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## ANALYSIS OF TRENDS IN THE AVAILABILITY OF INDICATOR DRUGS AND VACCINES IN PUBLIC HEALTH CENTER FOR 2016-2017

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**Abstract.** The health development strategies for 2015-2019 is about improving the availability, affordability, equity and quality of pharmaceuticals and medical devices. Since the enactment of national health insurance (JKN) on January 1, 2014, the availability of drug at the public health center become a very important aspect in primary health care services. Drug logistics management is an important aspect that influences accessibility to health services including the availability of essential drugs and vaccines. The aim of this study is to explore the trend of availability indicator drugs and vaccines in public health center for the period of 2016-2017 and drug logistics management factors that can affect the availability. The study was conducted using secondary data analysis. Data were obtained from data on the availability of indicator drugs and vaccines in public health center for the period of 2016-2017. This research is a quantitative study with an analytical observational approach. The Vector Auto Regression (VAR) conducted provides forecasting trends in indicator drugs and vaccines in public health center close to 80%. The 80% figure shows appropriate availability, but there are a number of things that need special attention including planning, procurement, pharmaceutical competency, financing, and management information systems.

**Keywords:** availability of indicator drugs and vaccines, public health center, trends

**Abstrak.** Strategi pembangunan kesehatan tahun 2015-2019 antara lain meningkatkan ketersediaan, keterjangkauan, pemerataan, dan kualitas farmasi dan alat kesehatan. Sejak diberlakukannya Jaminan Kesehatan nasional (JKN) pada 1 Januari 2014, ketersediaan obat di puskesmas merupakan aspek yang sangat penting dalam pelayanan kesehatan di Fasilitas Kesehatan Tingkat Pertama (FKTP). Pengelolaan obat di puskesmas haruslah baik dan benar, karena pengelolaan yang baik dan benar akan menjamin ketersediaan obat sesuai dengan kebutuhan puskesmas. Penelitian ini ingin melihat trend ketersediaan obat dan vaksin indikator di puskesmas periode tahun 2016-2017. Studi dilakukan dengan menggunakan analisis data sekunder. Data didapatkan dari data ketersediaan obat dan vaksin esensial di puskesmas periode tahun 2016-2017. Pendekatan Vector Auto Regression (VAR) yang dilakukan memberikan peramalan trend obat dan vaksin indikator di puskesmas mendekati angka kurang lebih 80%. Angka tersebut menunjukkan ketersediaan yang sesuai tetapi ada sejumlah hal yang perlu mendapat perhatian khusus antara lain peran dan kompetensi tenaga kefarmasian dalam menjamin ketersediaan obat, dana kapitasi untuk pembelanjaan obat di puskesmas, perencanaan kebutuhan obat, dan pencatatan dan pelaporan di puskesmas.

**Kata kunci:** ketersediaan obat dan vaksin indikator, puskesmas, trend

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### INTRODUCTION

Access to medicines explicitly recognized in the 2030 Agenda for Sustainable Development (SDG). For almost all targets of point number 3 of SDGs; good health and well-being; increasing access to medicines plays an important role in maternal and child health, non-

communicable diseases (NCD), malaria, and sexual and reproductive health (1). The World Health Organization (WHO) estimated that less than half of the population in 32 percent of the poorest countries in the world do not have regular access to essential medicines. Eighty-one percent of countries that have problems with access and availability of drugs is a low-income country(2).

In 2008, research conducted by Cameron in 36 developing countries noted that the availability of generic drugs ranged from 29-54% in the public sector, where Africa recorded as the lowest and United States as the highest. The availability of 15 generic drug items ranges from 10% in Yemen to 79% in Mongolia (3). All countries in Southeast Asia were committed to providing essential medicines for those who need them. Procurement and supply chains are weak in some countries, and many drug sales are not regulated(4).

Vaccination has an unrivaled impact on global health, and vaccines have the most significant potential for further improvement in health in the poorest countries of the world. In addition to the direct benefit of vaccines in preventing disease and death, there is growing evidence that their widespread implementation leads to much-needed economic development(5).

At the first meeting in 1977, the WHO Expert Committee on Selection of Essential Drugs described essential medicines as medicines that were "very important and basic, very necessary for the health needs of the population." While at a meeting held in 1999, the Committee stated that "Essential medicines are those that meet the health care needs of the majority of the population; therefore they must be available at all times in sufficient quantities and in appropriate dosage forms and at prices affordable to individuals and the community "(6). Access to health services, including essential medicines, is a fundamental human right. Access to health services is a construct covering different dimensions, which are availability, affordability, accessibility, and acceptance (2).

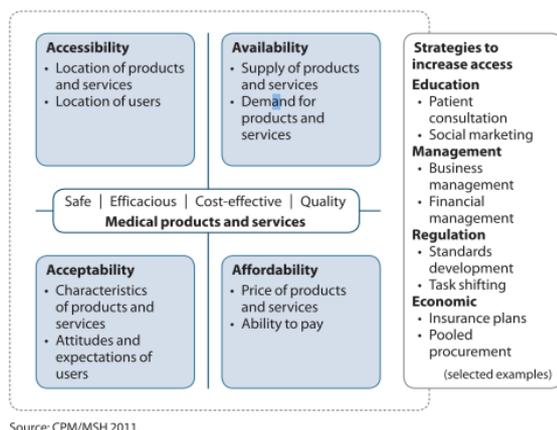


Figure 1. Access to health care

The percentage of the public health center with the availability of essential medicines and vaccines is an indicator of the Ministry of Health's Strategic Plan for 2015-2019 related to access, independence and quality of pharmaceutical preparations and medical devices(7). The 2019 target is to get 90% of the public health center has the availability of indicator drugs and vaccines. Data

on the availability of indicator drugs and vaccines, published by the Ministry of Health, shows an increase in results. In 2016, the percentage of indicator medicines and vaccines in public health centers was 81.57%; meanwhile, in 2017, it was increased to become 89.29%.

Drug logistics management is an important aspect that influences access to health services, including the availability of essential drugs and vaccines. If one component of the drug logistics management cycle is not optimal, it can lead to a drug and vaccines stock out in health care facilities that affect health services to the community. The aims of this study to explore the trend of availability indicator drugs and vaccines in public health centers for the period of 2016-2017.

**METHODS**

This research is a quantitative study conducted using secondary data analysis. We use the data on the availability of indicator drugs and vaccines in public health centers for the period of 2016-2017. The basis of selecting indicator drug items are drugs supporting maternal health programs, child health, prevention of diseases, as well as essential health care drugs and contained in the National Formulary(8). Availability of indicator drug and vaccines were checked from public health centers throughout Indonesia. Data were analyzed using an official data processing tool.

Table 1. List of Indicator Drugs and Vaccines in the Public Health Center.

NO	MEDICINE NAME	UNIT
1	Albendazol tab	Tablet
2	Amoxicillin 500 mg tab	Tablet
3	Amoxicillin syrup	Bottle
4	Deksametason tab	Tablet
5	Diazepam injection 5 mg/mL	Ampoule
6	Epinefrin (Adrenalin) injection 0,1% (as HCL)	Ampoule
7	Fitomenadion (Vitamin K) injection	Ampoule
8	Furosemid tablet 40 mg/Hidroklorotiazid (HCT)	Tablet
9	Oralit	Bag
10	Glibenklamid/Metformin	Tablet
11	Kaptopril tab	Tablet
12	Magnesium Sulfat injection 20 %	Vial

13	Metilergometrin Maleat inj 0,200 mg-1 ml	Ampoule
14	Anti tuberculosis drug (Adult)	Package
15	Oksitosin injection	Ampoule
16	Parasetamol 500 mg tab	Tablet
17	Iron and folic acid Tablet	Tablet
18	Vaccine BCG	Vial
19	Vaccine DPT/ DPT-HB/ DPT-HB-Hib	Vial
20	Vaksin Td	Vial

1	83.17	-0.47
2	81.70	0.20
3	81.06	-0.66
4	79.82	-0.32
5	79.39	-1.14
6	78.85	1.50
7	81.52	-0.05
8	83.03	-0.76
9	82.82	0.16
10	82.98	0.80
11	83.38	0.22
12	82.80	0.19
13	81.84	0.31
14	81.11	0.11
15	80.51	-0.08
16	80.15	-0.14
17	80.21	-0.65
18	80.14	0.67

RESEARCH RESULTS AND DISSCUSION

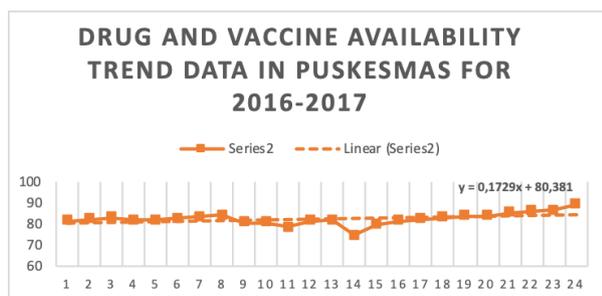


Figure 2. Data on Indicator Drug and Vaccine Availability in the Public Health Center for the 2016-2017 Period

The figure shows a tendency to increase the percentage of the national number. In January 2017, the availability of indicator drugs and vaccines reached the lowest point of 74.7%, while on December 2017 reached the highest point, which was 89.2%. On average, it can be seen that the availability rate reaches 80%.

Data analysis on the trend of the availability of drugs and vaccines is using the Vector Auto Regression (VAR) method approach as the method that does not distinguish the endogenous and exogenous variables. Endogenous variables are variables whose values are specified in the model. Although it is not the same, this endogenous variable is similar to the dependent variable in regression, where the value can be determined if the value of the independent variable has been determined first. While exogenous variables are variables that are determined outside the model or often said this variable is similar to the independent variable.

Table 2. Application of Models for Forecasting Drug and Vaccines Availability at the public health center

Observation (Month)	Predicted Y	Residuals
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The VAR approach forecasts the trends in indicator drugs and vaccines in public health centers close to approximately 80%. Many benefits occur by establishing a list of essential medicines in a country. For health effects, essential medicines can save lives and reduce suffering, especially for the poor. For economic impacts by focusing on essential medicines, rational drug selection, good procurement practices, reliable quality assurance, and efficient distribution systems, the best health services for public drug expenditure can be guaranteed(9). Essential drug policies can help countries to rationalize the purchase and distribution of drugs, thereby reducing costs for public and private health systems, increasing the accessibility of medicines and increasing the rational use of drugs (10).

The reformation of the health financing system in Indonesia started on January 1, 2014. The NHI program aims to guarantee the benefits of health care and financial protection for participants. Things covered by NHI are promotive, preventive, curative, and rehabilitative benefits, including medical services and medical materials consumable per medical needs (11). The supply of drugs in NHI has been regulated in the National Formulary, which is a list of medicines

compiled by the National Committee for National Formulary.

The trend results in the availability of drugs and vaccines in health centers that can be used for predicting data on the availability of drugs and vaccines for the next 18 months, shows the average availability of drugs and vaccines were around 80% for 20 indicator drug items monitored by the Ministry of Health. Although national data show a high result, some things still need special attention, especially in drug logistics management. Drug logistics management plays a vital role in ensuring access to health services, including the availability of drugs. Drug logistics management aims at the availability of good quality drugs, evenly distributed, types, and quantities by the essential health care needs of the community in the health care unit.

Generally, the cycle of drug logistics management consists of planning, procurement, storage, distribution, and use (12). Meanwhile, according to Managing Access to Medicines and Health Technologies, drug management involves four essential functions: selection, procurement, distribution, and use with drug management as core supporters including organization, sustainable financing, information management, and human resources (2).

The needs planning process done by the public health center refers to the 2002 Guidelines for Public Drug Management and Health Supplies. There are two types of methods commonly used, which are the consumption method and morbidity method. The consumption method is based on the analysis of the previous year's drug consumption data, while the morbidity method is a method of calculating drug needs based on the epidemiology. Most public health center only calculates drug needs based on consumption methods even though the ideal in quantifying drug needs is combining consumption patterns and disease patterns. If only using consumption patterns, it is likely that if the previous use of the drug is already irrational, it will continue to be irrational. If using disease patterns alone, there are difficulties in estimating because the prevalence of the disease continually changes over time (13).

In the era of NHI, there are capitation funds that can be used to purchase drugs directly by the public health center. As stipulated in article 3 of the Regulation of the Minister of Health of the Republic of Indonesia number 21 of 2016, capitation funds received by primary health care facilities from the Health Social Security Organizing Agency are used entirely for payment and support for operational costs of health services. These operational costs, as intended, is used for the cost of medicines, medical devices, and medical materials consumables and other operational costs of health services. The utilization of medicines at the public health center is still not optimal due to constraints in the procurement process (14).

The process of procuring medicines based on electronic catalogs has established since 2014. The regulation of procurement of drugs based on electronic catalogs aims to ensure transparency, effectiveness, and efficiency of e-purchasing planning and drug procurement processes based on electronic catalogs done by government institutions and private institutions. However, there are still obstacles related to the procurement of medicines in the district/city, causing a stock-out drug and vaccines at the public health center(15).

The efforts to increase the competence of pharmaceutical workers also have an essential role to play through sustainable professional development through the process of education and training. Regulation of the Minister of Health number 74 of 2016 concerning pharmaceutical service standards at the public health center, states that pharmacy personnel at the public health center must always improve their knowledge, skills, and behavior in order to maintain and improve their competence(16). If competence is inadequate, it can likely affect the process of managing drugs and impact the availability of drugs (17).

Recording and reporting at the public health center, commonly known as the Use Report and Drug Request Sheet, is sent to the district/city pharmacy installation as a routine report. Management of receipt and distribution data is an essential key to producing the report. Data management does not work well, especially at the public health center and district / municipal pharmacy level because of limited human resources and continuous distribution service activities. Manually compiling data with limited resources makes it challenging to produce full and timely reports (18).

## CONCLUSION

To establish access, independence, and quality of pharmaceutical preparations and medical devices requires high commitment. Strategies that need to be planned include ensuring the availability of essential medicines in health care facilities, especially in the public health center by conducting drug management according to standards at provincial, district/city pharmacy installations. From the results of data on the availability of indicator drugs and vaccines in public health centers in 2016-2017, there is a tendency for the percentage of national figures to increase. Data analysis on the availability trends of indicator drugs and vaccines in the public health center shows the results of the VAR approach, giving forecasting trends in indicator drugs and vaccines in public health centers close to approximately 80%. However, since the enactment of the NHI era, public demand for medicinal needs has increased so that the availability of medicines in public

health center needs to be maintained by paying particular attention to the factors of drug logistics management are planning, procurement, pharmaceutical competency, drug financing, and management information.

## RECOMMENDATIONS

Based on the results of the study, although the availability trend rate is around 80%, it is recommended that the drug logistics management cycle must be run well and optimally. Drugs planning, other than the consumption method, also considers the epidemiology in the district/city. Capitation funds for drug spending at the public health center can be used optimally to ensure the availability of medicines. Drug procurement using e-purchasing to fulfill the drug needs for the NHI program can be done well even though the budget is limited. Continuous training needs to be prepared on pharmacy staff at the health center and advocacy to the local government for the placement of pharmaceutical personnel in the public health center. Moreover, the use of information and communication technology that has some potential can better accommodate recording and reporting needs.

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