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Research article

Evaluation of rational drug use in pharmaceuitical services at Deli Serdang District Health Center, North Sumatera, Indonesia

Adek Chan, Hafizhatul Abadi*, Darwin Syamsul, Rodiahti Pulungan

Faculty of Pharmacy and Health, Institut Kesehatan Helvetia, Medan, Indonesia.

Key words: Rational drug use, pharmaceutical services, antibiotics evaluation, district health center.

***Corresponding Author: Hafizhatul Abadi,** Faculty of Pharmacy and Health, Institut Kesehatan Helvetia, Medan, Indonesia.

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Abstract

Objective: The aim of this research was evaluation of rational drug use at Health Society Center in Deli Serdang District, North Sumatera, Indonesia. **Method**: The method of this research is analytical survey with retrospective data collection from the data of patient and receipt in all health society center in Deli Serdang District, Sumatera Utara, Indonesia. **Results**: The 8 district health center with the highest percentage of rational drug use were sequentially Pengajahan (97.40%), Pantai Cermin (91.70%), Melati (83.30%), Tanjung Beringin (69.50%), Sialang Buah (67.10%), Bintang Bayu (66.50%) Perbaungan (62.30%) and Kuala Bali (61.60%), while 5 district health centers with the lowest percentage of rational drug use were Naga Kesiangan (37.3%), Kotarih (41.20%), Dolok Masihul (42.90%), Dolok Merawan (43.10%), Tebing Syahbandar (43.50%). **Conclusion**: The evaluation results of rational drug use based on indicators and the target of the Ministry of Health of the Republic of Indonesia are the number of district health center that have implemented rational drug use totaling 8 health centers (40%) from 20 District Health Center.

Introduction

Rational drug use (RDU) is a campaign that is spread throughout the world, including in Indonesia. RDU is an effort by the World Health Organization (WHO) on the background of the conditions which state that more than 50% of drugs worldwide are prescribed, formulated or sold inappropriately, and that the patient is not used appropriately [1-3]. Problems arising from improper use of drugs are wasteful, continuing health problems or unwanted drug reactions. To avoid this, a quality assurance process for drug use is needed. This makes pharmacists/pharmacy technical personnel must be responsible with other health professions and patients, to achieve therapeutic goals, namely with rational drug use [1, 4].

RDU is a condition in which the patient's condition is properly diagnosed, the most appropriate drug is given with the right dosage and formula, and the patient (health system) can provide what is needed and ensure that the drug is used in adequate time. In addition, RDU is defined by the patient's understanding of the drug and the imRDUtance of therapy so that the patient adheres to the use of the drug given [5-6].

The Ministry of Health of the Republic of Indonesia (Kemenkes RI) has conducted monitoring and evaluation of RDU reviewed from the prescription indicators in health centers in several provinces in Indonesia every year [7-8]. The monitoring system carried out consists of direct and indirect monitoring. Monitoring is not done directly with the multi-level training system from the health center to the Ministry of Health of the Republic of Indonesia. Furthermore, the Ministry of Health of Republic of Indonesia gets the RDU performance figures based on the calculation of prescription indicators. The dependent variable used in the assessment of Rational drug use (RDU) is the percentage of injection in myalgia, percentage of antibiotics in non pneumonia ARI percentage of antibiotics in non-specific diarrhea, and number of drug items in each prescription using injection parameters, antibiotic use and drug items in each recipe [6-9].

District health center as one of the frontline health services for the people of Indonesia should have applied rational drug use according to existing standards [9]. The inaccuracy of drug use at the District health center level can have an adverse effect on the wider community. This is because many people choose health services in District Health Center, especially from the middle to lower class who make up the majority of the population of Indonesia. The problem of drug use at the District health center level can result in the increasing prevalence of drug-related problems in Indonesia which can be very detrimental. The sub-district health center is the largest District health center in a sub-district which generally has the highest number of patients [9-11].

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Based on the Strategic Plan of the Ministry of Health of the Republic of Indonesia in 2017 - 2019 Pharmaceutical and Medical Devices Program in the Target of Pharmaceutical Services Improvement. The target of this activity is to improve pharmacy services and rational drug use in health facilities. The indicators for achieving these targets are: the percentage of district health center that carry out pharmaceutical services according to the standard of 20%. The percentage of rational drug use in the District health center is 60% [12-13].

Based on this background, it is necessary to conduct a study of evaluating the use of rational drugs in pharmaceutical services at Deli Serdang District Health Center, North Sumatra, Indonesia.

Materials and methods

This study is a type of Analytical survey analysis that uses a retrospective research design. Sample collection comes from secondary data of patient registration books and prescriptions in 2017. The research conducted in all sub-district health centers in Serdang Bedagai Regency, North Sumatra Province, amounted to 20 health centers.

The population of this study was all treatment data in general outpatient and prescription poly books from January to December 2017 in all the sub-district health centers of Serdang Bedagai Regency. Samples were determined by purposive sampling nonprobability method according to the operational definition of general poly / treatment and prescription books from January to December 2017 in all Serdang Bedagai District health centers.

Patients were taken from the daily register, 1 case per day for each selected diagnosis. Thus in 1 month, it is expected to collect around 25 cases per selected diagnosis. If on that day there were no patients with the diagnosis, the column was emptied, and filled with the same diagnosis, which was taken in the following days. For each diagnosis, the patient is taken first on the recording day. The diagnosis is taken single, not multiple or accompanied by other diseases / complaints. Puyer and combination drugs are written the details of the type of medication. Types of medicine include drugs for drinking, injection, and external medicine. Immunization is not included in the injection category. The term antibiotics includes chemotherapy and anti amoeba.

The selected data is entered into the table format contains date data, sequence number, patient name, age (year), number of drug items, antibiotics, injection, drug name, drug dosage, duration of use.

Results and discussions

Location and regional geography

The area of Serdang Bedagai Regency is geographically located in the position of 03˚01 '2.5 "- 03 ° 46'33" North Latitude, 98˚44' 22 "- 99 ° 19'01" East Longitude, located in a flat and bumpy geographical area with heights ranging from 0-500 meters above sea level. Serdang Bedagai Regency has an overall area of approximately 8,789.38 km^2 (878,938 ha) covering a land area of approximately 1,952.38 km^2 (195,238 ha) and an ocean of approximately 6,837 km^2 (683,700 hectares) consisting of 17 sub-districts and 243 urban villages/village. Administratively, Serdang Bedagai Regency borders several regions, namely:

a. North side: Malacca Strait
b. South side: Simalungun Regency
c. East side: Coal Regency and Simalungun Regency
d. West side: Deli Serdang Regency

The capital of Serdang Bedagai district is located in Sei Rampah sub-district namely Sei Rampah city. Administrative Region, Number of Villages / Villages, Hamlets and Area Area per District in Serdang Bedagai Regency can be seen in table 1.

Health workers at community health centers

The Serdang Bedagai district health office has 20 health centers (District Health Center). Each District health center has a number of health workers who vary in the number of doctors to officers responsible for pharmacy. The person in charge of pharmacy is not evenly distributed. This can be seen in table 2.

Rational drug use in antibiotics in upper respiratory tract infections Non pneumonia

One of the parameters for evaluating rational drug use is the use of antibiotics in the diagnosis of upper non-pneumonia respiratory tract infections. The percentage of antibiotic use in this diagnosis varies from District health center to health center. We can see more clearly in table 3.

Based on the tolerance limit established by the Ministry of Health of the Republic of Indonesia for the use of antibiotics is 20% [8, 14-17]. From the above data we can see that the use of antibiotics which are under 20% is Perbaungan 15.38%, Pantai Cermin 12.96%, Sialang Buah by 0.00%. And 5.56% exploration while the rest exceeds the set tolerance limit. For more details, see Graph 1.

Use of antibiotics in non-specific diarrhea

The results of the percentage of antibiotic use also show results that vary per District health center and every quarter. We can see these results from the presentation in table 4. The Ministry of Health of the Republic of Indonesia has set a tolerance limit for the use of antibiotics in diagnosing non-specific diarrhea which is 8% [8, 14-17], while the percentage achieved by District health center varies. From the results obtained, it shows that not one District health center gets the percentage

below the established tolerance limit. For more details, see Graph 2.

Rational drugs use

In the operational definition of the Ministry of Health of the Republic of Indonesia, it is explained that the percentage of districts/cities that use Rational Medicine (RDU) is District/City whose 20% of District health center have a minimum Rational Use of Medicines of 60%, use of antibiotics in the management of upper respiratory tract infections non-pneumonia cases, non specific diarrhea, use of injection in the management of myalgia cases, and average drug items for prescription at the district health center, for all cases of upper respiratory tract infections non-pneumonia and non-specific diarrhea in the same facility.

Table 1. Administrative Region, Number of Villages / Villages, Hamlets and Area Areas per District of Serdang Bedagai Regency.

Sr. No.	Sub-Districts	Large/Km²	Number		
			Village	Sub-village	Hamlet
1	Pantai Cermin	80.20	12	-	81
2	Perbaungan	118.63	24	4	107
3	Teluk Mengkudu	76.54	12	-	66
4	Sei Rampah	214.65	17	-	103
5	Tanjung Beringin	71.94	8	-	48
6	Bandar Khalipah	82.59	5	-	60
7	Tebing Tinggi	147.49	14	-	93
8	Sipispis	220.52	20	-	114
9	Dolok Merawan	141.70	17	-	54
10	Dolok Masihul	194.40	27	1	110
11	Kotarih	83.67	11	-	28
12	Pegajahan	99.36	12	1	60
13	Sei Bamban	82.01	10	-	82
14	Tebing Syahbandar	142.85	10	-	67
15	Silinda	56.54	9	-	33
16	Bintang Bayu	66.83	19	-	54
17	Serba Jadi	67.47	10	-	58
Total		1952.38	237	6	1.221

Table 2. Distribution of health workers related to Rational Drug Use at Serdang Bedagai District Health Center.

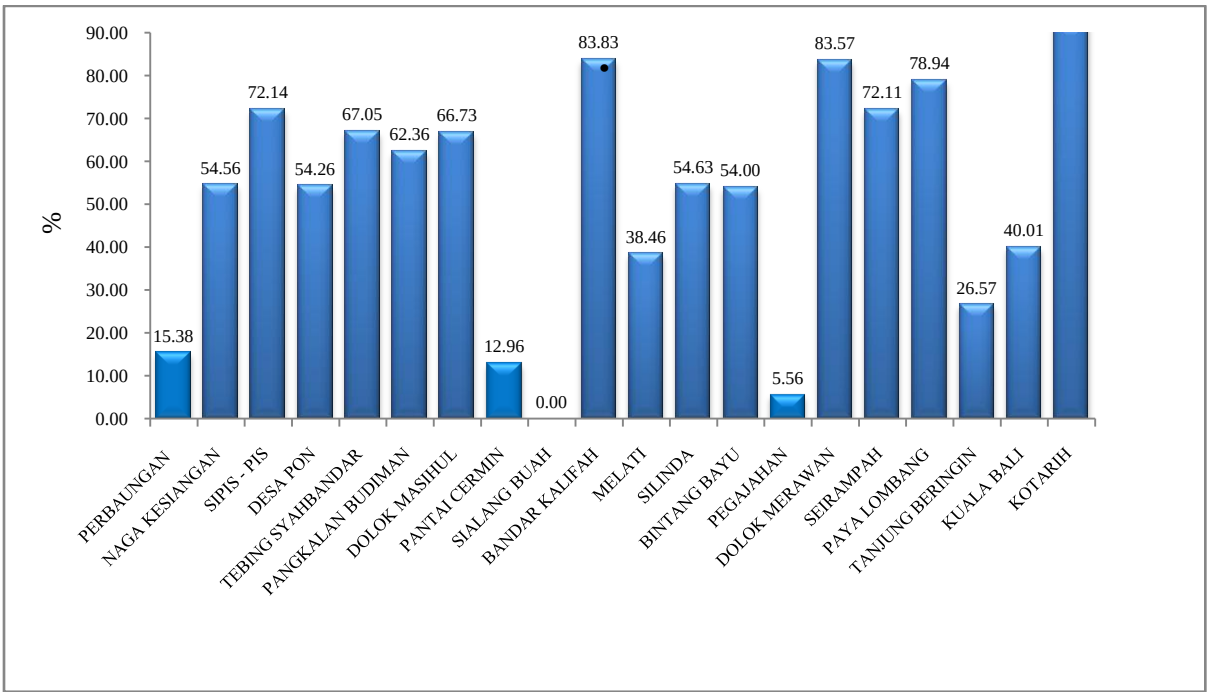
Sr. No.	District Health Center	Doctor	Pharmacist	Pharmacist assistant	Others
1	Perbaugan	3	0	1	-
2	Melati	2	0	1	-
3	Pantai Cermin	2	0	1	-
4	Pegajahan	2	0	1	-
5	Sialang Buah	3	0	-	1
6	Sei Rampah	4	0	1	-
7	Pangkalan Budiman	2	0	1	-
8	Tanjung Beringin	6	0	1	-
9	Desa Pon	3	0	1	-
10	Paya Lombang	2	0	-	1
11	Naga Kesiangan	2	0	-	1
12	Tebing Syahbandar	3	0	1	-
13	Bandar Khalipah	3	0	-	1
14	Dolok Merawan	2	0	-	1
15	Dolok Masihul	3	0	1	-
16	Sipispis	2	0	1	-
17	Kuala Bali	3	0	1	-
18	Bintang Bayu	2	0	-	1
19	Kotarih	3	0	1	-
20	Silinda	3	0	-	1
Total		55	0	13	7

Table 3. Distribution of the percentage of use of upper respiratory tract infections non-pneumonia antibiotics 20 health centers in quarter (Q) 1 to quarter (Q) 4 in 2017.

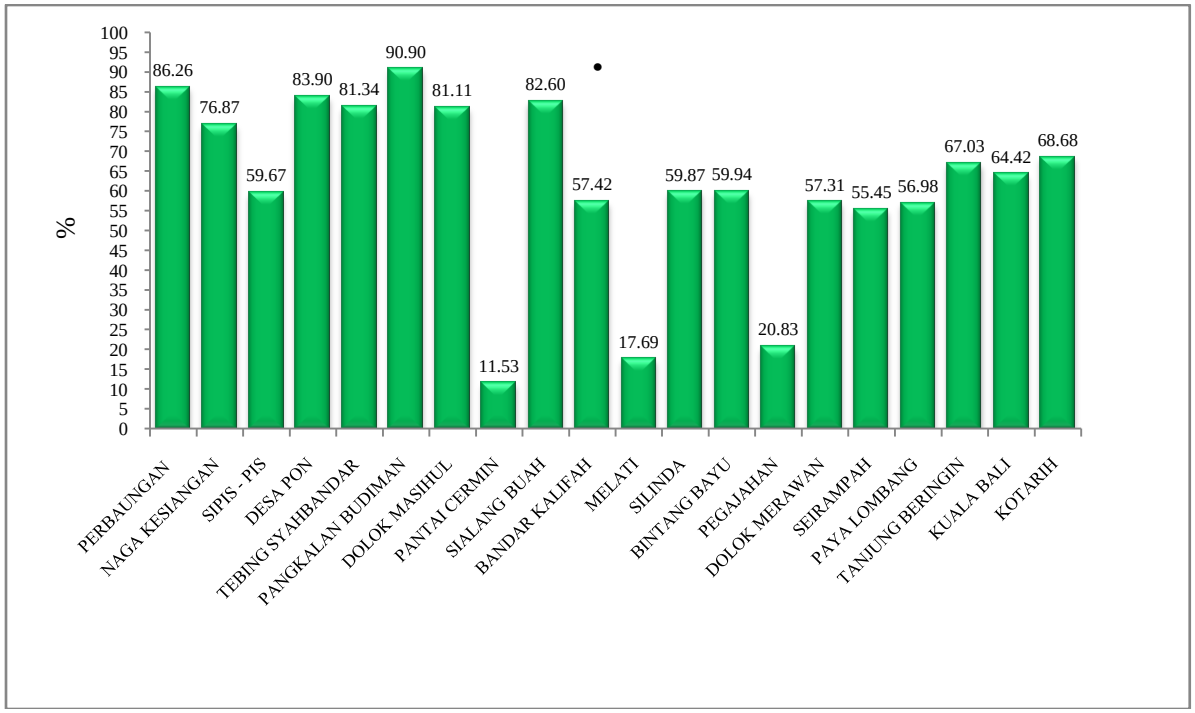
Sr. No.	District Health Center	Q1 (%)	Q2 (%)	Q3 (%)	Q4 (%)	Averages (%)
1	Perbaungan	0.00	00.00	61.54	0.00	15.38
2	Naga Kesiangan	43.55	23.45	56.39	94.87	54.56
3	Sipis – Pis	71.31	72.00	63.17	82.07	72.14
4	Desa Pon	60.34	54.60	53.76	48.33	54.26
5	Tebing Syahbandar	76.84	41.93	75.71	73.70	67.05
6	Pangkalan Budiman	51.88	72.85	67.50	57.23	62.36
7	Dolok Masihul	72.74	53.77	57.99	82.41	66.73
8	Pantai Cermin	19.55	11.20	11.79	9.33	12.96
9	Sialang Buah	0.00	00.00	00.00	00.00	00.00
10	Bandar Kalifah	86.33	84.00	82.33	82.67	83.83
11	Melati	46.33	32.03	42.37	33.13	38.46
12	Silinda	86.00	26.43	51.74	54.36	54,63
13	Bintang Bayu	80.00	29.90	72.87	33.25	54.00
14	Pegajahan	9.30	7.40	0.00	5.53	5.56
15	Dolok Merawan	59.13	91.58	89.82	93.75	83.57
16	Seirampah	84.90	77.77	93.65	32.11	72.11
17	Paya Lombang	83.60	69.03	91.40	71.74	78.94
18	Tanjung Beringin	50.17	39.00	9.51	7.60	26.57
19	Kuala Bali	43.93	21.27	59.10	35.95	40.01
20	Kotarih	92.37	85.00	100.00	91.38	92.19
Averages		55.91	44.66	57.03	49.47	51.76

Table 4. Distribution of the percentage of Use of Antibiotics in Non-Specific Diarrhea in 20 health centers in quarter (Q) 1 to quarter (Q) 4 in 2017.

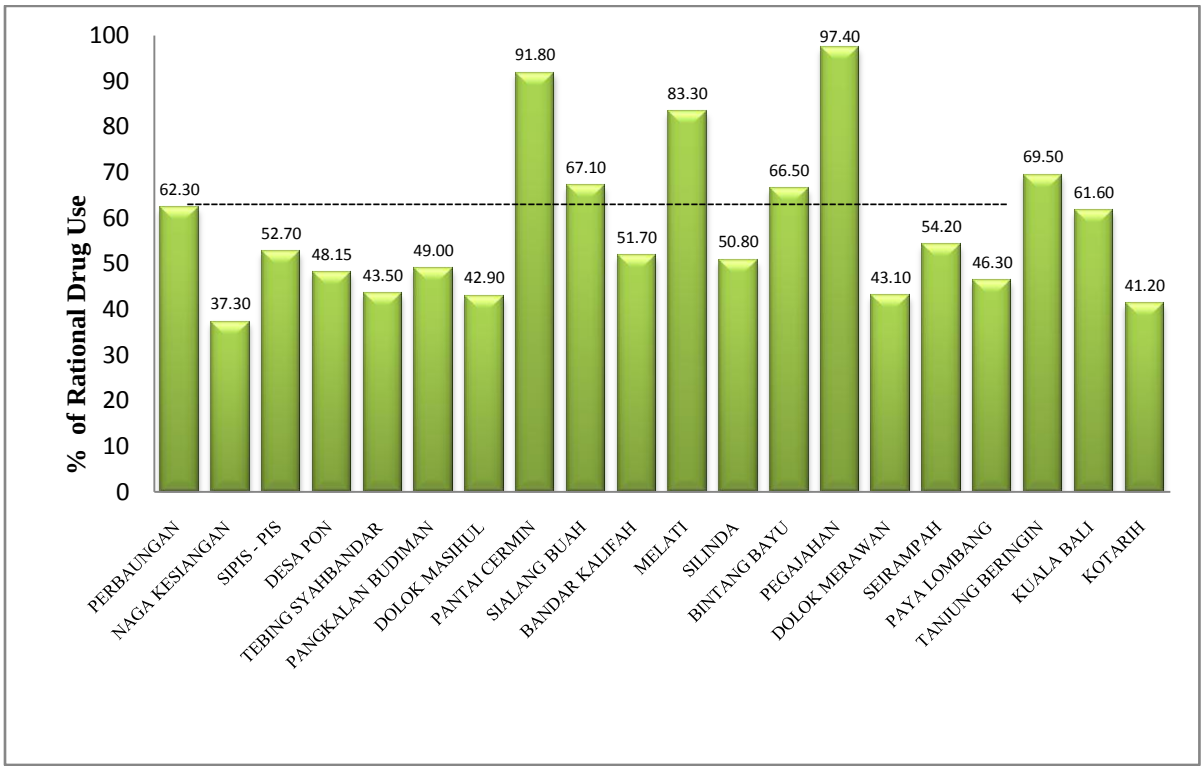
Sr. No.	District Health Center	Q1 (%)	Q2 (%)	Q3 (%)	Q4 (%)	Averages (%)
1	Perbaungan	47.62	100.00	97.44	100.00	86.26
2	Naga Kesiangan	64.07	90.00	81.19	72.23	76.87
3	Sipispis	83.33	16.67	72.00	66.67	59.67
4	Desa Pon	77.77	77.77	87.22	92.83	83.90
5	Tebing Syahbandar	90.77	63.67	81.94	89.00	81.34
6	Pangkalan Budiman	100.00	83.33	87.69	92.59	90.90
7	Dolok Masihul	83.33	46.67	94.44	100.00	81.11
8	Pantai cermin	12.50	10.84	9.70	13.07	11.53
9	Sialang Buah	80.56	58.73	100	91.10	82.60
10	Bandar Khalipah	70.67	48.33	76.33	34.36	57.42
11	Melati	19.67	0.00	28.87	22.23	17.69
12	Silinda	50.00	40.00	93.94	55.56	59.87
13	Bintang Bayu	88.57	33.47	80.70	37.03	59.94
14	Pegajahan	0.00	0.00	50.00	33.33	20.83
15	Dolok Merawan	52.07	4.97	94.43	77.77	57.31
16	Sei Rampah	82.20	46.58	81.90	11.10	55.45
17	Paya Lombang	49.86	37.93	74.27	65.85	56.98
18	Tanjung Beringin	81.27	80.67	48.10	58.08	67.03
19	Kuala Bali	55.57	54.23	82.50	65.37	64.42
20	Kotarih	83.33	60.00	60.00	71.41	68.68
Average (%)		63.66	47.93	74.13	62.48	62.00



Graph 1. The percentage of antibiotics in the diagnosis of upper respiratory tract infections non-pneumonia in each Serdang Bedagai district health center.



Graph 2. The percentage of antibiotics in the diagnosis of non-specific diarrhea in each of the Serdang Bedagai district health centers.



Graph 3. Percentage of rational drug use in each Serdang Bedagai district health center.

Table 5. Distribution of percentage of RDU 20 District health center in quarter (Q) 1 to quarter (Q) 4 in 2017

Sr. No.	District Health Center	Q 1 (%)	Q 2 (%)	Q 3 (%)	Q 4 (%)	Averages (%)
1	Perbaungan	79.5	68.2	39.4	61.9	62.25
2	Naga Kesiangan	44	43.3	28.1	33.8	37.3
3	Sipispis	40.5	65.6	51.4	53.4	52.7
4	Desa Pon	41.2	59.5	45.5	46.4	48.15
5	Tebing Syahbandar	32	70.5	27.4	44	43.5
6	Pangkalan Budiman	52.2	47.9	45.8	50.3	49
7	Dolok Masihul	44.7	66.5	35.2	25.1	42.9
8	Pantai cermin	89.4	95.1	92.2	90.3	91.8
9	Sialang Buah	69.9	78.9	60.8	58.9	67.1
10	Bandar Khalipah	45.4	54.4	43.6	63.5	51.7
11	Melati	80.6	89.9	75.9	87	83.3
12	Silinda	40.3	73.1	39.5	50.2	50.8
13	Bintang Bayu	50.6	81.4	51.7	82.3	66.5
14	Pegajahan	99.6	95.7	99.1	95.2	97.4
15	Dolok Merawan	64.1	60	27.4	20.8	43.1
16	Sei Rampah	39.1	51.5	43.7	82.5	54.2
17	Paya Lombang	39.1	64.3	27.1	54.7	46.3
18	Tanjung Beringin	53.6	56.4	85.1	82.8	69.5
19	Kuala Bali	67.5	67.1	46.6	65.4	61.6
20	Kotarih	42.9	50.3	29.4	42.3	41.2
Averages (%)		55.81	68.72	49.75	62.13	59.10

Based on graph 3 it shows that there are 8 health centers that exceed the percentage threshold of rational drug use set by the Ministry of Health of the Republic of Indonesia at 60% [8]. The 8 District health center are sequentially District health center Pengajahan (97.40%), District health center Pantai Cermin (91.70%), District health center Melati (83.30%), District health center Tanjung Beringin (69.50%), Sialang Buah (61.10%), Bintang Bayu health center (66.50%) Perbaungan health center (62.30%) and Kuala Bali health center (61.60%), while 5 health centers with the lowest percentage of rational drug use were Naga Kesiangan District health center (37.3%), Kotarih Health Center (41.20%), Dolok Masihul health center (42.90%), Dolok Merawan health center (43.10%), Tebing Syahbandar health center (43.50%). According to the Serdang Bedagai district health office, the most

decisive factor in achieving rational drug use in the District health center is coordination and collaboration between health center staff, especially the head of the District Health Center, general poly doctors and pharmacists. Thus, from the graph above, it can be seen that of the 20 District health center in Serdang Bedagai district that have carried out rational drug use, there are 8 District Health Center. And this data shows that the level of District health center implementing RDU increased from only 4 District health center in the previous year.

The Ministry of Public Health and Population should supervise, monitor, and give feedback to health workers, by developing and implementing in-terventions about drug use in generaland prescribing in particular in order to improve prescribing practices and rational use of drugs [18-20]. Poorly functioning government institutions may also impair provision of education and health. Reduced levels of education and health could substantially reduce long-run growth as well as short-run welfare, since public human capitalinvestment accounts for a large fraction of total investment in many countries. There is a strong need to utilize the important segment i.e. community pharmacies which acts as a first-line treatment source for most of the population. Strategies shall be formed to utilize their potential in promoting rational drug use in line with the experience of other developing countries. Policy investment is needed in regulation of drugs to reduce unnecessary proliferation and prescribing, and strengthening quality parameters at provider and community pharmacy [20-22].

Conclusion

The evaluation results of rational drug use based on indicators and the target of the Ministry of Health of the Republic of Indonesia are the number of District Health Centre that have implemented rational drug use totalling 8 health centres (40%) from 20 District Health Centre.

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