Health & Medical Sciences Volume: 2, Number 4, 2025, *Page*: 1-9

Evaluation of Good Distribution Practice (GDP) Implementation at the Provincial Pharmacy and Health Logistics Installation (IFLK) of Riau

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DOI:
https://doi.org/10.47134/phms.v2i4.495
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Received: 11-08-2025
Accepted: 22-08-2025
Published: 30-08-2025

Abstract: *This study aimed to evaluate the implementation of Good Distribution Practice (GDP) at the Provincial Pharmacy and Health Logistics Installation (IFLK) of Riau. The research employed direct observation, document review, and active participation in pharmaceutical management activities, including planning, procurement, storage, distribution, recording, and monitoring. The evaluation focused on three key areas: general drug management, cold chain products, and controlled substances such as narcotics and psychotropics. The results showed that all assessed aspects of GDP were properly implemented at IFLK Riau, including the application of FIFO and FEFO principles, well-maintained cold chain facilities, secure storage for controlled drugs, and systematic stock documentation. Overall, the implementation of GDP at IFLK Riau was considered optimal and compliant with national standards, ensuring the quality, safety, and availability of medicines within the region. These findings emphasize the critical role of pharmacists in maintaining the integrity and sustainability of the pharmaceutical distribution system.*

Keywords: *Good Distribution Practice; Pharmaceutical Logistics;,Drug Storage ,Cold Chain, Pharmacist Role.*

Introduction

Pharmacists play a strategic role in improving public health through the practice of pharmacy (As'hari et al., 2024). According to Government Regulation of the Republic of Indonesia No. 51 of 2009, pharmaceutical practice includes the manufacture of pharmaceutical preparations and quality control, procurement, storage, distribution, dispensing, drug information services, as well as the development of drugs and traditional medicines (Indonesian Ministry of Health, 2009). This regulation emphasizes that pharmacists are not only limited to working in community pharmacies, hospitals, or the pharmaceutical industry, but also bear responsibility in the distribution of medicines (Sinuraya et al., 2017).

Medicine distribution must be carried out in accordance with Good Distribution Practice (GDP) guidelines to ensure that the quality, safety, and efficacy of medicines are maintained until they reach consumers (BPOM RI, 2020). Pharmacists are responsible for overseeing storage, transportation, and documentation of stock to prevent deterioration,

misuse, or shortages (Sharma et al., 2022). Thus, their role is essential in safeguarding the integrity of the pharmaceutical supply chain and ensuring safe access to medicines for the community (Ministry of Health of the Republic of Indonesia, 2023a).

Several previous studies in Indonesia have examined how aspects of CDOB (Cara Distribusi Obat yang Baik) / GDP are implemented in real settings. For example Sinen et al., (2017) evaluated storage and distribution in PT. Unggul Jaya Cipta Usaha Manado and found that while much of the process mostly complied with CDOB, there were deficiencies in room conditions for storage, labeling of medicines on racks, facilities for destruction of expired drugs, and in procedures relating to import/export distribution. Another study by Mughnitiyas, A., & Raden (2025) assessing PBFs (Pharmaceutical Wholesalers) and branch PBFs under BBPOM supervision in Bandung over January–July 2024 found that only a small proportion (8.70%) of PBFs met more than 80% of CDOB aspects, many others fell in lower compliance categories, especially in aspects of building & equipment. Yet another study at PBF PT. Nareco Lestari in Jambi showed overall CDOB compliance at about 73.95%, but pointed out weak spots in cold chain product handling and in regulation of narcotics/psychotropics due to lack of relevant pharmaceutical preparations (Sukmawati, 2022).

To strengthen health logistics, the Indonesian government has established pharmaceutical installations in each region to manage medicines, medical devices, and consumables (Wulandari et al., 2020). One such unit is the Provincial Pharmacy and Health Logistics Installation (IFLK) of Riau, which is responsible for planning, procurement, storage, distribution, documentation, and monitoring (Ministry of Health of the Republic of Indonesia, 2023). Evaluating the implementation of GDP at IFLK is essential to determine the level of compliance with national standards and to identify challenges that need to be addressed (BPOM RI, 2020).

This study aims to evaluate the implementation of GDP at the Provincial Pharmacy and Health Logistics Installation (IFLK) of Riau. The findings are expected to provide an overview of compliance levels and highlight the strategic role of pharmacists in maintaining the quality and availability of medicines.

Methodology

This study employed a descriptive observational method conducted at the Pharmacy and Health Logistics Installation (IFLK) of Riau Province from August 4 to 16, 2025, during the Pharmacist Professional Practice Program (PKPA). Data were collected through direct observation of pharmaceutical management activities, including planning, procurement, receipt, storage, distribution, recording, and reporting. In addition, a document review was carried out on supporting materials such as Standard Operating Procedures (SOPs), stock cards, and reports from the SMILE and SELENA systems, as well as brief interviews with the responsible pharmacist to strengthen the information obtained. The collected data were then analyzed descriptively and qualitatively by comparing the field observations and documents with the standards of Good Distribution Practice (GDP) as stated in BPOM Regulation No. 6 of 2020. The results were interpreted by assessing the level of conformity

between actual practices and the established standards to determine the category of GDP implementation.

Result and Discussion

Result

Storage at IFLK Riau is generally in compliance with GDP, including regulatory adherence, temperature control, storage facilities, drug separation, stock rotation, and regular stock opname. One weakness identified is the absence of a permanent designated area for rejected, returned, recalled, or suspected counterfeit medicines.

Table 1. General Drug Store

CDOB Aspect	Condition at IFLK Riau Regulations	Remarks
Storage complies with relugation	Refers to BPOM & MoH regulations	Compliant
Temperature & humidity control	Room temp 25–30°C, cold storage 2–8°C, humidity 40–60%	Compliant
Rack/cabinet facilities	Adequate racks/cabinets, no overstocking	Compliant
Container separation	Performed before storage	Compliant
Quarantine area	Quarantine area available for newly received drugs, verification conducted there. Counterfeit/damaged/rejected drugs are separated, but no permanent area for such categories.	Not-Compliant
Stock rotation (FEFO)	Applied	Compliant
Damage prevention	Medicines stored on racks/pallets, area clean and organized	Compliant
Expired medicines	Immediately separated, labeled, and blocked in the system	Compliant
Stock opname (inventory check)	Conducted monthly	Compliant
Stock discrepancy investigation	Stock discrepancy investigation	Compliant

Table 2. Cold Chain Product (CCP) Storage

CDOB Aspect	Condition at IFLK Riau Province	Remarks
Chiller/Cold room	+2–8°C (Hepatitis, BCG, MR, PCV, etc.)	Compliant
Freezer	-15 to -25°C (OPV, Rotavac vaccines)	Compliant
Temperature monitoring	3 times/day, documented in logbook	Compliant
Vaccine arrangement	Not overcrowded, 1–2 cm spacing	Compliant
Safety system	Equipped with temperature alarm & backup generator	Compliant

Cold Chain Product (CCP) storage also complied with CDOB standards. Vaccines requiring cold temperatures were stored in chillers (+2–8°C), while those requiring freezing were stored in freezers (-15 to -25°C). Temperature monitoring was conducted three times daily and recorded in logbooks.

Table 3. Narcotics, Psychotropics, and Certain Drugs Storage

CDOB Aspect	Condition at IFLK Riau Province	Remarks
Special cabinet with double lock	Available, as required	Compliant
Restricted personnel access	Only pharmacist-in-charge & authorized staff	Compliant
Recording of stock movement	Recorded in stock cards	Compliant
Separation from other drugs	Not mixed with other drugs	Compliant

Narcotics, psychotropics, and certain drugs were stored in special double-lock cabinets with restricted access and proper stock recording, in accordance with regulatory requirements.

Table 4. Logistics Warehouse of IFLK Riau

Component	Condition at IFLK Riau Province	Remarks
Building & storage rooms	Owned by local government, good condition	Compliant
Cold chain facilities	Complete (chillers, freezers, cold boxes, vaccine carriers)	Compliant
Fire extinguisher & pest control	Available, but inspection not routine	Needs improvement
CCTV & alarm	Available but not fully functional	Non-compliant
Calibration of measuring devices	Thermometer & hygrometer available, but not routinely calibrated	Non-compliant

Supporting facilities and infrastructure were mostly adequate (storage rooms, cold chain equipment, generator, pest control). However, some aspects still need improvement, such as fire alarm installation, CCTV functionality, and routine calibration of temperature and humidity monitoring devices.

Discussion

The storage management of pharmaceutical supplies at the Provincial Pharmacy and Health Logistics Installation (IFLK) of Riau is in line with the principles of Good Distribution Practice (GDP) or Cara Distribusi Obat yang Baik (CDOB) established by the Indonesian Food and Drug Authority (BPOM RI, 2020). The installation operates through three main warehouses the pharmacy warehouse, the vaccine warehouse, and the logistics warehouse each designed to accommodate specific pharmaceutical categories and ensure product quality and safety throughout storage and distribution (Taha et al., 2021).

The storage of medicines in the pharmacy warehouse is organized based on disease programs and adheres to the FEFO (First Expired, First Out) and FIFO (First In, First Out) principles. This practice ensures that drugs with the earliest expiry dates are distributed first, reducing the risk of wastage and ensuring medication safety (Ministry of Health of the Republic of Indonesia, 2010). According to Pambudi & Windiasari (2024) the implementation of the FEFO system in pharmacies can reduce the risk of drug damage by up to 30%, demonstrating its effectiveness in maintaining inventory stability. Environmental monitoring at IFLK Riau is also well implemented. Each warehouse is equipped with thermohygrometers and air conditioning systems to control room temperature within 25–30°C and humidity within 40–60%, which complies with BPOM RI 2020 standards.

Maintaining these environmental parameters is critical, as excessive heat or humidity can degrade pharmaceutical stability and reduce potency, as emphasized by the World Health Organization (2010), in its Good Storage and Distribution Practice guidelines. However, one area requiring improvement is the absence of a permanent designated quarantine area for rejected, returned, or suspected counterfeit drugs. This issue has also been identified in several hospital pharmacy installations in Indonesia, where the lack of a fixed quarantine space can lead to potential mix-ups between acceptable and non-compliant products (Siregar et al., 2023). The WHO (2010) stresses that damaged or recalled drugs should be stored in separate, clearly marked, and access-controlled areas to prevent contamination and maintain accountability.

Controlled drugs, including narcotics, psychotropics, and precursors, are stored in double-locked cabinets with restricted access, in accordance with Ministry of Health Regulation No. 3 of 2017 (Ministry of Health of the Republic of Indonesia, 2017). This measure ensures both security and traceability. Access is granted only to the Responsible Pharmacist or designated authorized personnel, while every transaction is recorded on stock cards. This practice aligns with findings from Dalila et al., (2024) who reported that the dual locking and documentation system significantly improves accountability and reduces the risk of unauthorized access in narcotics storage at community pharmacies. Furthermore, BPOM RI (2020) requires that all controlled substances be stored in a secure, immovable cabinet located in a restricted area to comply with safety and regulatory standards. Hence, the controlled drug management system at IFLK demonstrates strong adherence to both regulatory and ethical principles in pharmaceutical security.

The vaccine warehouse at IFLK Riau is responsible for storing Cold Chain Products (CCP), including vaccines and temperature-sensitive medical supplies. The facility is equipped with two cold rooms, vaccine refrigerators, vaccine freezers, and deep freezers, which aligns with WHO recommendations for maintaining vaccine potency and stability. Freeze-sensitive vaccines (e.g., Hepatitis, BCG, PCV, MR, DT, Td, Pentabio, and Meningitis) are stored at +2°C to +8°C, while heat-sensitive vaccines (e.g., Rotavirus and Oral Polio Vaccine) are kept at –15°C to –25°C. These temperature ranges follow the WHO and UNICEF cold chain standards (Yakum et al., 2015). Temperature monitoring is performed

three times daily and documented in logbooks, supported by an alarm system and backup generator. Feyisa et al., (2022) emphasize that maintaining continuous temperature monitoring and documentation is vital to preventing vaccine degradation. Their study in Ethiopia found that adherence to WHO vaccine storage codes directly correlated with vaccine efficacy and reduced wastage. The availability of complete cold chain facilities at IFLK Riau indicates compliance with Good Storage Practice (GSP) and GDP principles, ensuring the effectiveness of immunization programs at the provincial level.

The logistics warehouse at IFLK is used to store medical consumables (BMHP) such as syringes, gauze, gloves, masks, and other disposable medical equipment. The separation between the BMHP warehouse and the pharmaceutical warehouse aims to prevent cross-contamination and improve stock management efficiency. This principle is consistent with the WHO (2010) guidelines, which recommend separating storage areas for pharmaceutical and non-pharmaceutical products to ensure product quality and safety. Although the storage facilities at IFLK are generally adequate, several aspects still require improvement, such as regular calibration of temperature and humidity measuring devices, the functionality of CCTV and alarm systems, and routine pest control maintenance. According to Siregar et al., (2023) measuring instruments that are not regularly calibrated may produce inaccurate temperature data, which can compromise the stability of pharmaceutical products. Therefore, calibration should be conducted at least once every six months, and annual facility audits should be implemented to maintain consistency in storage quality.

Overall, IFLK Riau has achieved a high level of compliance with GDP standards. The system integrates quality assurance, documentation, and environmental monitoring effectively. Continuous improvement, such as establishing a permanent quarantine area, routine calibration, and enhanced facility maintenance, would further strengthen GDP implementation. These measures align with the Continuous Quality Improvement (CQI) framework, emphasizing ongoing evaluation to sustain compliance and service excellence (Ministry of Health of the Republic of Indonesia, 2023b). Additionally, adherence to regulations like Permenkes No. 5 Tahun 2019 ensures effective planning and procurement, supporting a robust pharmaceutical supply chain (Ministry of Health of the Republic of Indonesia, 2019).

Conclusion

The implementation of Good Distribution Practice (GDP) at the Provincial Pharmacy and Health Logistics Installation (IFLK) of Riau has been carried out very well in accordance with BPOM RI (2020) standards. Key aspects such as temperature and humidity control, FEFO/FIFO system application, storage of controlled drugs, and cold chain product management have been properly implemented to maintain the quality and safety of pharmaceutical supplies. However, some areas still need improvement, including the establishment of a permanent quarantine area for rejected or returned drugs, regular calibration of temperature and humidity measuring devices, and ensuring CCTV and alarm systems function properly. These findings highlight the importance of environmental

quality monitoring and the active role of pharmaceutical personnel in maintaining compliance with regulations. It is recommended that IFLK conduct regular equipment calibration, annual facility audits, and continuous staff training to ensure consistent GDP implementation. Future studies should include the distribution and transportation aspects to provide a more comprehensive evaluation of pharmaceutical logistics management.

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