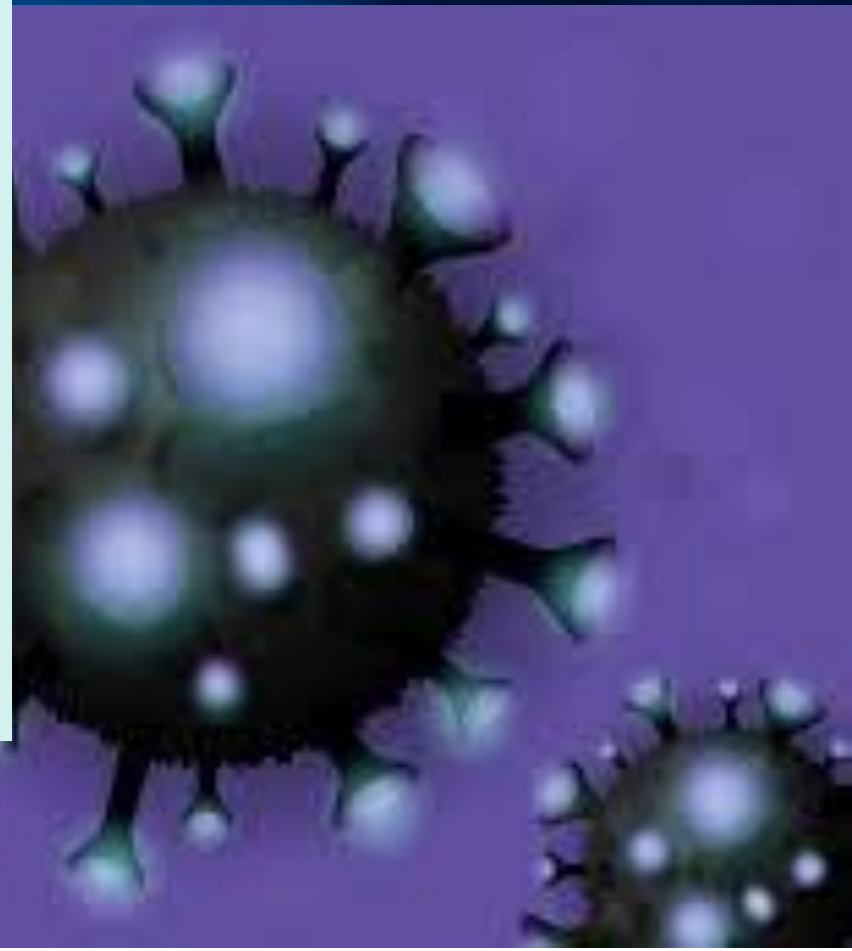


FINAL REPORT
Assessment Telemedicine
Service in Pandemic
Situation in Indonesia



MARCH 1, 2021

United Nations Development Programme
Authored by: Surahyo Sumarsono



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Term of Reference

During the COVID-19 pandemic, the use of telehealth has increased and supported to improve patient's health outcomes. Many professional medical societies endorse telehealth services and guide medical practice in this evolving landscape not only for COVID-19 services but also for other diseases such as AIDS, tuberculosis, diabetes, etc.

In view of this development, UNDP has the initiative to implement an assessment to measure the extent to which this telemedicine service can provide benefits to the people of Indonesia, what types of services are accessed by patients through this telemedicine service, the quality of health services, how much is the cost raised through this telemedicine service. Regarding this, UNDP engaged with the Ministry of Health Republic Indonesia and Aliansi Telemedicine Indonesia (ATENSI) to conduct this assessment and aim the objective where the Government received a valuable recommendation and became evidence for policy improvement related to telemedicine services in Indonesia.

The objectives of this assessment are:

1. Extent to which the telemedicine service can provide benefits to the people in Indonesia
2. Provides recommendations to the government regarding working areas of telemedicine services to improve services and as part of the public health service system in addition to hospital, clinic and Puskesmas (Public Health Center).

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Background

Coronavirus disease (COVID-19) spread rapidly around the world in 2020, resulting in more than eight million cases and nearly half a million deaths in a matter of months. Healthcare systems in every country are now faced with an infectious disease whose risk and protective factors remain poorly understood, and without access to an identified treatment or vaccine soon. Healthcare systems anticipate being overwhelmed with managing critically ill patients in hospitals and remotely monitoring patients with less severe symptoms at home. Government officials are also planning for large-scale contact tracing programs to notify and track the contacts of suspected and confirmed cases to contain the onward transmission of the disease. Digital platforms can support case management and the process of listing, notifying, and monitoring contacts of confirmed cases. Digital tools must be designed to meet the needs of healthcare providers and public health officials in their critical roles on the frontlines of responding to and recovering from COVID-19 in communities around the world.

Telemedicine was shown to be helpful in previous outbreaks, including former coronavirus outbreaks such as SARS-CoV (severe acute respiratory syndrome–associated coronavirus) and MERS-CoV (Middle East respiratory syndrome coronavirus), or PHEICs related to Ebola and Zika viruses [1].

Most countries, however, lack a regulatory framework to authorize, integrate, and reimburse telemedicine in their care delivery for all patients, particularly in emergency and outbreak situations [2]. Two possibilities are currently available for patients: (1) direct-to-consumer telemedicine with private providers mostly relying on out-of-pocket or private insurance payment and (2) free solutions, mainly from US-based companies (for example, WhatsApp, Skype, or Facetime), that may not respect national health data privacy and security requirements. Although these solutions may be useful to support and alleviate the pressure on health care systems during the outbreak, to date, they are mostly unintegrated within national health care systems and not sharing data with public health authorities for epidemiological surveillance.

One of the key responses to this pandemic in health care has been large-scale deployment of telemedicine as a substitute for in-person care throughout the country and worldwide. This was aimed at achieving the triple objectives of (1) caring for the influx of infected patients requiring isolation and intensive care, (2) continuing to care for customary patients, and (3) protecting providers and patients from infection. From all indications to date, all three objectives were met, and telemedicine became a household word in record time.

Most clinicians started using telemedicine with minimal planning or preparation. In this context, it is likely providers and patients have encountered avoidable problems and missteps, as well as positive experiences. Absent robust large-scale clinical trials to ascertain the effectiveness and efficiency of telemedicine in specific configurations of clinical interventions, applications, technological structures, logistics, and contextual settings, we would be left with circumscribed and/or anecdotal information

not conducive to optimal policy making or planning. Without this type of detailed information, we run the risk of viewing telemedicine primarily as a stop gap response to the exigencies created by the pandemic whose value would recede after the crisis.

For most current users, both providers and patients, telemedicine has been a novel experience. They embraced it as a necessity, not necessarily a choice. Some providers were pleasantly surprised to find that videoconferencing can serve as an effective substitute for in-person clinical encounters. Few were dubious about losing the ability to observe subtle signs and symptoms and the personal connection with their patients. Patients were generally pleased with ready access, convenience, and infection risk avoidance.

The determination of Covid-19 as a pandemic by the World Health Organization (WHO) in 2020 is something of interest. When the prevention method of transmission through social distancing schemes is applied globally, the decision to keep the distance between doctors and patients is common [3]. Holtz [4] notes that there has been a change in the paradigm of patients in choosing telemedicine services before and during the Covid-19 pandemic. Pre-pandemic patients choose telemedicine services if there are conditions 1) Health facilities are closed, 2) The body is too uncomfortable to leave the house, and 3) is not in an emergency position. Meanwhile, patients in the pandemic era were motivated to use telemedicine to prevent long waiting times in health services that increase the risk of disease exposure.

The Covid-19 pandemic is suspected to be a momentum to develop telemedicine in various countries and increase public exposure to this service [5]. In the West China region, the use of telemedicine to help medical services during a pandemic has been carried out since January 2020. Starting with tele-education programs, psychological consultations, and real-time video consultations for vulnerable groups of Covid-19 [6]. Mobile phone-based messaging applications are also used for prescription services via the internet. To see how smartphone-based telemedicine services were utilized during a pandemic in various countries, see appendix A. Telemedicine Use during Pandemic in 20 countries.

Unfortunately, comparative data on the use of telemedicine before and during the pandemic in Indonesia are not available. Other than that, no study has yet reported the types of services available during the pandemic in Indonesia, although many marketing advertisements related to telemedicine products have been widely circulated in the public and in the mass media.

Definitions of Telemedicine

The World Health Organization (WHO) in 2016 defined Telemedicine as "delivery of health care services, where patients and providers are separated by distance". Then by the Ministry of Health, it is explained as "Remote health care delivery by health professionals using information & communication technology, including exchange of information on diagnosis, treatment & prevention of disease & injury, research & evaluation, and continuing education of health service providers, for the benefit of improving individual health & public".

In more detail, here are some explanations about Telemedicine from various sources. Tele ~ *distance* medicine or health is the use of information and communication technologies (ICTs) to deliver health services where there is physical separation between care providers and/or the recipients over both long and short distances. It is about *transmitting* voice, data, images, and information *rather than moving* care recipients, health professionals, or educators. It encompasses preventive as well as curative aspects of healthcare services for recipients. The interactions can be between care recipient(s), care providers or educators, and lately also computerized devices—standalone, as well as working through a mobile.

Telemedicine describes remote clinical services in the form of patient and clinician contact. It includes diagnosis, monitoring, advice, reminders, education, intervention, and remote admissions. Variations include clinicians discussing a case over video conference; telementoring, which means overseeing a procedure being done by a less trained person; digital monitoring with live feed or application combinations; and forwarding of test reports for interpretation by a specialist. Other examples are home monitoring of the aged or infirm through continuous feeding of patient health data, client to practitioner online conference, videophone interpretation during a consult, and robotic surgery. In emergent situations, such support can save vital seconds and, in chronic care, cut down frequent travel, saving travel cost and time.

In telehealth the scope expands beyond telemedicine to administrative meetings and other nonclinical services too, like inclusion of preventive and promotive components. Also included is tele-education, for patients or care providers, through distance learning, meetings, supervision, and presentations.

Besides saving in physical transportation, which could be by the care recipient, the provider, or both, all variants support achievement of quality aims, addressing barriers to care through innovative means and leveraging the proliferation of technology in an increasingly mobile-friendly and technology-centric population. The information collected can be further processed and analyzed to plan a long-term health strategy of an increasing aged population, many living alone in diverse locations, with a rising number of chronic conditions.

eHealth, (currently Digital Health is the term preferred by WHO) an even broader term, has over 51 definitions including “The use of information and communication technologies (ICT) in support of health and health-related fields, including health care services, health surveillance and health education, knowledge and research.”

Another one is “eHealth is the use, in the health sector, of digital data - transmitted, stored and retrieved electronically- in support of health care, both at the local site and at a distance.” And yet another *eHealth is an emerging field in the intersection of medical informatics, public health, and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense the term characterizes not only a technical development but also a state of mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve healthcare locally, regionally, and worldwide by using information and communication technology.* Examples include treating patients, conducting research, educating the health workforce, tracking diseases, and monitoring public health.

Another method of classifying telehealth is by defining the partners and the direction of the flow of information. These Telehealth Streams are hereby listed as follows:

- **Between patient and provider.** Phone calls, emails along with text, or multimedia messaging services are used to explain the problem at hand and request for an appointment at the first instance and later to review investigation reports, assess progress, and provide online prescriptions. Social media and commercial tools like Skype as well as a range of ready-to-use apps have made this stream very diverse.
- **Between providers of different levels.** If patients are considered as tier 0, healthcare delivery is classified under primary care (GP, tier 1), secondary (specialist, tier 2), or tertiary (super specialist, tier 3) with costs escalating with each rise in level. Tier 1 may even be provided at the sub primary level, meaning the nurse practitioner.
- **Between providers of the same level.** Formal tele-education is through online CMEs, meetings and webinars. Medical schools with less-than-ideal number of faculty can benefit from classes held elsewhere. Most conferences these days have a remote speaker and remote delegate component. Many a time, one may be confronted with an atypical case or need help for a complication from a more experienced colleague.
- **Within an enterprise.** An example is cardiac hospital chains, wherein angiograms are done in a set of peripheral franchises, and then patients are referred for surgery to the higher center. Follow-up care is again local with unified billing and care administration.
- **For public health purposes.** Data collection and analytics; discussions within the team for health administration; online meetings; healthcare system integration; assessment of need for support in emergencies; inventory management to ensure the flow of essential supplies; etc.
- **Home healthcare.** The patient stays at home mostly with ICT-based monitoring with or without involvement of medical personnel. Home Healthcare is being used extensively in developed countries for care of the aged and infirm.

Classification based on connectivity. It is mentioned only in passing. During the early days, the connectivity option used to be a major decider of projects, for example, the data sent by phone, SMS, or satellite link. Omnipresence of the broadband Internet as well as 4G and 5G has overcome these barriers. Such issues still predominate in some areas of the developing world.

Classification based on specialty. While there is a complete chapter devoted to it, it would be easy to understand that those specialties that use images as an important component were among the earlier ones to adapt to telecare.

Telemedicine Implementation in Indonesia

Telemedicine among Healthcare Facilities by Ministry of Health

The Ministry of Health launched an internet-based telemedicine pilot project with tele-radiology and tele-electrocardiography (tele-EKG) services in 2012. Tele-radiology services were believed to be the most reliable product due to the lack of radiology doctors at that time, in where less than 50% of health facilities in Indonesia have radiology doctors. The Indonesian Association of Radiology Specialists (PDSRI) also stated the importance of tele-radiology and has developed the concept of developing tele-radiology. During the first service, radiological images are captured by

a film scanner and sent (store and forward) to the service provider. The minimum internet connection required is 1 Mbps for uploading and 2 Mbps for downloads. The tele-EKG service was chosen considering that in 2011, the cause of 30% of deaths in Indonesia is cardiovascular disease. This service works by transferring 12 leads of ECG data using a dedicated PP05V12 EKG. Data transmission with real-time evaluation of ECG waves changes can use a 3G connection. The implementation of these two programs involves several hospitals, which are categorized as supporting hospitals and managed hospitals. Staffing hospitals are used to describe the main referral hospitals, all of which are in major cities. The designated supporting hospital must meet the following criteria: (1) provide 24-hour specialist support, (2) type A hospital, (3) have ICT infrastructure, and (4) are willing to commit to the Telemedicine program.

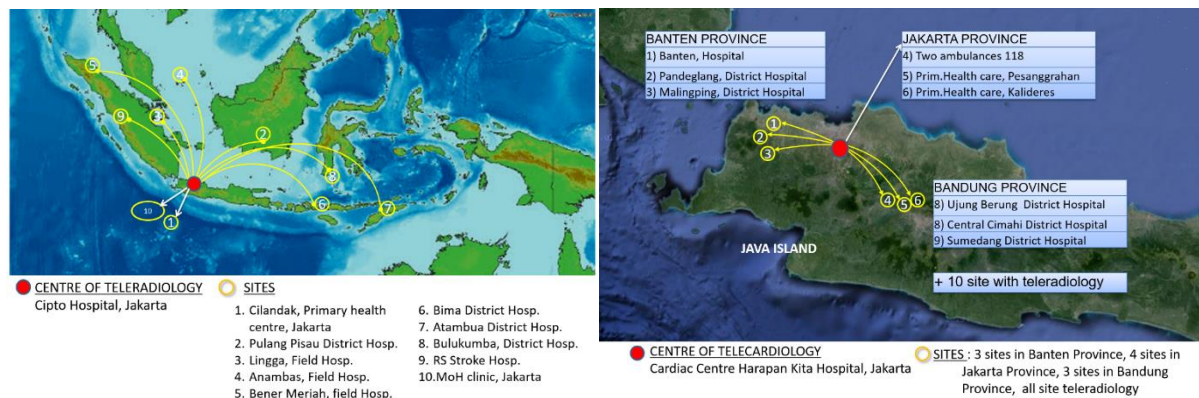


Figure 1. Pilot project for Teleradiology and Tele-EKG (MoH, 2012)

Apart from tele-radiology and tele-EKG, Indonesia also uses video conferencing (VICON) based telemedicine (teleconference) in July 2013. Teleconferences were held between provincial and district health offices and the Ministry of Health for program assistance and consultation, but utilization was considered low. Teleconferences were also used in 54 health education institutions to increase the education level of health workers.

Seeing the expanding potential of telemedicine, the Indonesian government proposes the implementation of a national scale telemedicine as the indicators for the Strategic Plan and National Medium Term Development Plan 2015-2019. This targets the number of national and regional referral hospitals that are included as telemedicine service providers.

In 2016, telemedicine services were initially run with 3 main aspects which were tele-radiology, tele-EKG, and tele-USG. assigned to use this service, which is also combined with tele-consulting. However, instead of being centrally controlled and valued by the government, services are performed using applications from two different private companies on a one-year rental system. This results in difficulties in monitoring and evaluating implementation, particularly dashboard monitoring. In addition, there is a limited amount of data regarding the success and failure of the program.

Finally, in 2017 all services were executed using a single application established by the Ministry of Health. This service application uses a web-browser platform and can be accessed in all regions of

Indonesia by opening www.temenin.kemkes.go.id. In addition, users do not have to pay for instalments or licensing fees. Information data is stored in the Ministry of Health's system, namely the Data and Information Center (Pusdatin). To ensure the spread of telemedicine implementation, the Ministry of Health is also responsible for conducting several consecutive trainings between doctors and health service provider operators. The implementation of this Temenin program is stated in detail in a ministerial decree number HK.01.07 / Menkes / 650/2017 for the Telemedicine Service Hospital and the Telemedicine Trial Program. According to the attestation, more hospitals designated to be involved in the agenda of the national telemedicine trial. Each location is allowed to optimize tele-radiology, tele-EKG, tele-USG and tele-consultation as required.

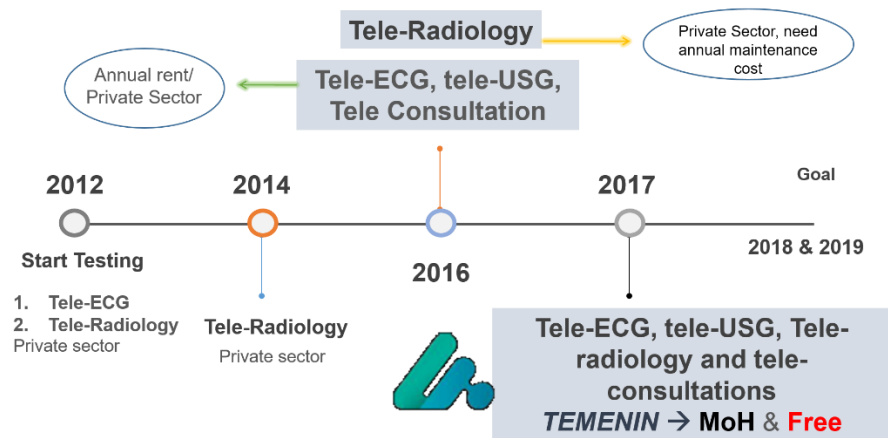


Figure 2. History of Telemedicine program by Ministry of Health Indonesia (MoH, 2017)

Improvement and Enhancement of Telemedicine Indonesia (Temenin) in 2018-2020

In 2020, there are 56 facilitating hospitals and 151 managed hospitals / Puskesmas registered with Temenin, with general practitioners being the most registered doctors. The number of health facilities that will be handled in 2020 has exceeded the Ministry of Health's target for 2020, which is 67 health facilities. The next target for 2021 is as many as 134, 2022 as many as 201, 2023 as many as 268, and in 2024 as many as 335 health facilities will be registered in the Ministry of Health.

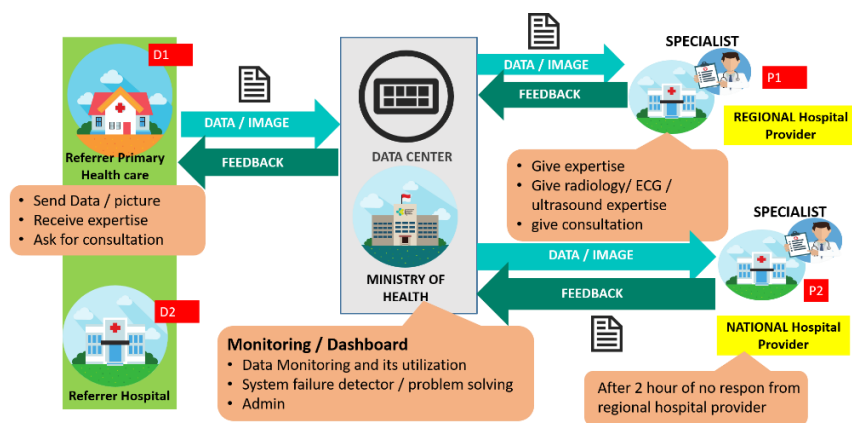


Figure 3. Flow chart of TEMENIN application services (MoH, 2017)

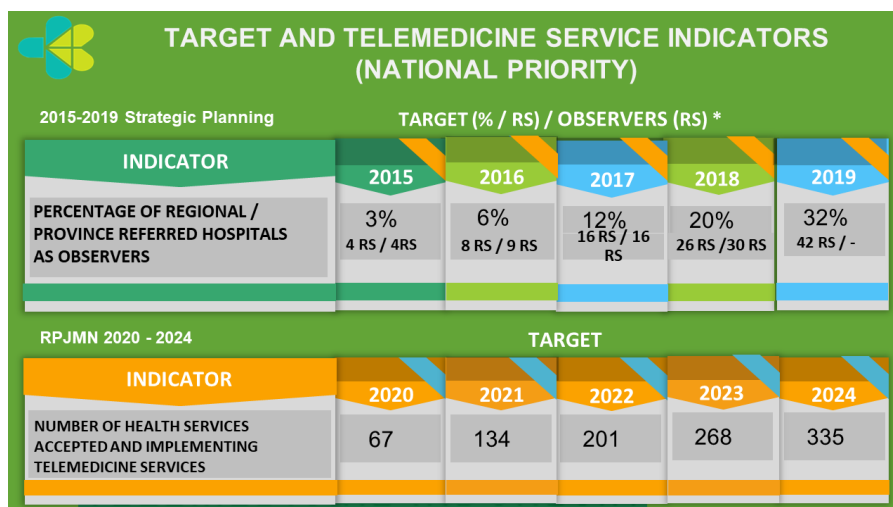


Figure 4. Target and Telemedicine Service Indicators as a National Priority (MoH, 2020)

The use of Temenin for teleradiology cases has increased significantly since early March 2020 along with the discovery of the first positive COVID-19 case in Indonesia (2 March 2020). From the total cases of patients treated with Temenin, 76.84% were patients with JKN / BPJS.

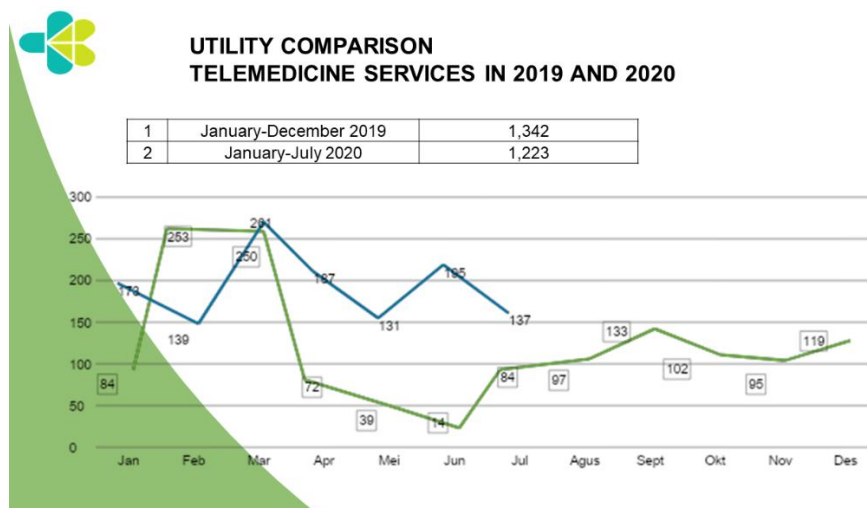


Figure 5. Target and Telemedicine Service Indicators as a National Priority (MoH, 2020)

The occurrence of a pandemic has made people hesitate to come to the health facilities directly. Therefore, the use of telemedicine has shifted towards community based (doctor-patient). This shift has also been supported by the emergence of various digital healthcare startups that have been able to connect patients with doctors face-to-face in recent years.

Telemedicine Services between Doctors and Patients

Telemedicine services that are carried out between doctors and patients have been widely implemented in Indonesia, although the supporting regulations do not yet exist officially. This shows that the Indonesian people are ready to take advantage of digital health services, although there are still many obstacles that must be overcome. In general, telemedicine services between doctors and patients can be divided into three (3) parts, namely internet-based application telemedicine services, telemedicine services at Puskesmas and telemedicine services at hospitals as below.

1. Internet-based application telemedicine services

There is already a Telemedicine service for Doctors to Patients based on a Website and Smartphone Application carried out both by the Ministry of Health with SehatPedia services and also by private companies organized by the Indonesian Telemedicine Alliance (ATENSI). Outside the alliance, there are many other telemedicine services, but they will not be discussed in this assessment.

Telemedicine services at SehatPedia by the Ministry of Health

Sehatpedia is an e-health application developed by the Directorate General of Public Health Services at the Ministry of Health in February 2018. The initial idea for the e-health application came from the direction of the President of Indonesia, Joko Widodo. The Minister of Health was accompanied by line ministries (consisting of the Secretary General of the Ministry of Health, the Directorate General of Public Health Services, and the Secretary of the Directorate General of Public Health Services) responded to the President's direction. This was carried out by the Minister of Health (2014-19), Dr. Nila Moeloek, towards the end of 2017 as a symbol of the implementation of public health services in the digital era. Between February and March 2018, at the Ministry of Health's head office in Jakarta, Sehatpedia was introduced as the first official digital e-health application. The name Sehatpedia was created from a combination of two words. The first is Sehat which means healthy, and the second is Pedia, which is a common and commonly used word to refer to learning.

Sehatpedia is categorized as an innovation in the public sector, although it is not the first online health application in Indonesia. Several e-health applications have been developed by private parties before. The making of Sehatpedia was inspired by two existing online health applications, namely Klik Dokter and Halo Doc. Health articles and doctor chats were the first features featured on Sehatpedia when it was launched on September 20, 2018.

Features provided by Sehatpedia

There are nine features in the Sehatpedia application, namely live chat with doctors, health care, health articles, e-policy, online registration, live fit, e-magazine, e-journal, and medical ID, with the last feature under development. All features are available for free and can be easily accessed by users. Each individual only needs 15.75 MB of memory on their smartphone for this feature to function. This feature can take three to seven minutes to download, depending on the cellular signal strength and smartphone capabilities.

Live chat with doctors: This feature makes it easy for residents to access health information from a number of doctors ranging from general practitioners, dentists, and specialists in 34 national hospitals under the Ministry of Health. A total of 638 doctors registered on the Sehatpedia application, including 54 general practitioners, 72 dentists, and 512 specialists. This feature limits users to up to three doctors a day. It aims to provide other users with the opportunity to chat with the same doctor. However, based on the national health regulations issued by the Ministry of Health, doctors are prohibited from prescribing medication to users through this feature because they do not have access to physically examine users.

Healthcare: Residents can access information from related hospitals as well as experienced doctors who are ready to consult through the Sehatpedia application.

Health article: This feature provides health education for all citizens, including how to prevent disease as part of the prevention and promotion efforts initiated by the Ministry of Health. There are 200 published health articles written by doctors and other medical personnel in 34 hospitals nationwide. In addition, there were important contributions from health officials at the Directorate General of Public Health Services, Ministry of Health.

Electronic journal: The e-journal feature in Sehatpedia is a collection of health journals written and compiled by doctors and medical experts who work under the Ministry of Health. There are also contributions from other people who are not from the ministry. The Research and Development Agency (R & D) at the Ministry of Health is a major producer of health research articles and journals as part of this feature.

Electronic policy: Citizens, stakeholders, and other parties concerned about health can access all government policies in the health sector. It consists of statutes, derivative laws, and national guidelines for physician services.

Live Fit: This is a special feature that aims to promote a healthy lifestyle among Indonesians. Government programs aimed at promoting healthy lifestyles and habits (Germas) are embedded in this feature. It promotes various activities such as running, walking, cycling and more. By using this feature, these activities can be monitored and controlled, so that people can choose sports activities and their duration.

Online health care registration: This feature is interrelated with all national hospitals in Indonesia (sirs.yankes.kemendes.go.id), which contains an online registration link for people who wish to seek outpatient treatment at the national hospital under the Ministry of Health. The purpose of this feature is to avoid long queues when patients register for medical examinations at national hospitals, so that public services become more efficient and effective. In addition, this feature also connects with other public health services, especially for those who are members of the National Health Insurance (JKN). Through this feature, those who are JKN participants can access the JKN program easily and quickly.

Electronic magazine: The e-magazine feature provides information on all new health services and health practices, both in Indonesia and in the world. The main contributors to the e-magazine are officials and staff at the Directorate General of Public Health Services, Ministry of Health. This magazine is converted into digital format, so that everyone can access, download and share the information provided by the e-magazine.

Medical ID: In the near future Sehatpedia will develop a feature called Medical ID. This will display health data from Sehatpedia users. This feature contains individual health data which will later be integrated into all public health service facilities.



Figure 6. Sehatpedia application

In summary, Sehatpedia was developed to answer three health challenges that exist in Indonesia today, namely making health services accessible to all Indonesians, increasing health awareness for the community to maintain health, and providing reliable health information to the public. These goals are interrelated, leading to a single ultimate goal of improving the quality of health of all Indonesians.

Sehatpedia is an open and free online health information application that can be accessed by all Indonesians wherever they live. This allows all citizens to have equal access to health information and access. In this way, people will receive new and reliable health information, which leads to better health. Health awareness is one of the main goals of this application, along with the reduced number of patient visits to the hospital for medical examinations or getting immediate treatment for minor ailments.

Organization and Procedures

In the Industrial 4.0 era, the making of Sehatpedia was a landmark application to solve the problem of irregularities or problems in accessing public health services. Collaboration and collaboration between the Directorate General of Public Health Services at the Ministry of Health and various ministerial agencies, external agencies and other relevant agencies are needed.

Within its internal structure, the Ministry of Health is obliged to coordinate 35 national hospitals throughout Indonesia under the Directorate General of Public Health Services. However, only 34 hospitals are coordinated directly by the Directorate General of Public Health Services to

provide e-health services through Sehatpedia. Each national hospital in Indonesia has specialized and general functions in accordance with their main duties as presented in Table 1.

Table 1. National Hospital in Sehatpedia

No.	Hospital	Specification	Class / Type	City / Province
1	RSUP Dr. Hasan Sadikin	General Hospital	A	Bandung / West Java
2	RSUP Dr. Kariadi	General Hospital	A	Semarang / Central Java
3	RSUP Dr. M. Djamil Padang	General Hospital	A	Padang / West Sumatra
4	RSUP Dr. Mohamad Hoesin	General Hospital	A	Palembang / South Sumatra
5	RSUP Dr. Sardjito	General Hospital	A	Yogyakarta / DIY
6	RSUP Dr. Wahidin Sudirohusodo	General Hospital	A	Makassar / South Sulawesi
7	RSUP Fatmawati	General Hospital	A	South Jakarta / DKI Jakarta
8	RSUP H. Adam Malik Medan	General Hospital	A	Medan / North Sumatra
9	RSUP Dr. Cipto Mangunkusumo	General Hospital	A	Central Jakarta / DKI Jakarta
10	RSUP Persahabatan	General Hospital	A	East Jakarta / DKI Jakarta
11	RSUP Prof. Dr. RD Kandou	General Hospital	A	Manado / North Sulawesi
12	RSUP Sanglah Denpasar	General Hospital	A	Denpasar / Bali
13	RSUP Dr. Seoradji Tirtonegoro	General Hospital	A	Klaten / Central Java
14	RSU Dr. Rivai Abdullah	General Hospital	C	Banyu Asin / South Sumatra
15	RSU Surakarta	General Hospital	C	Surakarta / Central Java
16	RSU Dr. Sitanala	General Hospital	C	Tangerang / Banten
17	RSU Dr. Tadjuddin Chalid	General Hospital	B	Makassar / South Sulawesi
18	RSU Ratatotok Buyat	General Hospital	C	Southeast Minahasa / North Sulawesi
19	RS Ibu dan Anak Harapan Kita	General Hospital	A	West Jakarta / DKI Jakarta
20	RSU J Lemeina *	General Hospital	Just built	Ambon / Maluku
21	RS Jantung dan Pembuluh Darah Harapan Kita	Heart and Blood Vessel Hospital	A	West Jakarta / DKI Jakarta
22	RS Jiwa Dr. Marzoeki Mahdi	Psychiatric hospital	A	Bogor / West Java
23	RS Jiwa Prof. Dr. Soerojo	Psychiatric hospital	A	Magelang / Central Java
24	RS Kanker Dharmais	Cancer Hospital	A	West Jakarta / DKI Jakarta
25	RS Orthopedi Prof. Dr. R Soeharso	Orthopedic Hospital	A	Surakarta / Central Java

26	RS Jiwa Dr. Radjiman Wediodiningrat	Psychiatric hospital	A	Malang / East Java
27	RS Jiwa Dr. Seoharto Heerdjan	Psychiatric hospital	A	West Jakarta / DKI Jakarta
28	RS Mata Cicendo	Eye Hospital	A	Bandung West Java
29	RS Paru Dr. Ario Wirawan	Lung Hospital	A	Salatiga / Central Java
30	RS Paru Dr. H.A. Rotinsulu	Lung Hospital	A	Bandung West Java
31	RS Penyakit Infeksi Dr. Sulianti Saroso	Infectious disease hospital	A	North Jakarta / DKI Jakarta
32	RS Pusat Otak Nasional	Brain Hospital	A	East Jakarta / DKI Jakarta
33	RS Paru Dr. Goenawan Partowidigdo	Lung Hospital	A	Bogor / West Java
34	RS Stroke Nasional Bukit Tinggi	Stroke Hospital	B	Bukit Tinggi / West Sumatra
35	RS Ketergantungan Obat	Drug addiction hospitals	A	East Jakarta / DKI Jakarta

The Directorate General of Public Health Services also coordinates with external agencies of the Ministry of Health for the functioning of the e-health application. In the early days of Sehatpedia's development, the collaboration was established with two online applications for the health business unit, namely Klik Dokter and Halo Doc. In addition, the Directorate General of Public Health Services also coordinates with startup players.

The Sehatpedia application has attracted nine organizations outside the Ministry of Health consisting of startups, private health institutions, and non-governmental organizations (NGOs) to develop e-health applications in Indonesia. In addition, the existence of the National Health Insurance Agency is proof of the existing cooperation in Sehatpedia. All institutions work together to build and run the national e-health application Sehatpedia.

Resources

Every activity carried out by an organization must be supported by the availability of sufficient resources, which are the main capital to ensure daily operations of the organization. In building the Sehatpedia e-health application, there are three main resources, namely government funding, human resources (civil servants and private), as well as physical health and IT facilities from the Ministry of Health.

The implementation of national e-health in Indonesia is fully funded by the Ministry of Health with an allocation from the annual APBN. The Ministry of Health through the Directorate General, Secretariat of the Health Service has spent IDR 200 million or around USD 14,328 to develop the Sehatpedia application in 2018.

Each year, the total budget for construction and maintenance is estimated at around IDR 400 million (USD 28,656). The budget is allocated by the Ministry of Health. It is spent on four important things. First, it is used to pay the salaries of IT consultants and technicians. Sehatpedia is a digital health application on Android and a smart system. To operate it, the Ministry of Health must employ IT consultants and technicians. Second, it is used to introduce and disseminate Sehatpedia features to the public. Third, it is used to monitor and evaluate the progress of the Sehatpedia program. Fourth, it is used for technical coordination between Sehatpedia actors.

Most of the human resources for running the Sehatpedia application are civil servants at the Ministry of Health. A total of 25 public health officials are responsible for this (mostly civil servants in the Ministry of Health). Based on the Decree of The Directorate General of Public Health Services Number HK.02.02 / I / 2255/2019 regarding the Sehatpedia Application Team, these civil servants are spread across various layers of structures and echelons under the Directorate General of Public Services of the Ministry of Health.

The Sehatpedia management team was officially appointed The Directorate General of Public Health Services. Structurally, The Directorate General of Public Health Services is in charge of directing all Sehatpedia activities. The Secretary of the Directorate of Health Services is in charge of all Sehatpedia activities. The Head of Organization, Legal and Public Relations is responsible for the routine activities of Sehatpedia. The Head of Advocacy and Legal Public Relations is the deputy chairman of Sehatpedia's routine activities.

The lower cadre staff consists of staff in The Directorate General of Public Health Services. They are in charge of Sehatpedia application features such as live chat, health articles, health journals, and e-policy; physical activity (exercise); registering outpatient treatment; number of credit points; and medical performance.

The IT team was drawn from the Program and Information Division of The Directorate General of Public Health Services, the Center for Data and Information, as well as private IT consultants. They develop and manage the Sehatpedia application, including the expansion of its network. Meanwhile, the administration team consists of legal advocates and public relations who are responsible for managing hospital data, e-policy, and health articles. This team also evaluates the active participation of doctors conducting consultations in live chat as well as the number

of health articles written and published by medical personnel or doctors at national hospitals each month.

The number and composition of public health personnel in the Sehatpedia management team is not limited to medical personnel only. This also includes medical professionals such as nutritionists, nurses, and pharmacists who contribute to the writing of health articles. In early 2019, there were 638 doctors consisting of 54 general practitioners, 72 dentists, and 512 specialists working in 34 national hospitals. However, there is no data that states the number of medical experts such as nutritionists, nurses and pharmacists who have contributed to the Sehatpedia application.

Physical facilities are important facilities that support the Sehatpedia application. The Directorate General of Public Health Services provides physical facilities such as internet connection, software and hardware. Hardware includes high-end computers for entering and storing supporting data, and smartphones for accessing and monitoring data. The internet connection at the Ministry of Health is connected to all internet networks throughout Indonesia. Besides that, a conducive work environment is also provided for those who work in implementing the Sehatpedia application.

Information Technology Infrastructure

In application development, SehatPedia collaborates with a private party, namely Zi Care, an information system startup at the hospital. Cooperation with the private sector is carried out by considering the capability and reliability of application development as well as the ease of financing, especially if changes occur in the middle of the process. Meanwhile, servers, systems and data are placed at the Ministry of Health's Data and Information Center (PUSDATIN). Data security and privacy are understood by Zi Care. Application development is carried out using Flutter so that the system can be used by both iOS and Android. Security storage uses built-in features from iOS and Android. Programming languages and databases using My-SQL and Python. Currently there is no special feature to provide feedback for health workers partners, health facilities and application users. Data regarding feedback from users is obtained from the PlayStore or AppStore through the rating and review features, while data regarding feedback from health workers and health facilities partners is obtained through the Whatsapp Group

formed by SehatPedia with partners. There are no supporting functions such as IoT, embedded devices and others.

Activities

The activity describes the tasks performed by public health workers in carrying out the Sehatpedia application business scheme. They consist of the management team of The Directorate General of Public Health Services and medical experts. They work together to carry out activities such as formulating e-health service program regulations, initiating and perfecting e-health service features (2018 to date), and introducing enhanced e-health service programs to communities, hospitals, health insurance institutions, and others.

The first activity is drafting regulations to support and guarantee Sehatpedia application practices. Several regulations issued include the Decree of The Directorate General of Public Health Services Number: PR.03.02 / I / 1567/2019 concerning Sehatpedia as a Type of Medical Performance and Decree of The Directorate General of Public Health Services Number HK.02.02 / I / 2255/2019 concerning the Sehatpedia Application Team.

The second activity, namely initiating and perfecting features of e-health services (2018 to date), is a collaboration between the Sehatpedia management team consisting of civil servants from the Ministry of Health and private / external IT consultants employed by the Ministry of Health. There are routine activities that require monitoring and evaluation from the Ministry of Health after receiving input from users. There are also activities that require regular monitoring of progress after global problems.

The third activity is the introduction of the e-health service program to the community, hospitals, health insurance institutions, the medical community, and others. To introduce it, the Sehatpedia team socialized Sehatpedia features to the wider community. This socialization aims to introduce Sehatpedia's advantages, including its newest features. The forms of socialization include visiting busy public places (such as public sports facilities and venues), visiting offices, presenting workshops and health fairs, and placing Sehatpedia advertisements through online media.

Output

To determine Sehatpedia's success, it is necessary to develop and measure the main performance indicators. There are three outputs and indicators to measure the progress of Sehatpedia, as shown in Table 2.

Table 2. The main output and performance indicators of the Sehatpedia application

No.	Output	Key Performance Indicators
1	Number of residents who access health information and Sehatpedia facilities.	The number of residents who download, install, and use the Sehatpedia application features.
2	The number of active doctors and medical experts who contribute to Sehatpedia	The number of doctors in each national hospital and medical experts contributing to live chats, journals or other health information The 10 most active doctors and the 10 best national hospitals in Sehatpedia are also recognized by the public
3	The number of organizations that cooperate with Sehatpedia	The number of institutions that cooperate with Sehatpedia The more external agencies that collaborate with Sehatpedia, the more feasible its implementation will be

Based on data from the Ministry of Health, the number of users who downloaded, installed and used Sehatpedia's features was 58,000 at the end of 2019. Every day, more than 100 users consulted doctors using the 'live chat' feature. The number of doctors in each national hospital and medical experts who contributed to the live chat and health articles was recorded by Sehatpedia's management team. More and more doctors at national hospitals want to be included in the application. In addition, nine organizations, both from public and private institutions, collaborate with Sehatpedia.

Beneficiaries of the Sehatpedia application include the community as active users, doctors, and other medical experts as program contributors; public health institutions including hospitals and public health insurance institutions that support the implementation of this program; as well as local government. Citizens will receive all health-related information and consultations with doctors. Citizens are Sehatpedia's top priority as an innovative means of receiving public health services.

One of the main benefits for doctors and medical experts who actively contribute to the Sehatpedia application is the prestigious recognition from top management at the hospital and from The Directorate General of Public Health Services at the Ministry of Health. This recognition is the main input in their performance assessment. Currently, according to the direction of the Minister of Health, each national hospital has a plan to provide incentives to doctors and medical experts / personnel who contribute the most to Sehatpedia's operations. As a result, the hospital in question will enjoy a good reputation as a public body. In addition, Sehatpedia is expected to reduce the number of patients hospitalized.

For local governments, Sehatpedia will assist the health offices in local governments in improving the quality of local public health, reducing spending on the health office which is tasked with providing equitable health services to the community, and accelerating the dissemination of the latest health information from the Ministry of Health. and other health institutions in Indonesia and from many countries in the world.

The obstacles faced so far include the slow response from health workers. Doctors' busyness at health facilities and the absence of special remuneration for health workers involved in Sehatpedia telemedicine services are the contributing factors. Remuneration is still an initiative from the health facility. In addition, the development of a notification or warning feature for consultation has not been optimal.

Recent activities during the Covid-19 Pandemic

At the end of December 2019, an outbreak of the corona virus infection disease (COVID-19) occurred in the City of Wuhan, PR China. Almost all countries are infected by it. Tens of millions of people are infected worldwide (more than 200 countries and regions infected), including Indonesia. The President of Indonesia, Joko Widodo officially announced the first cases of two people infected with COVID-19 in Indonesia on March 2, 2020. To prevent this contagious virus from spreading to other countries and regions, the World Health Organization (WHO) has declared COVID-19 a pandemic. global on March 11, 2020.

The number of people infected with this virus in Indonesia is alarming. With a large population of around 225 million people on thousands of islands, it is predicted that COVID-19 will spread widely and rapidly. In order to prevent the widespread spread and break the chain of infection, the Ministry of Health has mobilized all resources across the country. One of the Ministry of Health's policies to tackle the outbreak and maintain the mental health of the community is to add two special features of COVID-19 in the Sehatpedia online application. These features are rolling out on March 23, 2020.

These two important features are: (1) self-assessment and self-isolation, and (2) free mental health consultations. The first is how to actively involve the community through self-awareness and honesty in conducting tests to find out whether someone is infected with COVID-19 or not. There are three types of assessments, namely high-risk, middle-risk, and low-risk. If people are classified as high risk, they are asked to get special care at the hospital. If categorized as medium risk or low risk, they are directed to carry out a self-isolation program through Sehatpedia. Those

who are self-isolating at home will always be monitored by doctors and the Sehatpedia medical team.

Likewise, the 'live chat with doctor' feature is primarily aimed at those who experience excessive anxiety and fear during the pandemic. People can confide in their feelings during this chat. By clicking on this feature, they can consult a doctor and / or psychologist freely to get rid of their excessive anxiety and fear. That way, many people will be helped in dealing with psychological problems during the COVID-19 pandemic. All the main online features of Sehatpedia are worthy of use by everyone. This enables compliance with government policies including those relating to physical distancing, keeping people at home and working from home during the COVID-19 pandemic.

These features are very helpful for the Ministry of Health to identify people infected with COVID-19. From 23 March 2020 to 4 April 2020, the number of citizens conducting online consultations using the Sehatpedia application was 1,740. During this period, 4,062 people conducted self-assessment for COVID-19 symptoms, while 256 people self-isolated at home after conducting self-assessment.

Those who performed self-isolation were assessed individually based on online self-assessment and self-isolation features. No physical health checks (no rapid tests or swabs) are performed by medical staff. In the free mental health consultation feature, Sehatpedia can help minimize stress or depression in people during the COVID-19 pandemic. Since these two features were used during a pandemic, they cannot yet be evaluated for their effectiveness and effectiveness. However, these features are Sehatpedia's innovative idea to ensure that public health services are close to residents so they don't have to go to the Puskesmas directly during a pandemic.

In 2021, the Puskesmas will be selected as the first target of implementing this service. This is done with the consideration that the community in accessing government health services using their own funds is not as easy as accessing private services. People certainly expect health services from the government to be available free of charge. In addition, most Puskesmas do not yet have a system that supports telemedicine. During the pandemic, health workers at the health center provide services through messaging applications (Whatsapp), telephone and SMS to the community, especially for those who are outpatient or undergo routine treatment. It is also seen that the implementation of telemedicine services in government hospitals is not feasible given the more complicated hospital system, especially related to the imposition of financing. Therefore,

In 2021 SehatPedia collaborated with BPJS Kesehatan to integrate telemedicine services in P-Care (Primary Care) with the capitation financing system. P-Care is part of a website-based information system that has been provided by BPJS Kesehatan for First Level Health Facilities (FKTP), such as Puskesmas, Primary Clinics and Independent Practitioners in serving participants of the National Health Insurance-Healthy Indonesia Card. Meanwhile, the capitation payment system is a payment system implemented at first-level health facilities, especially first-level outpatient services in collaboration with BPJS Kesehatan, which is based on the number of participants registered at the health facility multiplied by the amount of capitation per person. Through this approach, the community can still access free health services without the need to come to the Puskesmas and does not incur new payments to the government. As an initial trial, this system will be implemented in 20-30 Puskesmas in Indonesia. If the trial runs smoothly, this system will be applied to all Puskesmas in Indonesia. Furthermore, the integrated '1 People 1 EMR' integrated electronic medical record and consultation (EMR) which can be accessed anywhere is expected to be added to the service in the future. Telemedicine services through SehatPedia are also expected to be integrated with the system developed by Data and Information Center (PUSDATIN) as an information system in public health centers and can provide real time data on public health conditions as a basis for government policy making.

Telemedicine services by the Indonesian Telemedicine Alliance (ATENSI)

There have been Telemedicine services for Doctor to Patient conducted by Private Companies based on Smartphone Application and Website, organized by Aliansi Telemedicine Indonesia (ATENSI). It is further followed by Cooperation between the Ministry of Health and ATENSI.

The scope of cooperation stipulated in this agreement are:

- Providing information and education related to COVID-19, utilizing information, and utilizing communication infrastructure that supports the provision of information and education, especially in the promotional and preventive fields. Some of them include how to wash hands properly, cough etiquette, to the application of social distancing.
- Provide correct COVID-19 information, so that there is no fake / hoax health information to reduce the panic of the Indonesian people.
- Providing information regarding the level of risk for COVID-19. Also, to minimize visits, there is no need to go to health facilities, so that self-quarantine and social distancing can be more effective. This method is expected to help health facilities to focus more on handling positive patients with COVID-19.



Menanggulangi COVID-19, Atensi Jalin Kerja Sama dengan Kemenkes

Figure 7. Cooperation between ATENSI and Ministry of Health in the response to COVID-19

Over time, the telemedicine concept was not only a concern of the government. The initial paradigm that a program is appropriate to be declared as telemedicine when communication occurs between health facilities is slowly being broken due to the increase in internet access for individuals through the development of mobile phones. Thus, the telemedicine field was expanded to provide a virtual relationship for doctors and patients, not just a virtual relationship between health facilities. This also opens opportunities for technology developers from the private sector to be involved in more massive telemedicine services which are gathered in the Indonesian Telemedicine Alliance (ATENSI).

2. Telemedicine in Puskesmas (Public Health Center)

Besides those achievements by Information Technology companies in implementing Doctor to Patient Telemedicine services, we should put attention on how Telemedicine services are implemented in Puskesmas. Telemedicine services at the Puskesmas are carried out between doctors and patients, and / or between doctors and other doctors. Doctors who provide telemedicine services to patients are responsible for the health services they provide, including ensuring the security of patient data accessing telemedicine services. The provision of telemedicine services between Doctors and other Doctors is in accordance with the provisions of laws and regulations.

According to WHO, Telemedicine has 4 elements that can be utilized in Puskesmas:

- Aims to provide clinical support
- Useful for overcoming geographical and distance barriers
- Involves the use of various types of information technology tools
- Aiming at improving public health

Telemedicine supports at Puskesmas are for:

1. Increase access to health services for the community
 - Increased accuracy and speed of medical diagnosis and medical consultation at first level health facilities and referral levels that do not have certain health workers.

- Using information and communication technology that can connect health facilities with referral facilities for purposes such as teleconsulting, teleassistance, teleeducation and telemonitoring.
2. Optimizing the role of the Puskesmas as a gatekeeper
 - Puskesmas as Gatekeeper:
 - i. First contact of service
 - ii. Continuous service
 - iii. Complete service
 - iv. Service Coordination
 - Gatekeeper Functions:
 - i. The patient's first contact
 - ii. Referral screening
 - iii. Quality and cost control
 3. Optimizing the function and authority of the Puskesmas as a First Level Health Facility
 - Patient registration
 - Completing the patient's medical record
 - Consultation
 - Communication, Information and Education
 - Visit and monitor patients virtually
 - Monitoring, reporting, data collection of cases
 - Reference

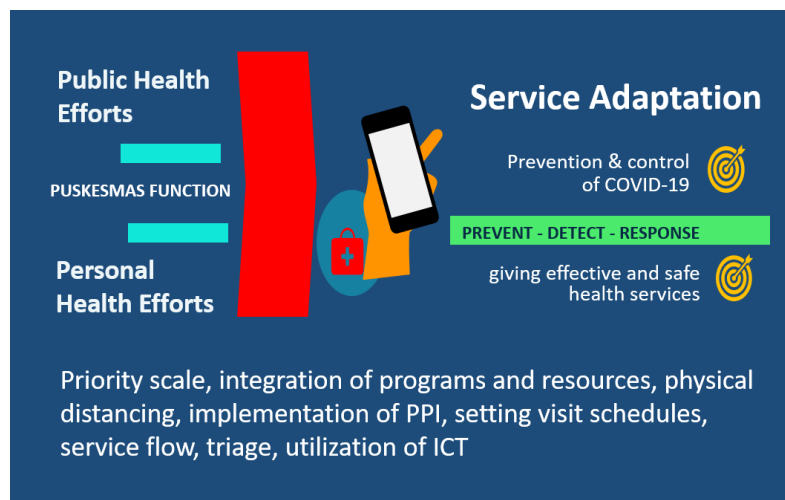


Figure 8. Service Adaptation in Puskesmas during Pandemic (MoH, 2020)

Recommendation for Telemedicine use in Puskesmas:

- Puskesmas can take advantage of telemedicine to improve access and quality of health services.
- Puskesmas conducts a mapping of the needs so that telemedicine operations would run well

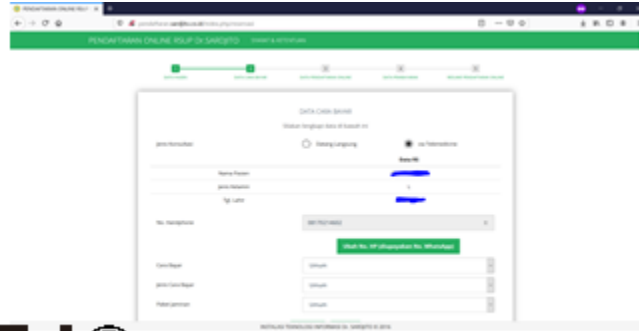
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- The District / City Health Office provides guidance, including meeting the needs related to telemedicine implementation by the Puskesmas
 - The Ministry of Health provides support to Puskesmas in the Regency / City in the implementation of Telemedicine.

In general, the use of telemedicine in Puskesmas at this time still does not use a separate application. Most of the general practitioners at the Puskesmas use the Temenin application from the Ministry of Health to conduct consultations at the referral hospital above to gain expertise from specialist doctors, and are also used for discussions with colleagues at other Puskesmas. Doctor consultation services with patients are still dominated by online chat services such as Whatsapp and the like. If there is a Public Health Center Information System, some have developed additional applications with chat facilities on the website, and also integrated it into a telephone-based teleconsultation system. Currently, there is no separate study regarding the use of telemedicine in Puskesmas in the service between doctors and patients. In 2021, the Ministry of Health will hold a trial using SehatPedia in several health centers (20-30) which will be determined later.

3. Telemedicine Services for Doctors to Patients conducted by Hospitals

There are telemedicine services provided by hospitals to support their existing patients (customers) through the system that is connected to the Hospital Information Systems (HIS). Patients can be served via communication systems such as web chat, WhatsApp, phone-call and many other technologies. The differences between these services with previous Telemedicine services provided by ATENSI members, the patients have been registered in HIS before, so they have Electronic Medical Records in the system and mostly in teleconsultation function. However, there is no existing database to show how many hospitals already use this teleconsultation so far.

Some examples of the application of Telemedicine services for Doctors to Patients in Hospitals are listed in Appendix B. Telemedicine services for Doctors to Patients in Hospitals. In the following figure there is an example of how Telemedicine services look at Dr. Sardjito and Cipto Mangunkusumo Hospital.



Tekon
Telemedicine Konsultasi

Figure 9. Teleconsultation service in Dr. Sardjito hospital Yogyakarta



Figure 10. Teleconsultation service in Cipto Mangunkusumo hospital

Regulations on Telemedicine Services in Indonesia

Most countries lack a regulatory framework to authorize, integrate, and reimburse telemedicine in their care delivery for all patients, particularly in emergency and outbreak situations, including Indonesia. However, the government has delivered some regulations to support the use of Telemedicine systems in delivering health services especially among health care facilities. Regulation to support Doctor to Patient Telemedicine systems are still being formulated yet. Table 3 summarizes the current legal basis used in implementing Telemedicine in Indonesia.

Table 3. The legal basis used in implementing Telemedicine

Topics	Legality	Information
Legal basis for Indonesian telemedicine	Law No.29 of 2004 concerning medical practice	Discusses the Indonesian medical council (functions, duties and authorities of KKI, organizational structure, work procedures, and financing); medical and dental professional education standards; medical and dental education and training; registration of doctors and dentists; medical practice administration; doctor and dentist discipline; guidance and supervision; and criminal.
	Law No.11 of 2008 concerning information and electronic transactions	Discusses information, documents, and electronic signatures; electronic certification and electronic system operation; electronic transactions; domain name, IPR, and protection of personal rights; prohibition; dispute resolution; the role of government and society; investigation; and criminal.
	Law No.36 of 2009 concerning health	Discusses the government's responsibility for health efforts; health resources; health efforts; health of mothers, babies, children, adolescents, the elderly, and people with disabilities; nutrition improvement; mental health; PM and PTM; environmental Health; occupational health; health management; health information; health financing; the role of society in health; health advisory board; investigation and guidance & supervision.
		Discusses the responsibilities and authorities of government and regional governments; classification and grouping of health workers;

	Law No.36 of 2014 concerning health workers	planning, procurement and utilization; Indonesian Health Workforce Council; registration and licensing of health workers; professional organizations; health workers for Indonesian citizens with foreign graduates and health workers for foreigners; health workers rights and obligations; professional administration; dispute resolution; guidance and supervision; administrative sanctions; and criminal
	PP No.47 regarding health service facilities	Discusses about the availability of health facilities; licensing; as well as guidance and supervision
	Presidential Decree No. 82 of 2018 concerning health insurance	Discusses about membership; contributions; health insurance benefits; administering health services; medical facility; quality control and cost control; information and complaint services; dispute resolution; prevention and handling of fraud; monitoring and evaluation; and local government support.
	Presidential Decree No. 18 of 2020 concerning the national mid-term development plan	Discusses the national development plan for the 5 year period (2020-2024) including strategic priority projects, development matrices, and development directions. Accelerating the reduction in maternal mortality and stunting is a strategic priority project in the health sector.
	Permenkes No. 20 of 2019 regarding the implementation of telemedicine services between health facilities	Discusses services (types of services, health care providers, requirements, registration and expertise); cost; rights and obligations; funding; as well as guidance and supervision.
	Per KKI No.74 of 2009 concerning clinical authority and medical practice through telemedicine during the COVID-19 pandemic in Indonesia	Discusses additional clinical authority for doctors and dentists during the pandemic to carry out practices through an electronic application / system (telemedicine), in the form of writing, voice, or online video.

Definition	Circular letter of MENKES HK.02.01 / MENKES / 303/2020	Telemedicine is a medical practice carried out by doctors with information and communication technology to diagnose, treat, prevent and / or evaluate the patient's health condition according to their competence and authority, proven by STR
	Permenkes No. 20 of 2019 regarding the implementation of telemedicine services between health facilities	Telemedicine is a telemedicine by health professionals with information and communication technology, covering the exchange of information on diagnosis, treatment, prevention of disease and injury, research and evaluation, and continuing education of health service providers.
Requirements for implementing medical practice	UU no. 29 of 2004 concerning medical practice	Required:
		1. Have SIP (article 36)
		2. Have STR (article 38)
		3. There is a practice area
		4. Have a professional organization recommendation
		5. Making medical records (article 46)
		6. Keeping medical secrets (article 48)
Medical practice	PERMENKES No.2052 / MENKES / PER / X / 2011 concerning License and implementation of medical practice	Medical practice:
		1. Anamneses
		2. Physical and mental examinations
		3. Supporting examination
		4. Enforcing the diagnosis
		5. Management and treatment
		6. Medical action
		7. Writing recipes and medical equipment
		8. Issuing a doctor's certificate
		9. Storing and delivering drugs in limited quantities and types
10. Mixing drugs in certain areas		
Patient safety goals	PERMENKES No.1691 / MENKES / PER / VIII / 2011 regarding the safety of hospital patients	1. Accuracy of patient identification
		2. Increasing effective communication
		3. Increasing the safety of drugs that need to be watched out
		4. The assurance of right-location, right-procedure, right-patient operation
		5. Reducing the risk of infection related to health services
		6. Reduction of the patient's risk of falling
Telemedicine service concept: 1. facility based (between health facilities) 2. community based (doctor-patient)	Facility Based: PERMENKES No. 20 of 2019 concerning the implementation of telemedicine services between health facilities	1. Types of services: teleradiology, tele-ECG, tele-ultrasound, clinical teleconsultation and others
		2. Healthcare provider consulting: Central, regional, private hospitals
		3. Healthcare center requesting consultation: hospital, health facility level 1, and others
		4. HR: doctors, specialists / subspecialists, IT

		5. Fee: charged to the health facility requesting consultation in accordance with the amount determined by the minister claimed through the application
		6. Funding: APBN, APBD, and other sources
		7. Coaching and supervision: Ministry of Health, Provincial Health Office, District Health Office
Limitation of implementing telemedicine	Per KKI No.74 of 2009 concerning clinical authority and medical practice through telemedicine during the COVID-19 pandemic in Indonesia	1. Teleconsultation of medical personnel directly with patients without health care facilities
		2. Provide a dishonest, ethical, and adequate explanation
		3. Conducting diagnosis and management beyond competence
		4. Requesting irrelevant investigations
		5. Committing disgraceful acts, intimidation, or acts of violence
		6. Performing invasive measures
		7. Withdrawing fees beyond the stipulated rate
		8. Provide a health certificate
Clinical authority	SE MENKES HK.02.01 / MENKES / 303/2020	1. Anamneses
		2. Certain physical examinations carried out via audio-visual
		3. Giving the necessary recommendations based on the results of supporting examinations and / or the results of certain physical examinations
		4. Establishing the diagnosis
		5. Management and treatment of patients
		6. Writing prescriptions for drugs and / or medical devices, given to patients in accordance with the diagnosis
		7. Issuing a referral letter for further examination or action to the laboratory and / or health center facilities in accordance with the results of patient management
Writing prescriptions and electronic medical devices	SE MENKES HK.02.01 / MENKES / 303/2020	Electronic prescription used 1x.
		1. Open: electronic prescription directly to patient (requires identification code to ensure validity)
		2. Closed: doctors give electronic prescriptions to pharmacy facilities through the application
Delivery of pharmaceutical preparations, medical equipment, BMHP, and supplements	SE MENKES HK.02.01 / MENKES / 303/2020	Includes assurance of the safety and quality of the product delivered (product is delivered in a closed and opaque container, the product is delivered to its destination, documentation of product handover, delivery accompanied by delivery documents and telephone number) and patient confidentiality. Products can be delivered via delivery services or telemedicine system providers.

When the COVID-19 pandemic started in Indonesia, in response, the MoH released the Circular Letter of MoH HK.02.01/MENKES/303/2020, which encourages the use of telemedicine. On top of that, this regulation also elaborates the definition of telemedicine from the MoH Decree No 20 of 2019. Considering that this regulation only specifically regulates the implementation of telemedicine services between healthcare facilities in Indonesia, the MoH then issued the Circular Letter (Surat Edaran/SE) No. HK.02.01/MENKES/303/2020 regarding the organization of health services through the utilization

of information and communication technology to prevent the spread of CoronaVirus 2019 Disease (COVID-19) (“**SE 303/2020**”), which regulates the new paradigm of clinical authority (allowing doctors and dentists to provide certain treatment, prescribe, and prepare pharmaceutical preparation including medical equipment, materials, and supplements).

Following the MoH, the Indonesian Medical Council (Konsil Kedokteran Indonesia/KKI) as an autonomous body issued KKI Regulation No. 74 of 2020 concerning the Clinical Authority and Medical Practice through Telemedicine during the Corona Virus 2019 (COVID-19) Pandemic in Indonesia (“KKI Reg 74/2020”).

Both the SE 303/2020 and KKI 74/2020 are efforts from the Indonesian government to reduce physical interaction between health workers and patients to reduce the risk of virus transmission, while keeping healthcare accessible during the COVID-19 pandemic. These regulations grant doctors, dentists, specialist doctors, and sub-specialist doctors the clinical authority to provide medical services to patients. Table 4 shows comparison between Minister of Health Circular Letter 303/2020 and Indonesian Medical Council Regulation 74/2020 in guiding the use of Telemedicine service during Pandemic in Indonesia.

Table 4. Comparison between Minister of Health Circular Letter 303/2020 and Indonesian Medical Council Regulation 74/2020

No.	Topics	Minister of Health Circular Letter 303/2020		Indonesian Medical Council Regulation 74/2020	
		Provisions	Article	Provisions	Article
1	Duration	During the COVID-19 pandemic	Point 1	During the COVID-19 pandemic	Article 3 paragraph 1 and article 11
2	Terms	STR	Point 2	STR and SIP	Article 3 paragraph 4
3	Type of service	Unwritten		Teleconsultation	Article 3 paragraph 2
4	Health facilities	Unwritten		Written	Article 1 point 6
5	Platform	Unwritten		Unwritten	
6	Type of case	Unwritten		Non-emergency	Article 4, paragraph 3
7	Physical examination	Via audio visual	Point 5b	Unwritten	
8	Diagnosis	Make the diagnosis	5d points	Make the diagnosis	Article 3 paragraph 3
9	Recipe	May be written, except narcotics and psychotropic substances	Point 5f	May be written, except narcotics and psychotropic substances	Article 8 paragraph 2
10	Data confidentiality	Described	Points 3 and 4	Unwritten	

11	Medical records	Recorded manually / electronically by the doctor	Point 4	Recorded manually / electronically at the health facility	Article 7 paragraph 2
12	Drug prescribing and redemption mechanisms	Described	7-10 points	Unwritten	
13	Financing	Unwritten		Rewards (+)	Article 10
14	Form of service	Unwritten		Writing, voice, and / or video	Article 3 paragraph 3
15	Approval	Unwritten		Requires informed consent from patient	Article 5
16	Prohibition	Unwritten		Teleconsultation directly with patients without going through the health facilities	Article 9 point a
				Performing invasive measures	Article 9 points f
				Provide a health certificate	Article 9 points h
17	Stakeholders	Doctors, specialist doctors, subspecialists, dentists, specialist dentists for telemedicine services. Pharmacist for electronic prescribing.	9c points.	Doctors, specialists, subspecialists, dentists, and specialist dentists	Article 1, paragraph 7

Implementation Report

Implementation Report: Assessment Framework, Implementation and Findings

Current Situation in Indonesia

Healthcare is one area where Indonesia lags, with relatively low levels of spending on healthcare per capita. Unsurprisingly, this translates to lower capacity in healthcare infrastructure compared to its ASEAN peers and neighbours, and that of advanced economies. This is reflected in a number of key indicators, such as hospital beds and physicians to 1000 population [7]. The COVID-19 pandemic has put a further spotlight on these issues.

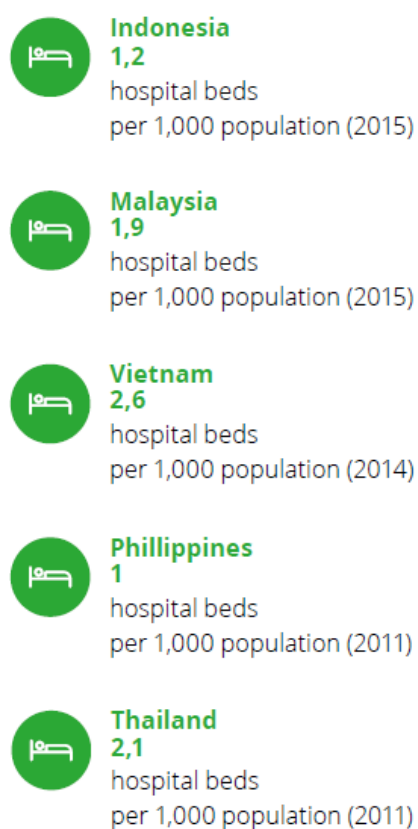


Figure 11. Hospital beds per 1,000 population (World Bank)

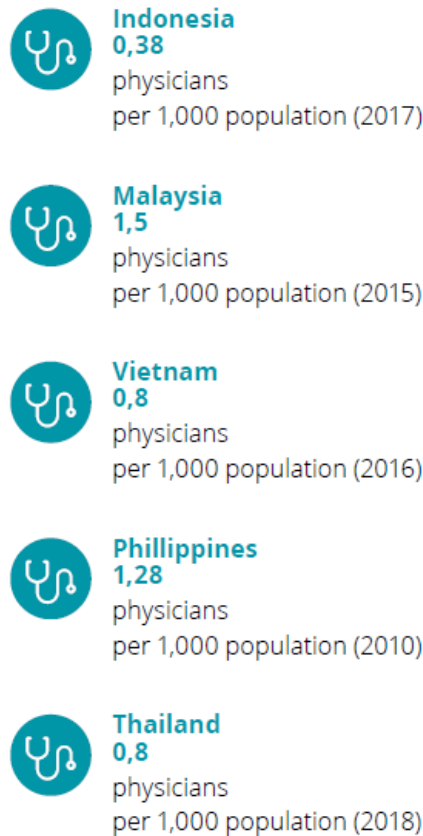


Figure 12. Physicians per 1,000 population (World Bank)

Notes: Latest year of data available in each country for hospital beds and physicians, respectively, are as follows: Indonesia (2015,2017), Malaysia (2015,2015), Vietnam (2014,2016), Philippines (2011,2010), and Thailand (2011,2018).

Although both government and private sector investment in healthcare has been rising, Indonesia still faces a steep hike in investment to improve health outcomes across the board, particularly as its population continues to grow, which will place additional demands on already under-resourced healthcare systems. Growing affluence brings further challenges in the form of a growing elderly population, chronic diseases, cancer and obesity, and higher expectations of standards of care.

As a strategy to alleviate pressures on existing facilities going forward, the Government of Indonesia’s is aiming to strengthen primary healthcare as part of its Long-Term National Development Plan (Rencana Pembangunan Jangka Panjang Nasional/RPJMN) 2020-2024. It aims to do so by improving promotive and preventive efforts, particularly in the areas of mother and child health, productive health, nutrition, disease control, community-level initiatives, health systems, drug and food control. Either way, further increases in private financing of both soft and hard infrastructure will be critical, particularly as the government faces greater fiscal pressures managing the stabilisation and recovery

of the economy through the current COVID-19 pandemic. Indonesia has lifted its previous budget deficit-to-GDP ratio of 3% to around 5% to accommodate an US\$ 47 billion stimulus program for 2020, with further increases expected in 2021.

The shortage of manpower and facilities to handle the pandemic have been routinely published. In Jakarta alone, there are already 40.000 HC workers (HCWs) served as Covid-19 frontliners. Still, the capital needs 2.767 more HCWs. The death toll among HCWs had surged to 499 people (227 doctors, 158 nurses, 69 midwives and others) nationally, hence worsening the country's effort to combat the disease. The government had added more Covid-19 referral hospitals, including converting the Asian Games Athlete Village in Jakarta and the former Vietnamese refugee camp in Galang, Riau Archipelago. However, the lack of protective personal equipment (PPE) for HCWs and the time-consuming scheme to claim for Covid-19 treatment from Indonesian national universal health insurance have overwhelmed the operational of HC providers.

In response to the situation, Indonesia Minister of Health (MoH) had issued the Circular Letter HK.02.01/MENKES/303/2020 to promote the use of telemedicine in the pandemic era, followed by Indonesian Medical Council Regulation 74/2020. The letters recommended its utility to diagnose, treat, prevent, and evaluate the patient's condition by multidisciplinary HCW where face-to-face health consultation might be limited in order to reduce the Covid-19 transmission. Furthermore, CDC also mentioned that telemedicine had a potential to lessen the burden of HC systems by minimizing the patient inflow demand on facilities and reduce the use of PPE. Virtual health could therefore help stabilise existing supply and increase the capacity from load-balance capacity, reduce workforce exposure, overcome clinicians quarantine hurdles, scale scarce expertise, redeploy clinical experts, and give a hospital-at-home solution.

Indonesia is considered to have the largest digital economy in Southeast Asia, built on its large and young population and high penetration of smartphones and the internet. Such a customer base has provided fertile ground for the growth of digital healthcare providers over the last 5 to 10 years, which are helping to overcome many of the issues in traditional healthcare models related to cost, efficiency and geographic inequalities.

Indonesia has proven potential for digital business, including digital health businesses Temasek research estimating that Indonesia's internet economy will reach \$174 billion by 2025 at a compounded annual growth rate of over 40 per cent. The country is currently home to over 170 million internet users, with a young population of 110 million, 90 percent of whom use the internet.

In the last 5–10 years, a range of digital health companies and digital health solutions have emerged in Indonesia. Indonesia's large and geographically dispersed population provides a strong user base for Indonesia's emerging digital health applications. As a relatively new phenomena in Indonesia, the private sector is driving the expansion of digital health. Key players in the sector include pharmaceutical

companies, healthcare companies, public and private hospitals and start-ups. On one estimate, digital health revenues are expected to multiply in Indonesia from \$85 million in 2017 to \$973 million in 2022 at a compound annual growth rate of over 60 per cent.

Nevertheless, the pandemic outbreak has been a catalyst to increase people's attention towards personal health. PwC Global explained that people's focus has increased more than 60% to their mental wellbeing, physical health, medical needs, and diets during the Covid-19 situation [8]. The importance of HC had surged among their respondents from only 19% before pandemic to 49% after. The large adoption of telemedicine by both patients and doctors are accelerating, including in Indonesia. In March 2020, Alodokter (one of Indonesian largest health startups) recorded 61 million web visits and more than 33 million active users in March – approximately 1.5 times higher than the usual traffic before the outbreak.

The fast development and utility of telemedicine should consider the stepwise approach. It should follow the patient centricity aligned with the goal of universal health coverage. The clear lines of accountability, open source, data confidentiality and auditability should be regulated by a strong digital governance. The development, deployment and maintenance should meet industry best practice in security, technical and clinical standards. Furthermore, the digital communication should be clear, honest, consistent and continuous to calm anxieties and facilitate wider adoption while promoting equity and inclusivity. Additionally, telemedicine should be contextual and localized to help the administration to map out services that would benefit most.

Especially during the pandemic situation, the stakeholders should engage on a shared global agenda to maximize telemedicine's potential by collectively addressing opportunities, identifying and communicating risks, and focus on threats associated with the use of digital technologies. Moreover, the digital health capacity should then be built on the basis of national needs. The commitment of the stakeholders is compulsory to advance digital health technology, including its improvement according to the continuous evidence-based measurement, monitoring, research and practice.

This combined strategy is not only hoped to promote the wider use of telemedicine during the temporary momentum of pandemic. The strategy should always be renewed and evaluated to keep the entire parties engaged even after the pandemic, hence the sustainability of each telemedicine program can be assured.

Memorandum of Understanding

Memorandum of Understanding between the United Nations Development Programme and Indonesian Telemedicine Alliance (ATENSI)

To initiate the assessment of telemedicine services during a pandemic in Indonesia, there is a need to conduct a Memorandum of Understanding (MOU) between the United Nations Development Programme (UNDP) and Indonesian Telemedicine Alliance (ATENSI).

Purpose and Scope of MOU

The purpose of this MOU is to provide a collaborative framework for the non-exclusive cooperation and facilitate and strengthen collaboration between the Parties in the areas of cooperation identified in the description below.

Areas of Cooperation

The Parties have identified the following activities in which cooperation may be pursued, with each Party operating subject to its respective mandates, governing regulations, rules, policies and procedures:

- Evidence based practices through Assessment to analyze the telemedicine service in pandemic situation and university network development on telemedicine research to provides recommendations to government regarding working areas of telemedicine services to improve their services and as part of the public health service system;
- Advocacy on development of national framework and governance on telemedicine; and
- Support to promote South-South learning, exchange and capacity building.

Consultation and Exchange of Information

The Parties will, on a regular basis, keep each other informed of and consult on matters of common interest, which in their opinion are likely to lead to mutual collaboration.

Consultation and exchange of information and documents under this MOU will be without prejudice to arrangements, which may be required to safeguard the confidential and restricted character of certain information and documents. Such arrangements will survive the termination of this MOU and of any agreements signed by the Parties within the scope of this collaboration.

The Parties will, at such intervals as deemed appropriate, convene meetings to review the progress of activities being carried out under the present MOU and to plan future activities.

The Parties may invite each other to send observers to meetings or conferences convened by them or under their auspices in which, in the opinion of either Party, the other may have an interest. Invitations will be subject to the procedures applicable to such meetings or conferences.

MoU Signing Ceremony

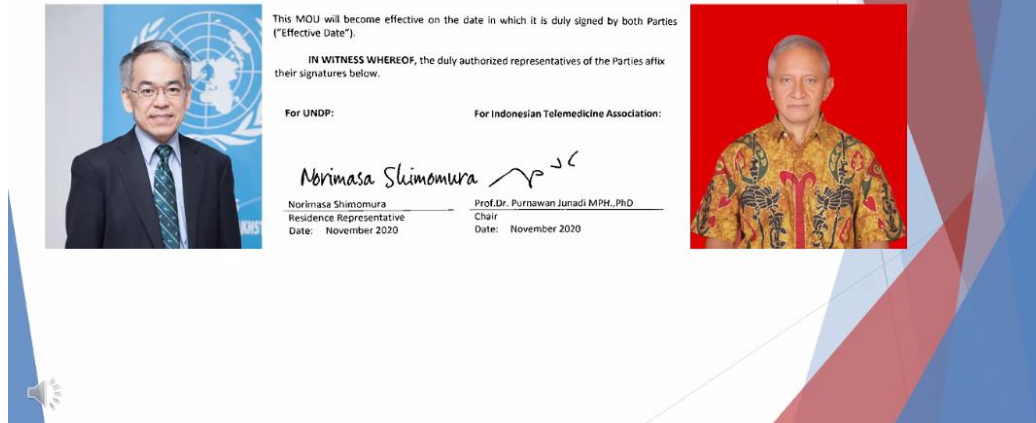


Figure 13. MoU Signing Ceremony

Following several meetings between UNDP and ATENSI in November and December 2020, the MoU Signing Ceremony was conducted on Friday, 18 December 2020.

Assessment the use of Telemedicine applications in Indonesia

The objectives of this assessment are:

1. Extent to which the telemedicine service can provide benefits to the people in Indonesia
2. Provides recommendations to the government regarding working areas of telemedicine services to improve services and as part of the public health service system in addition to hospital, clinic and Puskesmas health services.

The assessment covers several aspects such as described in figure 14 below:

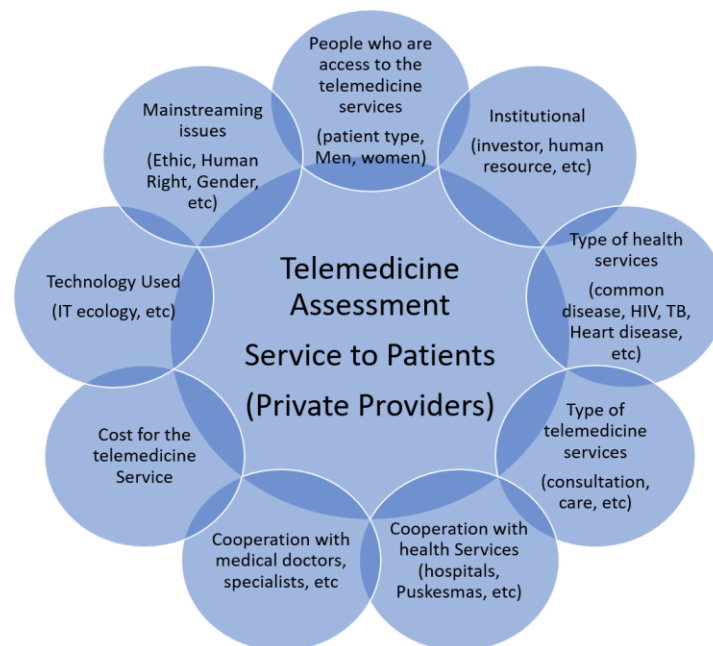
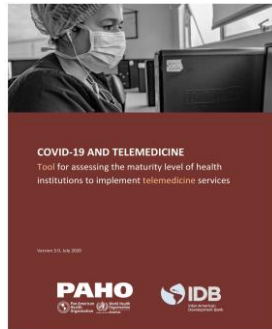


Figure 14. Several aspects covered in the Telemedicine Assessment – Service to Patients

The Telemedicine Assessment was developed using several references such as:

- PAHO, COVID-19 and Telemedicine, “Tool for assessing the maturity level of health institutions to implement telemedicine services”, July 2020 [9]
- K. Kidholm *et al.*, “A model for assessment of telemedicine applications: MAST,” *Int. J. Technol. Assess. Health Care*, vol. 28, no. 1, pp. 44–51, 2012 [10]
- Parmanto, A. N. Lewis, Jr., K. M. Graham, and M. H. Bertolet, “Development of the Telehealth Usability Questionnaire (TUQ),” *Int. J. Telerehabilitation*, vol. 8, no. 1, pp. 3–10, 2016 [11]



February, 2010

The MAST Manual

MAST - Model for Assessment of Telemedicine

International Journal of Telehabilitation • scholab.pitt.edu

DEVELOPMENT OF THE TELEHEALTH USABILITY QUESTIONNAIRE (TUQ)

BAMBANG PARMANTO, PHD¹, ALLEN NELSON LEWIS, JR., PHD², KRISTIN M. GRAHAM, MS, CRC³, MARNIE H. BERTOLET, PHD⁴

¹DEPARTMENT OF HEALTH INFORMATION MANAGEMENT, SCHOOL OF HEALTH AND REHABILITATION SCIENCES, UNIVERSITY OF PITTSBURGH, PITTSBURGH, PENNSYLVANIA, USA

²COLLEGE OF HEALTH RELATED PROFESSIONS, STATE UNIVERSITY OF NEW YORK DOWNSTATE MEDICAL CENTER, BROOKLYN, NEW YORK, USA

³DEPARTMENT OF REHABILITATION SCIENCE AND TECHNOLOGY, SCHOOL OF HEALTH AND REHABILITATION SCIENCES, UNIVERSITY OF PITTSBURGH, PITTSBURGH, PENNSYLVANIA, USA

⁴DEPARTMENT OF EPIDEMIOLOGY, GRADUATE SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF PITTSBURGH, PITTSBURGH, PENNSYLVANIA, USA

ABSTRACT

Current telehealth usability questionnaires are designed primarily for older technologies, where telehealth interaction is conducted over dedicated videoconferencing applications. However, telehealth services are increasingly conducted over computer-based systems that rely on commercial software and a user supplied computer interface. Therefore, a usability questionnaire that addresses the changes in telehealth service delivery and technology is needed. The Telehealth Usability Questionnaire (TUQ) was developed to evaluate the usability of telehealth implementation and services. This paper addresses: (1) the need for a new measure of telehealth usability, (2) the development of the TUQ, (3) intended uses for the TUQ, and (4) the reliability of the TUQ. Analyses indicate that the TUQ is a solid, robust, and versatile measure that can be

Figure 15. References for Telemedicine Assessment

The Telemedicine Assessment is published on the Internet using Survey Monkey application with the link: https://www.surveymonkey.com/r/Penyedia_Layanan as displayed in Figure 15. The survey was started on 15 December 2020 and the last data was extracted on 14 January 2021.



Figure 16. The Telemedicine Assessment on Survey Monkey application

Data collection method

This assessment uses a representative sampling method in which the telemedicine service provider companies that are members of the Indonesian Telemedicine Alliance (ATENSI) are considered as representatives of telemedicine service providers in Indonesia. ATENSI is an organization that houses various individuals, institutions and private companies that are actively involved in developing telemedicine services in Indonesia. Until now, it is not clear the number of telemedicine service providers in Indonesia. As a result, the population related to telemedicine service providers in Indonesia is still quite difficult to identify with certainty. Therefore, the researcher decided to use ATENSI members as the sample in this study, because at this time only ATENSI were known to have the criteria most suitable for the research subject. Respondents to this questionnaire included all ATENSI members, totaling 29 institutions. To date, 26 institutions have filled out the questionnaire.

The data collection technique used in this study was a data collection technique using a questionnaire. Questionnaires were distributed online via Survey Monkey.

Data processing method

The data analysis used is descriptive statistics to describe various aspects of telemedicine services in Indonesia from the provider side. Data is presented in the form of numbers and percentages. The aspects seen include the form of telemedicine services offered; relationship with health facilities partners, health workers and users, resource, and IT.

ATENSI Member Service Update

Table 5 and 6 provide the service update for ATENSI member's telemedicine applications on Google Android Play Store and Apple App Store, to show the number of downloaders, rating, number of reviewers and last update.

Table 5. ATENSI Member Service Update via Google – Play Store as of January 14, 2021 at 21.40 WIB

No	Application	Number of Downloaders	Rating (max 5.0)	Number of Reviewers	Last Update
1.	Alodokter	>5.000.000	4.6	340.712	19 December 2020
2.	Aveecena	>1.000	4.4	14	9 May 2019
3.	AVShunt Indonesia	>1.000	4.9	29	16 January 2018
4.	Call My Dokter	-	-	-	-
5.	Doctor to doctor	>10.000	4.8	1.586	12 January 2021
6.	Docquity	>100.000	4.7	11.320	22 November 2020
7.	DokterSehat	-	-	-	-
8.	GoAptik	>50.000	4.7	1.942	31 Augustus 2020
9.	GoodDoctor (incorporate with GrabHealth)	-	-	-	-
10.	Halodoc	>5.000.000	4.8	283.862	7 January 2021
11.	Hallo Bumil	>1.000.000	4.4	13.442	7 January 2021
12.	Hi Sehat	>100	5.0	5	18 October 2020
13.	Homecare24	>50.000	3.1	314	19 November 2020
14.	KakiDiabet Indonesia	>500	5.0	12	20 November 2019
15.	KlikDokter	>500.000	4.2	7.724	24 December 2020
16.	KlinikGo	>10	-	-	29 April 2020
17.	Link Sehat	>1.000	4.2	35	8 January 2021

18.	Milvik	>1.000	4.8	36	2 April 2020
19.	Naluri.Life	>10.000	4.1	57	22 December 2020
20.	Perawatku	>100	-	-	28 June 2019
21.	ProSehat	>100.000	4.0	862	23 July 2020
22.	SehatQ	>100.000	4.5	3.795	11 January 2021
23.	Teman Bumil	>1.000.000	4.5	17.063	23 December 2020
24.	Teman Diabetes	>10.000	4.4	523	3 November 2020
25.	TrustMedis	-	-	-	-
26.	Varises Indonesia	>1.000	4.9	28	12 September 2019
27.	Vascular Indonesia	-	-	-	-
28.	YesDok	>100.000	4.9	14.346	3 January
29.	Lekasehat	-	-	-	-

Table 6. ATENSI Member Service Update via Apple - App Store as of January 14, 2021 at 20.17 WIB

No	Application	Number of Downloads	Rating (max 5.0)	Number of Reviewers	Last Update
1.	Alodokter	Not Available on App Store	4.8	17.368	11 January 2021
2.	Aveecena		-	-	-
3.	AVShunt Indonesia		-	-	-
4.	Call My Dokter		N/A	N/A	14 November 2020
5.	Doctor to doctor		4.3	105	12 January 2021
6.	Docquity		3.9	72	12 January 2021
7.	DokterSehat		-	-	-
8.	GoApotik		4.7	324	14 November 2020
9.	GoodDoctor (incorporate with GrabHealth)		4.9	829	7 January 2021
10.	Halodoc		4.9	116.586	7 January 2021
11.	Hallo Bumil		4.4	19	14 January 2021
12.	Hi Sehat		-	-	-
13.	Homecare24		2.2	66	14 December 2020
14.	KakiDiabet Indonesia		-	-	-
15.	KlikDokter		4.1	138	1 January 2021
16.	KlinikGo		-	-	-
17.	Link Sehat		-	-	-
18.	Milvik		-	-	-

19.	Naluri.Life		5	1	1 January 2021
20.	Perawatku		-	-	-
21.	ProSehat		-	-	-
22.	SehatQ		4.7	157	12 January 2021
23.	Temam Bumil		3.9	170	7 January 2021
24.	Temam Diabetes		4.7	10	14 November 2021
25.	TrustMedis		-	-	-
26.	Varises Indonesia		-	-	-
27.	Vascular Indonesia		-	-	-
28.	YesDok		4.9	1.262	8 January 2021
29.	Lekasehat		-	-	-

Assessment Results

In this study, the results of the study are grouped into 6 categories, namely:

1. Organization and Procedures
2. Human Resources
3. Health Services
4. User Demographics
5. Information Technology Infrastructure
6. Financing

Organization and Procedures

As of January 14, 2020, as many as 26 of the 29 telemedicine providers had responded to the questionnaire, including Alodokter, AVShunt Indonesia, CallMyDokter, CARE, Docquity, Dokter Sehat, Get Medik, GoodDoctor (GrabHealth), Hallo Bumil, Halodoc, HelloSehat, KakiDiabet Indonesia, KlikDokter, Konsuldok, Lekasehat, Link Medis Sehat, MEDI-CALL, Milvik, Naluri.life, Okedok, Perawatku, ProSehat, SehatQ, Varises Indonesia, Vascular Indonesia and YesDok. The completeness of filling out the questionnaire is in the range of 10-99%. Telemedicine providers in Indonesia are dominated by Limited Liability Companies / PT and most of them already have service coverage areas throughout Indonesia.

Participating Telemedicine Companies

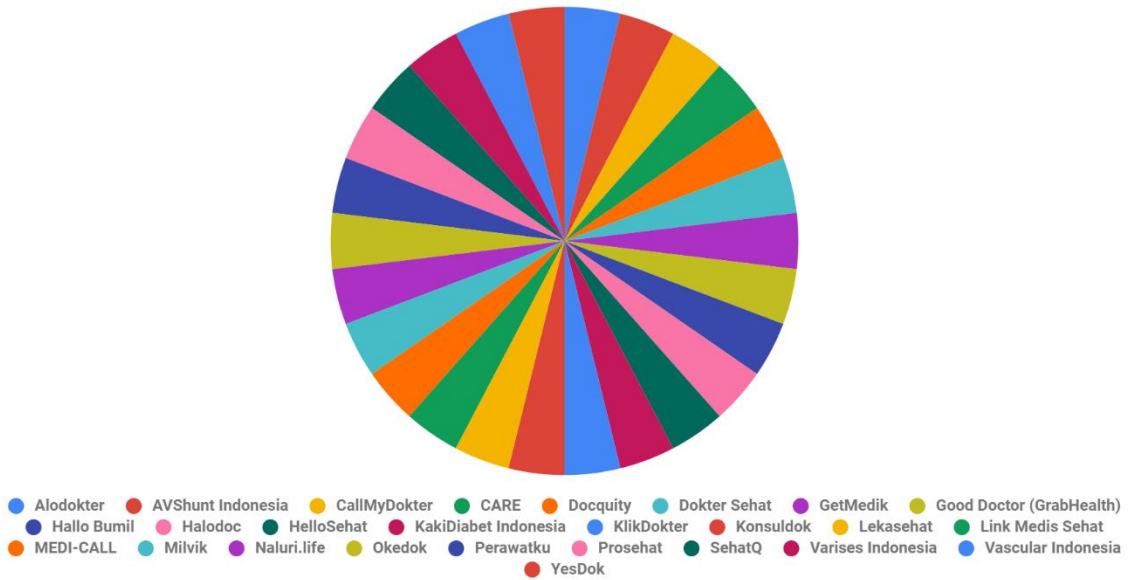


Figure 17. Telemedicine providers in Indonesia participating in the survey

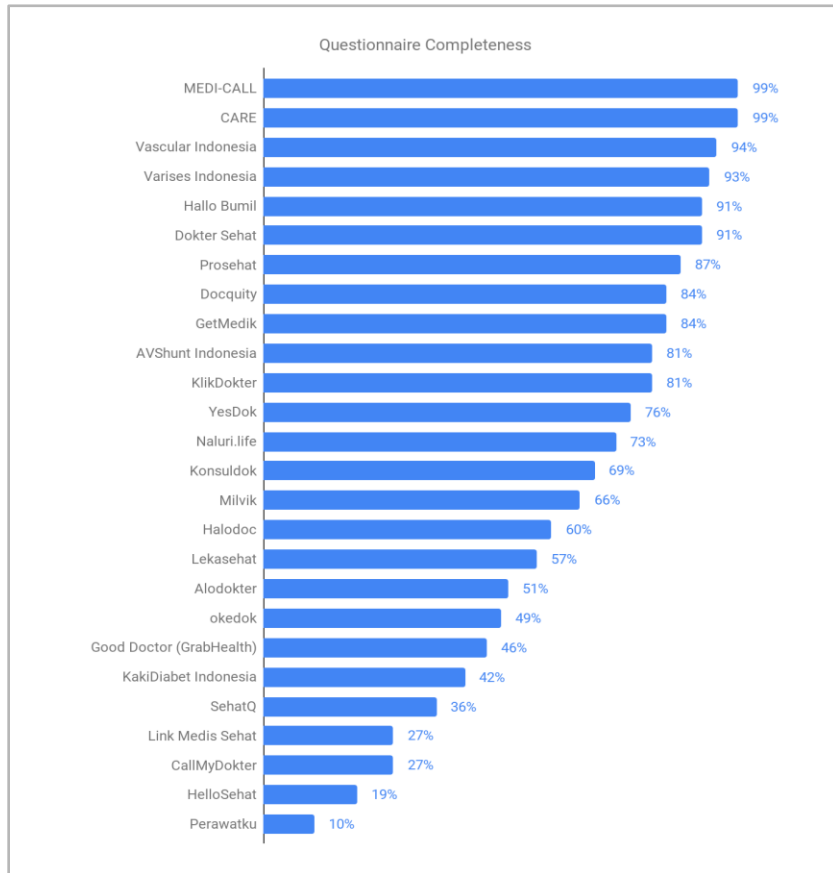


Figure 18. Completeness of filling out the questionnaire

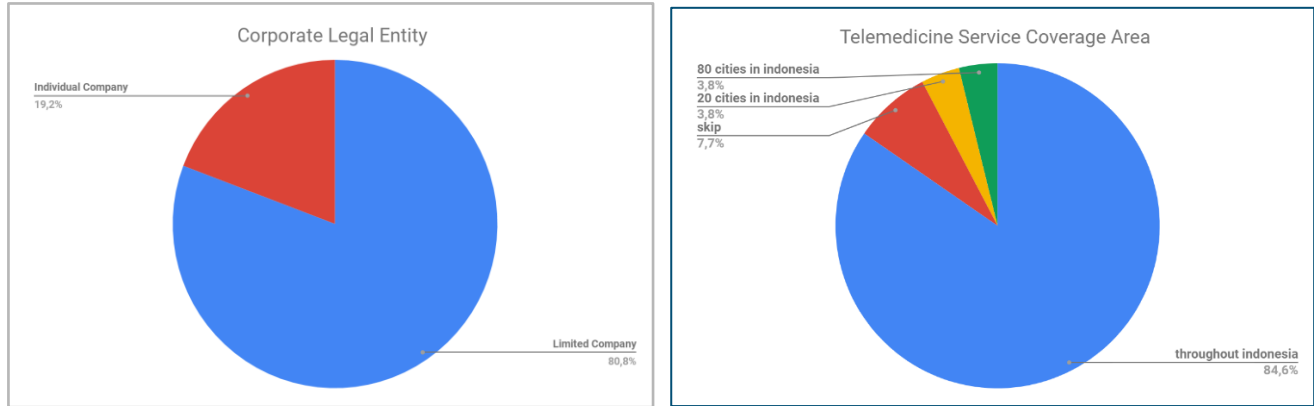


Figure 19. Legal entity and company service coverage area

The majority of telemedicine services in Indonesia were initiated by foundations or start-up companies themselves. Some of them are initiated by start-up companies together with health facilities management such as hospitals, health centers or health clinics and / or government or private partners such as pharmaceutical services and online delivery of goods. Alodokter, Dokter Sehat and GetMedik are telemedicine service providers that were first established, namely in January 2016. Investors in the provider companies come from venture capital, angel investors or a combination of both.

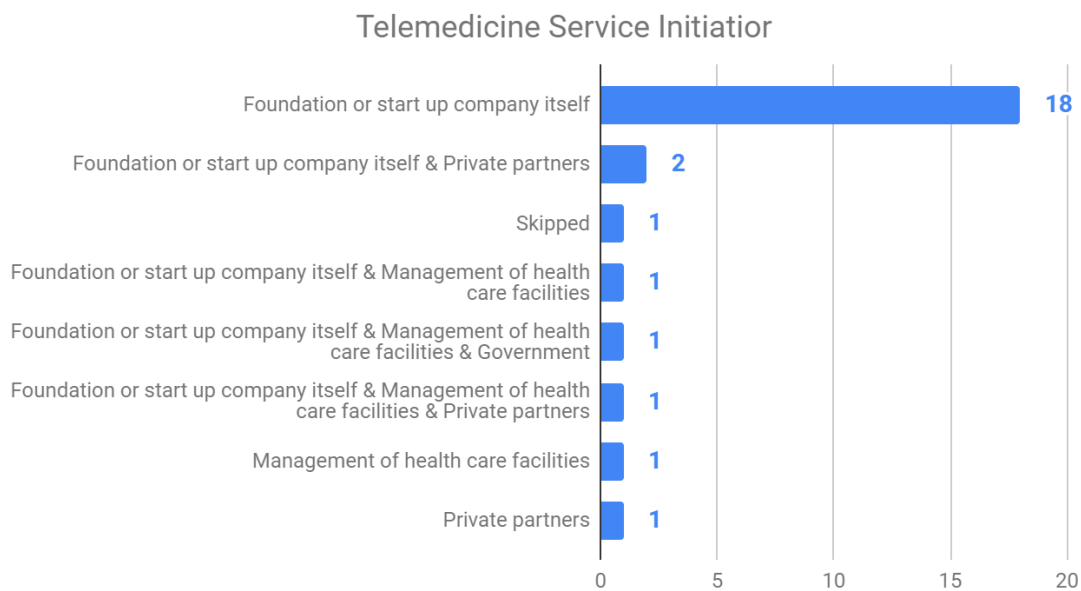


Figure 20. Initiators of the company's telemedicine services

More than half of the companies that participated in this survey have collaborated with health care facilities, with the number varying between 2-60 institutions. As many as 53.8% of companies stated that their health facilities partners had adequate medical equipment. Some companies also have facilities or tools so that healthcare partners can evaluate providers such as partner satisfaction,

feedback and follow-up. The majority of health facilities partners considered the telemedicine services provided by the company to be satisfactory. The number of partners who gave an assessment ranged from 20-50 institutions. Through evaluations by health facilities partners, 3.8% of companies made slight changes / improvements, 7.7% of companies made significant changes and 38.5% of companies made moderate changes / improvements. Changes made include improvements to the system and operational flow; changes to processes, response times and reports; improved user experience (UX), adding features and human resources as well as increasing the number and types of telemedicine services provided. Only 7.7% of companies were willing to share supporting data regarding this evaluation further.

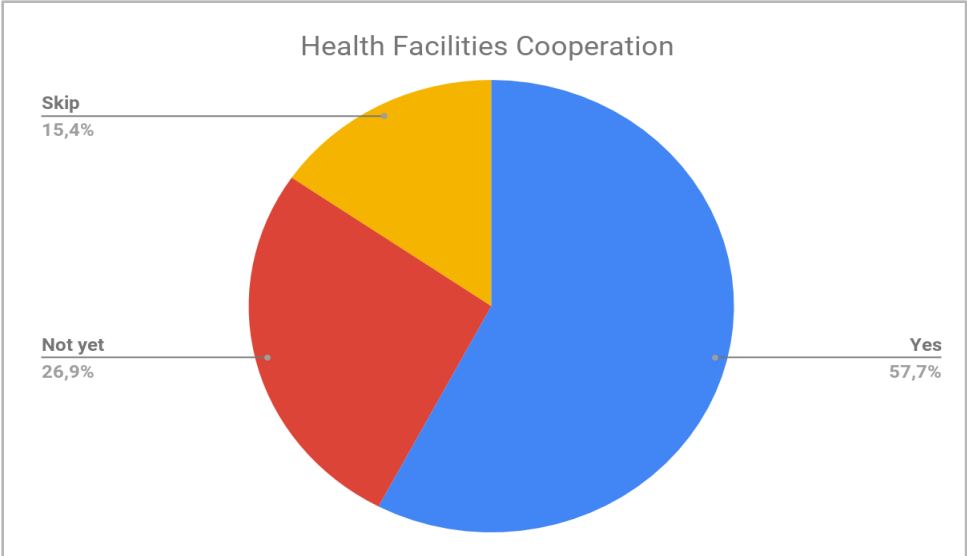


Figure 21. Cooperation with health facilities

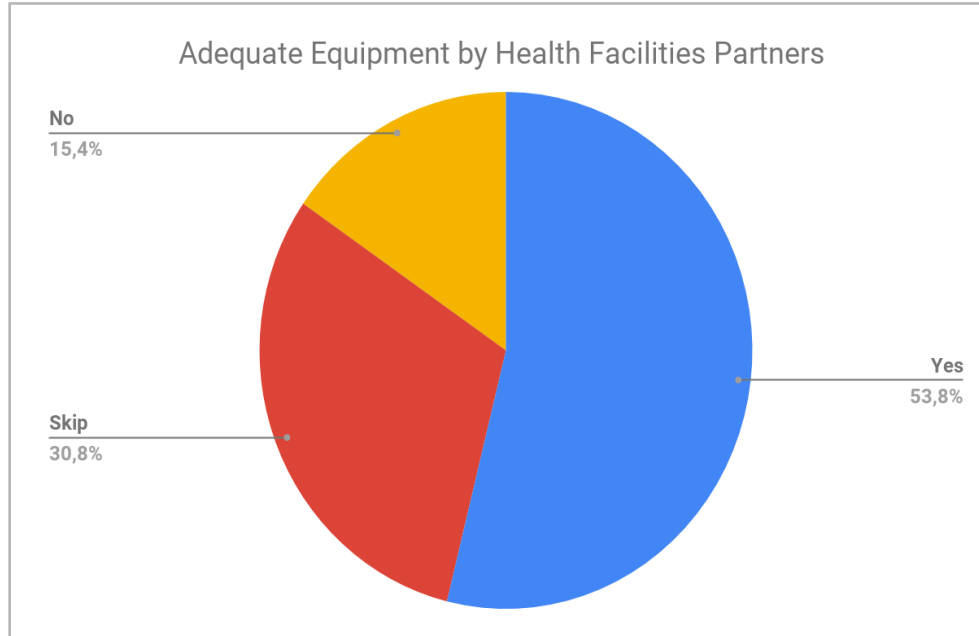


Figure 22. Adequate ownership of medical equipment for health facilities partners

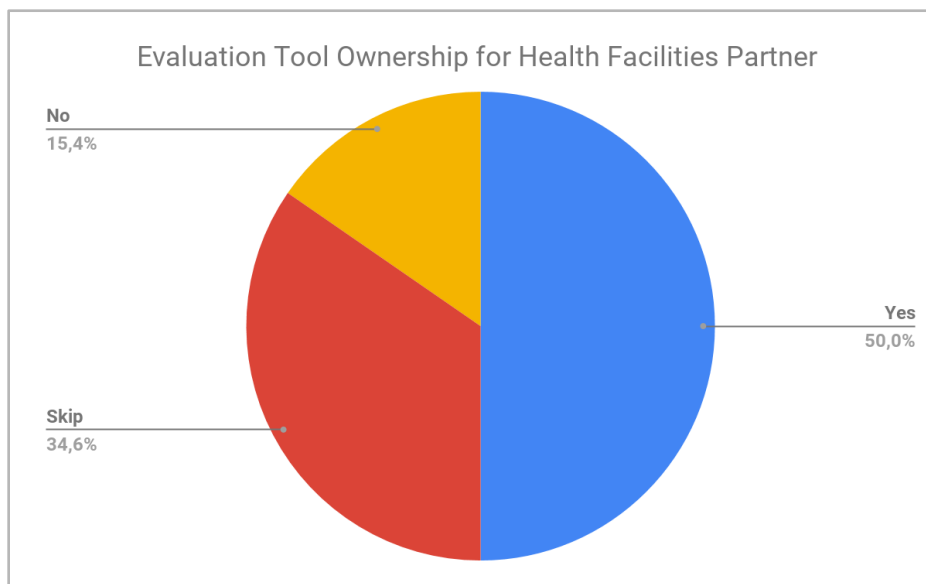


Figure 23. Ownership of evaluation tools for health facilities partners

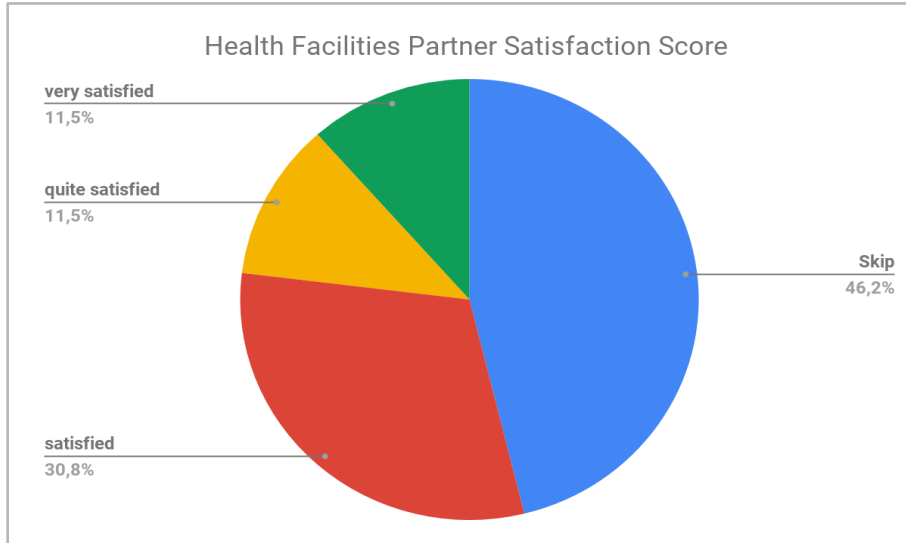


Figure 24. Satisfaction scores of health facilities partners on the company's telemedicine services

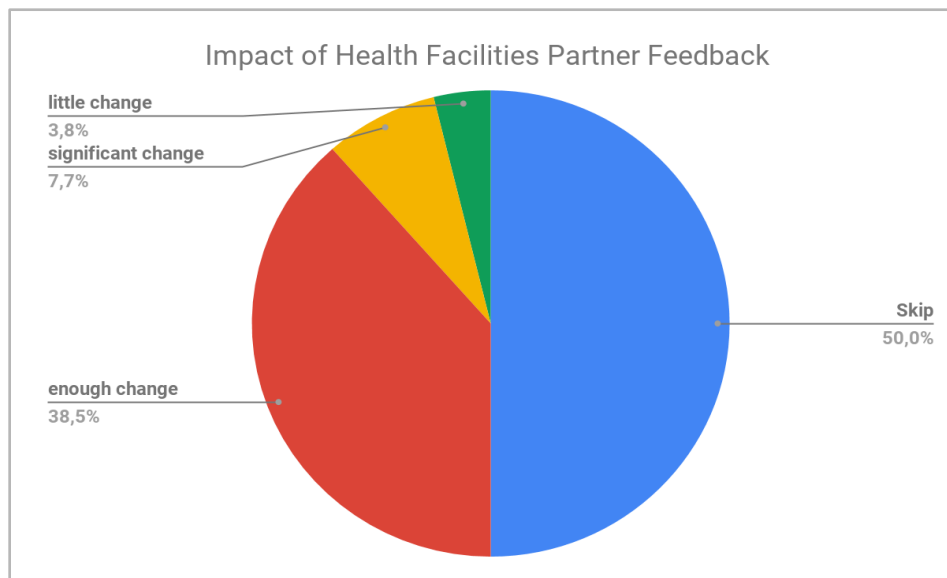


Figure 25. Feedback from health care partners and changes made by the company

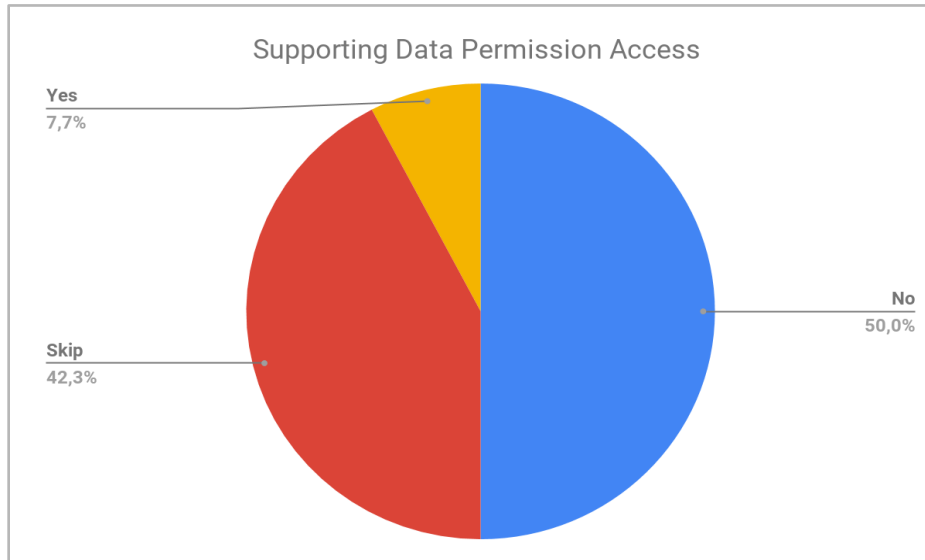


Figure 26. Permission to obtain supporting data regarding evaluations from health facilities partners

Human Resources

The human resources of telemedicine service providers consist of various professions. Operational is the position with the highest number of human resources. The majority of telemedicine providers in Indonesia consider that their current human resources are insufficient.

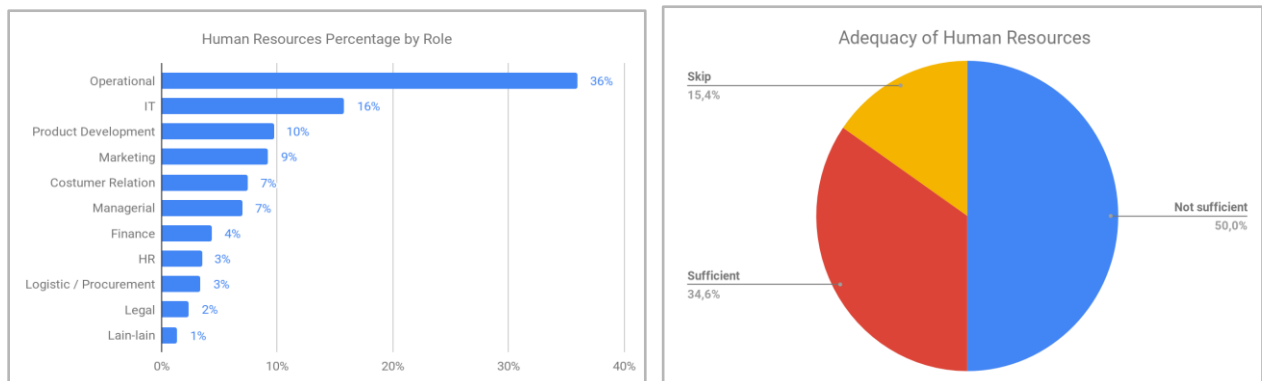


Figure 27. Percentage of human resources based on position and adequacy of human resources

Twenty one of the 26 companies confirmed that they have ethics committees from various scientific fields, including medicine, neurology, clinical pathology, clinical microbiology, clinical pharmacology, pediatricians, pediatric surgeons, obstetrics and gynecology, skin and genitalia, mental health, vascular health sciences, health law, hospital management, nursing, mental nursing, nutrition / dietitian science, pharmacy, public health, midwifery / midwifery, psychology, law and / or ethical legal, IT and business. The majority of companies claim that members of the ethics committee understand malpractice issues related to telemedicine services.

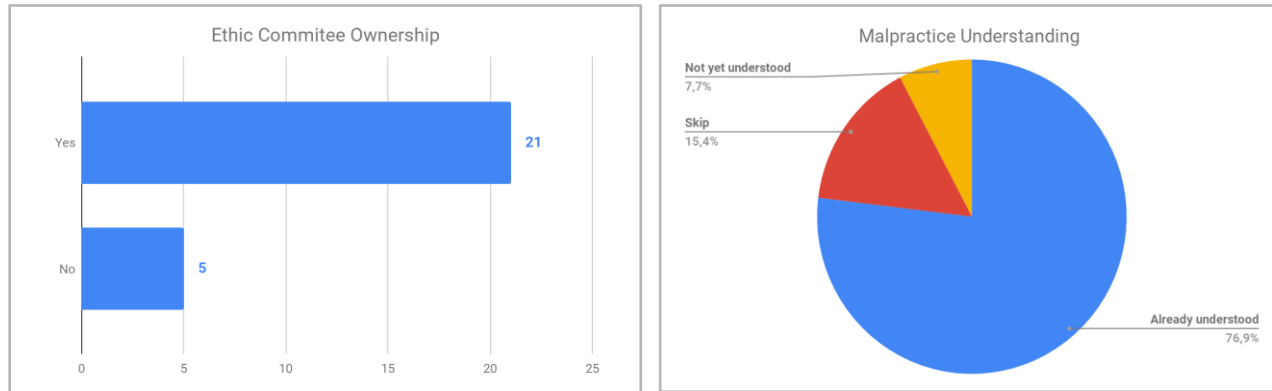


Figure 28. Ownership of ethics committee and understanding of malpractice issues

More than half of the companies have also provided training for health workers with varying frequency. In terms of collaboration between professions, the majority of provider companies claim telemedicine services increase collaboration between medical professions. To date, general practitioners are the health professionals most facilitated by provider companies. The majority of companies also have a tool for health workers partners to evaluate the provider company. As many as 44% of health workers partners felt that the telemedicine service provided by the company was satisfactory. Data obtained from more than 10 health workers partners. Through evaluations by health workers partners, 3.8% of the companies made some changes / improvements, 19.2% made significant changes and 42.3% made quite changes. Changes made include developing a business strategy, adding features, adding training, and improving the user interface (UI) and user experience (UX). Only 12% of companies agreed to provide further supporting data regarding the evaluation of health workers partners.

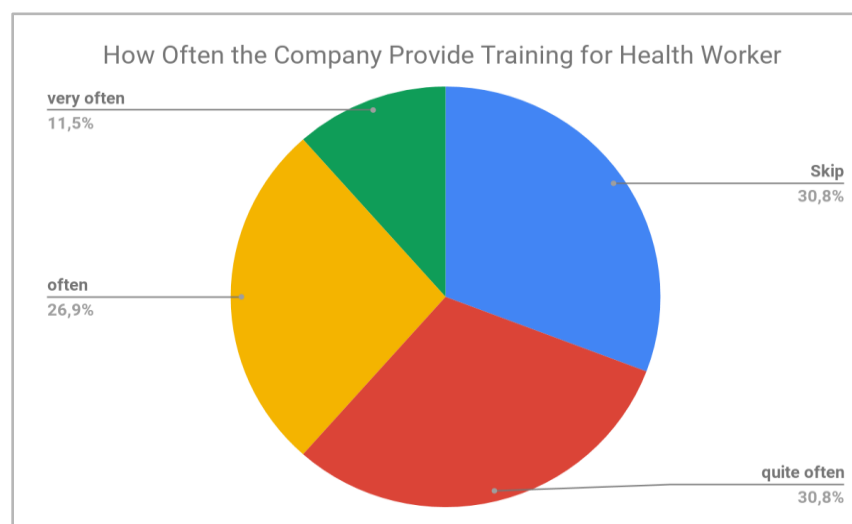


Figure 29. Training for health workers

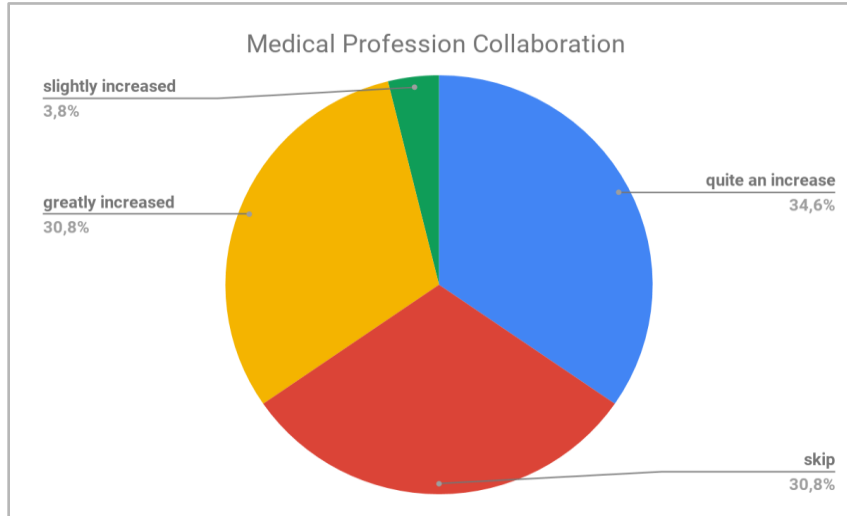


Figure 30. Telemedicine services and collaboration between health professions

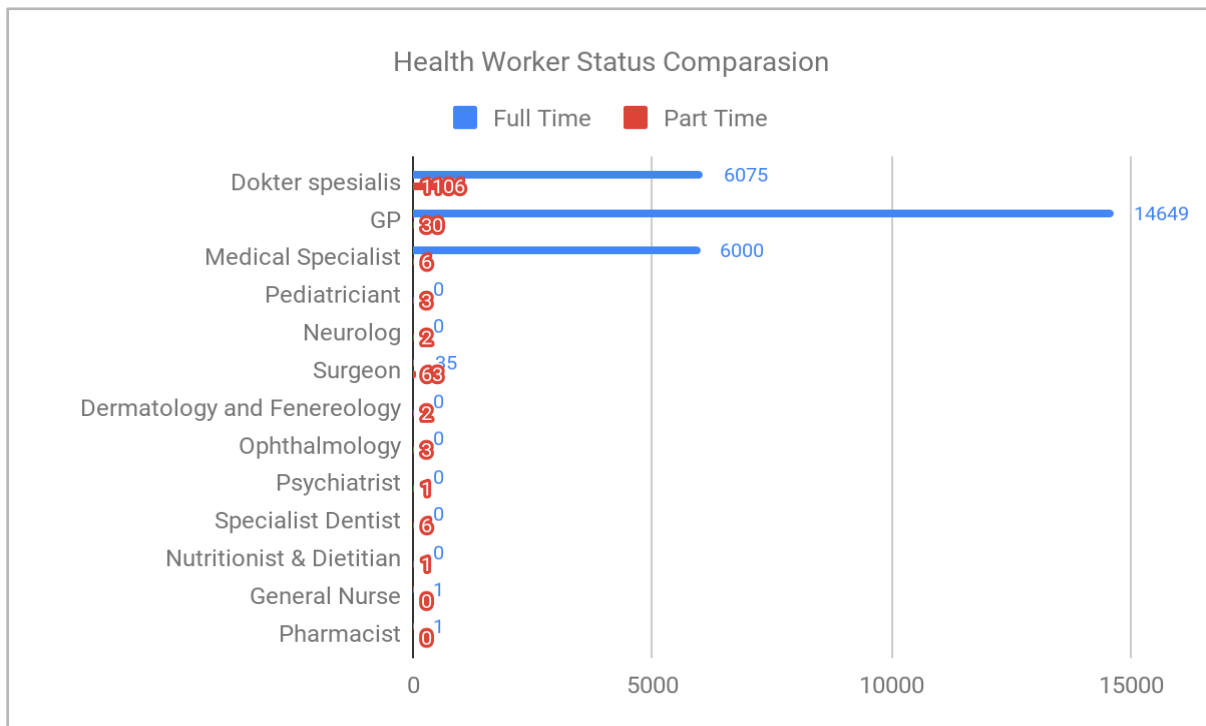


Figure 31. Proportion of comparison of full and part-time health workers

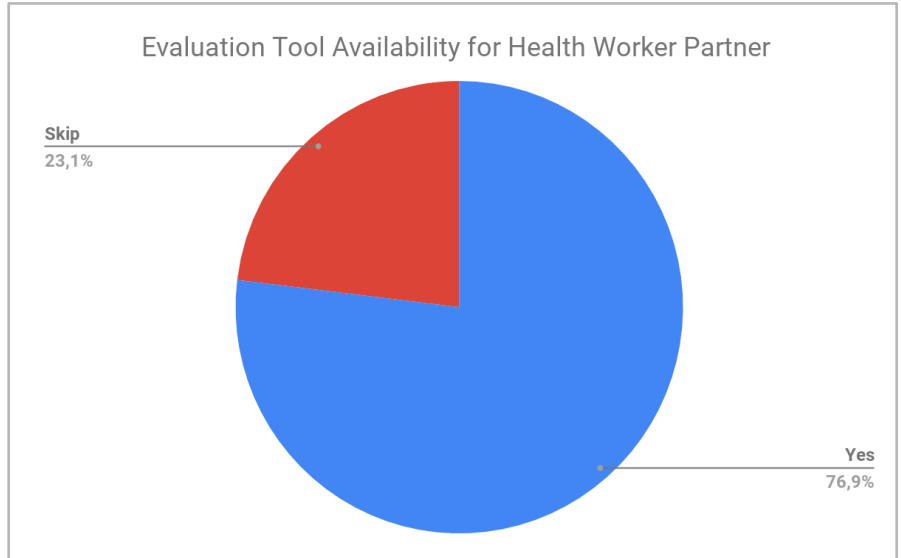


Figure 32. Ownership of evaluation tools for health workers partners

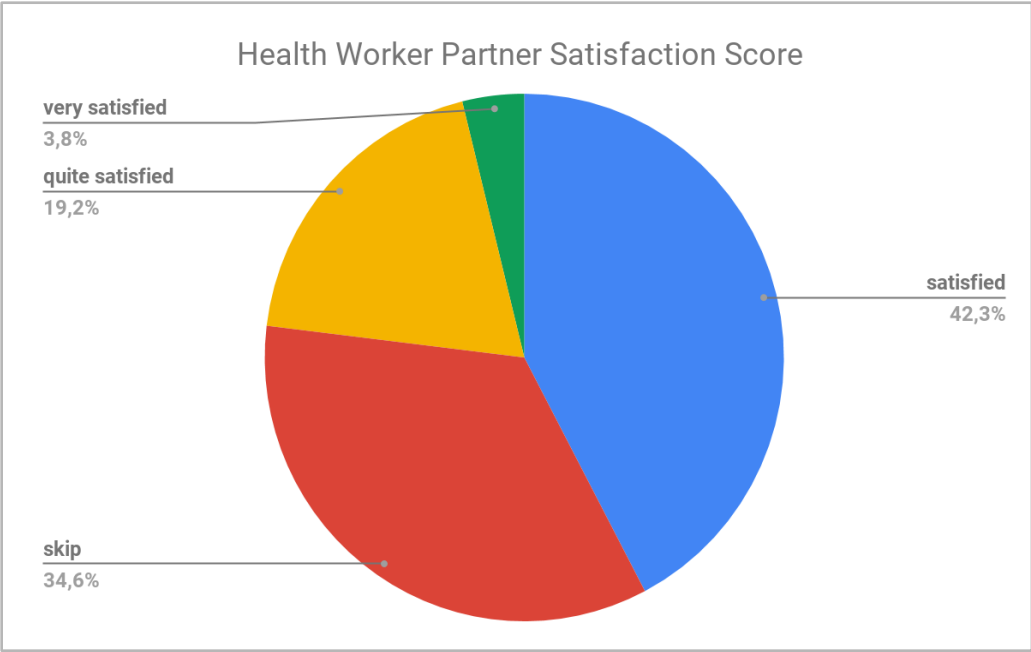


Figure 33. Health workers partner satisfaction score

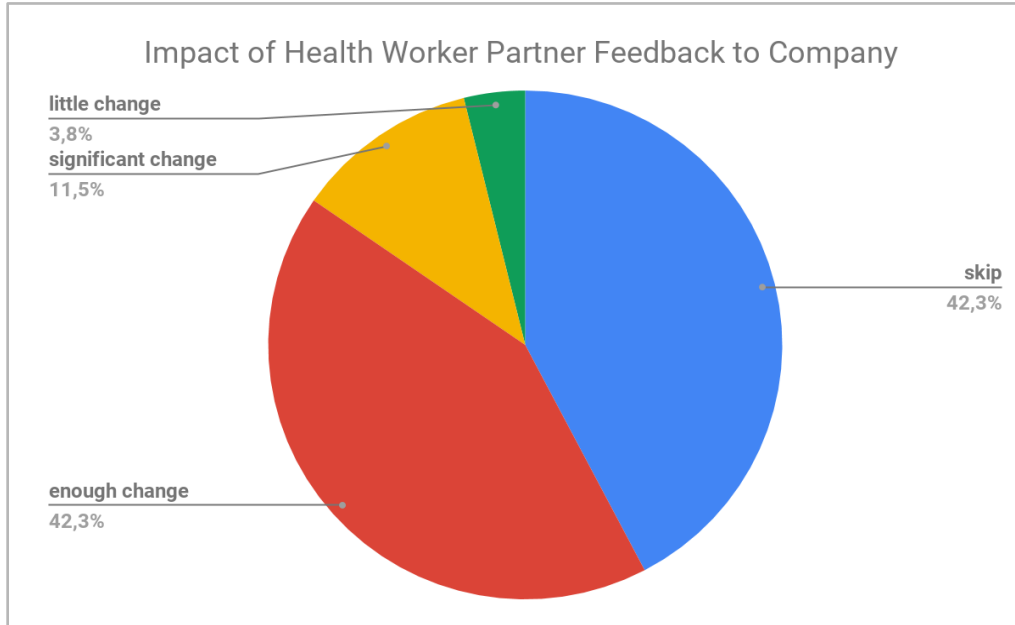


Figure 34. Feedback from partner health workers and company changes

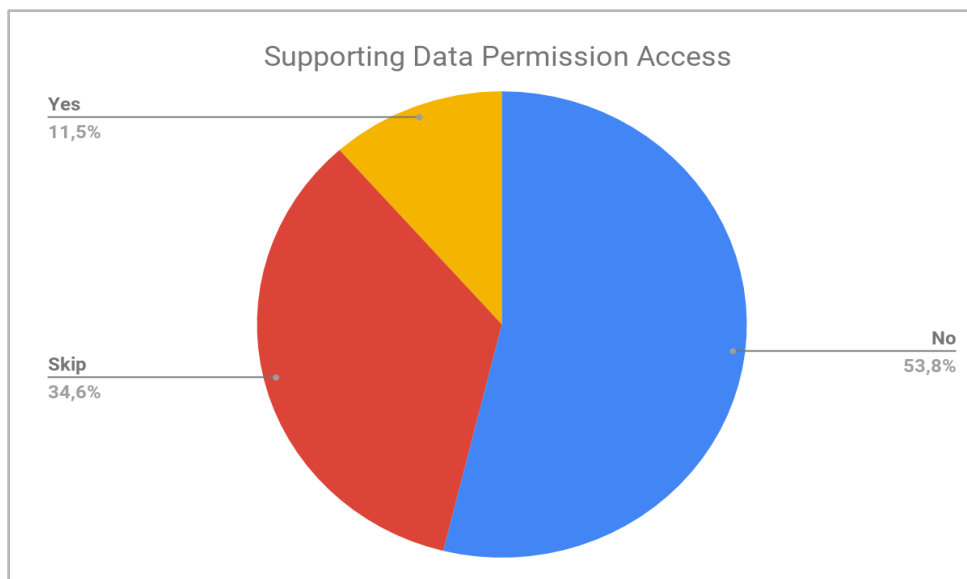


Figure 35. Permission to obtain supporting data regarding evaluations from health workers partners

Health Services

Most companies also claim that the telemedicine services provided increase people's access to health services in both urban and rural areas. The telemedicine service that is mostly provided by provider companies is online consultation services between health workers and patients. Meanwhile, the most online consultation services provided are regarding COVID-19. The service most users have accessed is the teleconsultation service.

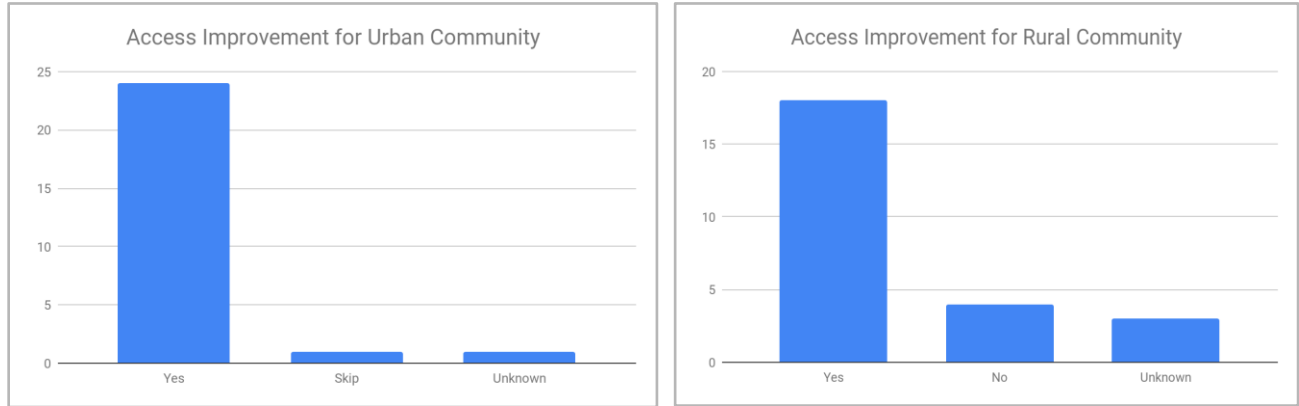


Figure 36. Access to telemedicine services

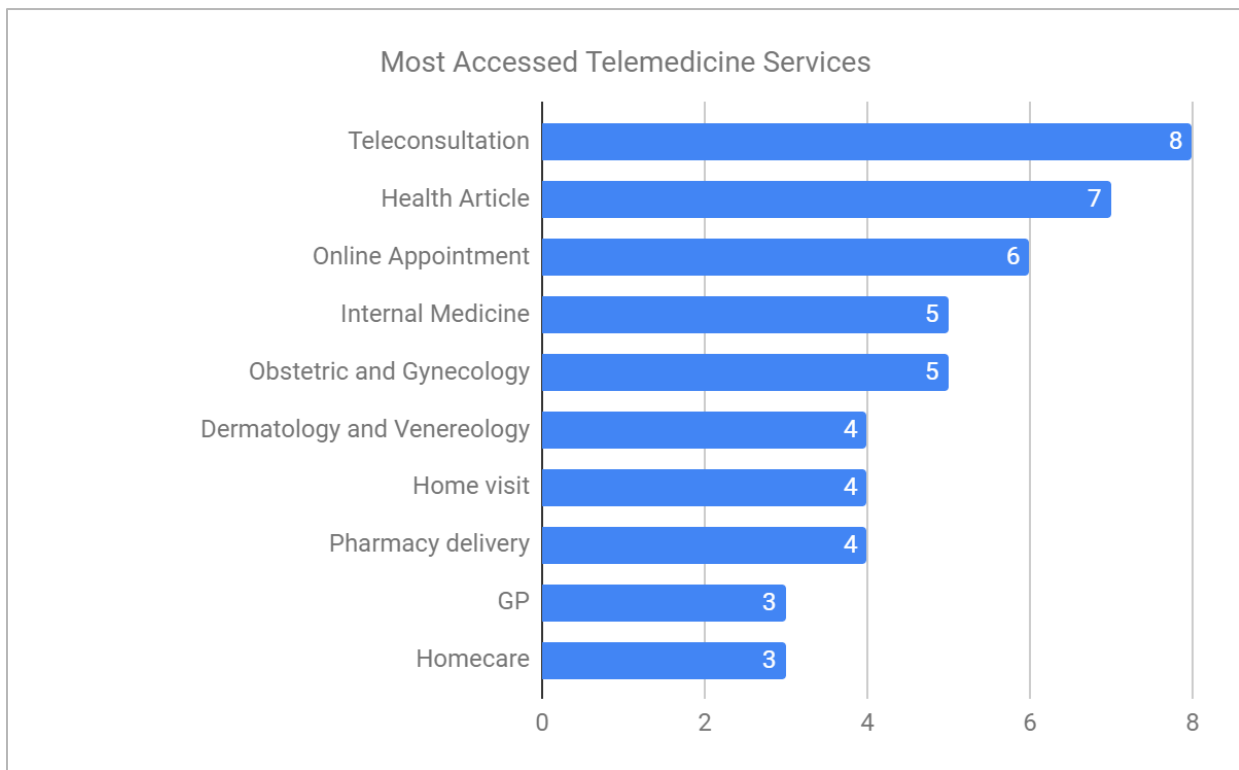


Figure 37. Ten telemedicine services were mostly provided

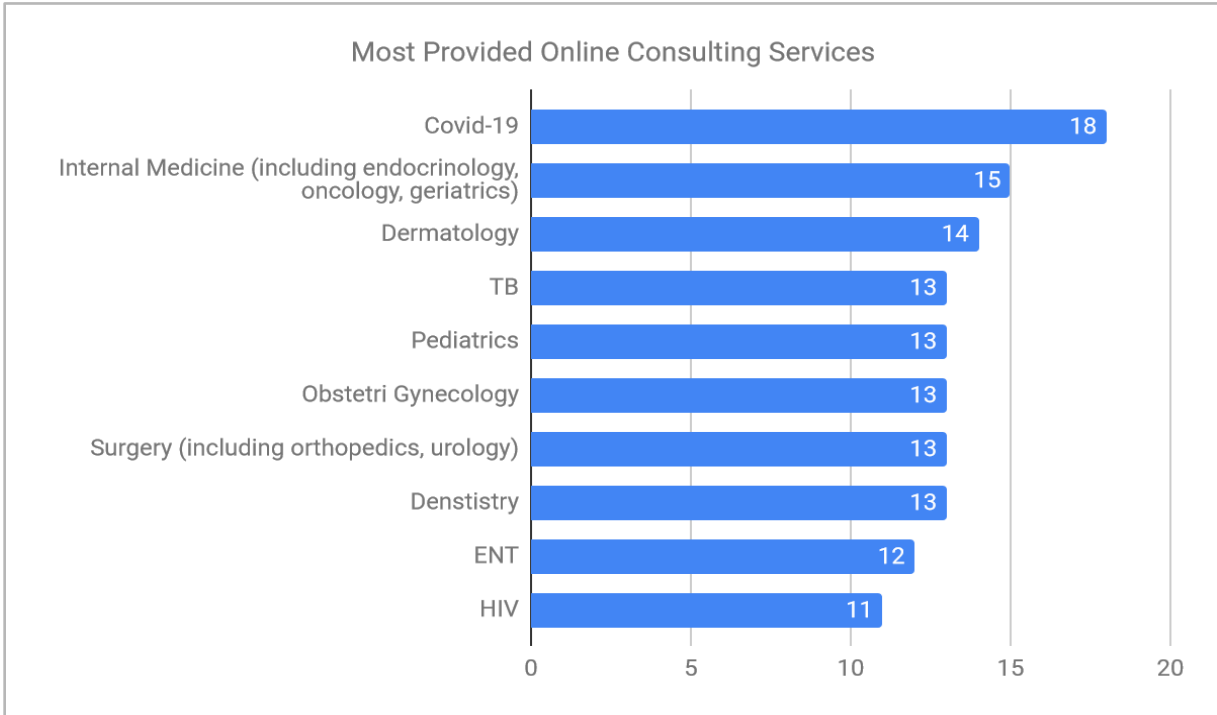


Figure 38. Top ten online consulting services provided at most

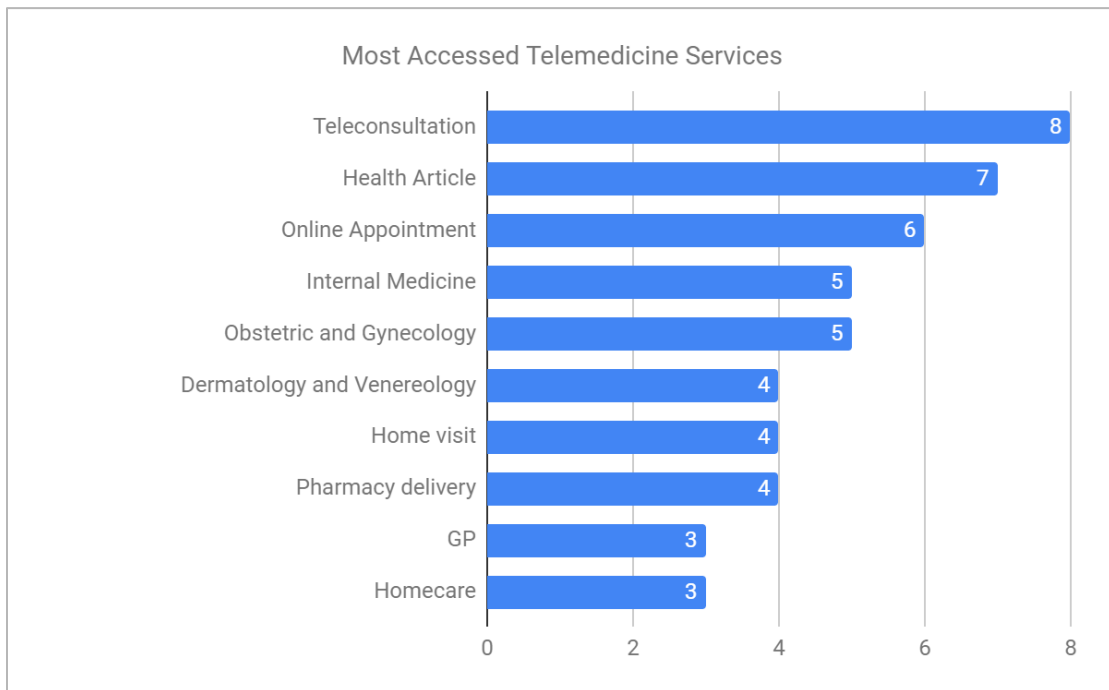


Figure 39. The ten services most accessed by users

The advertising media most used by providers to introduce the telemedicine services provided is through social media. As many as 3.8% of companies admitted that they received fake clients quite often and 61.5% rarely.

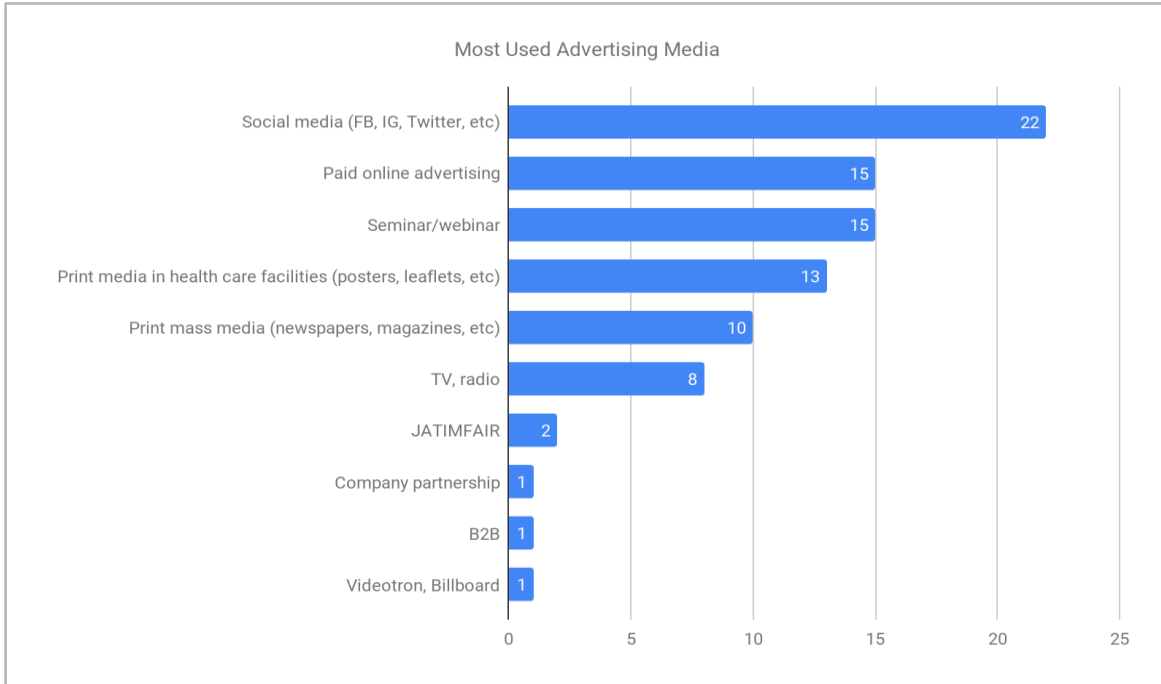


Figure 40. The most used advertising media

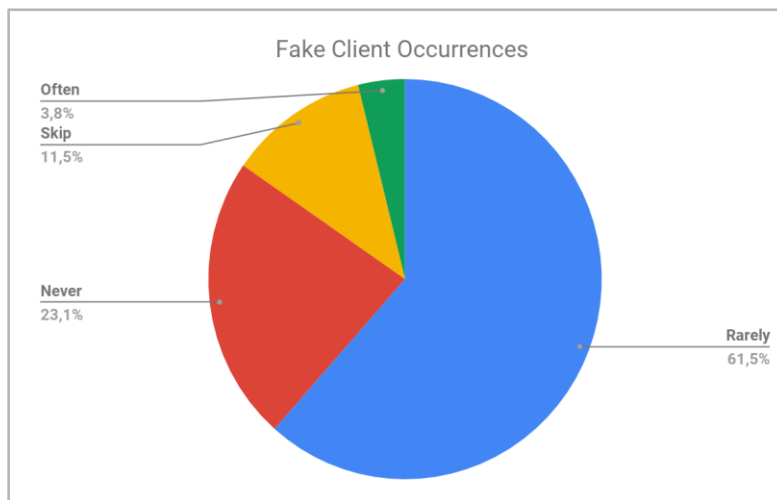


Figure 41. Fake client occurrence frequency

User Demographics

The average number of patients treated from the start to the present by all companies is 55. The majority of users of telemedicine services are female. The users who most accessed telemedicine services were in the age range of 31-50 years with a bachelor's degree and working as private employees. DKI Jakarta, West Java and East Java are the provinces with the most users. As many as 50% of companies stated that there was an increase in access to telemedicine services after the COVID-19 pandemic, with the increase in numbers ranging from 15% to 1000%.

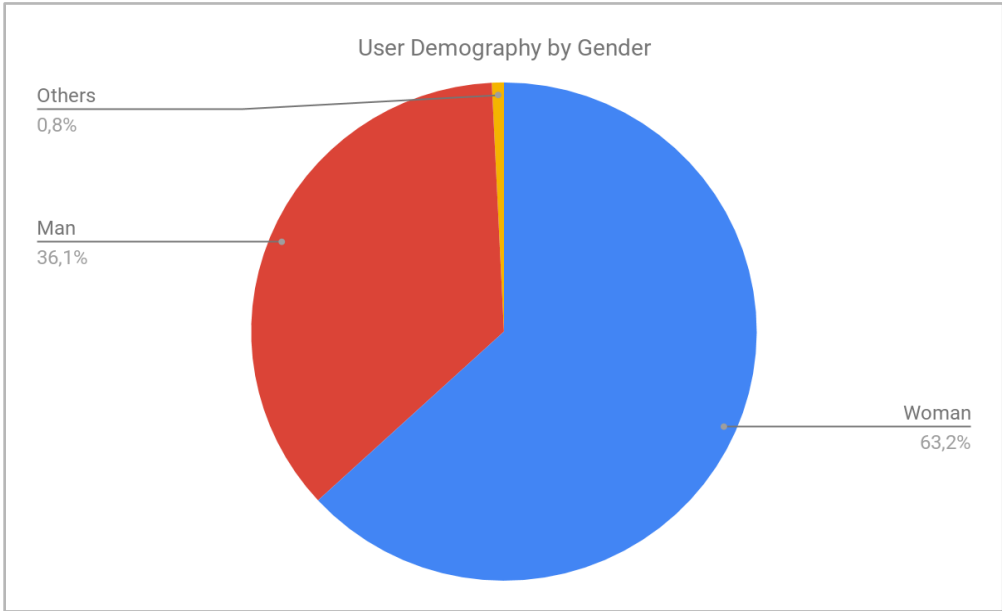


Figure 42. Demographics of users by gender

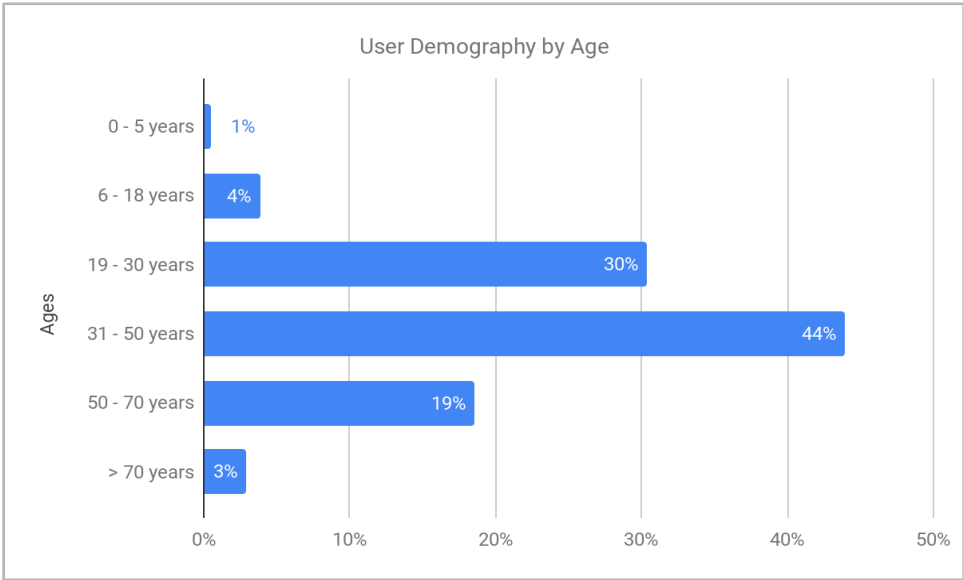


Figure 43. Percentage of service users by age

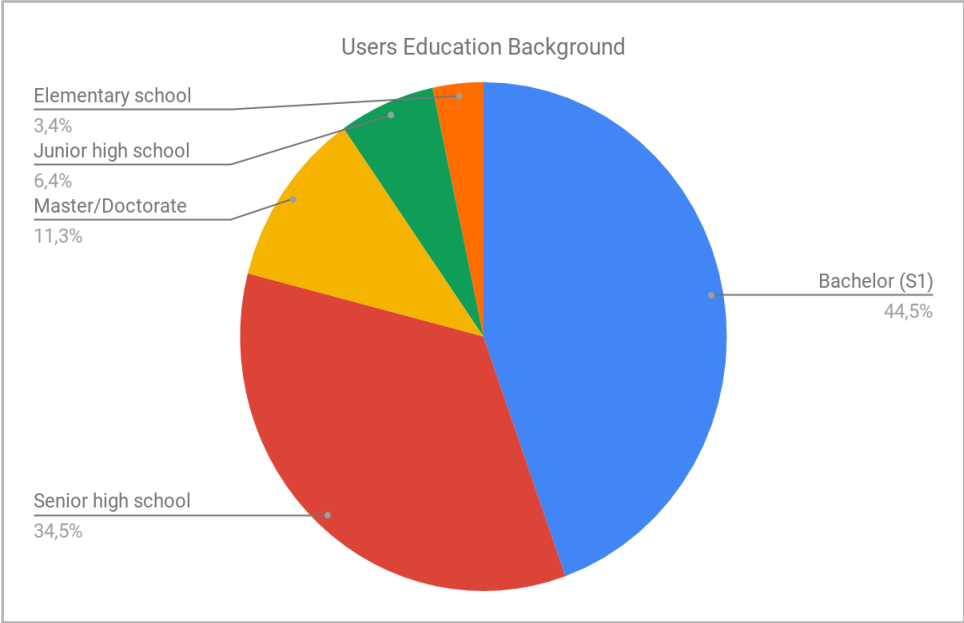


Figure 44. User education level

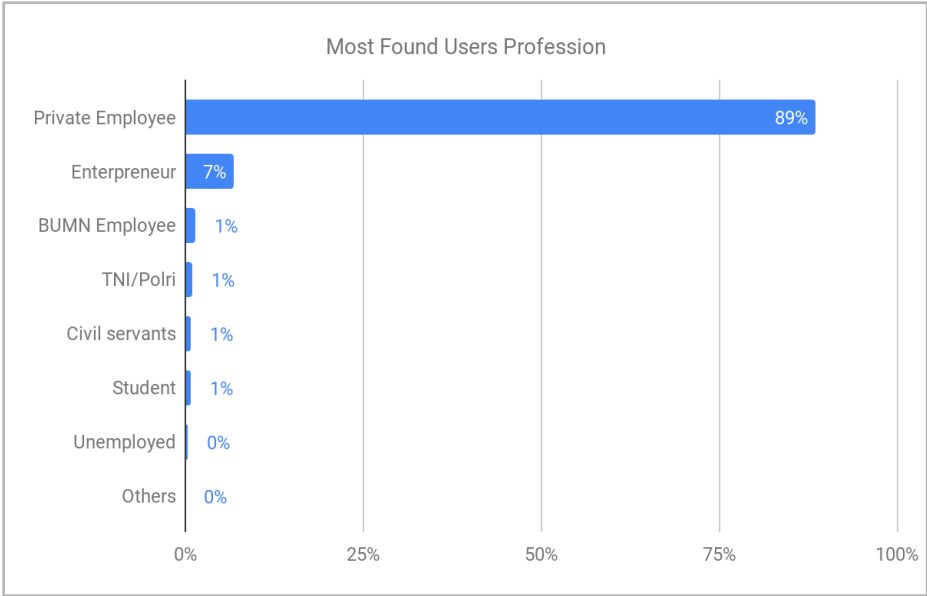


Figure 45. Types of user work

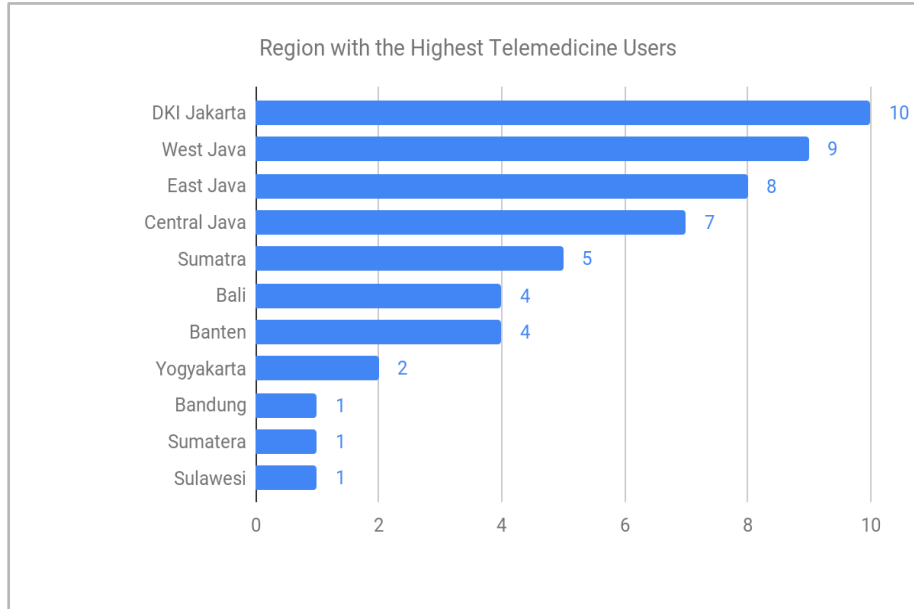


Figure 46. Provinces with the highest number of users

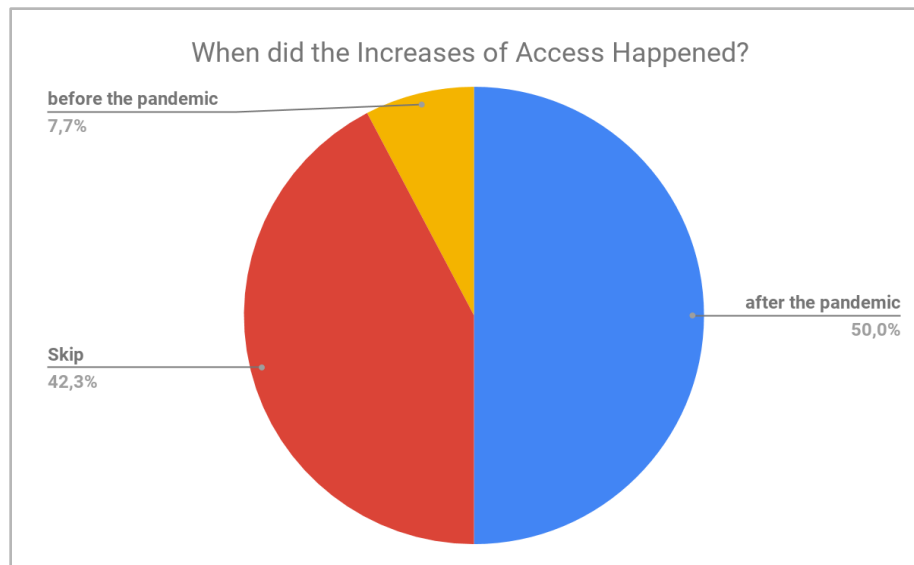


Figure 47. Increased visits

As many as 57.7% of companies have provided evaluation facilities for users. The majority of users felt the telemedicine service provided by the company was satisfactory. The majority of users who conducted this assessment ranged from 25-50 people. Through evaluations from users, 23.1% made significant changes and 30.8% made enough changes. Changes made include improving service quality and improving user experience (UX). As many as 42.3% of companies do not agree to provide further evaluation data from users.

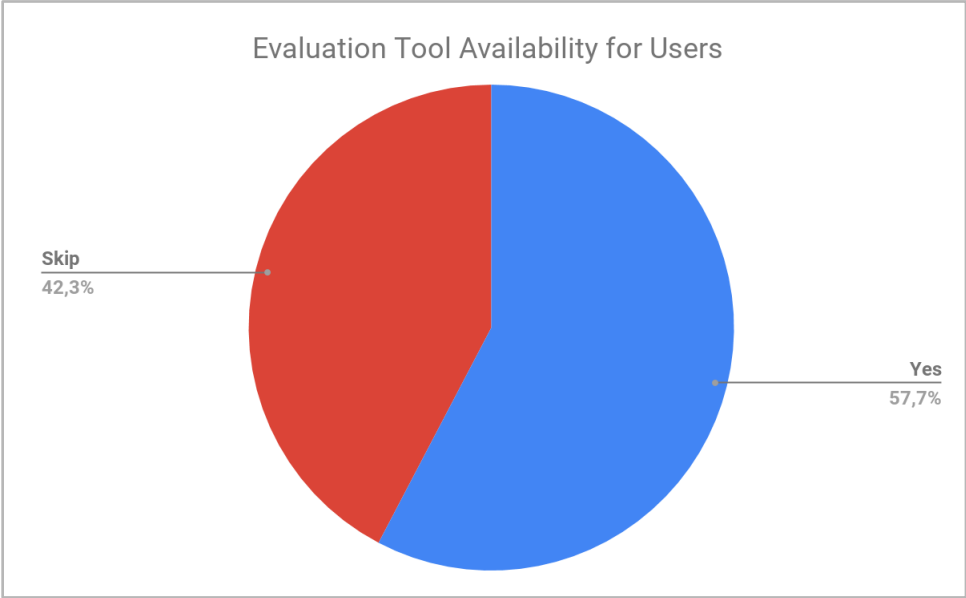


Figure 48. Ownership of evaluation device for user / patient

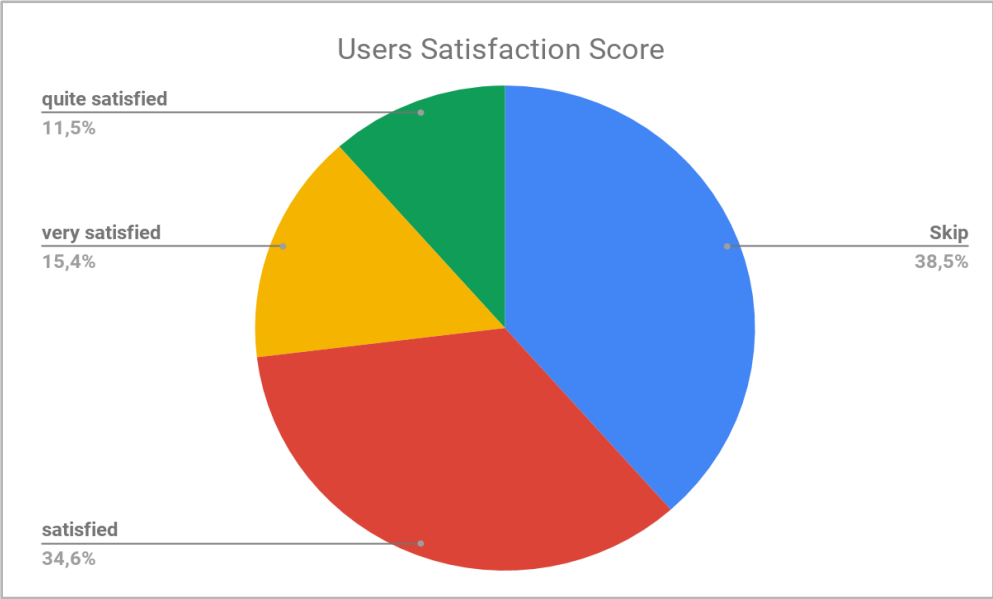


Figure 49. User / patient satisfaction score

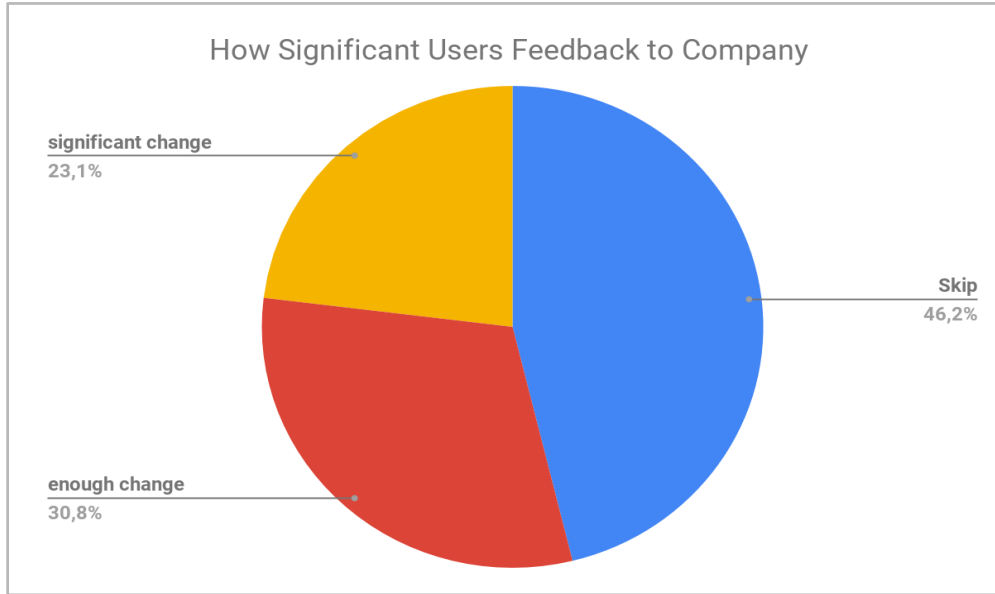


Figure 50. User feedback and company changes

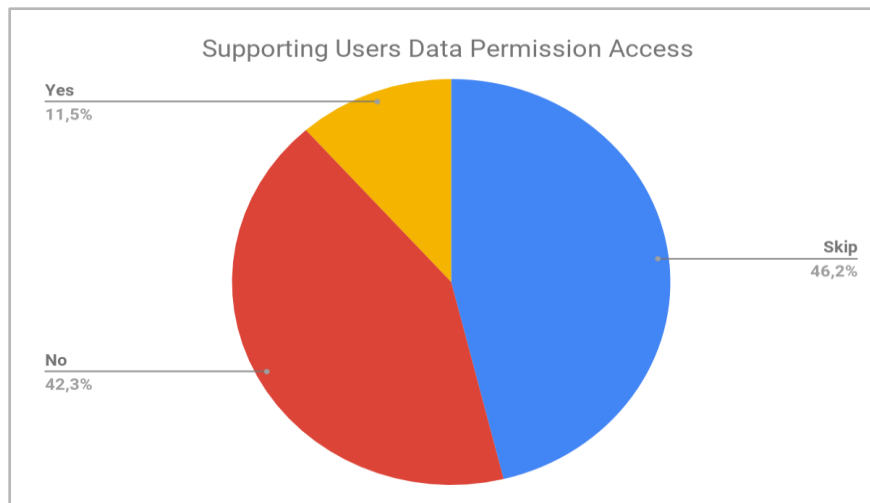


Figure 51. Permission to obtain supporting data regarding the evaluation from the user / patient

Information Technology Infrastructure

The Website-Android-iOS combination is the basis for the most widely used service platform. Although the average company uses more than one platform, the majority of companies say that there have never been over-appointments due to the use of different platforms. The most widely used types of programming languages are Java and Python. The most widely used database management systems are PostGRE and SQL. The majority of companies place their information system servers on cloud-based servers. IoT / embedded devices is the support function most widely used by telemedicine service providers in Indonesia.

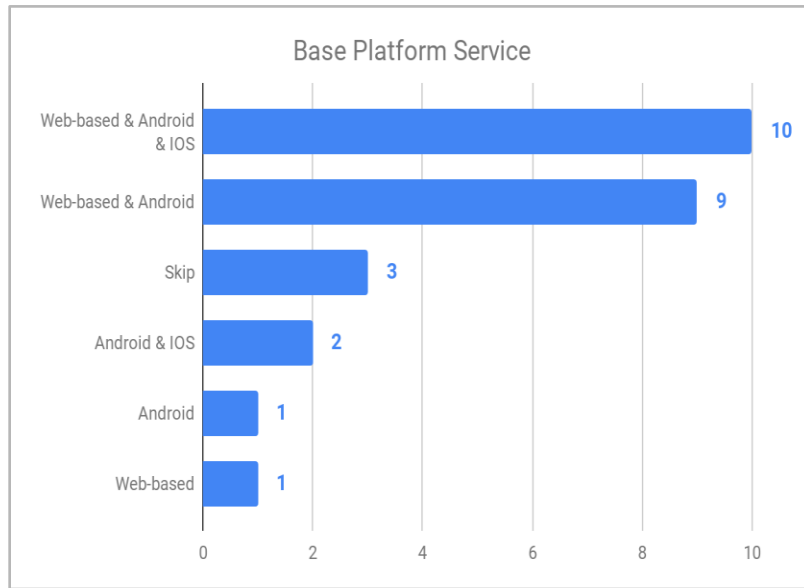


Figure 52. Base service platform

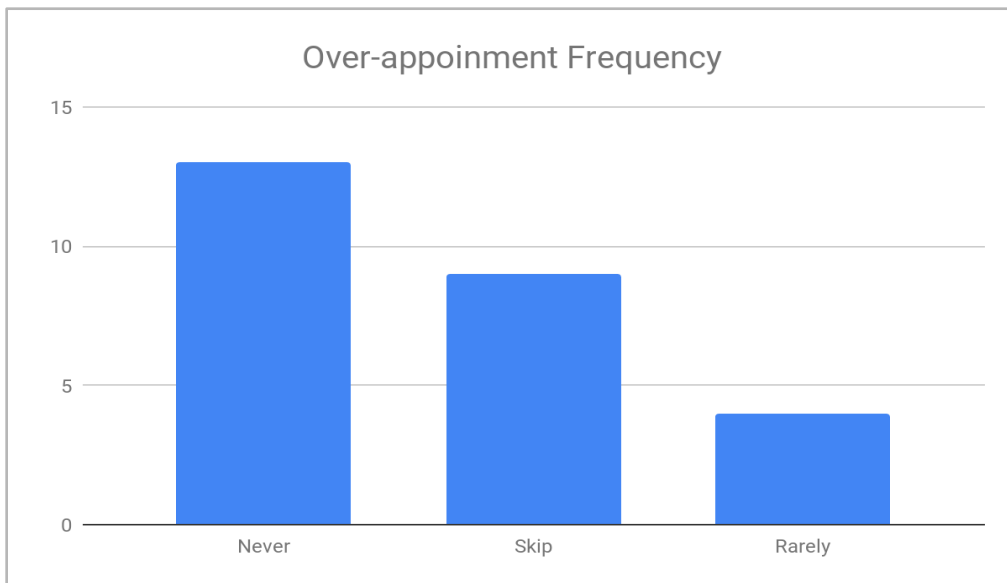


Figure 53. Over-appointment frequency

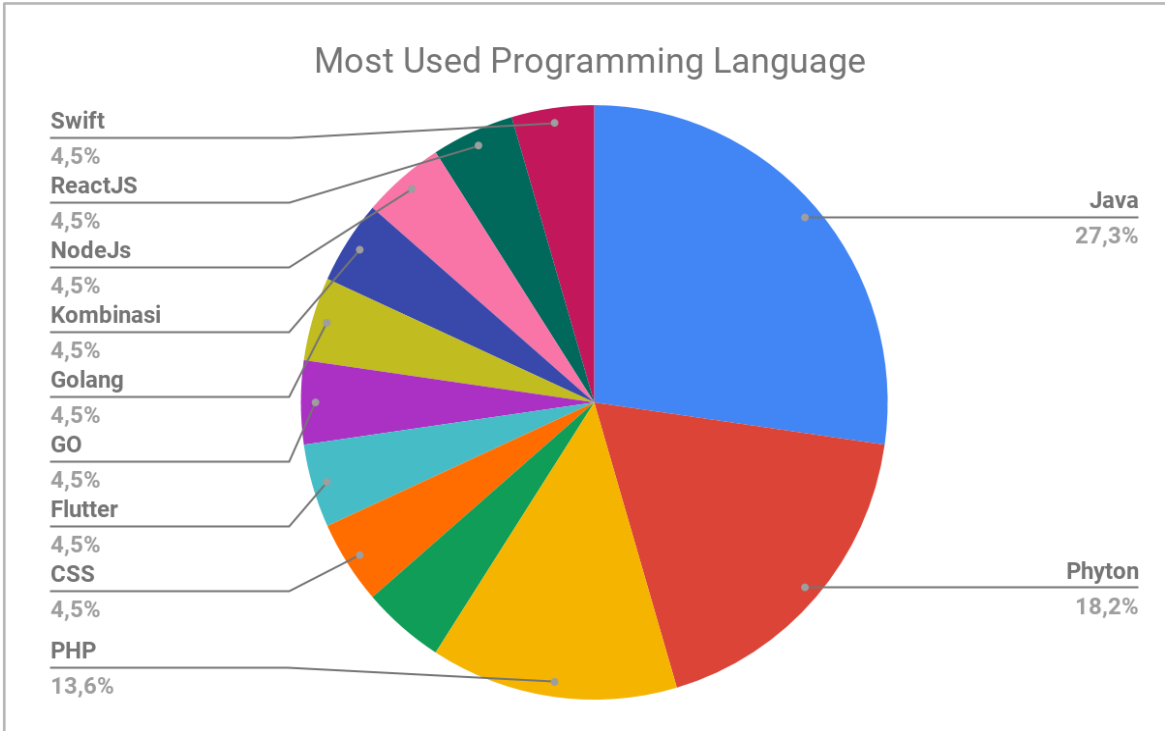


Figure 54. The programming language used

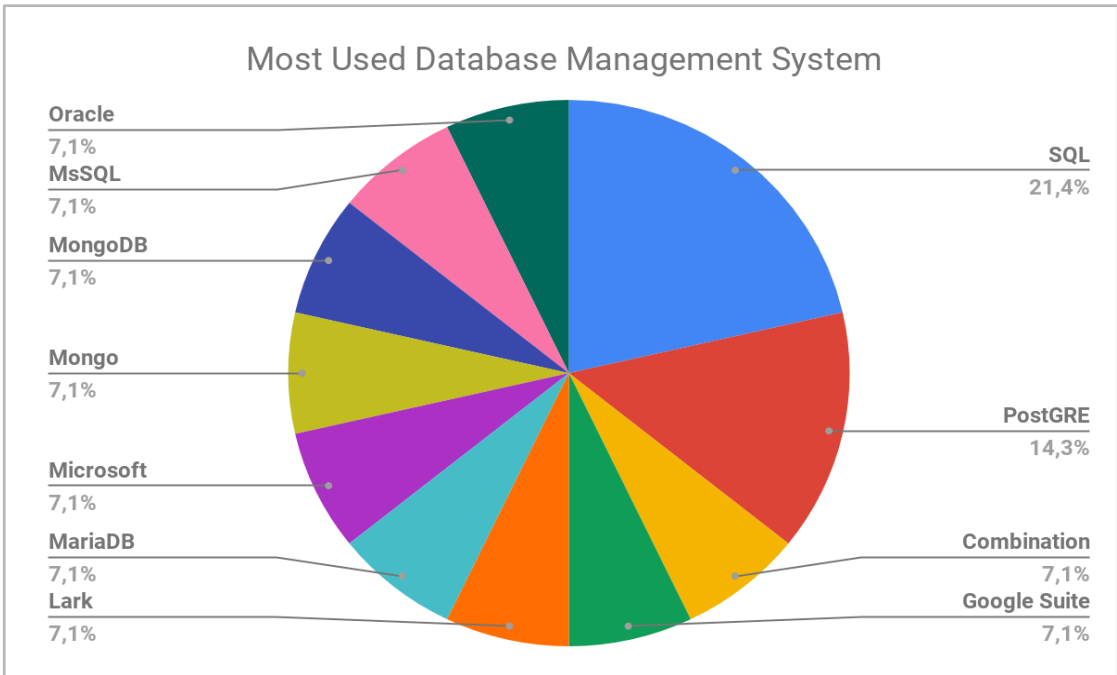


Figure 55. The database management system used

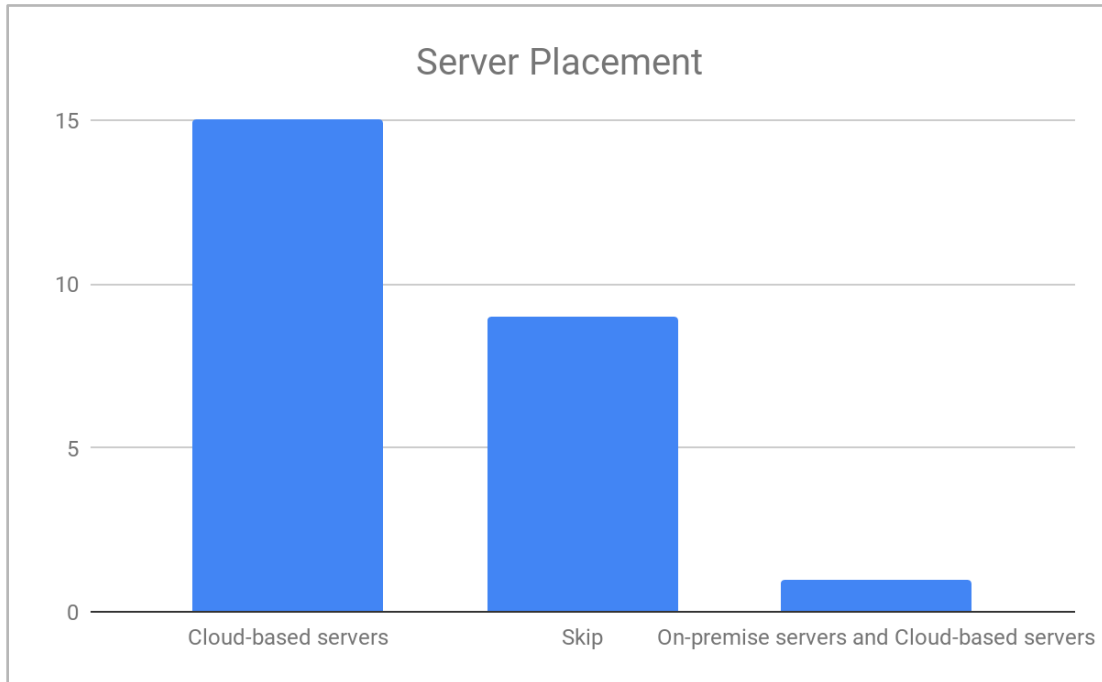


Figure 56. Information system server placement

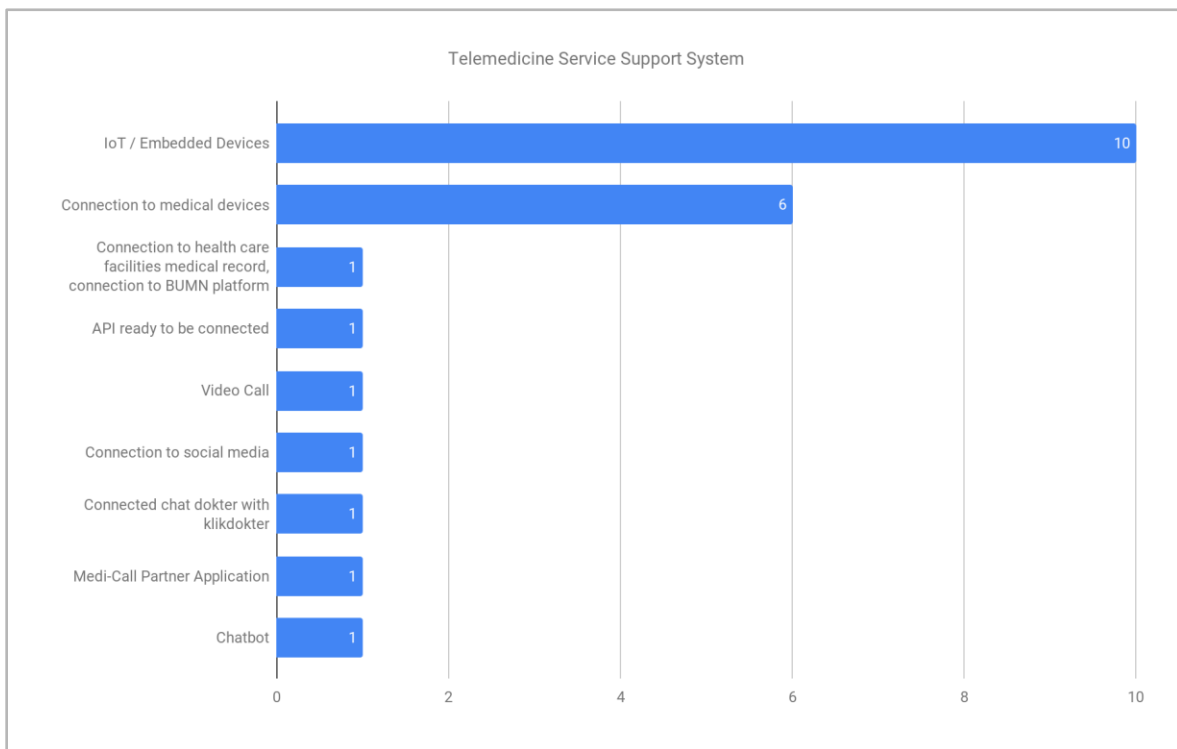


Figure 57. Support functions of telemedicine services

More than 50% of companies have SOPs for data management and processes involved in implementing telemedicine. Most companies also have guidelines on patient safety, privacy and data confidentiality.

In terms of resolving errors that may occur in IT systems, companies have periods that vary from hours to 30 days to resolve them.

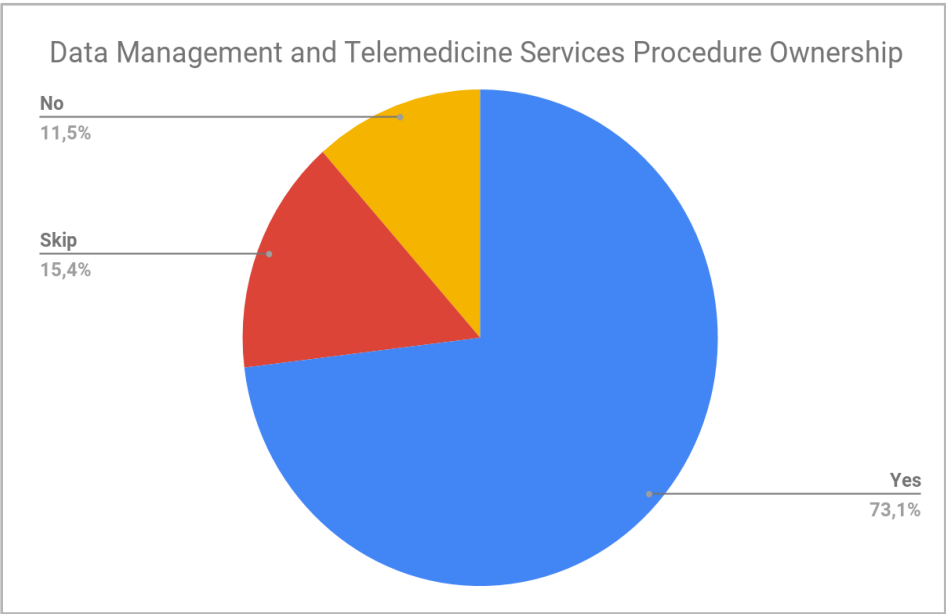


Figure 58. SOP for data management and implementation process

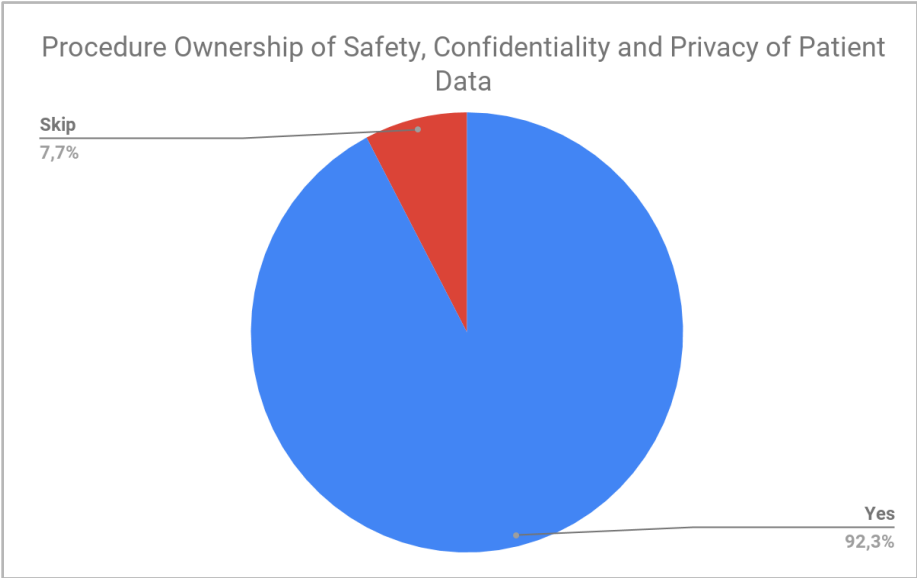


Figure 59. Ownership of patient safety, data privacy and confidentiality guidelines

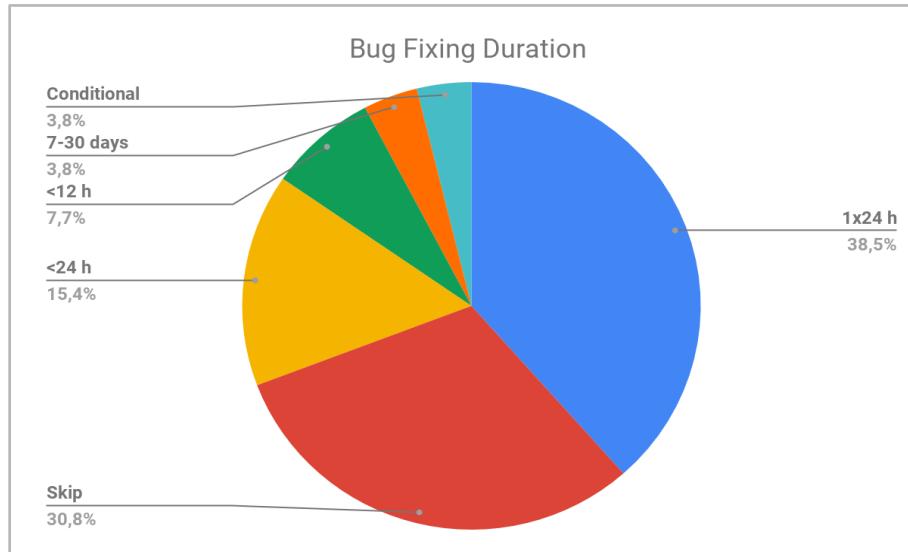


Figure 60. Duration of error correction

Financing

Teleconsultation service costs vary widely in Indonesia. The lowest cost charged to patients for accessing general consultation telemedicine services is Rp 0 and the highest can be more than Rp 90,000. Meanwhile, the lowest fee for specialized consulting services is IDR 20,000 and the highest is more than IDR 200,000.

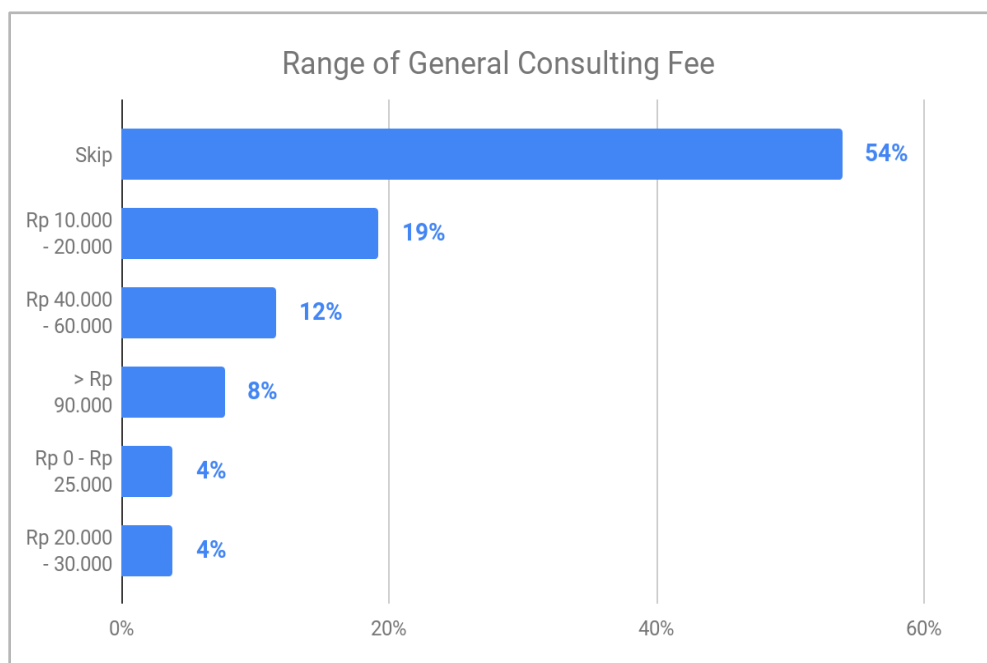


Figure 61. General consultation fee ranges

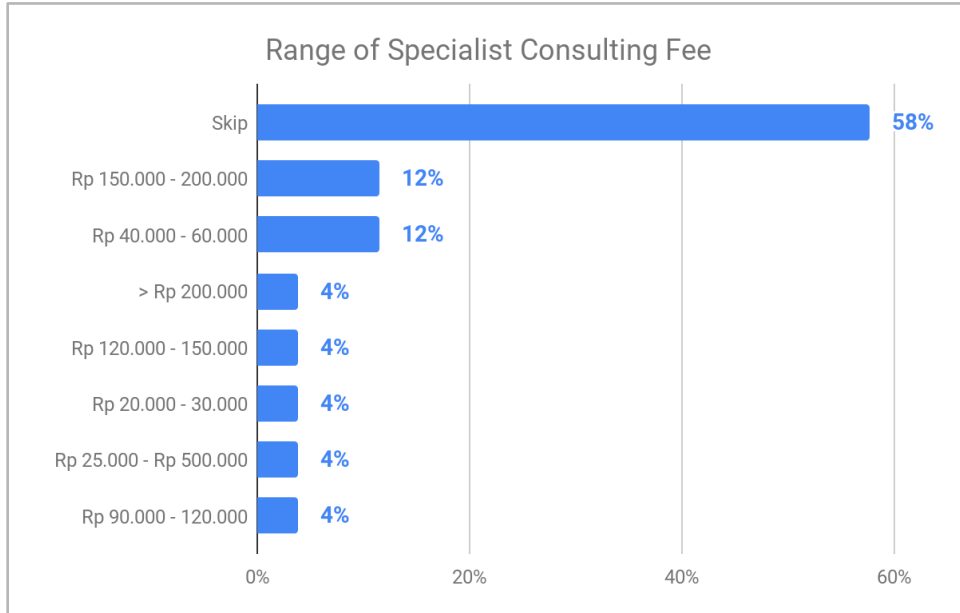


Figure 62. Range of specialist consulting fees

As many as 38.5% of companies stated that the telemedicine financing system was carried out on a fee-for-service basis. Only 26.9% of companies have collaborated with insurance partners in providing their services. The payment method most commonly used by users is through electronic payments such as GoPay, OVO, LinkAja, etc. In addition, there are companies that still offer various telemedicine services for free. The majority of companies said they would continue to provide telemedicine services after the COVID-19 pandemic ended.

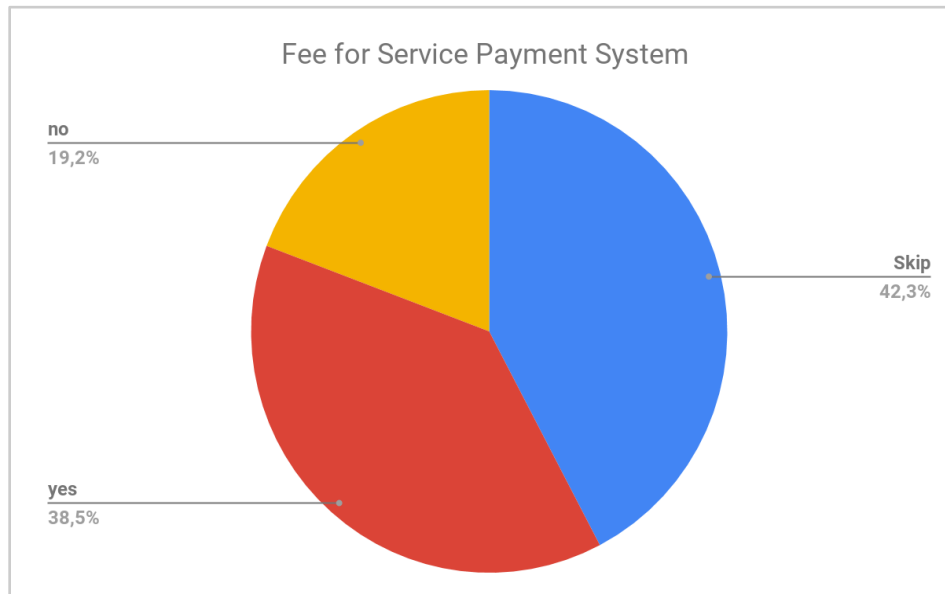


Figure 63. Fee for service payment system

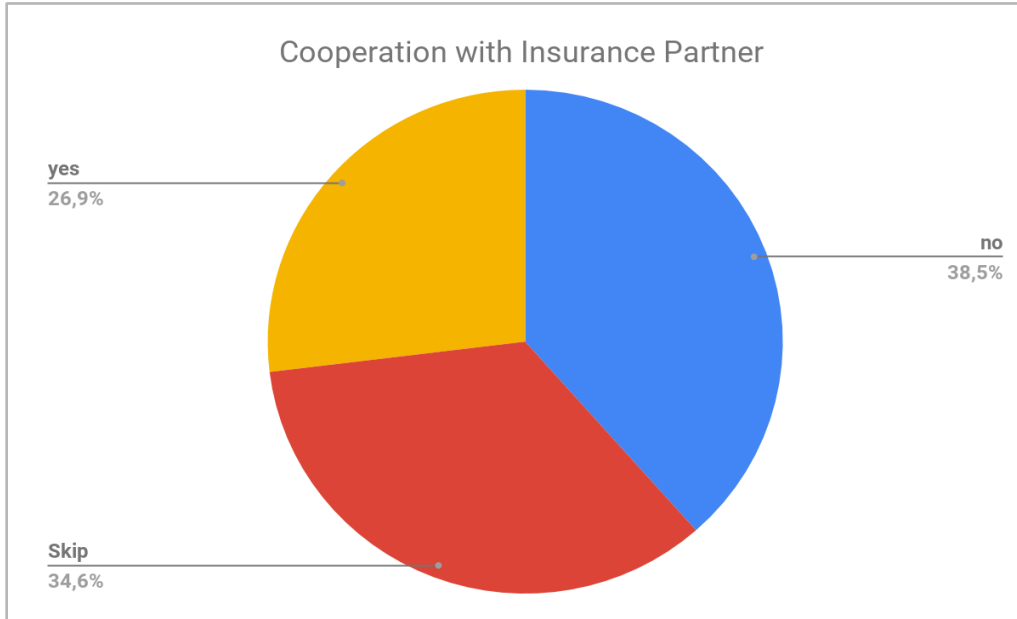


Figure 64. Cooperation with insurance partners

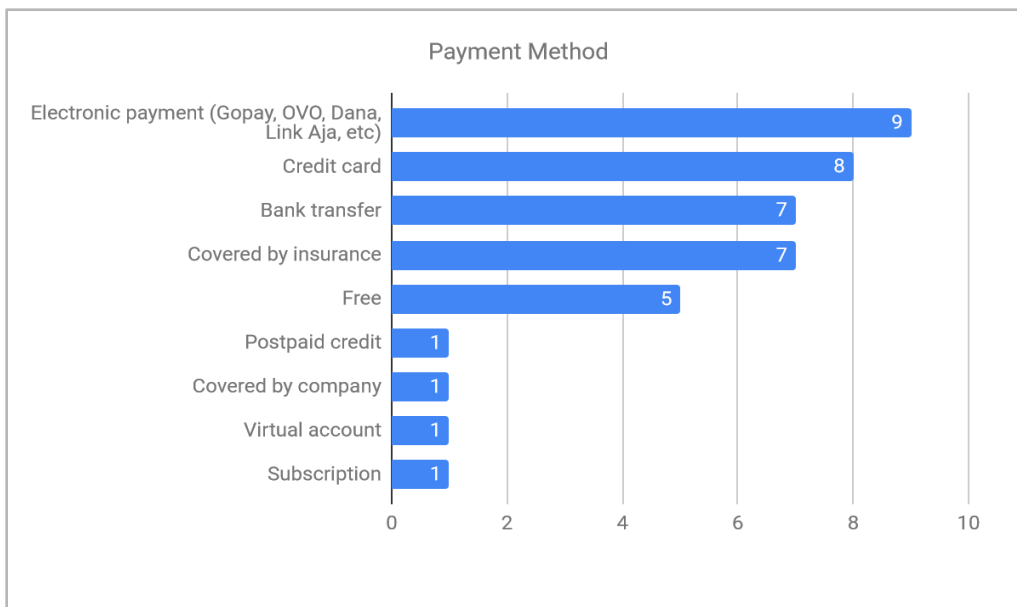


Figure 65. Method of payment

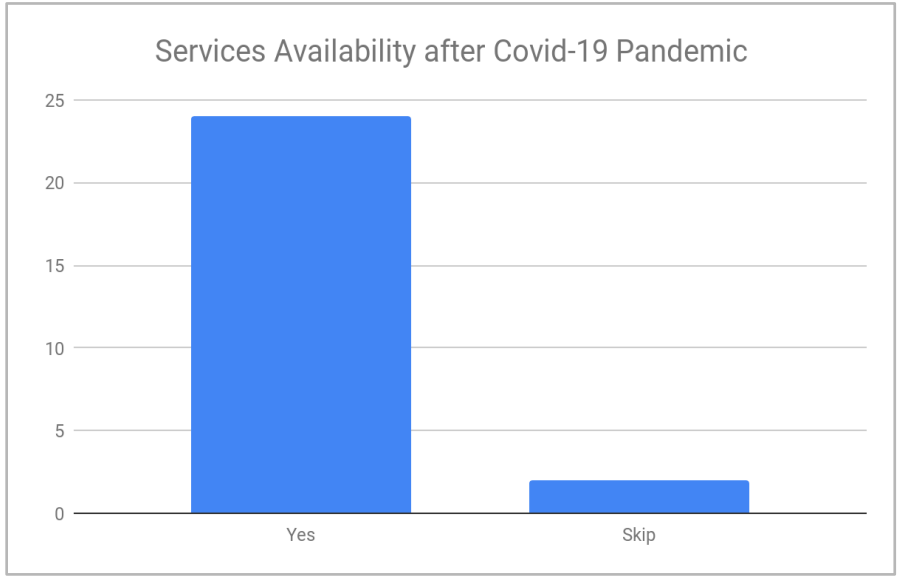


Figure 66. Commitment to continue telemedicine services after the pandemic

Discussion, Conclusion and Recommendations

With the existence of Telemedicine services that have been carried out in Indonesia, both from the government and the private sector, it gives hope that these services will develop further, where this is supported by various conditions such as developments in information technology including increasingly even network infrastructure, population demographics dominated by productive age and understanding Digital-based health services, challenging geographical conditions, and increasingly conducive legal regulations and following the development of digital services.

Organization and Procedures

Based on the results of the assessment, it can be summarized and concluded as follows. This shows that the development of IT-based Health Solution providers, such as Telemedicine services, requires mature organization and strong financial support. Only a few have collaborated with health facilities, but quite a few have collaborated with pharmaceutical services including delivery of goods. This data can be referred to in Appendix C. Data from ATENSI member website and from the committee, which shows various drug purchasing services including their delivery.

Collaboration with health facility partners is the right strategy in supporting the quality and sustainability of services in the future, although only a few do it. Furthermore, constructive feedback from partners will greatly help improve telemedicine services to customers in the future.

Human Resources

The majority of telemedicine operators in Indonesia consider their current human resources to be insufficient. This shows that telemedicine administering organizations are on average still in their early stages and moving towards maturity. In general, telemedicine operators have understood the importance of ethical committees and are concerned with malpractice issues.

Good collaboration with doctors as core personnel in services will provide many benefits, so that regular training is needed for doctors, as well as to improve skills in providing telemedicine services which for some doctors is a new form of service to patients. Responses from doctors are also very necessary so that services are maintained, and can even provide input for companies including the development of business strategies, as well as details in service to patients. For the record, the real number of doctors joining telemedicine services cannot be known with certainty, because some companies have policies in publishing data which can only be used internally.

Health services

In general, some Indonesians can enjoy telemedicine services, although they are still limited in big cities where internet access is easier to obtain. Teleconsultation services are the most accessed services, mainly used to get information from doctors to patients. Meanwhile, the most online consultation services provided are related to COVID-19, followed by internal diseases, dermatology, TB, childhood diseases and so on. In general, the use of telemedicine has been carried out to help provide services

for various diseases, and in Indonesia there is a great possibility of **increasing its use for both infectious and non-communicable diseases, which are currently increasing in incidence.**

The advertising media most widely used by providers to introduce the telemedicine services provided is through social media. It could be said that most of its users are people who are familiar with internet-based services.

User Demographics

The number of patients treated by telemedicine companies varies, but has increased since the pandemic. For the record, the real number of patients who have used telemedicine services cannot be known with certainty, because several companies have policies in publishing data that can only be used internally. Judging from the profile of service users, most of them are women, come from an established age, have a university degree, and work in the private sector. The location of its users is still dominated by provinces on the island of Java. Referring to claims from service providers, most users responded that the service was satisfactory. From this feedback, improvements were made to improve the service including the user experience.

Following are the results of the study referring to several references regarding user demographics, especially the composition of female users who mostly use telemedicine services here.

From the results of the study here, data shows that the demographics of telemedicine users in Indonesia are dominated by women with the latest S1 education and working as private workers. It was found that the higher a person's income, the higher the level of accessing telemedicine services [12]. **This may be related to telemedicine payments that have not fully entered into the conventional health insurance scheme so that services are still provided in the form of fee for services.** In addition, higher education is associated with better health literacy levels. Health literacy relates to the ability of people to seek health services and report health conditions [13]. **Thus, further efforts are still needed to equalize access from low-income and disadvantaged education groups.**

Also explained that female telemedicine users exceeded 70% of total users, far more than male users [14]. In addition, Liu stated that there were differences between men and women in the choice of telemedicine modalities. Men tend to prefer video-based teleconsultation, whereas women prefer to use voice calls. Furthermore, the results of the telemedicine study in the United States also illustrate the same thing with women claiming more telemedicine [15]. This may be related to the prevalence rates of chronic, autoimmune and pregnancy diseases in women and the lack of peer support among male users [16].

Gender differences in seeking health services do not only occur in telemedicine services. Conventional health services also show that women do more consultations and health checks. This may be related to patriarchal patterns among men to hide pain in order to remain strong [17][18]. Research in Yogyakarta also shows a similar pattern showing that women are immediately checked out when they have symptoms of tuberculosis [19]. A study by Kusumawati also illustrates that Puskesmas or primary services are dominated by female patients [20].

This is interesting to discuss considering that one of the goals of telemedicine is to increase access to health for vulnerable groups or individuals, one of which is women [21]. In many regions or cultures, women find it difficult to access health services because they do not have the right to make decisions, are not economically independent, travel prohibitions for women alone, and taboo discussion of several health problems [22]. Thus, with telemedicine, it is hoped that women will have health autonomy even though they are at home. However, the number of telemedicine users in Indonesia, which is dominated by women, cannot yet illustrate that telemedicine has succeeded in increasing gender equality in seeking health services. In addition, the development of telemedicine in Indonesia should pay attention to the psychosocial aspects of Indonesian society who still adhere to religion and alternative medicine. This paradigm is especially strong among women and causes them to delay seeking treatment in the hope that their illness can heal on their own or use other, more familiar methods [23].

Information Technology Infrastructure

The Website-Android-iOS combination is the basis of the most widely used service platform. In accordance with the characteristics of internet users in Indonesia, most users use Android smartphones. The technology used refers to solution platforms in other fields, such as the use of Java and Python programming languages, as well as the use of DBMSs such as PostGre and SQL. Given the need for reliability and scalability, most servers are hosted on the Internet or based on cloud technology.

Most of the telemedicine providers have implemented good IT governance, including data and process management, patient safety guidelines, privacy, and data confidentiality. Meanwhile, the error resolution process is still not standardized. It is necessary to further study the readiness and maturity of the processes and systems that support the implementation of patient safety guidelines, privacy and data confidentiality in separate activities so that a deeper understanding can be obtained.

As a reference, there are several things that need to be considered in responding to the challenges above. **As digital health capabilities and popularity increase, healthcare organizations need to continue to invest in security services to identify risks and prevent them.**

Five key areas to look into are:

- 1. Safety medical devices and wearables**
- 2. Identity management and external device authentication**
- 3. Security monitoring and behavior analysis**
- 4. Development, security and operations**
- 5. Security awareness and training**

By discussing the five main areas identified above, telemedicine service provider organizations can bring more users and providers into the comfort zone of telemedicine services. When security is well maintained and strong, and perceptions match that reality, users and providers alike will be more inclined to take part in telemedicine services and drive its growth.

In response to this, ATENSI and UNDP can organize separate activities in conducting studies implementing patient safety guidelines, privacy and data confidentiality. As initial activities, self-assessment activities can be carried out using the questionnaire attached to Appendix D. Questionnaire Statement on Telemedicine Safety Self-Assessment. With this self-assessment questionnaire, telemedicine providers can perform a rapid self-assessment of their telemedicine system. The results of the assessment can be used to identify possible vulnerabilities in telemedicine systems and practices or demonstrate to patient's adequate safety and privacy protection for patient data.

Financing

Telemedicine service costs can be said to be quite affordable for customers, with the highest cost for general practitioners only Rp. 90,000 and for specialist doctors a maximum of Rp. 200,000. The payment model used is fee for service, and only a small proportion of them collaborate with insurance partners. Payment methods vary and accommodate electronic payments as well.

Recommendations

Several challenges remain for telemedicine services in Indonesia and how to be integrated into the public health response to COVID-19 and future outbreaks:

1. The integration of telemedicine into international and national guidelines for public health preparedness (in keeping with International Health Regulations, 2005) and response [24].
2. The definition of national regulations and funding frameworks for telemedicine in the context of public health emergencies.
3. A strategy to quickly define telemedicine frameworks; use case scenarios; develop clinical guidelines; and standardize triage auto questionnaire and remote patient-monitoring algorithms for any outbreaks at local, national, or global scales,
4. A strategy and operational plan guiding health care providers to switch to outpatient teleconsultation and increase tele-expertise and remote patient monitoring.
5. A communication toolkit to inform and educate the population on the recommended use of telemedicine.
6. A data-sharing mechanism to integrate telemedicine providers' data with epidemiological surveillance.
7. A scientific evaluation framework and dedicated research funds to describe and assess the impact of telemedicine during outbreaks.

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Appendices

1. Appendix A. Telemedicine Use during Pandemic in 20 countries
2. Appendix B. Telemedicine services for Doctors to Patients in Hospitals
3. Appendix C. Data from ATENSI member website and from the committee
4. Appendix D. Pernyataan Kuesioner Penilaian Mandiri Keamanan Telemedicine