

# The impact of National Health Insurance online referral system on the access and quality of health services in Gianyar District, Bali, Indonesia

Ida Ayu Agung Dewi Sawitri,<sup>1\*</sup> Pande Putu Januraga,<sup>2</sup> Ni Made Sri Nopiyani<sup>2</sup>

## ABSTRACT

**Background and purpose:** The introduction of an online referral system aims to improve the quality and costs control of the National Health Insurance (NHI) or *Jaminan Kesehatan Nasional*. This study aims to determine the impact of the NHI online referral system implementation on access and quality of health services in Gianyar District.

**Methods:** This is an explorative qualitative study conducted in Gianyar, Bali, Indonesia. Data was collected through semi-structured in-depth interviews to a total of 26 informants recruited purposively. They were including policy makers in the health office and the NHI implementing organization (BPJS), heads of public health centres (*puskesmas*), private health facilities and referral healthcare facilities; and 13 NHI participants. Data collection was undertaken from May to August 2019. The interview results were thematically analysed based on the Health Care Reform Control Knobs Framework.

**Results:** The study identifies several positive impacts of the online

referral system, which include: the closer distance of patients accessing services, the easier it is to obtain information on services at referral health facilities, and the easier the hospital to promote its service products, the higher assurance of patients being accepted by the referral hospitals, patients with special conditions are better accommodated, the easier the administrative procedure, improved time, cost and working procedure efficiencies, increased punctuality of the services, and guaranteed data security that reduces the risk of lost or damaged referral documents. On the other hand, the online referral system has also resulted in negative impacts, some of them were system inconsistencies, information and communication technology (ICT) constraints, service discontinuity, service injustices and loss of patients' loyalty.

**Conclusion:** NHI online referral system generally have positive impacts on access and quality of health services, however, it is necessary to improve several aspects of the online referral system to better accommodate user needs and to optimize service.

**Keywords:** online referral, access, quality, health insurance

<sup>1</sup>Sanjiwani General Hospital, Gianyar District

<sup>2</sup>Department of Public Health and Preventive Medicine, Faculty of Medicine, Udayana University

## INTRODUCTION

The implementation of the National Health Insurance (NHI) or *Jaminan Kesehatan Nasional* (JKN) is one form of health sector reformations in Indonesia to achieve universal health coverage.<sup>1</sup> The NHI, managed by implementing organization called as *Badan Pelaksana Jaminan Sosial-Kesehatan* (BPJS Kesehatan), aims to provide comprehensive health insurance and ensure that all people have access to health services that are of high quality and equitable.<sup>2</sup> Successful implementation of NHI requires quality and cost control strategies. Optimizing the referral system of NHI is one of the essential strategies to improve the effectiveness and efficiency of health services.<sup>3</sup>

According to Indonesia Presidential Regulation Number 82/2018, NHI adopts a tiered referral system consisted of three levels of health care

facilities. NHI members who seek health care must first come to the first level health care facility. If further health services that cannot be provided by first level health facilities are needed, referral to the closest higher level of health care facilities should be undertaken, except for emergency conditions.<sup>4</sup>

Ineffective referrals system can lead to poor health service quality, high non-specialist referral numbers, accumulation of patients in certain hospitals and poor coordination between the referring and receiving health care providers. All of these problems result in disadvantages to patients, health providers and insurance administering organization.<sup>5-7</sup> Also, these problems could become disincentives for current NHI participants to stay in the program or for new voluntary users to join the NHI as the perceived benefit was considered an important factor for participation in the program.<sup>8</sup>

\*Correspondence to:  
Ida Ayu Agung Dewi Sawitri;  
Sanjiwani General Hospital,  
Gianyar District;  
[dr.dayuagung@gmail.com](mailto:dr.dayuagung@gmail.com)

NHI online referral system is a reform that aims to change the health service system to improve access of NHI participants to quality health services. The implementation of digital referral procedures is expected to have a positive impact on health services including improving patient access, reducing patient waiting time, improving timeliness of service to patients, establishing good referral communication, and an accurate and integrated transfer of health information between health care facilities.<sup>6,9-11</sup>

Despite the positive outcomes intended by NHI online referral system, the implementation of this reform remains controversial. Various news in the mass media indicate that there are negative responses from some stakeholders, claiming that its implementation could jeopardize the access of community to health services, disadvantage patients and health facilities that collaborate with *BPJS Kesehatan*, and disregard for the patient's right to choose appropriate health services.<sup>12-14</sup>

So far, in Indonesia, there has been no study that systematically investigate into how the changes of the NHI referral system impacts upon the quality and access of health services. Exploration of the impact of implementing NHI online referrals on the access to and quality of health services from the perspectives of health service providers, users and policy makers is necessary to provide insight on the current state of implementation and inform future reform.

To explore health care reform, the Control Knobs Framework from Robert et al (2004) has been widely used in the literatures. This framework describes five 'control knobs' of the health system that can be adjusted or changed, namely financing, payment, organization, regulation, and behaviour. Changes in the settings of the control knobs will result in changes in the intermediate outcomes (efficiency, quality and access), and consequently lead to the changes in the long-term outcomes of health system (health status, risk protection and public satisfaction).<sup>15</sup>

Gianyar is one of the districts in Bali Province, Indonesia, with a 96.17% NHI coverage of its 508,100 population as per 1 February 2019. NHI health care providers in the district consisted of 84 primary and six referral healthcare facilities.<sup>16</sup> Preliminary exploration suggests that there are several negative issues emerged after the implementation of online referral system in the district including unequitable numbers of visits to hospitals that mainly disadvantaged the public hospital and patients' complaints regarding access to healthcare.<sup>17</sup> This study aims to explore the impacts of NHI online

referral system on the access and quality of health services in Gianyar District.

## METHODS

This was a qualitative exploratory study conducted in May to August 2019 in Gianyar, Bali, Indonesia. Data collection was carried out through semi-structured in-depth interviews with a total of 26 informants who were selected purposively, to gain a comprehensive understanding from the perspectives of NHI health service providers, users and policy makers. Health service providers consisted of informants from public and private referral health care facilities (RHC) or hospital and primary health care facilities (PHC) namely public health centres, private clinic, private doctor. The selected health care services who were invited to contribute in this study have become a service provider in the NHI prior to the online referral implementation and continues to operate serving NHI members after the enactment of the online referral system. Meanwhile, NHI service users are NHI members who have used health services prior to the online referral system, have chronic diseases so that they were still in need of medical treatment and access health services after the online referral system was rolled out in Gianyar District. Policy makers consisted of the Head of Gianyar Health Office and Head of Klungkung Branch of *BPJS Kesehatan* that covers NHI management at Gianyar District.

All respondents were provided with information sheets and presented written consent prior to their participation in this study. Interview guide was developed by incorporating the aspects of Health Reform Control Knobs Framework, particularly the access and quality aspects. This study only focuses on intermediate health system performance, namely access to and quality of health services because NHI online referral was in the early phase of implementation, making it less possible to measure the long term outcomes in the forms of health status, patient satisfaction and protection against financial risk. Interviews were conducted in the informants' workplace or their houses. The interviews were audio recorded and lasted for 28 to 95 minutes. Data obtained from the in-depth interviews were analyzed by thematic analysis. The stages of the analysis included coding, reducing data, categorizing to find themes, interpreting, presenting data and making conclusions or verification based on the research conceptual framework, Health Reform Control Knobs by Robert et al.<sup>15</sup> The internal validity of the data was ensured through triangulation of sources, member

checking and peer debriefing.

This study granted an Ethical Clearance from the Ethics Committee of the Faculty of Medicine, Udayana University/Sanglah General Hospital with number 1247/UN14.2.2.VII/17LP/2019.

## RESULTS

### Characteristics of Informants

The informants consisted of NHI health service providers, users and policy makers. Based on gender, the respondents consisted of 15 men (57.7%) and 11 women (42.3%) with the lowest education is elementary school and the highest is a master's degree. Most of the informant's occupation are doctor as many as 11 people (42.3%). The duration of the interview ranges from 28 minute to 95 minutes

Research findings are presented in two dimensions, namely NHI participants' access to health services and health service quality in the implementation of NHI online referral system in Gianyar District. There are 15 main themes that emerged from the analysis. The dimension of *JKN* members access to health services include six themes namely accessibility, accommodation, availability, acceptance, special conditions and consistency. The dimension of the quality of health services include nine themes, namely infrastructure, continuity of service, service efficiency, administrative procedures, timeliness of services, fairness of service, data security, convenience and communication information on coordination of complaints handling. Three new themes emerged, namely specific conditions

**Table 1. Characteristics of Informants**

Informant's ID	Gender	Age	Occupation	Education	Informant Status
I01	M	54	Carver	Senior high school	NHI service users
I02	F	72	Housewife	Senior high school	NHI service users
I03	M	32	Trader	Elementary school	NHI service users
I04	M	58	Civil servant	Bachelor	NHI service users
I05	F	68	Retired civil servant	Bachelor	NHI service users
I06	F	65	Housewife	Senior high school	NHI service users
I07	M	53	Private employee	Bachelor	NHI service users
I08	F	59	Housewife	Elementary school	NHI service users
I08	M	45	Entrepreneur	Bachelor	NHI service users
I10	F	78	Housewife	Elementary school	NHI service users
I11	M	72	Hindu priest	Senior high school	NHI service users
I12	F	57	Private employee	Bachelor	NHI service users
I13	F	68	Housewife	Elementary school	NHI service users
I14	M	51	Doctor	Master	Health service providers (RHC)
I15	M	35	Doctor	Medical doctor profession	Health service providers (RHC)
I16	M	41	Doctor	Medical doctor profession	Health service providers (RHC)
I17	F	45	Doctor	Medical doctor profession	Health service providers (RHC)
I18	F	33	Doctor	Master	Health service providers (RHC)
I19	M	40	Doctor	Medical doctor profession	Health service providers (PHC)
I20	M	37	Doctor	Medical doctor profession	Health service providers (PHC)
I21	F	27	Private employee	Diploma	Health service providers (PHC)
I22	M	39	Doctor	Master	Health service providers (PHC)
I23	M	60	Doctor	Master	Health service providers (PHC)
I24	M	60	Doctor	Master	Health service providers (PHC)
I25	F	37	Doctor	Medical doctor profession	Policy makers ( <i>BPJS Kesehatan</i> )
I26	M	43	Civil servant	Bachelor	Policy makers (District health office)

and consistency in the dimension of access to health services, communication information and coordination of complaints management in the dimension of health services quality.

### Access to Health Services

Access to health services is the ability of service users (NHI members) to obtain the required health services at NHI service providers. Access to health services includes the distance to reach health care facilities, ability to get timely, appropriate and continuing medical services, ease of administrative procedures and availability of a comprehensive health services information. The impact of the online referral system implementation that was immediately conveyed by respondents when first interviewed was to bring access to the closest referral health facilities according to medical conditions and patient needs. Referral is made by PHC based on the zoning system.

*They (PHC) asked me to choose the nearest hospital from my house, and it was X Hospital. So, I was referred to that hospital.” (I06)*

*“Yes, because it (hospital) is close to my house, takes about 10 minutes to get there, and it has cardiologist.” (I09)*

Furthermore, both NHI members and primary healthcare providers stated the ease to access information related to opening hours of polyclinics, specialist doctor's practice schedules and facilities owned by referral health facilities as the perceived benefits of the online referral system.

*“Yes, because it is all online, it makes it easy to find out about hospital hours, opening times, and where to access cardiovascular health services, for instance.” (I09)*

The disclosure of service information contained in the Health Facilities Information System (HFIS) provides benefits for hospitals, especially the private hospitals, in promoting their services to patients and PHC.

*“It is more effective to promote the services with HFIS compared to promote ourselves via social media or website. Because, when users are in need of health services, they have to go to the primary health care facilities. In PHCs, they have to access HFIS, where they can get complete information about health services provided in our hospitals.” (I16)*

This study also reveals that the online referral system leads to improvement on the availability

of health workforces (such as medical specialists, pharmacists), service hours and supporting facilities. These improvements were made particularly by the private hospitals to anticipate the increasing numbers of patient visits and to maintain the quality of services.

*“We try to improve our quality of services by recruiting more medical specialists and lengthening the service hours. Furthermore, we also recruited more personnel in pharmaceutical unit and change the system to improve the response time and patients' satisfaction.” (I17)*

Online referral ensures that patients are guaranteed assistance at the referral health facility without rejection due to unavailability of particular services. Referrals were addressed precisely so as to prevent incorrect referrals.

*“It guarantees certainty for the patient that they will be given the most accurate and efficient referral available” (I15)*

Furthermore, the existence of special conditions in the online referral system has provided the benefits of the continuation of health services for NHI patients with a history of certain diseases, making it easier and faster to access services in referral health facilities and ensure patient safety. Patients with special conditions do not follow the tiered referral provisions, thus preventing the risk of being late in handling patients which can result in worsening of the patient's condition.

*“You can go to Sanglah (referral hospital) if there is a particular condition, for example haemophilia. Also, for oncology services. For mental health services there is Bangli [Bangli District Mental Health Hospital], basically anyone with special health needs can view service access and go directly to the hospital indicated, as opposed to presenting at a general facility then being referred on.” (I19)*

*“It is critical that this service is available because we can't afford to keep patients waiting or complicate things.” (I15)*

Pcare is a service information system application that used by public health care service (PHCS) to organize online referrals from PHCS to referral health care services (RHCS) in real time based on the HFIS database. With digitalization of referrals, health facilities should make it easier for providers to process health referrals. However, it was evident that inconsistencies occurred in the online referral system. Having to log in and re-open the system each



time often means that the choice of referral hospital may change each time the “Pcare” application is accessed. PHCS had difficulty in securing the access of patients to regularly visit RHCS.

*“The choice of referral hospital seen in the Pcare application can change, at one time a particular hospital appears, but then the name of the health facility disappears so that the referral cannot be made to the intended hospital. Yes, the system open closes independently which can be annoying” (I23)*

### Quality of Health Services

This study reveals the perceptions of informants towards the quality of health services during the implementation of NHI online referral system that includes the administration procedures, patient management, data storage, information communication technology (ICT), continuity of medical services, and complaint handling system. In terms of service quality, both health service users and providers generally stated that administrative procedures were now more straightforward.

Administrative issues in accessing for health services are reduced. Before the implementation of the online referral system, service users have to bring the copy of referral letter, identity card and NHI card, to be presented to the administration staff during registration. The absence of these documents will prevent the NHI participants to access the health care services. Since the implementation of the online referral system, the hard copy of these documents is no longer required. With the ease of administration procedures, services are become faster, queuing time is shorter so that it can save patients and health providers time. Efficiencies in services occur in the form of time efficiency, cost efficiency in administering paperwork and efficiency in the way staff work.

*“Things are easier, not as much as paper-based admin.” (I07)*

*“It is much easier to register. All you need to do is show your BPJS card, explain that you already have a referral online. It saves so much time for everyone.” (I14)*

The ability to track status and record patient referral activities and the exchange of patient information and data has the effect of reducing inaccuracies in patient management, reducing unnecessary examinations and avoiding inappropriate referral errors. Another advantage of the quality aspect of an online referral system is that the referral data is recorded in the system so the safety of the referral data is guaranteed which

has the effect of reducing the risk of lost, damaged or forgotten referrals. By storing reference data electronically, the management of referral data recording becomes easier and more practical.

*“So, if a patient has been there before, he needs to be referred. If indeed we need the data, we just look at p-care. then we also have the list of patient visits. That’s all” (I21)*

*“Recording of patient visit data can help health facilities to find out patients, for instance who are using dialysis service, there is a history of data in the application. when and at which hospital the patient was checked or treated” (I19)*

*“ Well, yes of course it is more practical. Don’t need to fuss with paper admin and forms. It is all online. Especially for elderly who may be forgetful and lose things. Now they just need to show up as all the information is in the system” (I09)*

Nevertheless, there are still reports of complaints related to technical problems due to disruption of ICT such as application maintenance problems, server or internet disruptions.

*“Almost every day, some of my colleagues complain about the Pcare error.” (I23)*

*“The error was caused by the disruption of the network at the center (BPJS). So, everyone must wait until the network is back to normal.” (I05)*

Furthermore, another drawback of the online referral system is that the patient cannot choose the referral hospital according to their wishes but based on the hospital’s competency and class. For example, a patient who has frequently checked into a type C hospital for the necessary years - since applying online referral can no longer visit the hospital because in the Pcare application, the name of the hospital is not in the referral option although it is in the same district.

The inability to select previously visited hospital has resulted in service discontinuity due to the zoning and tiered referral system. Some respondents stated that they were forced to move to a hospital and had to go through the same examinations because the medical record containing their history, results of supporting examinations (e.g. laboratory result) and records of patient progress were inaccessible, since it was stored in previously visited health care facilities.

*“We had to move even though at the other hospital all of our data was saved. If we move, we have to do it all again. Be evaluated and examined all over again. Running around like that is a bit annoying. Especially being old and frail.” (I11)*

*“There are faults with the system because if you have to move to another hospital you have to start from zero, do it all over again.” (I24)*

Another weakness mentioned by respondents is the existence of a policy of referral quota from PHCS to RHCS of 30% in the application of online referrals. This quota is considered as a form of injustice to provide equal opportunities in accessing services at referral health facilities. In the quota system, patients can directly access services to the higher type hospitals if the number of referrals per health facilities from PHCS to RHCS has exceeded 30% capacity of patients who can be served in class C or D health facilities.

*“From my point of view, it is not fair, since it limits patients’ rights to choose services they want. With the quota system, for example, a patient who need services in type B hospital could not get it because the 30% quota has not been reached. Meanwhile, another patient who doesn’t need health service in type B hospital can be referred to type B because the quota in type C hospital is full. That’s not fair for the patients. (I14)*

At the beginning of the online referral system evaluation, there were many complaints made by patients and health care facilities providing NHI services. Respondents complained about the lack of promotion related to the implementation of online referrals which resulted in an increased workload of officers.

*“I think the promotion about this online referral system is still lacking because some patients did not know about it, they confused. They came to the hospital without knowing the new regulation. When they arrived at the hospital, they had to go back to the public health center or their doctor to make new referral.” (I07)*

For the above reason, a Complaints Handling and Information System was developed to facilitate the provision of information on NHI services. The health care facilities appointed Information and Complaints Handling Officers to provide assistance for any obstacles or complaints from NHI participants when obtaining health services. The coordination between health care facilities and *BPJS Kesehatan* was also conducted through WhatsApp group to accelerate decision to solve problems faced by patients and health providers.

*“We developed a platform, information provision and complaints handling system. At the time the complaint is submitted, we (BPJS kesehatan) will receive it, so will the healthcare frontliner and complaints handling officer.” (I15)*

## DISCUSSION

This study revealed that the implementation of the NHI online referral system in Gianyar District generally had a positive impact on NHI participants’ access to quality health services. However, there are some issues which are required improvement regarding ICT performances, continuity of medical services, lack of fairness in access to healthcare facilities due to quota policy, and lack of NHI participants’ knowledge regarding the changes in referral system.

The results showed that the first positive impact felt by participants was the ease in terms of NHI participants’ access to the referral health facilities. This finding is in line with studies conducted in Japan among patients using the Japan NHI and Medicare participants in the USA. Patients in those studies prefer health facilities close to where they live, with the closer the distance, the easier it is for patients to complete the examination.<sup>18,19</sup> Increasing information disclosure regarding service time, type of service, resources owned by the health facilities in the *BPJS Kesehatan* online referral system has an impact on the ease of PHCS and patients to obtain information about the services available at the RHCS.<sup>10,20</sup> Accurate information about the type of specialist services and service schedules at RHCS greatly helps patients to obtain health services more quickly and precisely in accordance with the patient’s medical needs.<sup>10,21,22</sup> The online referral system also provides certainty in scheduling visits to specialists at the referral hospital which allows patients to meet specialists directly according to the agreed schedule.<sup>10,21–23</sup>

The use of online-based electronic referrals can provide certainty that referrals will be accepted by the RHCS (referral transparency) so it is unlikely that the referral will be disregarded. Implementation of electronic referrals can prevent the occurrence of unnecessary referral errors, while the exchange of information and patient data can reduce the inaccuracy of patient management and examination.<sup>10,23,24</sup> Patients with specific health service requirements and special conditions such as haemodialysis, thalassemia, haemophilia, psychiatric disorders, leprosy, MDR-TB, chemotherapy, radiotherapy, HIV-PLHIV are able to be more easily acquire appropriate treatment according to their medical condition.<sup>20,25</sup> Improved communication between services on the online referral system also facilitates the transfer of information (knowledge sharing) between health professionals.<sup>21,26,27</sup>

Another positive impact is the ease of administration arrangements for patients and service providers. In many studies, ease of administration

facilitated improvement in the quality of health services to the public.<sup>6,20,22,28</sup> Ease of administration also ensures time efficiency. Electronic referrals can shorten the patient's waiting time when receiving services at the RHCS.<sup>10,22,23,29</sup> Furthermore, there is a decrease in the workload of officers, especially due to reduced recording and filling time, and assurance that the referral reach RCHS without any need to do any confirmatory calls.<sup>20-22</sup> In terms of the quality of patient's data recording, the results of the study showed an increase in the quality of referral data recording. This result is in accordance with several studies which state that referrals using an online registration system provide a sense of security to patients because they do not need to worry about referral letters being scattered, lost or damaged.<sup>6,21,23</sup>

Despite its aims to bring health services closer to patients, there are complaints on the implementation of online referral system due to inability to choose service provider. Studies conducted in Jepara and Sumedang reported similar highlights that patients were unable to choose their preferred hospital.<sup>7,30</sup> The limitations in the selection of RHCS and inconsistencies in the Pcare application made it difficult for patients to access the desired services and were forced to move hospitals. From the perspective of health facilities, they complain about the loss of old patients who are loyal to the hospital.<sup>31</sup> The occurrence of service discontinuity is contrary to the patient-centred principle.<sup>26</sup> The existence of a service quota system and restrictions on the choice of patients to have the same opportunity in accessing services to referral facilities considered as a form of injustice. Justice in health implies that ideally everyone should have the same opportunity to achieve their full health potential, and that no one is disenfranchised in this process.<sup>32</sup>

Improvements to the aspects of consistency, stability of the online referral system and ICT capacity in the NHI program still need to be done. These constraints can interfere with access and quality of service.<sup>6,7,33</sup> Quality information systems must meet aspects of consistency. Web-sourced data, big data can be said to be of quality if it meets the elements of data completeness, consistency, accuracy, and timeliness. Consistency can guarantee the quality of the system delivered does not change over time. The inconsistency of the system can cause difficulties for users in obtaining appropriate information or a decline in the quality of information displayed.<sup>34</sup> This study also indicates that the implementation of the online referral system should be disseminated more intensively by *BPJS Kesehatan* and related stakeholders to

NHI participants to avoid confusion. Moreover, improvement in complaint handling system to provide fast and adequate responses to NHI participants and service providers' complaints, is essential to improve the quality of online referral system.<sup>30,35,36</sup>

One of the limitations of this study is the limited transferability of the results to the same settings with similar context as Gianyar District since there are some local policies (i.e. zoning system) that influence the implementation of online referral system. In addition, the triangulation of the data was not optimal since the data was only obtained through in-depth interviews of the informants. Further study regarding online referral system should employ quantitative and comparative measures to provide objective evidence about the system's impacts on access and quality.

## CONCLUSION

The implementation of the NHI online referral system has improved the access of NHI patients to health service and the quality of services provided by health service providers to NHI patients. Nevertheless, some overriding issues remain. These include the system inconsistency and capacity of the ICT, the need to strengthen the health referral system including equitable mapping of referrals and optimizing quota service arrangements. Stakeholders should increase efforts to disseminate information to the public and to strengthen coordination between the government, health facilities and *BPJS Kesehatan*.

## ACKNOWLEDGEMENTS

The authors thank all respondents who have participated in this study.

## AUTHOR CONTRIBUTION

IAAD designed the study, conducted data collection, analyzed the data, wrote the first draft of the manuscript and edited the manuscript. NMSN and PPJ involved in designing the study, supported data analysis, provided feedback and edited the manuscript.

## CONFLICT OF INTEREST

None declared.

## FUNDING

The study was self-funded by the researcher.



## REFERENCES

- World Health Organization. The World Health Report 2008: Primary Health Care. Now More Than Ever. Geneva; 2008.
- President of The Republic of Indonesia. Undang-Undang Republik Indonesia Nomor 40 Tahun 2004 Tentang Sistem Jaminan Sosial Nasional [The Republic of Indonesia Law No. 40 Year 2004 on National Social Insurance System]. Jakarta; 2004.
- Ministry of Health of The Republic of Indonesia. Pedoman Umum Program Indonesia Sehat Dengan Pendekatan Keluarga [Guidelines for the Program of Healthy Indonesia with Family Approach]. Jakarta; 2016.
- President of The Republic of Indonesia. Peraturan Presiden Republik Indonesia Nomor 82 Tahun 2018 [Indonesia Presidential Regulation No 82 Year 2018]. Jakarta; 2018:1-74.
- Primasari KL. Analisis sistem rujukan Jaminan Kesehatan Nasional RSUD. Dr. Adjidarmo Kabupaten Lebak [Analysis of National Health Insurance referral system at Dr. Adjidarmo Hospital in Lebak District]. *J Adm Kebijakan Kesehat*. 2015;1(2):78-86.
- Faudzan M, Karim A, Paselle E. Studi tentang sistem informasi pendaftaran rujukan rawat jalan online (SIPULAN) di RSUD A.M Parikesit Tenggarong [Study on the online outpatient referral information system at A.M Parikesit Hospital, Tenggarong]. *eJournal Adm Reform*. 2017;5(3):622-632.
- Indrianingrum I, Handayani OWK. Input sistem rujukan Badan Penyelenggara Jaminan Sosial (BPJS) Kesehatan di fasilitas kesehatan tingkat pertama (FKTP) Kabupaten Jepara [Input on referral system of the BPJS Kesehatan at the primary health facilities]. *Public Heal Perspect J*. 2017;2(2):140-147.
- Widhiastuti IAP, Januraga PP, Wirawan DN. Hubungan persepsi manfaat dengan kepesertaan JKN secara mandiri di Puskesmas I Denpasar Timur [Association between perceived benefits with independent participation of National Health Insurance at Puskesmas I Denpasar Timur]. *Public Heal Prev Med Arch Univ Udayana Bali*. 2015;3(2):203-210.
- Naseriasl M, Adham D, Janati A. E-referral solutions: Successful experiences, key features and challenges-a Systematic review. *Mater Socio Medica*. 2015;27(3):195-199.
- Bello AK, Molzahn AE, Girard LP, et al. Patient and provider perspectives on the design and implementation of an electronic consultation system for kidney care delivery in Canada: a Focus group study. *BMJ Open*. 2017;7:e014784.
- Augestad KM, Revhaug A, Johnsen R, Skrørvseth S-O, Lindsetmo R-O. Implementation of an electronic surgical referral service. Collaboration, consensus and cost of the surgeon-general practitioner Delphi Approach. *J Multidiscip Healthc*. 2014;4(7):371-380.
- Antara News. IDI Surabaya tolak aturan baru rujukan berobat [Indonesia Medical Doctor Association Surabaya branch refuses the new regulation on treatment referral]. Available from: <https://www.antaranews.com/berita/752588/idi-surabaya-tolak-aturan-baru-rujukan-berobat>
- Media Indonesia. Persi: Perlu aturan lebih tinggi untuk rujukan berjenjang daring BPJS [Indonesia Hospital Association: Need a higher regulation for BPJS online tiered referral]. Available from: <https://mediaindonesia.com/read/detail/191966-persi-perlu-aturan-lebih-tinggi-untuk-rujukan-berjenjang-daring-bpjs>
- Perhimpunan Rumah Sakit Seluruh Indonesia (PERSI). Masukan PERSI soal sistem rujukan berjenjang telah disampaikan pada kemenkes dan dinkes [PERSI recommendations on the tiered referral system have been provided to the Ministry of Health and health offices]. Available from: <https://www.persi.or.id/78-berita/berita-persi/637-masukan-persi-soal-sistem-rujukan-berjenjang-telah-disampaikan-pada-kemenkes-dan-dinkes>
- Roberts MJ, Hsiao W, Berman P, Reich MR. Getting health reform right: A guide to improving performance and equity. New York; 2004.
- Gianyar District Health Office. Profil Kesehatan Kabupaten Gianyar [Gianyar District Health Profile]. Gianyar; 2019.
- Sawitri IAAD. Studi pendahuluan permasalahan dalam penerapan sistem rujukan online BPJS Kesehatan di fasilitas kesehatan penyelenggara JKN di Kabupaten Gianyar [A preliminary study on problems in the implementation of BPJS Kesehatan online referral system at the health facility implementing National Health Insurance at Gianyar District]. Gianyar; 2018.
- Toyabe S, Kouhei A. Referral from secondary care and to aftercare in a Tertiary Care University Hospital in Japan. *BMC Health Serv Res*. 2006;6(11):1-9.
- Patel MP, Schettini P, Leary CPO, Bosworth HB, Anderson JB, Shah KP. Closing the referral loop : an analysis of primary care referrals to specialists in a large health system. *J Gen Intern Med*. 2018;33(5):715-721.
- Goldthorpe J, Sanders C, Macey R, Gough L, Rogers J, Tickle M. Exploring implementation of an electronic referral management system and enhanced primary care service for oral surgery: Perspectives of patients, providers and practitioners. *MBC Health Serv Res*. 2018;18(646):1-14.
- Tuot DS, Leeds K, Murphy EJ, et al. Facilitators and barriers to implementing electronic referral and/or consultation systems: A qualitative study of 16 health organizations. *BMC Health Serv Res*. 2015;15(568):1-10.
- Scheibe MM, Imboden JB, Schmajuk G, Margaretten M. Efficiency gains for rheumatology consultation using a novel electronic referral system in a safety net health setting. *HHS Public Access*. 2016;67(8):612-624.
- Petruik CR, Drobot A. The e-referral evaluation final report. Alberta Health Service. Calgary; 2015.
- Warren J, White S, Day KJ, Gu Y, Pollock M. Introduction of electronic referral from community associated with more timely review by secondary services. *Appl Clin Inform*. 2011;2(4):546-564.
- Naseriasl M, Janati A, Amini A, Adham D. Referral system in rural Iran: Improvement proposals. *Cad Saude Publica*. 2018;34(3):1-12.
- Zhou L, Nunes MB. Barriers to knowledge sharing in Chinese healthcare referral services: An Emergent Theoretical Model. *Glob Health Action*. 2016;9(1):1-13.
- Maarop N, Singh SSH, Win KT. Teleconsultation technology and its benefits: in the case of public hospitals in Malaysia. *AIS eLibrary*. 2011:1-12.
- Chen SJ, Lai KC, Shih FY, et al. Electronic referral system for transferred patients with acute myocardial infarction. *J Med Sci*. 2015;35(6):248-253.
- Boykan R, Milana C, Propper G, Bax P, Celestino P. Implementation of an inpatient electronic referral system (Opt-to-Quit ) from the electronic health record to the New York State smokers' quitline: First steps. *Hosp Pediatr*. 2018;6(9).
- Muchsam Y, Mareta F. Analisis pengaruh kepaahaman sistem rujukan online peserta BPJS terhadap kepuasan pelayanan BPJS [Analysis on the influence of BPJS participants' awareness regarding online referral system towards satisfaction on BPJS services]. *Portal J Univ Islam Indones*. 2019:34-39.
- Lestari WRS, Rahmayanti F, Noor VMM. Observasi terhadap rendahnya kunjungan pasien rawat jalan



- pelayanan medik spesialistik lain [Observation towards the low number of outpatients visit at other specialistic medical services]. *Akademika*. 2018;16(2):87-96.
32. Braveman P, Gruskin S. Defining equity in health. *J Epidemiol Community Heal*. 2003;57:254-258.
  33. Bouamrane M, Mair FS. A qualitative evaluation of general practitioners' views on protocol-driven referral in Scotland. *BMC Medical Informatics Decis Mak*. 2014;14(30):1-14.
  34. Jaya I, Sidi F, Ishak I, Affendey LS. A review of data quality research in achieving high data quality within organization. *J Theor Appl Inf Technol*. 2017;95(12):2647-2657.
  35. Setiawati ME, Nurrizka RH. Evaluasi pelaksanaan sistem rujukan berjenjang dalam Program Jaminan Kesehatan Nasional [Evaluation on the implementation of tiered referral system in the National Health Insurance Program]. *J Kebijak Kesehat Indones*. 2019;08(01):35-40.
  36. Hermiyanty, Wandira BA, Nelianti F. Implementasi rujukan pasien Jaminan Kesehatan Nasional (JKN) Badan Penyelenggara Jaminan Sosial (BPJS) di Puskesmas Singgani Kecamatan Palu Timur Kota Palu [Implementation of National Health Insurance BPJS patients referral at Puskesmas Singgani, Palu Timur Sub-District, Palu City]. *J Kesehat Tadulako*. 2019;5(1):32-38.



This work is licensed under a Creative Commons Attribution