationally prescribed,
- Expenditures for the different therapeutic categories have been changed to reflect internal allocative shifts within the drug budget, and
- Larger expenditures are being made on pharmaceuticals such as vaccines, oral rehydration salts (ORS), vitamin A, and iron folate, which directly support child survival programs

Based on these evaluation criteria, two principal questions can be asked when selecting priority areas: (1) Will change in this area have a significant impact on prescribing behavior, especially in relation to child survival? and (2) Will change in this area have a significant impact on drug expenditures and on the reallocation of resources to child survival pharmaceuticals? Table 1 presents the current working list of priority areas with their relevance to project objectives of improving prescribing practices and reallocating resources.

Parasitic diseases are added to this list because of their importance to child survival. However, the DUS cannot provide information on parasitic diseases because many of them are not diagnosed or treated.

While this project focuses primarily on issues pertaining to child survival, project goals cannot be accomplished without the modification of general prescribing patterns that are untherapeutic and expensive.

In addition to identifying priority areas for intervention, the integrated analysis also incorporated findings from the FAs and the DUS. Originally, the team thought of doing further analysis by linking supply with use data. However, the data available were not complete, and a full analysis was impossible. (Only one puskesmas had compatible and complete data in both the DUS and DMS.) While actual analysis of the data was not feasible, it was possible to integrate findings and identify areas that needed further exploration. This process was essential for defining research questions for the KAP Study.

A. DRUG MANAGEMENT STUDY AND DRUG USE STUDY

The influence that supply has on prescribing behavior has not yet been studied in depth. The DMS identified many problems relating to the ordering, procurement and distribution of drugs that lead to drug shortages at the puskesmas. The doctors and paramedics who participated in the FGDs related the

problems created by an inadequate drug supply (e.g., prescribing less than a full course of treatment) The following questions need to be answered in order to develop interventions:

- What are the supply problems relating to drugs, especially those drugs that are central to interventions (drugs for treating diarrhea, acute respiratory infection (ARI), antibiotics and injections¹)?
- What do providers do when these drugs are out of stock?
- How do drug shortages influence amounts given? (There is anecdotal information to suggest that the staff in the Puskesmas pharmacy reduces amounts when supply is low, meaning that DUS estimates on average amounts could be high.)
- Can patients get prescribed drugs in private pharmacies? How often is this solution used when drugs are out of stock?

B. MANPOWER STUDY AND DRUG USE STUDY

The MPS found that Puskesmas doctors were often too preoccupied with administrative duties to see patients. This finding is confirmed by the DUS data which show that paramedics treat a majority of patients — 69 percent in Puskesmas induk and 99 percent in Puskesmas pembantu.

This finding suggests two principal areas for further study: (1) organization of the Puskesmas (Does the doctor have time to supervise the paramedics? How is information transmitted within the Puskesmas?), and (2) level of knowledge among drug providers, especially paramedics, who do not get training in diagnosing and prescribing. The FGDs results provide initial answers to these questions.

Another area for further study is the use of lab facilities. The DUS has data on use of lab tests. Although exact percentages are not yet available, it appears that use of lab tests was very low. The MPS also found that lab facilities were inadequate.

C. ADSP-1 (POLICY REVIEW)

This review focused on the policies and regulations concerning the use of drugs. The ADSP-1 concentrated primarily on policy and legislation pertaining to drug management. The integrated analysis team decided to construct a matrix of policies affecting all aspects of drug management and use. This matrix will be a useful tool for designing interventions and the KAP Study.

The importance of information and local policies became clear in the course of these discussions. The practice of prescribing drugs for three days (the three-day rule), although widespread in Indonesia, is not a written policy. In the FGDs, the doctors and paramedics discussed local policies that had an impact on prescribing patterns in their regions.

The key issues related to policies and regulations that have an impact on the use of drugs are standard treatment protocols (the “red book” and the “pink book”) and national drug policies (list of essential drugs, generic drugs and the “blue book”). More information is needed on knowledge of and attitudes

¹ During the integrated analysis, the team discussed listing key drugs by their importance to project goals (e.g., drugs used for treatment of diarrhea or ARI and drugs most frequently used in the Puskesmas). This list will be useful for designing the KAP Study.

towards standard treatment and drug policies The FGDs provided some very interesting information about both these topics

E. COST

The cost factor is central to all four FAs In the integrated analysis, cost was explored as an analytic category on its own by ISTI consultant Dr Steven Fabricant His consultant report, *Economic Considerations in the HSP/P Drug Costs and Expenditures* (Report No 30), complements this discussion and the following discussion on the KAP Study

CHAPTER 3 IMPLICATIONS FOR THE KAP STUDY

A. INTRODUCTION

This section summarizes and integrates the research questions identified in the integrated analysis and the DUS for the design of the KAP Study. The KAP Study is the last of the FAs. The findings from previous studies can be used to refine the KAP Study objectives and increase its usefulness for intervention design. As presently defined, the KAP Study replaces the original Social Marketing Study (SMS) and the exploration of factors influencing prescribing behavior that had initially been incorporated into the DUS. The FGDs done by the DUS are a first step towards eliciting factors influencing prescribing practices. They provide the basis for further exploration of knowledge, attitudes and practices of the providers.

Work undertaken by previous consultancies specifies the objectives of the KAP Study². Further refining of concepts, objectives and methods was done by the DUS and the SMS in their protocols. All of these documents are useful and should be used by the CCS in the development of this survey. In particular, the KAP Study design should use the results from the FGDs, the questionnaires for prescribers and dispensers from the DUS, and Dennis Ross-Degnan's draft observation instruments on providers and dispensers.

The KAP Study has a facility-based component, which will be carried out by the CCS, and a community-based component. Data for the community-based component will be collected using Survey Research Indonesia (SRI) omnibus surveys. Individual questions about the use of drugs will be included in these studies, which are carried out bimonthly in key urban centers and annually in rural areas. This report suggests some research questions for the community-based component, but focuses more specifically on the facility-based study.

The facility-based KAP Study will complete and expand information on behavioral and structural obstacles to rational prescribing patterns at the health unit in order to develop effective and comprehensive interventions which focus on the primary actors within the health unit: managers, prescribers (doctors and paramedics), dispensers and patients.

The KAP research should be designed so that it will be useful for the development of interventions.

The KAP Study has the potential to accomplish three major tasks:

1. Fill in gaps in knowledge and answer questions that were not included in other FAs,
2. Probe behaviors that will be the focus of later interventions to determine the rationale for these behaviors and potential resistance to change, and
3. Provide baseline information on knowledge, attitudes and practices that can be used for evaluation purposes at a later date.

² *Preparation for Focused Assessments (Quick), Detailed Design of Focused Assessments (Bates, Holtzman, Quick, Ross-Degnan, Visser), Strategy for Evaluation of the HSFP/P and Progress of the Focused Assessments (Ross-Degnan), Research Plan for KAP Study of Prescribers, Dispensers and Consumers of Drugs (Maran)*

The KAP survey was originally designed to fulfill the first task and, to a lesser extent, the second. Since the project is nearer the intervention phase, the second objective has become more important and can be focused on clearly defined objectives for intervention. The task of providing baseline data was not explicit in earlier discussions of the KAP Study. However, if quantitative data is collected for the KAP Study, it would be useful to collect this information in areas where the interventions will take place.

B. GENERAL RECOMMENDATIONS FOR THE KAP STUDY

Because the KAP Study is the last FA, it can be used as a tool for developing and refining interventions. This study could also collect data useful for the evaluation of the project. However, to achieve these goals, the project must have a clear vision of eventual intervention packages and the evaluation strategy. Dr. Steven Fabricant, ISTI consultant for the integrated analysis, suggested that a working list of interventions be elaborated before the KAP Study is designed and that the project work backwards. This strategy is conceivable because so much background work has already been undertaken. The following questions must be answered in order for the CCS to design the KAP Study.

- What are the priority tasks of the three reference studies mentioned earlier?
- What qualitative and quantitative data will be collected?
- What data collection methods should be used and how? (Interviews, in-depth interviews, FGDs and observations are all currently being used, the objectives and benefits of each data collection method must be specified so that redundant information is not collected.)
- How are hospitals integrated into the KAP Study?

Clearly, it would be useful to collect some quantitative data on patients and knowledge and attitudes of prescribers, especially if this information could be used as baseline information for interventions. Moreover, no data on patients has yet been collected. However, this information would have to be narrowly delineated. A large quantitative exploratory survey is not feasible, given resources and time constraints.

1. SUGGESTIONS ABOUT METHODS

It is suggested that the KAP Study be staged to allow the project team to resolve key issues before quantitative data collection (task 3) or in-depth probing for interventions (task 2) is completed.

Phase I should fill in gaps in knowledge and answer questions arising from the DUS. Qualitative information should be collected on doctors, paramedics and patients on a wide range of topics. This information would answer preliminary questions about knowledge, attitudes and behavior of the target groups and provide a basis for later phases.

Phase II should review qualitative results and design FGDs that will probe behaviors, help develop interventions, and design quantitative instruments for data collection. This phase would use the working list of interventions and the evaluation design as a basis for deciding sample sizes and priority areas.

Phase III should include probing behaviors for the design of interventions, and collecting quantitative information on knowledge, attitudes and behavior of target groups.

2. SUGGESTIONS ABOUT INCLUSION OF HOSPITALS

Decisions should be made as to whether or not the project will intervene in hospitals. At the moment, the pharmaceutical component would like to include D hospitals and perhaps C hospitals in its program. However, it is still unclear how interventions in drug use will be carried out in hospitals. One solution may be to exclude hospitals for the pilot phase of the interventions focusing on drug use (Drug management interventions could still be done in hospitals). If this decision is made, then the KAP Study could focus on puskesmas. Eliminating hospitals from parts of the KAP Study would be practical, given the wide scope of the KAP Study and the large number of instruments to be developed. This decision needs to be made before the KAP Study begins to develop its instruments and protocols.

3. INTEGRATION OF INTEGRATED ANALYSIS FINDINGS

The matrix presented as Table 2 lists the priority areas concerning drug management which have an impact on drug use at the puskesmas. This matrix can be expanded when the matrix for management and policy issues is complete. At present, the matrix includes priority areas, findings in those areas, the research questions that arise from the findings, possible interventions and possible evaluation criteria. The interventions and the evaluation criteria comprise an initial working list. This list must be expanded and refined.

One area listed in this matrix that was not discussed in Chapter 2 is the "organization" of the puskesmas. Anecdotal information suggests that there is financial pressure on the puskesmas to collect fees from patients. The fees at the puskesmas may often be the second or third largest source of income for the local government. If this is so, health center staff may feel pressure to give patients what they request out of fear that alienating the patients would mean reduced revenues. This aspect should be explored further.

C. INTEGRATION OF DUS FINDINGS

Table 3 is a continuation of the matrix of priority areas with an emphasis on areas identified in the DUS. The same format is used: findings, research questions, possible interventions and possible evaluation criteria. The research questions concern both providers and patients.

Other areas which were added are diagnosis, dispensing and patient compliance. None of these areas was covered by the DUS or the other FAs. The following does not review all of the research questions in these areas, since these are available in other documents concerning the KAP Study, but focuses on DUS findings with direct relevance to these areas.

1. DIAGNOSIS

The prescribing behavior observed in the DUS suggests a large amount of diagnostic insecurity among prescribers. Since paramedics do not receive formal education in diagnosis, they probably lack basic knowledge about diagnosing. In order to affect change in prescribing behavior, diagnostic confidence will have to improve. For example, paramedics will have to be able to distinguish mild ARI (for which antibiotics are not needed) from moderate or severe ARI (for which antibiotics are needed) in order to change current patterns of antibiotic use for ARI. At present, almost all cases are treated with antibiotics "just in case." Information about current diagnostic practices is needed to design interventions to increase confidence and change practices.

2. DISPENSING

The main question raised by the DUS in relation to dispensing is whether dispensers change prescriptions if stocks are low or a drug is out of stock. Anecdotal information suggests this may happen regularly.

3. PATIENT COMPLIANCE

To complement and expand DUS findings, more information is needed regarding whether patients return to renew their prescriptions after three days. Some information was collected on return visits in the DUS, but the data available on the medical records were not sufficient to obtain a clear picture. Information on whether or not patients use other private pharmacies to purchase their drugs would also give a clearer idea of options available when drugs are out of stock.

D. FOCUS GROUP DISCUSSIONS

As part of the DUS, FGDs were organized in three study provinces with doctors and paramedics by Dr Amal, an FGD specialist from the School of Public Health, University of Indonesia. The areas chosen for the FGDs were Gresik in East Java, Tana Toraja in South Sulawesi and Balikpapan in East Kalimantan. These FGDs had a dual purpose:

- Collect information on factors affecting prescribing behavior among providers, and
- Assess the usefulness of FGDs for obtaining information on the use of drugs from doctors and paramedics.

The following discussion is based on a meeting between the consultant and Dr Amal. The principal purpose of the meeting was to review the usefulness of the FGDs for the KAP Study. However, Dr Amal also presented some preliminary findings from the discussions. The final results of the FGDs will be included in the DUS final report.

Overall, Dr Amal reported that the FGDs constituted a rich source of information about doctors' and paramedics' views on drug prescribing and drug policy in Indonesia. Dr Amal gave the following comments about using this tool for data collection and suggested using the FGD again in the KAP Study.

1. GENERAL SUGGESTIONS AND COMMENTS

- The FGD is a good tool for collecting information, but the range of data collected can vary greatly depending on the circumstances and the individuals involved. In Tana Toraja, for example, the Dokabu insisted on participating in the FGD. His presence made it unlikely that the doctors/paramedics would comment freely on local policies. Another example given by Dr Amal was including specialists from hospitals with puskesmas doctors. In certain areas, the specialists arrange informal training courses for the puskesmas doctors. It is difficult to get the puskesmas doctors to speak openly about subjects that are covered in the training sessions and the specialists tend to dominate the conversation.
- The FGD is not the best tool for collecting information on individual knowledge, since those who know the answers to the questions tend to respond.
- The FGD would be most effective if the topics for discussion were limited. Out of 10 points on a guideline, only about 6 are discussed in depth. Questions about training and background

take the most time and provide the least interesting information, because the answers to these questions do not vary much among respondents. Since generic drugs are a controversial subject, this subject took up a significant amount of time. Sessions could be divided into topics concerning drug policy and management.

- The moderator for the FGDs should have basic data from the kecamatan relating to the points to be discussed, such as Oralit use, antibiotic use, etc. For example, in the FGDS, respondents claimed to always give Oralit to patients with diarrhea, but data from the DUS show that Oralit was given to less than half the patients. To probe deeper, the moderator needs to understand and be able to document actual behavior in the region.
- The FGDs would be useful for probing behavior patterns. Once the intervention areas and specific interventions are drafted, these could be explored further in an FGD session (e.g., resistance to not using antibiotics for diarrhea or mild ARI).
- The FGDs are a good forum for identifying regional innovations for changing drug use and management. For example, Balikpapan has developed a program to improve drug use and management. These regional initiatives should be explored in more depth.

2. SPECIFIC SUGGESTIONS

- Smaller groups would be better: six to seven for puskesmas doctors and paramedics, four to five for specialists.
- Specialists should be separated from puskesmas doctors. Sessions with specialists should be shorter (one hour instead of two).
- Respondents should be chosen based on location: remote, urban (Kodya) and rural. It is acceptable to have fewer representatives from urban areas because their experiences tend to be similar. However, it is not useful to have doctors from the same unit.

3. FACTORS INFLUENCING PRESCRIBING: HIGHLIGHTS FOR THE FGDs

- Providers feel constrained by the supply of drugs in the puskesmas. The monthly delivery of drugs only lasts for two weeks. Their prescribing behavior must take into account the insufficiency of supply. The prescribers realize they are not giving therapeutic doses of drugs, but they see no alternative.
- Patients have a large impact on prescribing. The providers feel they cannot send a patient away empty-handed. Patients have clear concepts of "good drugs" based on appearance (e.g., yellow capsules) or packaging.
- Providers feel constrained by regulations that are not useful. In Gresik, one of the criteria for ranking puskesmas is the quantity of Oralit used. Forty percent of patients are supposed to receive Oralit. However, providers complain that there are too few cases of diarrhea to fill this quota and that they are required to give Oralit to non-diarrhea cases if they want to preserve the rank of their puskesmas. This is an example of how having additional knowledge about Oralit use in Gresik would have been useful. (In 1987-88, only 36 percent of diarrhea cases received Oralit, far from the 100 percent claimed by the providers. However, the new regulation may have influenced behavior since 1988.)

- **Generic drugs, essential drugs, Impres drugs** There is a lot of confusion over the definition of generic and essential drugs Only 1 doctor out of 30 participating in the FGDs could explain the difference between these concepts Providers, especially doctors, have many specific opinions about the quality and pricing of generic drugs

In the puskesmas, generic drugs have created a problem To patients they represent yet another category of drugs because they have a logo (*berlogo*) and therefore are considered better than the Impres drugs For example, in Trisulfa, the Impres tablet is white with no markings while the generic drug is marked "TS" This illustrates the importance that patients place on the appearance of drugs in assessing their value

- **Providers claim to understand the proper use of antibiotics** However, they also partially defend the prophylactic use of antibiotics Many providers felt that conditions in Indonesia justified giving antibiotics, even in cases in which they were not necessary, to protect patients from possible infection

4. CONCLUSIONS

Focused Group Discussions are a useful tool for the KAP Study The CCS should meet with Dr Amal for a complete briefing on the discussions Emphasis should be placed on building on the information already collected The FGDs will be most useful for identifying resistance to change in areas for which the project will be designing interventions, such as antibiotic use for acute diarrhea and mild ARI, Oralit use for diarrhea, injections, etc

E. METHODOLOGICAL SUGGESTIONS

The principal methodological suggestion arises from the variability of characteristics and behaviors observed among the puskesmas in the DUS Table 4 presents general prescribing patterns for all 18 puskesmas and puskesmas pembantu Behavior patterns which vary are the percent of patients that are treated by doctors, the percent of patients who receive injections, representation of the under-five population, and cost There is some variation in relation to antibiotic use, but these differences are not as striking

1 Why do doctors see a higher percentage of patients in certain areas?

The percent of patients treated by doctors varies from a high of about 60 percent in Getengan and Tapus to 12 percent in Bonjol and 16 percent in Ampenan (The puskesmas pembantu are staffed by paramedics and are not included in this discussion) Does this difference reflect the presence of two doctors at the puskesmas, a different organizational structure, a committed doctor or reduced administrative work?

2 Why do certain puskesmas use almost no injections?

In Getengan and Tana Toraja, only 2 percent of children under five years of age received injections, whereas four out of five children under five years who went to puskesmas Rejoso in Pasuruan were given injections In Balikpapan, injection use was also very low (1 percent and 6 percent for children under five in the two sampled puskesmas) Anecdotal information from the enumerators gives initial responses to these questions In Tana Toraja, a patient died from a shock reaction to an injection, which frightened the paramedics and the community In Bonjol, where no children under five years and only 3 percent of children five years and older received injections, the doctor

was assisted by SMA (high school) students at the puskesmas and not by paramedics. Since these students did not have medical training, they may have been instructed not to give injections. The Bonjol doctor was also trying to reduce injection use and he may have had a policy restricting injection use in his puskesmas. Issues that need to be addressed include

- Does the puskesmas have an explicit anti-injection policy?
- Did supply influence the decision not to use injections?
- How do the paramedics/doctors respond to the patients who request injections?
- Are other drugs substituted for injections?

3 Why is the representation of under-fives low in certain areas?

The percent of children under five years varies from a low of 1 out of 325 cases sampled in Jumpandang Baru in Ujung Pandang to 32 percent in Bulongan. Other lows are 10 percent in Cerme and 11 percent in Sigompul. This variation is most likely related to other services available in the area. (This appears to be the case in Ujung Pandang.) It would be useful to know more about the interaction between private and public services for the children under five years.

Looking at variations among puskesmas has many potential benefits. First, if some doctors or paramedics have developed policies to correct prescribing problems (such as injection use) these could be used in the design of interventions. Second, this analysis could provide a context for studying the impact of structural change on behavior (e.g., a policy regarding injections when the supply is limited). Third, this analysis can be used for choosing intervention sites. Areas with a very low representation of children under five at public health centers would not be good choices for intervention sites since many interventions target this age group. Additionally, if a puskesmas already gives almost no injections, it would not be a useful site for testing an intervention to reduce injection use.

The problem with this approach is that the DUS data date from 1987-88. Many puskesmas doctors rotate and may not be available for discussion. Moreover, policies and supply problems may change over time. However, the paramedics do not change positions as frequently as doctors and could help answer questions about these years.

A second methodological suggestion is to use the enumerators from the DUS to gather further information about the puskesmas. The enumerators spent over two weeks in each kecamatan and had ample time to meet with staff at the puskesmas and hospitals. They would be a good resource for answering some of the questions about specific puskesmas arising from the DUS analysis, and giving descriptions of the management and organization of the puskesmas for choosing intervention sites.

F. RECOMMENDATIONS FOR INTERVENTION AND EVALUATION STRATEGY

This report has stressed the necessity of designing an intervention and evaluation strategy so that the KAP Study can be utilized effectively to achieve project goals. The following presents a possible evaluation strategy for interventions in drug use in puskesmas (hospitals not included). This design assumes a pilot phase of one year in which packages of interventions could be tested and evaluated. At the end of this period, these intervention packages could be modified and implemented over a larger area.

This strategy builds on the principles elaborated by Mr Ross-Degnan in his report, *Strategy for Evaluation of the HSF/P and Progress of the Focused Assessments* (Report No 27) The evaluation uses a pre-post design, although process indicators or certain time series data could be collected as well In a pre-post design, baseline data on key indicators of behavior, knowledge and attitudes are collected before interventions are implemented The same data are collected in a post-intervention study done after the implementation period These indicators are compared in order to analyze the impact of the interventions A comparison site ("control") where no interventions are implemented will be included in the study in order to determine whether observed changes are due to the impact of interventions or other environmental factors

This strategy chooses to evaluate the interventions at the kabupaten level because

- Drug ordering is done at this level,
- Interventions could be evaluated throughout the kabupaten Since a kabupaten includes 20 - 30 health centers, kabupaten-wide change could be studied,
- The kabupaten would be a logical geographical and administrative unit for intervention packages in drug use and management, and
- The kabupaten chosen from a single province would share characteristics that would make them more easily comparable

Mr Ross-Degnan suggested using both kabupaten and provincial levels The provincial level may be too large for this evaluation However, this point should be discussed before a design is finalized

This intervention and evaluation strategy covers a one-year period for interventions in drug use (the yearly drug ordering period) Drug management interventions will also be done in these areas However, because drugs are only ordered once a year, a one-year period may be insufficient to measure the impact of interventions in management Because of this timing incompatibility, this design focuses primarily on use The ways in which interventions in drug management and use will be linked must be clearly specified before this design can be used

This design evaluates intervention packages and not individual interventions Mr Ross-Degnan proposes the possibility of trials for individual interventions if time and resources are available Unfortunately, this ideal will probably not be feasible because of time limitations The packages discussed in this strategy include the following

- Management Training is a package of interventions aimed at individuals involved in the management of drugs This package is not incorporated into the evaluation design described below, however, management interventions must be done simultaneously with use interventions in order for the interventions to be sustainable
- Training in the Use of Drugs is directed at the staff of the puskesmas, focusing on standard treatment protocols and drug policies
- Social Marketing interventions are aimed at patients and puskesmas staff to increase knowledge and change behavior in drug use

1. EVALUATION DESIGN

The evaluation design is presented in Table 5. This design evaluates two principal packages. It evaluates the impact of training interventions and the impact of training interventions accompanied and reinforced by social marketing interventions. This design is based on two assumptions:

- There can be no useful interventions to change the use of drugs without training puskesmas staff. Therefore, testing the social marketing interventions alone would not be useful.
- It is important to look at the contribution of social marketing interventions to training packages. The social marketing package may be more complex and will be an added expense to the kabupaten. An evaluation of its impact would be necessary to underscore its importance.

Three kabupaten from within one province are chosen: one for training intervention only, one for training intervention plus social marketing intervention, and one for comparison. The interventions should be evaluated in at least two provinces. Approximately 20-30 puskesmas are found in one kabupaten. The kabupaten should be randomly assigned to each of the three sites, but attempts should be made to ensure similarities in key characteristics (e.g., populations and pharmacies, urbanization, ethnic composition, literacy, morbidity profiles).

A last element to consider is the supply of drugs. As mentioned above, drug management interventions will be implemented in these areas as well. However, since the impact will not be immediate, attention to supply at puskesmas is necessary, since there is a danger that interventions will be hindered by an insufficient supply of appropriate drugs. The importance and cost of ensuring supply will have to be evaluated before this design is finalized. The information from the KAP Study will be essential for evaluating the link between use and supply, especially for those drugs most effected by interventions.

2. EVALUATION OF THE IMPACT OF INTERVENTIONS

Many different tools can be used to evaluate the impact of these interventions. These are also presented in Table 5. Sample sizes cannot be estimated until evaluation criteria are elaborated. The KAP Study could be used to collect some of the baseline information described below (especially the interviews and observations).

R_x Prescription Software will be the principal tool for evaluating impact. The prescription audit provides information on prescribing behavior. Since behavior is what the project aims to change, these data will best illustrate the impact of interventions.

The R_x audits should be limited in order to obtain sufficient sample sizes of under-fives and those health problems central to the interventions. (In a total audit, for example, 325 randomly selected cases yielded fewer than 10 children under 5 years of age with diarrhea.) One suggestion presented in this scheme would be to focus on diarrhea and ARI with only one total audit within the kabupaten.

Interviews with health staff would provide information on their knowledge and attitudes. All providers and dispensers in the puskesmas within the kabupaten could be interviewed. These interviews would explore changes in knowledge and attitudes resulting from the interventions.

Interviews should be conducted with patients in the puskesmas about their knowledge and attitudes towards drugs. The impact of interventions on patients' knowledge, attitudes and behavior could be explored. Patients will be randomly selected from kabupaten puskesmas.

If training focuses on diagnosing behavior, observations of patient/provider interactions would be an effective method for examining key indicators of correct diagnosing practices (e.g., physical examinations given, etc.). See Mr. Ross-Degnan's observation instruments for an example of information that could be collected.

When this design was presented at the debriefing session with members of the POM team and ISTI staff in Jakarta, several important questions were raised. All these questions need to be answered before development of a design such as this one can proceed.

- **Management versus Use** Is it really possible to separate interventions in management and use? Would these management interventions be done in the comparison site?
- **Where should interventions that do not clearly fit into "training" or "SMS" packages be placed, particularly interventions that change management in the puskesmas (e.g., better recording systems, periodic prescription audits, more supervision by doctors, better labeling on drugs)?** Should these be included in a separate package or incorporated into the training or SMS package?
- **How can supply to support interventions be ensured without these additional drugs becoming part of the intervention?**
- **What process indicators should be used?** Since the training process, in particular, will be ongoing over the implementation period, there should be process indicators (e.g., a midterm review or periodic audits) to evaluate its success and allow for modifications.
- **Should there be pre-intervention trials or assessment of feasibility?**

Table 1
Priority Areas for Intervention in Drug Use
by Relevance to Project Objectives

Priority Area	Rational Prescribing	Resource Reallocation
1 Diarrhea	<ul style="list-style-type: none"> - leading cause of morbidity, especially for under 5 yrs. prevalence 158 9/1000 < 5 yrs. 505/1000 > 5+ yrs. - current practices are irrational UNDER FIVES (for acute diarrhea) <ul style="list-style-type: none"> ■ 46% receive oralit ■ 73% receive oral antibiotic ■ 26% receive antibiotic injection ■ there is frequent use of antidiarrheal combination 	<ul style="list-style-type: none"> - represents 13.3% cost for < 5 yrs 7.3% of total cost - antibiotics are two-thirds of cost - By using standard protocols <ul style="list-style-type: none"> ■ reduce cost slightly ■ reallocate resources towards ORS, child survival pharmacies
2. ARI	<ul style="list-style-type: none"> - leading cause of morbidity prevalence 420 5/1000 < 5 202 7/1000 5+ - current practices irrational <ul style="list-style-type: none"> ■ antibiotics frequently used for mild ARI. 86% < 5 yrs 71.5% 5+ yrs. 	<ul style="list-style-type: none"> - 28% of total cost - 46.8% of cost < 5 yrs. - significant savings result from use of standard treatment protocols for mild ARI <ul style="list-style-type: none"> ■ < 5 yrs actual cost 4 X standard treatment cost ■ 5+ yrs actual cost 2 1/2 X standard treatment cost
3 Skin Disease	<ul style="list-style-type: none"> - leading health problem prevalence 176 9/1000 < 5 yrs. 71.5% 5+ yrs 	<ul style="list-style-type: none"> - 12.6% cost for <5 yrs - 13.8% cost for 5+ yrs
4 Parasitic Diseases	<ul style="list-style-type: none"> - priority as child survival issue 	<ul style="list-style-type: none"> - information not available
5 Antibiotic Use	<ul style="list-style-type: none"> - antibiotic use widespread 83% of all < 5 yrs 59% of 5+ yrs - antibiotics used in subtherapeutic doses 	<ul style="list-style-type: none"> - antibiotics 50% of total drug cost
6 Injection Use	<ul style="list-style-type: none"> - widespread infection use 43% < 5 yrs 55% 5+ yrs 	
7 Polypharmacy Use of Expensive Drugs	<ul style="list-style-type: none"> - polypharmacy affects patient 	<p>polypharmacy and use of expensive drugs has an impact on expenditures</p>

Table 2
Factors Influencing the Rational Use of Drugs at Health Unit
Priority Areas in Management

Factor	Findings from FA	Research Questions from FA	Possible Intervention	Possible Evaluation Criteria
1 SUPPLY (DMS)	Stockouts are frequent Supply is inadequate Delivery is not systematic	PROVIDERS <ul style="list-style-type: none"> ■ Information on the impact of supply on prescribing, especially when key drugs <ul style="list-style-type: none"> - out of stock at low stock levels - at high stock levels PATIENTS <ul style="list-style-type: none"> ■ What are other sources of drugs when supply is low/out at Puskesmas DISPENSERS <ul style="list-style-type: none"> ■ Procedures when supply is low/out 	see MANAGEMENT MATRIX	
2 MANPOWER (MPS & DUS)	Doctors occupied by administration Paramedics do most prescribing <ul style="list-style-type: none"> - % in Puskesmas - 99% in 	PROVIDERS <ul style="list-style-type: none"> ■ Evaluation of adequacy of training ■ Identification of existing on-job training ■ Description of task division in health unit 	<ul style="list-style-type: none"> ■ reorganize distribution of tasks ■ improve referral to doctor ■ improve supervision of paramedics ■ restrict prescription of certain drugs to doctors only (?) 	<ul style="list-style-type: none"> % patient seen by doctor % of certain diseases seen by doctor % paramedics receive on-job training
3 ORGANIZATION/ BUDGET (Not covered by FA)	Financial pressure of health unit (revenue from PKM as % of local budget)	PROVIDERS <ul style="list-style-type: none"> ■ Information on financial pressure ■ Attitudes about financial pressure 		
4 POLICY (ADSP and AGD) (Impact on Puskesmas/RS not covered in FA)	Reference books not available in health units <ul style="list-style-type: none"> - Policy not understood by doctors or paramedics esp drug policies - Paramedics don't have access to materials sent to doctors 	PROVIDERS <ul style="list-style-type: none"> ■ Information on reference sources ■ Knowledge of policies & standards re drugs, ARI, diarrhea ■ Use of reference sources ■ Attitudes about policies & standards PATIENTS <ul style="list-style-type: none"> ■ Knowledge of policies and standards ■ Attitudes about policies/standards 	<ul style="list-style-type: none"> ■ increase access to reference sources ■ train health personnel on MOH policies ■ training on standard therapy ■ improvement of reference books (geared to paramedics) 	<ul style="list-style-type: none"> % Puskesmas with reference books % Providers who know DOEN, or standard therapy Diarrhea, ARI

Table 3

Priority Areas Behavior	Findings from FA	Research Questions from FA	Possible Intervention	Possible Evaluation Criteria
5 TREATMENT OF DIARRHEA (DUS)	Treatment of Diarrhea does not correspond with standard treatment <ul style="list-style-type: none"> ORs use Antibiotics Anti-diarrheals 	PROVIDERS <ul style="list-style-type: none"> Knowledge of Standard Treatment Attitudes about standard treatment Attitudes about treating diarrheal disease Rationale for not prescribing ORS Rationale for prescribing antibiotics PATIENTS <ul style="list-style-type: none"> Knowledge of condition Knowledge of treatment of diarrhea Expectations for treatment 	<ul style="list-style-type: none"> Training in standard treatment Improving diagnostic skills Prescription audits for diarrhea (participation of providers) development of communication material for patients about (CDD messages) <ul style="list-style-type: none"> recognition of diarrhea treatment of diarrhea 	<ul style="list-style-type: none"> % cases of diarrhea receive ORS % cases of diarrhea receive antibiotics % providers know standard treatment % providers know symptoms of dehydration % patients know symptoms of dehydration % patients know correct use ORS
6 TREATMENT OF ARI (DUS)	Treatment of ARI does not correspond with standard treatment <ul style="list-style-type: none"> antibiotic use symptomatic/expensive drugs 	PROVIDERS <ul style="list-style-type: none"> Knowledge of Standard Treatment Attitudes about standard treatment Attitudes about treating ARI Rationale for prescribing antibiotics PATIENT <ul style="list-style-type: none"> Knowledge of condition Knowledge of treatment of ARI Expectations for treatment 	<ul style="list-style-type: none"> Training in standard treatment Improving diagnostic skills Prescription audits for ARI (participation of providers) development of communication material for patients about. (CDC messages) <ul style="list-style-type: none"> recognition of ARI treatment of ARI 	<ul style="list-style-type: none"> % cases of ARI receive antibiotics % cases of ARI receive antitussives % providers know standard treatment % patients know
7 ANTIBIOTIC USE (DUS)	Antibiotic use is not rational <ul style="list-style-type: none"> antibiotics are overprescribed relative to need antibiotics are prescribed in sub-therapeutic doses 	PROVIDERS <ul style="list-style-type: none"> knowledge about antibiotics Attitudes about antibiotics Rationale for using antibiotics PATIENTS <ul style="list-style-type: none"> Knowledge about antibiotics Attitudes about antibiotics 	<ul style="list-style-type: none"> training in use of antibiotics prescription audits for antibiotic use requiring justification for prescribing antibiotics for certain cases communications material about antibiotics 	<ul style="list-style-type: none"> % cases receive antibiotics % antibiotics total drug cost % cases receive therapeutic doses of antibiotics
8 INJECTION USE (DUS)	Injection use is not rational <ul style="list-style-type: none"> injections are over used 	PROVIDERS <ul style="list-style-type: none"> Knowledge about injections Attitudes about injections 	<ul style="list-style-type: none"> training in use of injections prescription audits for injection use requiring justification for prescribing 	<ul style="list-style-type: none"> % cases receive injections % patients who request injections??

9 DIAGNOSING (not covered by FA)	- diagnostic insecurity	PROVIDERS <ul style="list-style-type: none"> ■ Measurement of diagnostic skills ■ Description of practices 	<ul style="list-style-type: none"> ■ training in diagnosing diarrhea and ARI 	<ul style="list-style-type: none"> ■ time with patient ■ completeness of physical exam <ul style="list-style-type: none"> - temperature - respiratory rate - use of stethoscope ■ questions asked policies
10 DISPENSING (not covered by FA)		<ul style="list-style-type: none"> ■ do dispenses alter prescription if drug low/out of stock? GENERAL <ul style="list-style-type: none"> ■ description of dispensing practices/ dispenses knowledge 	<ul style="list-style-type: none"> ■ better labelling for drug ■ explanations to patients 	<ul style="list-style-type: none"> % patients who understand how to use drugs % patients who can explain packing symbols - explanations given to patients
11 PATIENT COMPLIANCE (not covered by FA)		<ul style="list-style-type: none"> ■ do patient refill prescriptions after 3 days? ■ use of other pharmacies? GENERAL (sec protocols for SMS & KAP) <ul style="list-style-type: none"> - description of patient compliance 	<ul style="list-style-type: none"> ■ better explanations about how to use drugs ■ full course treatments not needing refill ■ fewer drugs ■ clearer labelling of drugs 	<ul style="list-style-type: none"> % patient correctly use medicine

Table 4
Comparison of Health Center Case Characteristics and Prescription Patterns
6 Provinces in Indonesia, 1987-88

Province Health Center Kabupaten	Total Cases	% Female	% Under 5	% Non Doctor	% PHB	Avg Drugs/ Case	% 4 or more Drugs	% Receiving Injections		% Receiving Antibiotics		Avg Cost Case
								<5	≥5	<5	≥5	
TOTAL CASES	5836	52	20	76	20	3.5	49.7	43	55	82	58	541
SUMATERA UTARA												
TAPANULI UTARA												
1 Sigompul	325	45	11	69	19	3.4	46.8	46	40	86	58	519
2 Porsea	325	38	31	43	7	3.5	47.4	19	35	74	64	644
SUMATER BARAT												
PASAMAN												
3 Bonjol	316	57	12	88	35	3.7	60.6	0	3	97	65	746
4 Tapus	325	58	25	40	31	4.3	88.6	44	22	94	67	599
5 P.P. Tapus	325	54	24	99	8	4.3	90.2	61	98	92	63	399
SULAWESI SELATAN												
UJUNG PANDANT												
6 Jumpang Baru	325	55	0	46	27	3.7	59.1	0	72	100	64	504
TANA TORAJA												
7 Getengan	322	45	20	38	35	3.3	36.3	2	32	71	51	1065
8 P.P. Getengan	324	53	19	99	3	2.6	17.9	10	12	63	54	514
JAWA TIMUR												
GRESIK												
9 Cerme	325	46	10	70	28	3.3	39.7	39	45	94	58	1026
10 P.P. Cerme	325	63	21	100	2	3.6	54.8	68	72	93	70	806
PASURUAN												
11 Grats	325	54	21	69	29	3.9	70.8	84	80	87	57	519
12. Rejoso	325	47	23	66	19	3.0	22.5	88	80	81	69	382
NTB												
LOMBOK Barat												
13 Gerung	325	58	30	94	21	3.7	60.3	64	88	60	46	398
14 Ampenan	325	51	20	82	70	3.4	50.2	58	79	68	41	320
KALIMANTAN TIMUR												
BALIKPAPAN												
15 Manggar	325	51	25	73	6	3.6	44.3	54	65	83	56	308
16 P.P. Manggar	325	60	18	100	1	3.5	46.8	81	94	93	55	332
BULONGAN												
17 Mawburungan	325	54	16	93	10	3.0	23.4	0	10	88	53	310
18 Krg. Rejo	325	45	32	47	16	3.1	35.1	5	8	93	49	360

Table 5

INTERVENTION & EVALUATION SITES	PROVINCE No 1			PROVINCE No 2		
	Training	Training + SMS	Comparison	Training	Training + SMS	Comparison
Number of Kabupaten	1	1	1	1	1	1
Number of Puskesmas (approx)	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30
Doctors (approx)	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30
Number of Paramedics (approx)	50 - 80	50 - 80	50 - 80	50 - 80	50 - 80	50 - 80
EVALUATION TOOLS						
Rx Audit for Diarrhea and ARI - 50 cases per puskesmas(?)	?	?	?	?	?	?
Total Rx Audit. 325 cases - in 1 puskesmas only	325 cases	325 cases	325 cases	325 cases	325 cases	325 cases
Interview with doctors - all in kabupaten	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30
Interview with paramedics - all in kabupaten	50 - 80	50 - 80	50 - 80	50 - 80	50 - 80	50 - 80
Interview with patients - 25 per puskesmas(?)	?	?	?	?	?	?
Observations of (25 per pkm)						
Doctor - patient (?)	?	?	?	?	?	?
Paramedic - patient (?)	?	?	?	?	?	?
Dispenser - patient (?)	?	?	?	?	?	?

Sample sizes need to be calculated based on evaluation criteria and number of pkm included in evaluation