



## Differences in drug availability levels before and during the covid19 pandemic in the pharmaceutical installation of NTB provincial hospital

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### ABSTRACT

Health services are now increasingly needed during the COVID-19 pandemic which threatens public health. The need for public medicines that must be available such as flu, cough, vitamin c, antibiotics and antimalarials and antivirals for health services makes hospitals must try to fulfil and currently the COVID-19 pandemic situation is still continuing so hospitals must be ready to provide health services to patients. This study aims to determine the differences in drugs in the Pharmacy Installation of the NTB Provincial Hospital before the COVID-19 pandemic in 2019 and during the COVID-19 pandemic in 2020. This study is a descriptive-evaluative study with retrospective data collection in 2019 which represents the period before the COVID-19 pandemic and 2020 which represents the COVID-19 pandemic. The samples used in the study consisted of drug data from the Pharmacy Installation of the NTB Province Regional General Hospital (RSUD) and were analyzed using the Wilcoxon test. The results obtained are the level of drug availability in the pharmaceutical installation of the NTB Provincial Hospital obtained based on the results of observing data in 2019 and 2020, namely 19 and 37 months. There is a significant difference (Asymp. Sig (2-tailed) 0.000) the level of drug availability in the Pharmacy Installation of the NTB Provincial Hospital before and during the COVID-19 pandemic in 2020 with a difference of 18 months.

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## 1. Introduction

Hospital as a health care institution that organizes comprehensive individual health services that provide inpatient, outpatient and emergency services. Health services carried out in hospitals require pharmaceutical supplies to run. Pharmaceutical service standards in hospitals include standards for the management of pharmaceutical preparations, medical devices, and medical consumables. Management is carried out starting from selection, needs planning, procurement, receipt, storage, distribution, destruction and withdrawal, control and administration [1].

The COVID-19 pandemic has become an event that threatens public health and has become a global concern on 30 January 2020, WHO (world health organisation) declared the COVID-19 disease as a public health emergency of worldwide concern. Adequate health services are expected to be a form of defence from the COVID-19 Pandemic [2]. The need for medicines for health has become a public need that has not been affordable and there is still a lack of supply of medicines and this has happened in Europe [3]. Italy is one of the countries that was not prepared when facing the COVID-19 pandemic in the first wave so they need more time to prepare in health services [4]. This increased need can cause drug shortages so that patients receive treatment late and make patients non-compliant [5]. Poor control of drug supplies can cause stockouts (shortages or vacancies in drug supplies) and stagnant (excess drug supplies). This stagnant drug inventory is something that is not good because it can cause drug expiration and damage when not stored properly [6].

The need for public medicines that must be available for health services makes hospitals have to try to fulfill and currently the COVID-19 pandemic situation is still continuing so hospitals must be ready to provide health services to patients. In a previous study on the evaluation of drug management that was conducted in 2017 at the Pharmacy Installation i Regional General Hospital (RSUD) Province West Nusa Tenggara (NTB) it was found that there were still several stages that were not in accordance with the standards [7]. The COVID-19 pandemic needs to be faced with wise use of resources and remain prepared for the future [8]. During the COVID-19 pandemic, there is an increase in the need for Over The Counter (OTC) medicines such as cold, cough, vitamin C as well as the use of antibiotics, antimalarials and antivirals ([9]–[12]).

The condition of the COVID-19 pandemic affects the management of drugs at the public health center. However, as a health institution that holds the role of the First Level Health Service Facility (Fasyankes), public health center must maintain the quality of its services, especially in ensuring the fulfillment of access to medicines for the community [13], both COVID-19 patients and non-COVID-19 patients. In connection with this, Public health center needs to make the necessary adjustments to services during the COVID-19 pandemic [14]. Based on the results of research conducted at the health centre, it was found that many drugs for non-COVID-19 patients expired due to a decrease in the number of patients and procurement and planning were not optimal because the needs of COVID-19 patients had not been met [15; 16]. In the research conducted [17] who conducted an overview of pharmaceutical logistics management during the COVID-19 pandemic at the Bhakti Asih Brebes General Hospital in Central Java can run well according to the Minister of Health Regulation No. 72 of 2016, while the research conducted by [18] found problems with the *e-purchasing* system which overall has not been running well. The Indonesian

Food and Drug Authority issued guidelines for public services in the field of medicine in the conditions of the COVID-19 pandemic in 2020 which were able to assist health workers in meeting the community's drug needs.

## 2. Method

This study is a descriptive-evaluative study with retrospective data collection in 2019 which represents the period before the COVID-19 pandemic and 2020 which represents the COVID-19 pandemic at the NTB Provincial General Hospital conducted by document review and analysis of the level of difference. First, data was collected through documents containing specific data on drug management history. Calculation of the level of drug availability by recording the use of drugs in a year (X), and the average use of drugs in a month (Y),  $Z = 0$ . . The difference in the level of drug availability before and during the COVID-19 pandemic was found using the Wilcoxon test. The data was then examined for differences in the COVID-19 pandemic on availability through the T test using the Statistical Package for the Social Sciences (SPSS) 25 program.

## 3. Results and Discussion

The COVID-19 pandemic requires hospitals to be more careful in organizing the financing of hospital operational expenditures, including pharmaceutical logistics expenditures. NTB Provincial Hospital is one of the hospitals to be able to handle COVID-19 patient services. COVID-19 patient services require a lot of drugs and Personal protective equipment (PPE) that can prevent transmission. In this study, researchers intend to look at the level of availability of COVID-19 pandemic drugs for drug management at the NTB Provincial Hospital.

Table 1. Number of Patients at NTB Provincial Hospital

Moon	2019 (Before the COVID-19 pandemic)		2020 (COVID-19 pandemic)	
	Patient Count	Patient Non Covid	Patient COVID	Patient Count
Total	20710	10741	852	11593

Patients who sought treatment at the NTB Provincial Hospital before the COVID-19 pandemic in 2019 were 20710 patients and the COVID-19 pandemic in 2020 were 11593 patients. In 2020, the number of patients decreased by almost half from 2019 and this has occurred since the COVID-19 pandemic entered Indonesia at the end of March 2020 and patient restrictions have begun at the NTB Provincial Hospital since April 2020 because COVID-19 has spread in Indonesia. During the pandemic, the number of patient visits to public health centres often decreases dramatically, resulting in a large number of accumulated and expired medicines [15]. Studies show that there is an increased risk of non-communicable diseases and susceptibility to infectious diseases due to changes in diet and physical activity levels during the COVID-19 pandemic [19]. NTB Provincial Hospital restricts the number of Non-COVID outpatients according to the Medical Staff Group (KSM) to maintain the safety of the spread to patients and staff. The impact of Covid 19 on hospitals is more pronounced in the decrease in the number of patients, full bed

capacity, and the lack of services provided to patients considering that not all patients can be fully served because they are limited to the Covid protocol which requires a reduced number of patient visits in order to maintain social distancing [20].

Hospitals in carrying out health services to the community need medicines. The availability of drugs is the main thing for doctors, pharmaceutical personnel and patients so that they must be available [21]. Measurement of the level of drug availability in IFRS is intended to be able to determine how long the level of drug adequacy needed by the Pharmaceutical Installation of the NTB Provincial Hospital for one year in each month. Data collected retrospectively from data searches in 2019 and 2020 can be seen in the table below. Another study conducted with quantitative and qualitative methods using retrospective data in 2019 (before the pandemic) and 2020 (during the pandemic) for the level of drug availability in units of months, the purpose of this indicator is to see the effect of the pandemic on the level of drug availability in units of months at Puskesmas [22].

Table 2. The level of drug availability before and during the pandemic at the NTB Provincial Hospital

Description	Year	
	2019	2020
Number of drug preparations	450	419
Average drug availability rate (month)	19	37

The availability of drugs at the Pharmaceutical Installation of the NTB Provincial Hospital obtained based on the results of observing data in 2019 and 2020 exceeds WHO standards, namely 12 to 18. The availability of drugs in the Pharmacy Installation of the NTB Provincial Hospital in 2019, which on average is still above the maximum standard with a total drug item exceeding half, while during the COVID-19 pandemic in 2020 it has increased almost twice from the previous year, where the average drug availability time can exceed 3 years. The number of drugs in 2020 that have a drug availability level that is not in accordance with the standard because the COVID-19 pandemic affects the number of patients with patient restrictions. In other research conducted by [5] stated that the level of drug availability at the RSUA Pharmacy Intalasi in 2020 was at 15.45 months. Previous research at the Pharmacy Installation of the NTB Provincial Hospital in 2017 the level of drug availability [7] was 13.71 months which was in accordance with the standard.

Based on the results and discussion above, the level of availability is not in accordance with existing standards and exceeding standards needs to be considered again by hospital management. Changes in disease patterns also affect changes in drug availability times, restrictions on outdoor activities implemented during the COVID-19 pandemic have led to changes in people's lifestyles in the form of decreased participation in physical activity and changes in diet, and thus changes in disease patterns. The 10 most common diseases for hospitalization at the NTB Provincial Hospital have changed with the presence of COVID-19, namely the Corona virus infection. In 2019, it was found that the 10 diseases experienced a slight shift, namely the presence of concussion and infra cerebrum while in 2020 it was replaced by the presence of corona virus infection and neoplasm and there was an increase in severity for chronic renal failure disease which was not specific to stage 5. The most common disease in hospitalization in 2019 only represents less than half of the patients in 2019 while in 2020 it can represent the most diseases because it represents more than half of the total patients that year. This can affect the level of drug availability

in IFRS. Some drug items come out faster and some items come out slower or even do not come out at all. A decrease in the percentage value of under-stock does not always mean positive, because there is a possibility that other items fall into the category of overstocked items or damaged and/or expired items. Drug groups that have a high level of availability in 2019 are antibiotics, diabetes mellitus, COPD drugs, cancer drugs, nausea and vomiting drugs, heart, gout and antivirals with a supply of nearly 200 drugs while in 2020 all drugs have high availability exceeding the standard. Other research during the pandemic the number of patient visits to public health centres often decreased dramatically and caused many drugs to be found that had accumulated and expired [15].

The data was then examined for differences in the COVID-19 pandemic on availability through the *T test* using the *Statistical Package for the Social Sciences* (SPSS) 25 program. The test began by looking at the normality of the data and found that the data was not normal and continued with a non-parametric test, namely the Wilcoxon test. The Wilcoxon test found that the data significance value was less than 0.05, which can be said that there is a difference between the level of drug availability of the 2019 and 2020 groups which is significant overall. Drugs can be fulfilled and there is no shortage of drug supplies due to a decrease in the number of patients and changes in disease patterns but an increase in drug storage (more than before) In 2019 and 2020, there were changes in the disease patterns of inpatients [24], [25].

#### 4. Conclusion

The level of drug availability at the Pharmaceutical Installation of the NTB Provincial Hospital in 2019 and 2020 during the COVID-19 pandemic exceeds the standard, namely 19 months and 37 months and there is a significant difference (Asymp. Sig (2-tailed) 0.000) the level of drug availability at the Pharmaceutical Installation of the NTB Provincial Hospital before and during the COVID-19 pandemic in 2020 with a difference of 18 months.

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#### REFERENCES

- [1] Menteri Kesehatan Republik Indonesia, "Peraturan Menteri Kesehatan Republik Indonesia Nomor 72 Tahun 2016 Tentang Standar Pelayanan Kefarmasian Di Rumah Sakit." hal. 1–63, 2016.
- [2] R. GÜNER, i. HASANOĞLU, dan F. AKTAŞ, "COVID-19: Prevention and control measures in community," *TURKISH J. Med. Sci.*, vol. 50, no. SI-1, hal. 571–577, Apr 2020, doi: 10.3906/sag-2004-146.
- [3] K. Pauwels, I. Huys, M. Casteels, dan S. Simoens, "Drug shortages in European countries: A trade-off between market attractiveness and cost containment?," *BMC Health Serv. Res.*, vol. 14, no. 1, 2014, doi: 10.1186/1472-6963-14-438.
- [4] C. Deana *et al.*, "Learning from the italian experience during covid-19 pandemic waves: Be

- prepared and mind some crucial aspects," *Acta Biomed.*, vol. 92, no. 2, 2021, doi: 10.23750/abm.v92i2.11159.
- [5] T. Bochenek *et al.*, "Systemic measures and legislative and organizational frameworks aimed at preventing or mitigating drug shortages in 28 European and Western Asian Countries," *Front. Pharmacol.*, vol. 8, no. JAN, 2018, doi: 10.3389/fphar.2017.00942.
  - [6] F. A. Rosmania dan S. Supriyanto, "Analisis Pengelolaan Obat Sebagai Dasar Pengendalian Safety Stock pada Stagnant dan Stockout Obat," *J. Adm. Kesehat. Indones.*, vol. 3, no. 1, hal. 1, Jan 2015, doi: 10.20473/jaki.v3i1.2015.1-10.
  - [7] N. Oktaviani, G. Pamudji, dan Y. Kristanto, "Evaluasi Pengelolaan Obat Di Instalasi Farmasi Rumah Sakit Umum Daerah Provinsi NTB Tahun 2017 Drug Management Evaluation in Pharmacy Department of NTB Province Regional Hospital during 2017 Period Rumah sakit adalah Institusi kesehatan yang pelayanan kes," *J. Farm. Indones.*, vol. 15, no. 2, hal. 135–147, 2018.
  - [8] R. Lodha dan S. K. Kabra, "COVID-19: How to Prepare for the Pandemic?," *Indian J. Pediatr.*, vol. 87, no. 6, hal. 405–408, 2020, doi: 10.1007/s12098-020-03293-0.
  - [9] N. Ayati, P. Saiyarsarai, dan S. Nikfar, "Short and long term impacts of COVID-19 on the pharmaceutical sector," *DARU J. Pharm. Sci.*, vol. 28, no. 2, hal. 799–805, Des 2020, doi: 10.1007/s40199-020-00358-5.
  - [10] S. Mudenda *et al.*, "Knowledge, Attitude, and Practices of Community Pharmacists on Antibiotic Resistance and Antimicrobial Stewardship in Lusaka, Zambia," *J. Biomed. Res. Environ. Sci.*, vol. 2, no. 10, hal. 1005–1014, Okt 2021, doi: 10.37871/jbres1343.
  - [11] S. Mudenda *et al.*, "Self-medication and its Consequences during & after the Coronavirus Disease 2019 (COVID-19) Pandemic: A Global Health Problem," *Eur. J. Environ. Public Heal.*, vol. 5, no. 1, hal. em0066, Nov 2020, doi: 10.29333/ejeph/9308.
  - [12] A. Zhang, E. V. Hobman, P. De Barro, A. Young, D. J. Carter, dan M. Byrne, "Self-Medication with Antibiotics for Protection against COVID-19: The Role of Psychological Distress, Knowledge of, and Experiences with Antibiotics," *Antibiotics*, vol. 10, no. 3, hal. 232, Feb 2021, doi: 10.3390/antibiotics10030232.
  - [13] L.-A. O. Ngo Bibaa, "Primary health care beyond COVID-19: dealing with the pandemic in Cameroon," *BJGP Open*, vol. 4, no. 4, hal. 1–4, Sep 2020, doi: 10.3399/bjgpopen20X101113.
  - [14] Kemenkes RI, *Petunjuk Teknis Pelayanan Puskesmas Pada Masa Pandemi Covid-19*. 2020.
  - [15] F. P. Gurning, S. F. Siregar, U. R. Siregar, R. Rusmayanti, dan F. Nurhasanah, "Analisis Manajemen Pengelolaan Obat Pada Masa Pandemi Di Puskesmas Sering Kecamatan Medan Tembung," *J. Kesehat. Masy.*, vol. 9, no. 5, hal. 688–695, 2021, doi: 10.14710/jkm.v9i5.30742.
  - [16] E. Wulandari dan A. Widayati, "Evaluasi Pengelolaan Obat Di Puskesmas Salaman 1 Kabupaten Magelang Dalam Masa Pandemi Covid-19 Tahun 2020 Evaluation of Drug Management in Salaman 1 Primary Health Center Magelang During the Covid 19 Pandemic," *Jfsp*, vol. 7, no. 2, hal. 2579–4558, 2021.
  - [17] A. C. Widodo, Slamet; Sjaaf, "Gambaran Manajemen Logistik Kefarmasian pada Masa Pandemi COVID-19 di Rumah Sakit Umum Bhakti Asih Brebes Jawa Tengah," *J. Med. Hutama*, vol. 03, no. 02, hal. 2047–2053, 2022.
  - [18] A. E. Polii, Stacey; Posangi, Jimmy; Manampiring, "Sam Ratulangi," *J. Public Health (Bangkok)*, vol. 2, no. 1, hal. 7–13, 2021.
  - [19] K. B. Ardella, "Risiko Kesehatan Akibat Perubahan Pola Makan Dan Tingkat Aktivitas Fisik Selama Pandemi Covid-19," *J. Med. Hutama*, vol. 02, no. 01, hal. 292–297, 2020.
  - [20] S. Y. Ahmad Gugun Gunawan, Budimanan, Setiawati dan I. lin, "Kualitas Pelayanan Terhadap Minat Pasien Dalam Memanfaatkan Kembali Jasa Pelayanan Rawat Jalan," vol. 13, no. 1, hal. 1–11, 2022.
  - [21] H. Wati dan R. Elly, "Analisis Faktor-Faktor Yang Mempengaruhi Ketersediaan Obat Di Era Jkn Pada Rsud Dr. Saiful Anwar Malang," *Java Heal. J.*, vol. 5, no. 1, 2018.
  - [22] Sabarudin, S. Ihsan, H. Kasmawati, R. Mahmudah, dan E. Febriana, "Dampak Pandemi Covid-19 Terhadap Pengelolaan dan Tingkat Ketersediaan Obat di Puskesmas Puuwatu Kota Kendari," *J. Farm. Sains dan Prakt.*, vol. 7, no. 3, hal. 306–312, 2021.
  - [23] Y. M. Indriana, E. S. Darmawan, dan A. C. Sjaaf, "Analisis Pengelolaan Obat di Instalasi

- Farmasi RSUD Tahun 2020," *Promot. J. Kesehat. Masy.*, vol. 11, no. 1, hal. 10–19, 2021, doi: 10.56338/pjkm.v11i1.1512.
- [24] "10 penyakit terbanyak pasien rawat inap tahun 2019," *General Hospital of West Nusa Tenggara Province*. .
- [25] "10 penyakit terbanyak pasien rawat inap tahun 2020," *General Hospital of West Nusa Tenggara Province*. .