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Analysis Of Drug Logistics Planning Management In Community Health Centers New Pakuan Of Jambi City

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Abstract

Drug logistics planning in primary healthcare centers remains a major challenge in ensuring medicine availability and continuity of health services. Inadequate planning often leads to stockouts, overstock, and mismatches between drug supply and patient needs. This study aimed to analyze the implementation of drug logistics planning management at Pakuan Baru Public Health Center, Jambi City. This research used a qualitative observational design with a case study approach. The population consisted of all personnel involved in drug logistics planning, while seven informants were selected using purposive sampling. Data were collected through semi-structured interviews, observation checklists, and document review of LPLPO, stock cards, and planning reports. Data analysis employed the Miles and Huberman model through data reduction, data display, and conclusion drawing with triangulation techniques. The results showed that drug planning was conducted through stages of drug selection, consumption compilation, calculation of drug needs, projection, and procurement adjustment based on LPLPO data, National Formulary, and consumption methods. However, several obstacles were identified, including distribution delays, mismatches between proposed and received drugs, limited budgets, and recurring stock shortages. In conclusion, drug logistics planning management at the health center has generally followed national guidelines, but improvements in data based planning, distribution systems, and monitoring are still required to optimize drug availability and service continuity.

Keywords: Drug Logistics, Health Service, Pharmaceutical Management, Primary Health Care, Public Health Center.

INTRODUCTION

Healthcare is a basic need that must be guaranteed by the state through an effective system in primary health facilities such as Community Health Centers (Puskesmas) in Indonesia, which play a key role in promotive, preventive, curative, and rehabilitative care (Permatasari et al., 2020; Yuliani et al., 2022). Globally, drug logistics in primary health centers in developing countries remains problematic, with stockouts reaching 40-60 percent and wastage of expired drugs, as reported in a 2021-2025 review emphasizing data-driven planning for Universal Health Coverage (Abera et al., 2021; McNerney et al., 2025). Nationally, the availability of essential drugs in Community Health Centers (Puskesmas) was only 70-80 percent in 2023-2025, driven by post-pandemic fluctuations (Latifah et al., 2025; Namelia & Yasli, 2024).

In Jambi City, inpatient community health centers like Pakuan Baru experienced repeated shortages of essential medications (azithromycin, vitamin D) between September and November 2025, and ibuprofen overstocks were at risk of expiring, with a heavy reliance on the City Pharmacy (Latifah et al., 2025; Octaviani et al., 2025). This phenomenon disrupted 24-hour service and public trust, with patient visits increasing by 15–20 percent due to chronic illnesses (Yuliani et al., 2022; Zhuhriano et al., 2024).

Previous research has shown that drug logistics planning at community health centers (Puskesmas) involves selection, compilation, calculation, projection, and adjustment based on Ministerial Regulation 1121/2008, but the consumption method alone leads to duplication and shortages (Permatasari et al., 2020; Yuliani et al., 2022). At the Cikulur and Kampar Kiri Community Health Centers, discrepancies between SOPs and suboptimal forecasts led to stockouts and overstocks, despite routine LPLPO recording (Permatasari et al., 2020; Namelia & Yasli, 2024).

Latifah et al.'s (2025) study in Paal Merah II Jambi confirmed that previous year's visit projections failed to anticipate unplanned items, achieving only 75-80 percent accuracy despite an 18-month buffer, but lacking in-depth insight into inpatient dynamics (Latifah et al., 2025; Octaviani et

al., 2025). The limitations of a single descriptive and qualitative approach limit generalizability to volatile contexts like Pakuan Baru (Yuliani et al., 2022; Zhuhriano et al., 2024).

The research gap lies in the lack of a comprehensive analysis of the planning process at Jambi's inpatient community health centers, which have high monthly requests. Therefore, the problem statement is: How is drug logistics planning implemented at the Pakuan Baru Community Health Center in Jambi City? (Latifah et al., 2025; Abera et al., 2021).

This study aims to analyze the implementation of general and specific drug logistics planning (selection, compilation, calculation, projection, and adjustment) at the Pakuan Baru Community Health Center. The urgency arises from the 2025-2026 service load and stock imbalance, while the novelty of the underexplored process-specific focus on inpatient care contributes theoretically to the Jambi primary logistics literature and provides practical recommendations for the Health Office and community health centers (Permatasari et al., 2020; McNerney et al., 2025).

RESEARCH METHODS

This study employed a qualitative design with an observational approach complemented by supporting quantitative data to explore the drug logistics planning process in depth at the Pakuan Baru Community Health Center in Jambi City. This approach enabled the researcher to act as a key instrument in capturing field dynamics through contextual narratives, in accordance with the principles of qualitative research that emphasize the description of social phenomena without dominant statistical procedures (Sugiyono, 2021; Creswell & Poth, 2023). A single case study was chosen because it is relevant for analyzing complex processes in primary healthcare facilities, as evidenced by recent drug logistics research (Namelia & Yasli, 2024; Latifah et al., 2025).

The study population included all personnel involved in drug logistics planning at the Pakuan Baru Community Health Center. Seven key informants were selected using purposive sampling: one head of the community health center (key informant), two pharmacists and their assistants (key informants), and four supporting staff (warehouse head, doctor, administration head, and head of the Health Office Pharmacy Installation). This selection was based on their direct involvement and expertise in the stages of drug selection, compilation, calculation, projection, and procurement adjustment, ensuring qualitative data saturation (Sudaryono, 2022; Emzir, 2023). Inclusion criteria included a minimum of one year of experience, while exclusion criteria applied to non-relevant staff to focus on replicability (Yuliani et al., 2022; Permatasari et al., 2020).

The main instruments were a semi-structured interview guide, an observation checklist, and a document review matrix, validated through initial triangulation and pilot testing on similar documents. Indicators included drug selection data sources (DOEN/Fornas), monthly usage recaps, calculation methods (consumption/epidemiology), 18-month buffer stock projections, and ABC/VEN adjustments. Reliability was maintained through audio recordings and field notes (Sugiyono, 2021; Braun & Clarke, 2022). Instrument validity was enhanced through member checking, in line with current qualitative standards (Namelia & Yasli, 2024).

The research procedure began with preparation (ethics and pilot permits), implementation (in-depth interviews per informant, two weeks of non-intrusive participant observation, and LPLPO/RKO document review), and post-collection (verbatim transcription). Primary data from interviews and observations were validated with secondary data such as the 2025 stock report, ensuring a replicable chronology (Emzir, 2023; Creswell & Poth, 2023).

Data analysis adopted the Miles et al. (2020) model with reduction (relevant data filtering), presentation (tabled narrative with quotations), and iterative conclusion drawing using content analysis. Triangulation of sources (different informants) and methods (interviews-observations-documents) strengthened validity, without any special software due to the manual narrative focus appropriate to the scale of the case study (Sudaryono, 2022; Braun & Clarke, 2022).

Ethical considerations included written informed consent from all informants, confidentiality via pseudonyms, and official permission from the Jambi City Health Office and the Community Health Center. The principles of beneficence, justice, and integrity were upheld through practical recommendations and risk minimization, with ethical clearance from the campus committee prior to fieldwork (Hansen et al., 2023; WHO, 2021).

RESULTS AND DISCUSSION

Informant Characteristics

Primary data collection in this study was conducted through in-depth interviews with informants directly involved in the drug logistics planning process at the Pakuan Baru Community Health Center. Furthermore, this research was supported by data from field observations and a review of documents related to drug logistics planning at the Pakuan Baru Community Health Center. In-depth interviews were conducted with seven informants with the following characteristics:

Table 1. Informant Characteristics

Informant Code	Gender	Age	Last education	Position	Informant's Statement
R56 (Inf-1)	Woman	56	Specialist	Head of Pakuan Baru Health Center	Key Informant
UD28 (Inf-2)	Woman	28	Pharmacist Profession	Pharmacist at Pakuan Baru Community Health Center	Key Informant
YW41 (Inf-3)	Woman	41	Bachelor of Pharmacy	Pharmacist Assistant	Key Informant
VO42 (Inf-4)	Woman	42	Pharmacist Profession	Warehouse Manager	Supporting Informant
RB43 (Inf-5)	Woman	43	Bachelor of Public Health	Head of Administration of Pakuan Baru Health Center	Supporting Informant
RN56 (Inf-6)	Woman	56	Medical Profession	General practitioners	Supporting Informant
MG46(Inf-7)	Woman	46	Master of Pharmacy	Head of Jambi City Pharmaceutical Installation	Supporting Informant

Drug Selection

Based on interviews, determining the quantity and type of medication at community health centers is generally done by reviewing drug usage data from the previous period. This data is usually obtained from the LPLPO report, then supplemented with data on the most common diseases, the number of patient visits, and remaining drug stock. In some cases, calculations are also based on average monthly drug usage and requests from medical personnel. This is evident from the following informant's answers:

"To determine the amount and type of medication, we usually look at previous periods' drug usage, especially from monthly reports such as the LPLPO." (Inf-1)
"...using a consumption method based on the previous year's drug usage as seen from the LPLPO report, data on the 10 most common diseases, and remaining drug stock." (Inf-2)
"...last year's usage was calculated from January to December and then divided by 12." (Inf-3)
"...based on previous drug use recorded in the LPLPO." (Inf-4)
"...using the average monthly usage of the previous year." (Inf-7)

Based on the interview results, the informant understood that the standard drugs that must be available at community health centers refer to the National Formulary (Fornas) or the formulary

established at the community health center. These drugs are mandatory as stipulated by the Ministry of Health. This is evident from the informant's response as follows:
"The standard drugs refer to the National Formulary." (Inf-1)
"...refer to the National Formulary or Community Health Center Formulary." (Inf-2)
"...it is mandatory because it is part of the Ministry of Health regulations in accordance with Fornas." (Inf-3)
"Based on Fornas standards." (Inf-4)
"We have a standard, namely the national formulary." (Inf-5)
"Fornas standards are definitely used because the RKO is sent to the Ministry of Health." (Inf-7)

Based on interviews, the match between planned medications and patient needs was generally quite good, but discrepancies still occurred. This was due to limited stock from the IFK, changing disease patterns, increasing patient numbers, and delays in drug distribution. As a result, some medications needed by patients were sometimes unavailable at the community health center. This was revealed based on the following informant's response:
"Generally, it's appropriate, but sometimes there are some medicines that haven't been met by the IFK." (Inf-1)
"...there are limited stocks, changing disease patterns, and delays in distribution." (Inf-2)
"...must adapt because diseases can change, so safety stock is needed." (Inf-3)
"There are often gaps because requests to IFK are not met." (Inf-4)
"It's appropriate." (Inf-5)
"There's something wrong... the patient bought it from outside because it was out of stock." (Inf-6)

From the document review, it was found that there were cases of discrepancies between patient drug requests and drug availability at the community health center.

Based on the interview results, the data used in drug logistics planning at the community health center includes the LPLPO (Large-Scale Drug List), monthly drug usage data, patient visit data, the 10 most common diseases, patient visit data, and drug stock and remaining stock. Additionally, guidelines such as the National Formulary and the RKO format from the Ministry of Health are used. This data serves as the primary basis for calculating drug needs for the following period. This is known from the informant's answers as follows:
"LPLPO report, drug usage data." (Inf-1)
"LPLPO, drug use, 10 most common diseases, patient visits, and drug stock." (Inf-2)
"Based on previous use." (Inf-3)
"Data on drug usage per month." (Inf-4)
"From LPLPO." (Inf-5)
"Based on monthly drug consumption." (Inf-6)
"Fornas, RKO format, treatment guidelines, and LPLPO." (Inf-7)

The document review also uncovered data on LPLPO (Large-Scale Drug Administration), remaining stock, monthly drug usage, and the most common diseases. However, data on population, health status by age group, and the number of drug items on the market were not found. Furthermore, data on the available drug budget was also missing.

Drug Usage Compilation

Based on interviews, the compilation of drug usage data at the community health center begins with the collection of drug usage reports from each service unit. This data is then summarized by pharmacists using sources such as the LPLPO (Large-Scale Inventory Management System), stock cards, prescriptions, and manual and EMR recording systems. Afterward, the total drug usage and remaining stock are summarized and analyzed to determine future drug needs. This is evident from the following informant responses:
"Usually it starts with collecting drug usage reports from each service unit and then summarizing them by the pharmacist." (Inf-1)
"...reports from general polyclinics, KIA, dental, stock cards, LPLPO, RME, then summarized by the pharmacy staff." (Inf-2)

"...from LPLPO we can see usage, receipts, and remaining stock to calculate needs." (Inf-3)
"...collecting LPLPO, stock cards, prescriptions, monthly usage recaps, and analyzing disease patterns and buffer stocks." (Inf-4)

Based on the interview results, information obtained from the drug usage compilation stage includes the amount of each drug used, the most and least used drugs, average monthly usage, usage in each service unit, and estimated drug needs for the next period. This information also helps to understand drug usage patterns and their compatibility with available stock. This is evident from the following informant's responses:

"The amount of use of each drug, the most and least used drugs, and the estimated future needs." (Inf-1)
"Number of drug use, disease patterns, compliance with stock, and estimated future needs." (Inf-2)
"Average drug usage." (Inf-3)
"Use of drugs." (Inf-4)
"Use of drugs that have been used." (Inf-5)
"Medication usage per month." (Inf-6)

Based on the interview results, all informants stated that the drug use compilation stage significantly influences the drug logistics planning process. If this stage is skipped, planning will not be based on accurate data, which can lead to inaccuracies in compiling drug requirements and even risking drug shortages or wastage. This is evident from the informants' answers as follows:

"It's very influential, because planning becomes less accurate if it's not based on usage data." (Inf-1)
"Planning becomes invalid and is based on estimates only." (Inf-2)
"It can be very influential if the calculations are not correct." (Inf-3)
"Influential in preventing waste and maintaining smooth service." (Inf-4)
"There could be a drug shortage." (Inf-5)
"Influence on planning." (Inf-6)

Based on these results, it can be concluded that the drug usage compilation stage is an important part of drug logistics planning because it is the main basis for producing accurate usage data to compile drug requirements at community health centers.

Calculation of Drug Needs

Based on in-depth interviews with informants, it was discovered that the community health center uses the consumption method to calculate medication needs. This method is a method of calculating medication based on previous use. This is consistent with the informant's response as follows:

"Community health centers typically use the consumption method, which is based on drug usage data from previous periods." (Inf-1)
"The method used by the community health center to calculate drug requirements is to use the consumption method based on drug usage data from the previous period,..." (Inf-2)
"The consumption method was used previously last year, but actually all of them are used, only the most frequent one was the previous use." (Inf-3)
"Here there is a method, namely the previous method of use which is often used." (Inf-4)

Based on interviews, document reviews, and observations, the calculation of medication needs, both in terms of type and quantity, was conducted using the consumption method. Data obtained at the Community Health Center included medication usage, remaining stock, and average medication usage.

Projection of Drug Needs

Based on interviews, informants understood drug demand projections as a way to estimate the quantity and type of drugs in the coming period to ensure services continue and avoid shortages. Furthermore, projections are used to prioritize needs and align them with the available budget.

The variety of informants' answers indicates differences in depth of understanding. Informants 1 and 4 emphasized prioritization and budget adjustments. Informant 2 provided a more comprehensive explanation, including the goal of maintaining drug availability, preventing stockouts

and overstocking, and considering previous disease patterns and consumption. Meanwhile, Informant 3 focused more on practical experience, specifically planning frequently used medications. This can be seen from the informant's answers as follows:

"As far as I understand, the drug needs projection estimates the drug needs for the next period to ensure uninterrupted services. With this projection, we can prioritize needs and adjust them within the available budget." (Inf-1)

"Drug demand projections are crucial in logistics planning, allowing us to estimate the quantity and type of drugs needed over a given period… to ensure availability, prevent shortages and overstocking, and adapt to disease patterns and past consumption." (Inf-2)

"What is certain is that we plan for those that are frequently used, for example paracetamol, vitamins..." (Inf-3)

"By prioritizing needs and adjusting needs to the available budget." (Inf-4)

Based on these results, it can be seen that the informant's understanding is already directed towards the projection function, but in practice it still tends to focus on previous drug use habits.

The process of projecting drug needs at community health centers involves collecting and analyzing data such as previous drug use, number of patient visits, disease patterns, and remaining stock. These calculations are generally performed by pharmacists, then adjusted against the budget and discussed with management to determine final drug needs for the following period.

The variety of informants' responses indicates that not all informants understand this process equally. Informants 1 and 2 were able to explain the process stages, from data collection and calculating needs using the consumption method to adjusting to budgets and policies. Meanwhile, Informant 3 stated that he or she had a poor understanding of the process. This is based on the following informant's response:

"Technically, this is usually done by pharmacists.... It usually starts by reviewing previous medication usage data, the number of patient visits, recurring disease patterns, and available stock. After calculating the needs, it's then discussed with management to align with budgetary capabilities and service needs." (Inf-1)

"The first step is usually data collection... then calculating needs based on average drug usage, then adjusting it to the budget and policies." (Inf-2)

"Yes, it is used, I don't really understand," (Inf-3)

Based on these results, it can be seen that the flow of drug needs projections has been running quite systematically, but is not yet understood evenly by all informants.

The data used by community health centers in the drug needs projection stage includes drug needs or drug requests, as well as available budgets. This data serves as the basis for determining the quantity and types of drugs planned for the following period. This is based on the following informant responses:

"Demand and budget data." (Inf-1)

"Data on the quantity and type of drugs in the calculation of drug needs and available budget." (Inf-2)

"Data on drug needs and available budget." (Inf-3)

From the document review conducted regarding the projection of drug needs at the Air Hitam Community Health Center, data was found on the final drug stock plan for the next period, data on the available drug budget was found but incomplete and data on the price list for basic health service drugs was found.

Adjustment of Drug Procurement Plan

Based on interviews, adjustments to drug procurement plans at community health centers are made after initial needs are established, then adjusted to reflect available budgets and field stock levels. These adjustments also take into account previous usage data and any drug shortages or surpluses. In certain situations, community health centers utilize other funding sources, such as the Regional Public Service Agency (BLUD), to meet short-term drug needs. This is evident from the following informant's responses:

"After the proposed needs are compiled, we then adjust them to the available budget and field stock levels. We assess which drugs are truly a priority..." (Inf-1)
"Looking at consumption data from previous periods, identify drug shortages or surpluses…adjust to the budget." (Inf-2)
"We have two funding sources... so we're proposing to use BLUD funds... we're buying stock for the next two or three months." (Inf-3)

ABC and VEN analyses are used to help prioritize medications during the adjustment process. ABC analysis is used to assess the value of medication use, while VEN analyses assess the importance of medications. The results are used as a basis for determining medication priority, especially when budgets are limited or stocks are insufficient. This is evident from the following informant responses:
"This analysis is used to see which drugs have high usage value and which are important or vital…" (Inf-1)
"ABC analysis is used to group drugs based on their usage value… then VEN is used to identify vital, essential, and non-essential drugs." (Inf-2)
"The application is based on usage because some drugs are always used, while others are used under certain conditions." (Inf-3)

The ABC and VEN methods are not always applied in detail in drug logistics planning, but are used in specific situations, such as during planning or when budget and inventory are limited. In practice, these methods can also be used in combination in the form of an ABC-VEN matrix to facilitate prioritization of drug needs. This is evident from the following informant responses:
"It is not always used in detail every time, but it is usually used when preparing annual plans…" (Inf-1)
"The application usually uses a combination of ABC VEN…" (Inf-2)
"With usage data then calculate ABC, classify, create ABC VEN matrix." (Inf-3)

From these results it can be seen that the ABC and VEN methods have been used in planning, but their implementation is still being adjusted to conditions and needs in the field.

Based on the field observations carried out, it was found that there were activities to adjust drug procurement plans carried out by the person responsible for drugs and the assistant pharmacist.

Fulfillment of Drug Needs at Community Health Centers

Based on the interview results, informants' opinions regarding the quantity and quality of medicines at the community health center indicate that, in general, the quality of the medicines is good because they come from official distribution. However, in terms of quantity, the availability of medicines is not always sufficient, due to shortages of certain types of medicines, particularly program drugs, as well as delays in distribution and increased use during certain periods. This is evident from the informants' answers as follows:
"In general, the quality of the available medicines is good… In terms of quantity, most are sufficient, but sometimes there are some types of medicines whose quantities are not sufficient…" (Inf-1)
"The quantity is sufficient… but what still happens is that certain drugs are out of stock… eeee… the quality is good and meets standards." (Inf-2)
"It's appropriate and good, it's been fulfilled." (Inf-3)
"It's fine, it seems like the medicine has been fulfilled." (Inf-4)
"Sometimes it's not enough, they go back there again." (Inf-5)

Regarding input and recommendations, informants emphasized the importance of planning based on real-world needs, improving data-driven planning systems, and strengthening monitoring and evaluation. They also emphasized ensuring that essential medicines are not out of stock and that procurement and distribution processes are more timely. This is evident from the following informant responses:
"The planning must be truly based on the needs in the field..." (Inf-1)
"Improving the planning system… using real data, applications, training, and monitoring and evaluation." (Inf-2)

"If we run out of medicine, we can buy it from the BLUD, but there are often shortages due to distribution." (Inf-3)
"It's best not to run out of important medicines." (Inf-4)
"Don't let there be any empty medicine." (Inf-5)

Regarding constraints in drug logistics planning, several issues were identified, including changes in disease patterns and patient visits, discrepancies between proposed and actual drugs, distribution delays, limited funding, and incoming drugs that were inappropriate or had a near expiration date. This was identified based on the following informant responses:
"Unpredictable changes in the number of patient visits and disease patterns…" (Inf-1)
"Discrepancy between the quantity of drugs proposed and received…out of stock or near ED." (Inf-2)
"Distribution constraints… sometimes the medication takes a long time to arrive because of the e-catalog." (Inf-3)
"The medicine that arrives sometimes does not match the amount requested." (Inf-4)
"The application process is late and funds are limited." (Inf-5)

Regarding the provision of medicines from the Jambi City IFK, informants stated that the need for medicines is not always 100% met; only a significant portion is met. This results in some types of medicines still being out of stock at community health centers. This is evident from the informant's response as follows:
"Sometimes IFK doesn't always fulfill 100% of drug requests." (Inf-1)
"Not 100% fulfilled, maybe only 90%." (Inf-2)
"Sometimes it is fulfilled, sometimes it is not." (Inf-3)
"Not fulfilled." (Inf-4)
"Not all of them are fulfilled." (Inf-5)

In situations where medication is on the waiting list or not yet available from the IFK, community health centers meet the need by using BLUD funds to purchase medication independently, ensuring services can continue despite distribution delays. This is evident from the following informant's responses:
"Filled with BLUD funds." (Inf-1)
"Usually using BLUD funds to buy medicine." (Inf-2)
"For the time being with BLUD funds." (Inf-3)
"Using BLUD funds." (Inf-4)
"There are BLUD funds to purchase the missing drugs." (Inf-5)

Based on these results, it can be seen that the fulfillment of drug needs in community health centers still faces obstacles in terms of availability and distribution, so that the use of BLUD funds is one of the main strategies to maintain the continuity of services.

Discussion

Drug Selection

Drug selection at community health centers is based on average previous drug use, the National Formulary (LPLPO), and the National Formulary. Drug demand at community health centers does not yet match drug availability.

This research is in line with the research conducted by Yuliani, et al. (2023) on Analysis of Health Drug Logistics Planning Management at Kampar Kiri Community Health Center, Kampar Regency, that drug selection at Kampar Kiri Community Health Center uses data on the most frequently used drugs, disease patterns, and LPLPO data. The difficulty in selecting drug items is because the selection does not use basic selection criteria. Drug selection is only based on generic drugs from the Health Service, so there is still drug duplication, so there are some drugs that are not available. (Ministry of Health of the Republic of Indonesia, 2019).

The function of drug selection is to determine the type of medication truly needed, based on the disease pattern and drug consumption. The criteria for selecting a drug in drug planning are one of

the factors that determine why that particular drug is chosen to meet drug needs effectively and efficiently. (Listiana et al., 2024).

The drug selection process at the community health center is good, although not perfect, because the selected drugs do not represent patient needs. This occurs because some drugs are not available at the Jambi City Pharmacy Installation, so the drugs needed by the community health center are not available because the community health center only acts as a planner, not as a procurement party. As a result, the community health center must wait for drugs for some time, while to purchase drugs independently, the community health center has a limited budget, because not all of the community health center budget is allocated to drugs alone.

Therefore, in selecting further drugs, Community Health Centers must refer more to the Public Drug and Medical Device Planning Guidelines issued by the Indonesian Ministry of Health so that the drugs selected are in accordance with the criteria and meet the patient's needs.

Drug Usage Compilation

Based on the research results, drug usage data compilation at community health centers was conducted by collecting reports from all service units, such as general clinics, maternal and child health clinics, dental clinics, and other units. The data was collected by pharmacists from various recording sources, including LPLPO (Large-Scale Hospitals), stock cards, prescriptions, and manual and electronic medical record (ER) systems. All data was then summarized to obtain an overview of drug usage and remaining stock.

The results of this recapitulation are then used as the basis for analysis in drug requirement planning. This process can reveal drug usage patterns, the most and least used types of drugs, average monthly usage, and estimated drug requirements for the following period. Thus, data compilation serves not only as an administrative activity but also as the primary basis for developing more accurate drug requirements.

This finding is in line with the research of Listiana et al. (2024) at the Boyolali I Community Health Center which showed that LPLPO was used as the main instrument in compiling drug usage data to assess drug usage, demand, and availability as a basis for planning drug needs. (Listiana et al., 2024).

This is also supported by Yuliartanti et al. (2023) who stated that the compilation of drug usage data in community health centers is carried out through the collection of LPLPO data and service unit reports, which are then analyzed to determine drug needs for the next period. (Yuliartanti et al., 2023).

In addition, Wahyuni et al. (2022) emphasized that data compilation that combines LPLPO, stock cards, and prescriptions can improve the accuracy of drug planning because it reflects real usage conditions in health facilities (Wahyuni et al. 2022).

However, there is research that is not entirely in line, namely Saputera et al. (2021) who found that there is still a discrepancy between drug demand data and drug realization at LPLPO, so that the data compilation does not fully reflect the actual condition of drug use.(Saputera et al. 2021).

In addition, Ulfa & Chalidyanto (2021) also showed that in several community health centers there was still incomplete and inconsistent compilation data, which resulted in a less than optimal drug planning process.(Ulfa & Chalidyanto 2021)

Thus, it can be concluded that the compilation of drug usage data at community health centers (Puskesmas) is running according to the principles of drug logistics management, namely based on LPLPO data, stock cards, prescriptions, and RMEs, which are summarized as the basis for drug requirement planning. However, challenges remain in data consistency and accuracy at several health facilities, which need to be improved to optimize and target drug planning.

Calculation of Drug Needs

Based on the research conducted, it was discovered that drug requirement planning in community health centers uses a consumption method based on previous drug usage data, available stock, and average drug usage. These findings indicate that the approach used is historical or retrospective, where planning decisions are based on past drug usage patterns.

The use of this consumption method demonstrates a fairly consistent practice pattern in drug logistics management at community health centers. This method was chosen because it is relatively easy to implement and does not require complex analysis, making it suitable for primary healthcare facilities, which generally have limited resources, both in terms of personnel and information systems.

These findings align with research conducted by Ningsih and Aumeilia (2024), which stated that drug planning in community health centers is conducted using a consumption method calculated monthly based on previous usage data. These results indicate that data-driven planning, such as the consumption method, can support drug availability and maintain continuity of health services to the community. Therefore, the use of the consumption method in this study can be considered relevant and effective under certain conditions, especially when disease patterns and service needs are relatively stable (Ningsih & Aumeilia, 2024).

However, not all studies have yielded consistent results. Research conducted by Eviyan and Indrawati (2023) showed that drug requirement planning in community health centers still does not fully reflect actual needs, as evidenced by instances of drug shortages and excess stock. These results indicate that the planning methods used, including the consumption method, have not been able to produce optimal planning. (Eviyan & Indrawati, 2023).

Determining medication needs is a significant challenge for pharmacists and other pharmacy staff in planning medication at community health centers. Out-of-stock or overstocked medications can occur if errors occur in medication calculations at the health center. Therefore, health centers must thoroughly evaluate medication needs when planning drug logistics to ensure that requested medications match needs, both in terms of type and quantity.

The consumption method is a method for calculating drug needs based on an analysis of drug consumption in the previous year, plus buffer stock, lead time, and taking into account remaining stock. Data that need to be prepared for the consumption method calculation include: budget allocation data, drug list data, initial stock data, drug receipts and expenditures, remaining stock, lost/damaged and expired drugs, drug shortages, average usage, lead time, buffer stock, and developments in visit patterns. (Ministry of Health of the Republic of Indonesia, 2019).

Based on the data required before calculating drug needs, the community health center (Puskesmas) lacks data on lost/damaged drugs, drug shortages, lead times, buffer stock, and data on the development of visit patterns. This data does not comply with the Technical Guidelines for Pharmaceutical Standards from the Directorate General of Pharmacy and Medical Devices of the Republic of Indonesia. Because of this, the calculation of the community health center's drug needs sometimes does not align with patient requests. Therefore, for future planning, the community health center is expected to provide the data needed to calculate drug needs comprehensively to avoid obstacles in drug logistics planning.

Projection of Drug Needs

Based on research results, drug demand projections at community health centers (Puskesmas) are the process of estimating the quantity and type of drugs for a specific period to ensure optimal health care delivery. These projections serve as a basis for determining drug needs, preventing shortages, and adjusting to budgetary availability. In practice, projections are primarily based on historical drug usage data, although ideally, they should also consider disease patterns and service trends.

These findings align with research by Ghaffar A. et al. (2021) in the Journal of Pharmaceutical Policy and Practice, which states that drug demand projections in primary healthcare facilities generally use the consumption method because it is easier to implement and based on actual usage data. This suggests that using previous usage data to project drug demand is a common and realistic practice in healthcare facilities with limited resources, such as community health centers (Puskesmas). Therefore, the results of this study align with field conditions, which still rely on historical data as the basis for calculations. (Ghaffar et al., 2021).

Furthermore, research by Ningsih and Aumeilia (2024) also supports that drug needs planning, including the projection stage, influences drug availability in community health centers. This means

that the better the projection process, the better the drug availability in health services.(Ningsih & Aumeilia, 2024).

However, there are conflicting findings, such as research by Eviyan and Indrawati (2023), which shows that drug demand projections based solely on previous consumption data can lead to inaccurate estimates of demand, such as drug shortages or excess stock. This occurs because consumption-based projection methods fail to capture changes in demand resulting from changes in disease patterns or increases in the number of patient visits. (Eviyan & Indrawati, 2023).

Thus, in accordance with the guidelines from the Indonesian Ministry of Health, drug demand projections should not rely solely on consumption data but also consider morbidity data and service indicators. This demonstrates that conceptually, the projections conducted at community health centers are on track, but implementation still needs strengthening to be more responsive to changing service needs.

Adjustment of Drug Procurement Plan

Adjustments to the drug procurement plan at community health centers are made after drug needs are determined. At this stage, the needs calculation results are not used immediately as a basis for procurement, but are first adjusted based on budget availability and the stock levels in the pharmacy warehouse. In practice, essential drugs and program drugs remain the top priority as they represent basic healthcare needs. Meanwhile, other drugs are adjusted based on the remaining available budget, so procurement is carried out in stages according to financial capacity.

This adjustment also takes into account previous drug usage data and stock levels, including both shortages and excesses. This information is used to determine procurement priorities to ensure services continue despite budget constraints. In certain circumstances, community health centers also utilize alternative funding sources, such as the Regional Public Service Agency (BLUD), to address drug shortages.

This finding is in line with research by Setyowati et al. (2026) which shows that drug procurement using the ABC method helps health facilities determine priorities based on usage value and budget efficiency, where drug groups with high consumption value are the main focus in procurement.[50].

Adjustments to the drug procurement plan serve as a guideline for determining the quantity of drugs procured, the priority scale for drug types, and the number of packages for the drug procurement plan for the coming year, all adjusted to the health center's funding. ABC analysis groups drug items based on their funding needs. Meanwhile, VEN analysis groups drugs based on their impact on health.

Fulfillment of Drug Needs at Community Health Centers

Based on the research results, the overall quality of medicines available at community health centers is considered good, as all drugs come from official distribution channels and meet pharmaceutical standards. However, in terms of quantity, drug availability is not always sufficient. There are still shortages of several types of drugs, particularly program drugs, as well as delays in distribution and increased use during certain periods, which cause unstable stocks. This situation indicates that the main problem is more about availability than quality.

Furthermore, the district/city pharmacy unit's drug needs are not always fully met. Not all types and quantities of drugs requested by community health centers are available as requested. This is because drug distribution must be divided among several community health centers within the working area, so not all needs can be met immediately. As a result, community health centers must make adjustments to meet drug needs in the field.

In such circumstances, community health centers have an alternative to ensure drug availability: using available funds, specifically the Public Health Agency (BLUD) funds. These BLUD funds are used to independently purchase drugs if they are unavailable at the district/city pharmacy or if there are delays in distribution. BLUD funds come from service revenue, contributions, grants, collaborations with other parties, and other legitimate sources, which are then used to support community health center operations, including drug procurement.

This finding is in line with Mustika's (2022) research which shows that when drugs are not available at the health service, community health centers independently procure them using BLUD funds to maintain the availability of drug services to the community. (Mustika, 2022).

Thus, it can be seen that the mechanism for fulfilling drugs in community health centers does not only depend on distribution from the Pharmacy Installation, but is also supported by the flexibility of using BLUD funds as a solution when there are supply limitations.

Overall, the research results indicate that meeting drug needs in community health centers still faces challenges related to distribution and availability from the pharmacy. Nevertheless, independent procurement mechanisms through the Public Service Agency (BLUD) and drug substitution are important strategies for maintaining the continuity of health services to the community.

CONCLUSION

The study concluded that drug logistics planning management at the Pakuan Baru Community Health Center in Jambi City has been implemented through the stages of drug selection, usage compilation, needs calculation, needs projection, and adjustment of drug procurement plans that generally refer to the National Formulary, LPLPO data, disease patterns, and consumption methods based on previous use. The drug usage compilation stage serves as the main basis for producing more accurate drug needs data, while the use of consumption methods is considered still relevant because it is easy to apply in primary health care. Adjustments to drug procurement have also taken into account ABC and VEN analysis as well as BLUD funding support to address drug shortages. However, the study results indicate that drug availability is not fully optimal due to the mismatch between drug needs and realization, delays in distribution from the City Pharmacy Installation, changes in disease patterns, budget limitations, and the presence of drugs with near expiration dates that affect the continuity of health services at the community health center.

This study has limitations because it was conducted at only one community health center using a case study approach, so the results cannot be generalized to all community health centers in Jambi City or other regions. Furthermore, the study focused more on qualitative aspects, so it did not quantitatively measure the level of logistics efficiency, planning accuracy, and drug stockout ratio in detail. Therefore, further research is recommended to use a mixed methods approach with a wider coverage of health facilities and add quantitative analysis of drug logistics indicators to obtain a more comprehensive picture. Practically, the results of this study can be used as evaluation material for community health centers and the Health Office to strengthen data-based planning systems, improve drug distribution monitoring, optimize the use of information technology, and strengthen coordination with the Pharmacy Installation to make drug availability more effective, efficient, and sustainable.

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