

# L.E.K. Consulting

## Evolution of Patients' Perception of Hospitals and Telehealth Companies During COVID-19 in SEA

January 2023

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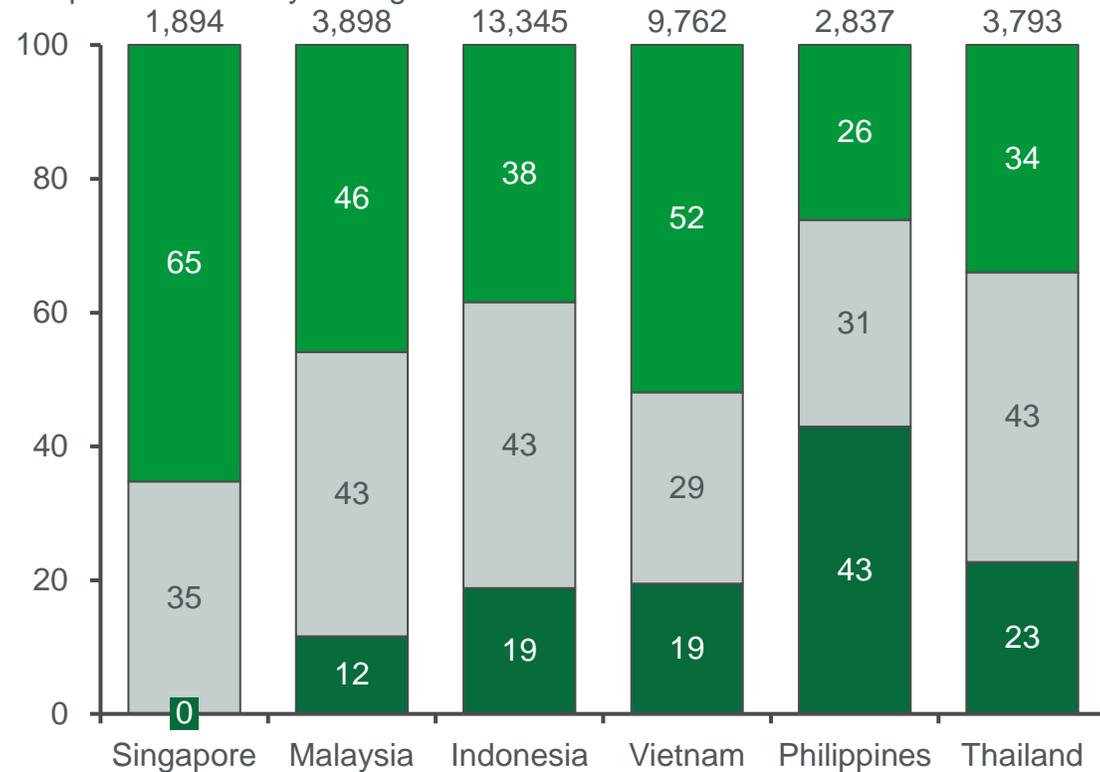
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# L.E.K. Consulting analyzed over 35,000 Google reviews on ~200 hospitals across 6 SEA countries, segmented by ownership type (public, private chain, private independent) ...

## Sample overview (N=35,529)

### Hospital reviews

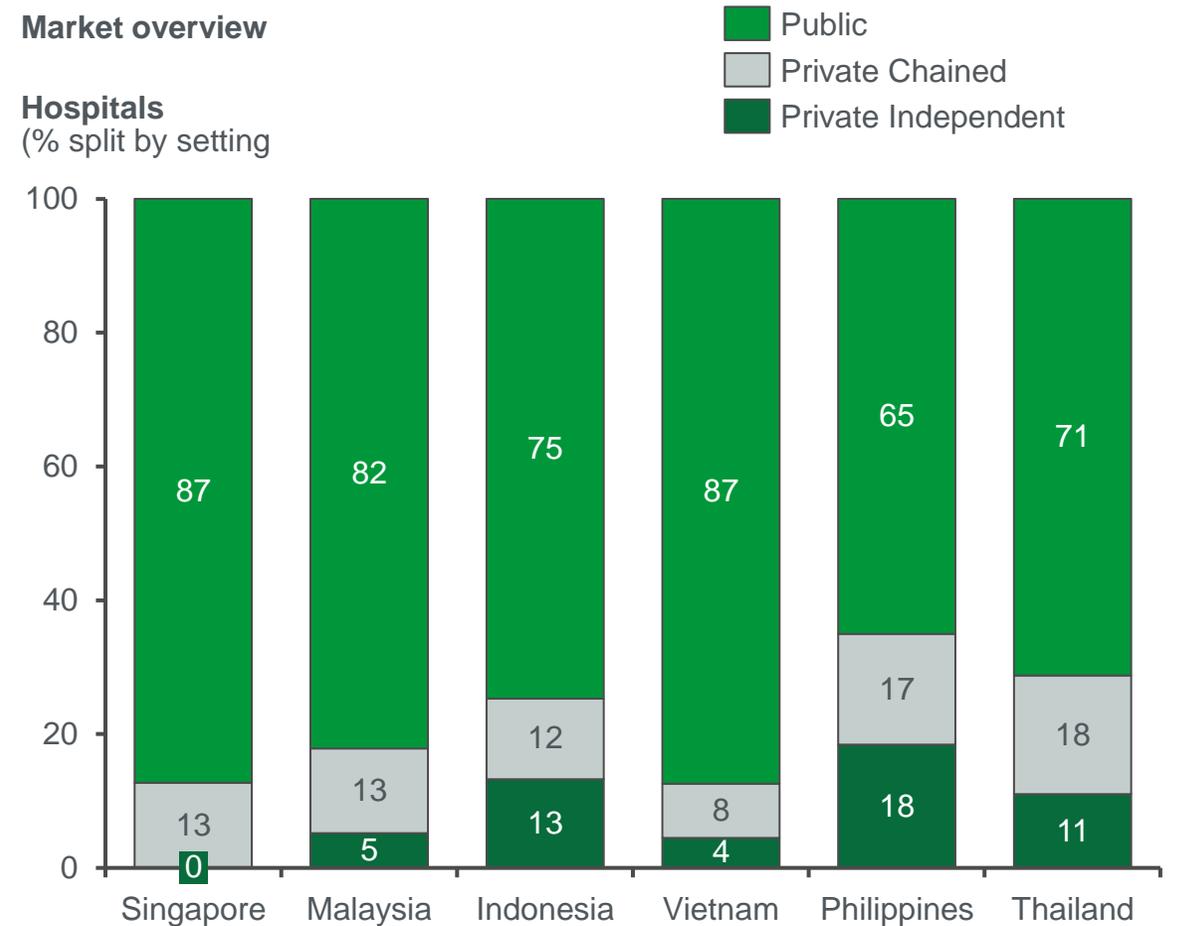
% split of reviews by setting



## Market overview

### Hospitals

(% split by setting)



## ... together with over 13,800 reviews on 33 telehealth apps in major SEA markets

List of apps with presence in multiple countries

							
Doctor Anywhere		✓	✓	✓	✓	✓	✓
MyDoc		✓					✓
DoctorOnCall			✓			✓	
Good Doctor				✓			✓
Speedoc		✓	✓				
WhiteCoat		✓		✓			
MaNaDr for Patient		✓	✓				
Homage		✓	✓				
WhatsDoc		✓	✓				
Doctor2U		✓				✓	
BookDoc		✓		✓			✓
YesDok		✓		✓			

List of apps with presence in single country

						
Minmed Connect		Teleme	Halodoc	Jio Health	HealthNow	Doctor Raksa
						
DigiHealth		DOC2US	Alodokter	VieVie	NowServing	Chiiwii
						
Healthway Medical Group			ProSehat	Electronic Health Book	mWell PH	
						
Raffles Connect			KlikDokter	MyVinmec	AIDE	
						
					KonsultaMD	
						

# Google reviews were analyzed using natural language processing to derive an NPS (Net Promoter Score) and further categorized into service components for hospitals and telehealth apps

## Methodology



### Data procurement

- Google reviews based on a predetermined list of hospitals and telehealth apps were obtained using web scraping



### Sentiment analysis

- Using natural language processing, reviews were analyzed and allocated a sentiment score, before categorization into different periods based on review dates

Dates	Defined periods
Jan 2018 – Dec 2019	Pre-COVID
Jan 2020 – June 2021	COVID
July 2021 – current	Post-COVID



### Keyword association analysis

- Reviews were also categorized into different service components to understand the underlying drivers of the sentiments

## Service component categories

Categories	Hospitals	Telehealth apps
Service efficiency	✓	✓
Staff competency	✓	✓
Value for money	✓	✓
Service quality	✓	
User experience		✓
Staff professionalism	✓	✓
Billing/reimbursement/administrative services	✓	✓
Facilities/environment	✓	
Technical robustness		✓

## Key findings

1

**Hospitals overall came out of the pandemic with a recovered or even improved public perception, while patients' views on telehealth apps have largely deteriorated.**

- While telehealth was seen positively as an innovative and convenient service in the early days of the pandemic, operational challenges (human, technical) faced by telehealth providers while scaling have eventually taken a toll on the general patients' perception of telehealth

2

**Private chain hospitals in particular have gained strong perception momentum, driven in particular by a general recognition of staff professionalism and competency during the pandemic. A more nuanced pattern can be seen for public hospitals, which overall have weakened in terms of public perception, driven by staff professionalism and facilities/environment.**

- The shortage of healthcare personnel in public hospitals post-COVID, combined with a more prominent role in handling the pandemic for a longer period of time, might have contributed to the erosion of positive sentiment.

3

**Strong differences appear at a country level in terms of change in hospital perception, with Malaysian hospital operators – and to a certain extent Indonesian – now enjoying an improved patient perception post-pandemic, while the opposite is observed for Vietnamese hospitals.**

- For Malaysia and Vietnam the gain or loss in positive patient sentiment is across all categories of service evaluated, reflecting very polarized patient views.

4

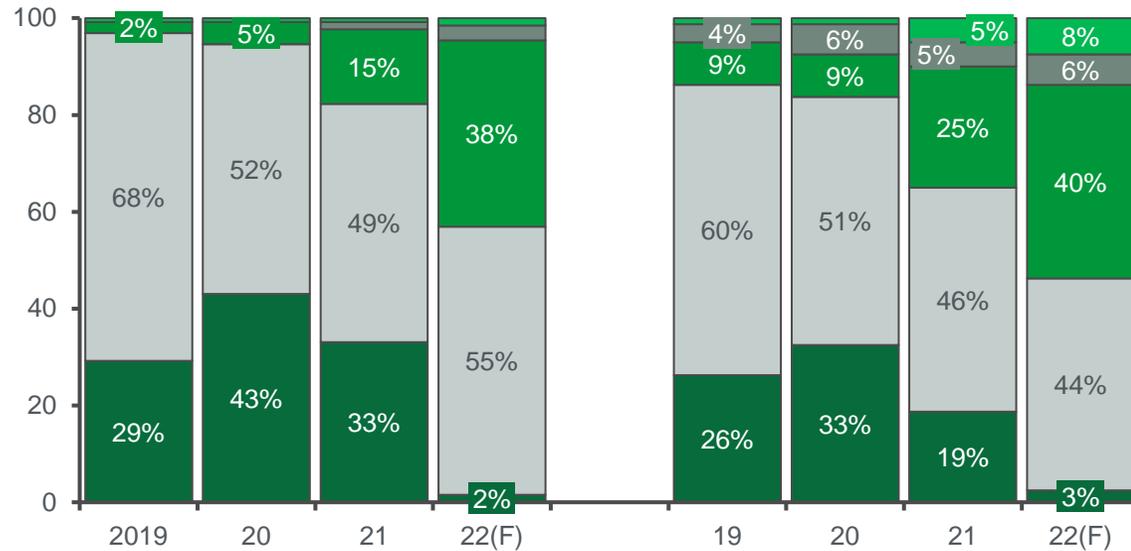
**After an unprecedented surge in usage, MAU (Monthly Active Users) has now stabilized/started to decline for telehealth providers. During COVID, the share of positive sentiment for telehealth platforms has decreased on a par with the increase in usage.**

- Billing/reimbursement (e.g., payment features) and service efficiency (e.g., waiting times) are the key service components weakening the overall patient sentiment of telehealth.
- The drop in positive perception is also quite substantial in terms of value for money in the post-COVID era, with the reopening of “offline” care options

# Across most APAC hospitals, elective procedure volumes have mostly returned to pre-pandemic levels, with growth expected over the coming years

**Number of elective procedures per month performed/expected each year\***  
Percentage of respondents

700+    300-<500    <100  
500-<700    100-<300



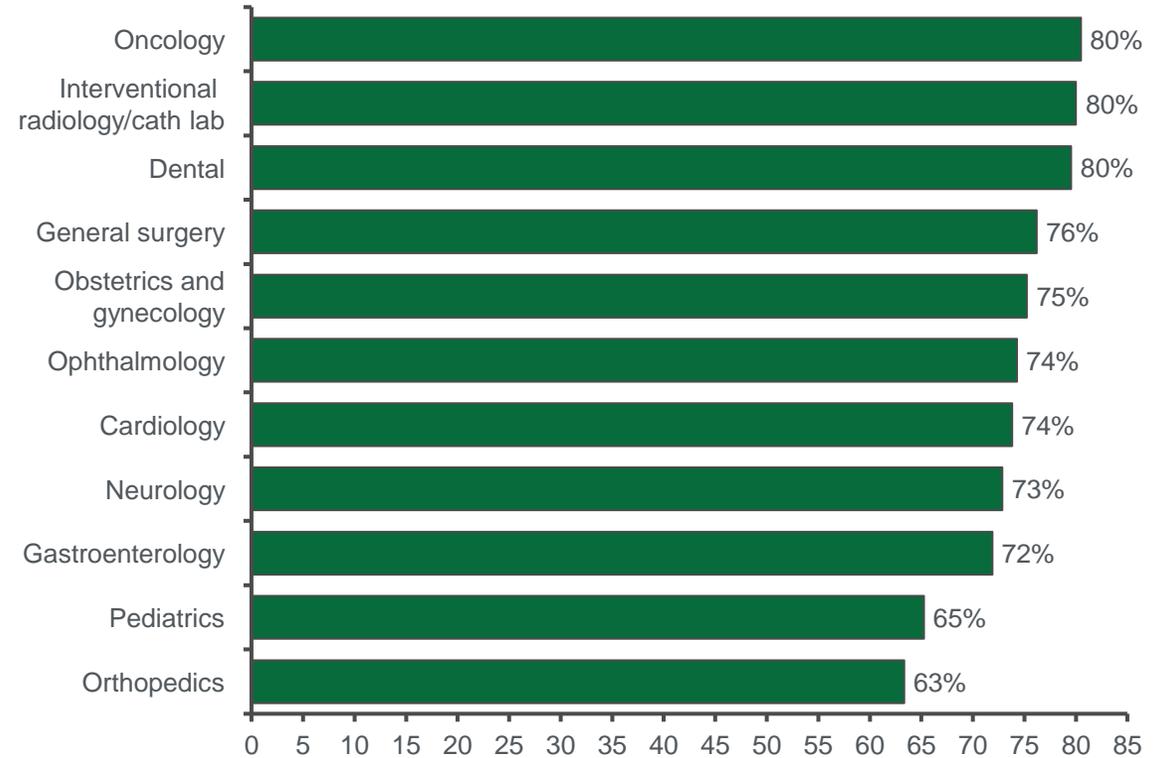
**Other developing markets (N=130)**

Includes Indonesia and Thailand

**Other developed markets (N=80)**

Includes Singapore

**Departments recovered to pre-COVID levels of operations in terms of number of elective procedures\***  
Percentage of respondents



\*Survey question: How many elective surgeries did your hospital perform/do you expect your hospital to perform over the following time period (monthly figures)? Other developed markets include South Korea, Australia and Singapore. Other developing markets include India, Indonesia and Thailand.

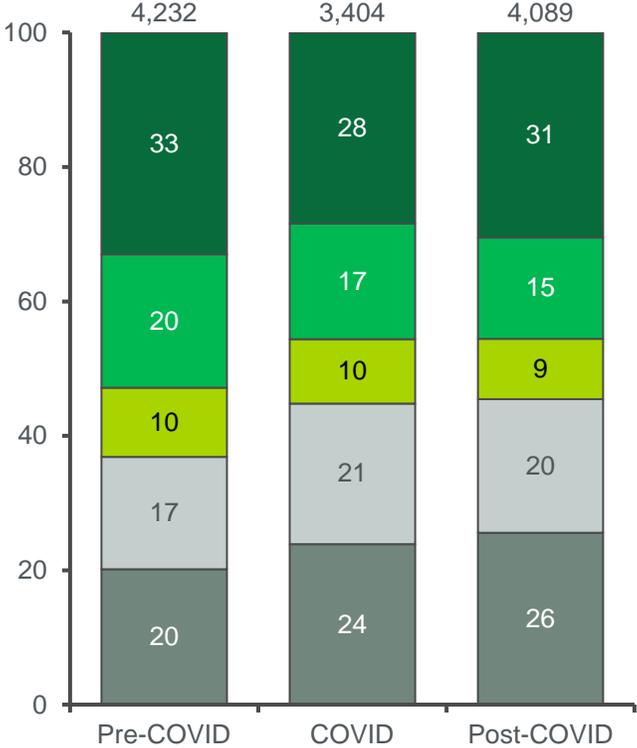
Source: L.E.K. 2022 APAC Hospital Priorities Survey

# Private hospitals, especially the private chain hospitals, gained improved perception post-COVID while public hospitals generally saw a decrease in positive reviews

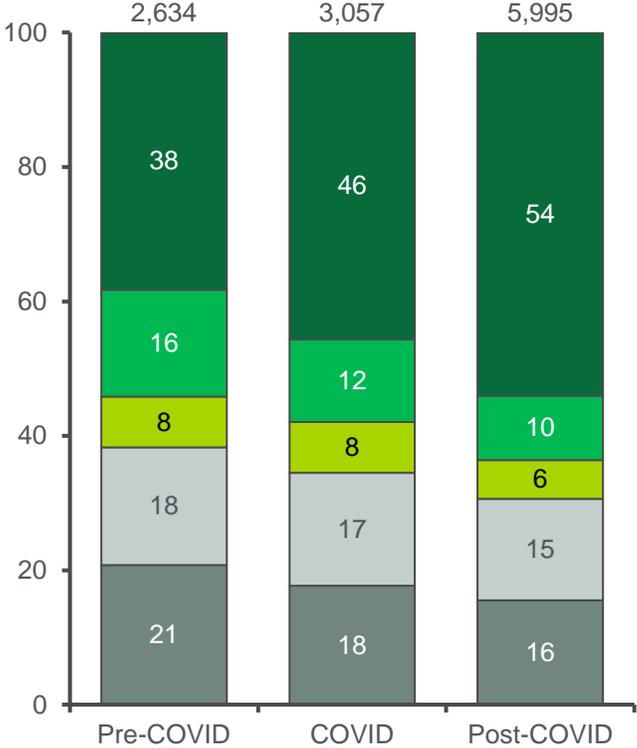
Sentiment analysis overview, by setting

Number of online reviews  
Percentage breakdown by sentiment category

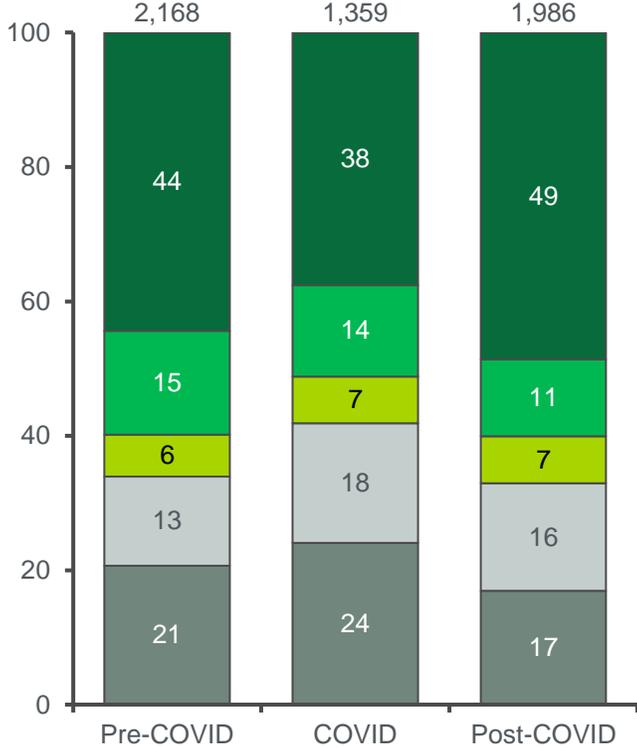
Very negative Negative No sentiment Positive Very positive



Public hospitals



Private chain



Private independent

Note: Pre-COVID refers to Jan 2018 – Dec 2019, COVID refers to Jan 2020 – June 2021, post-COVID refers to July 2021 – current  
Source: L.E.K. research and analysis

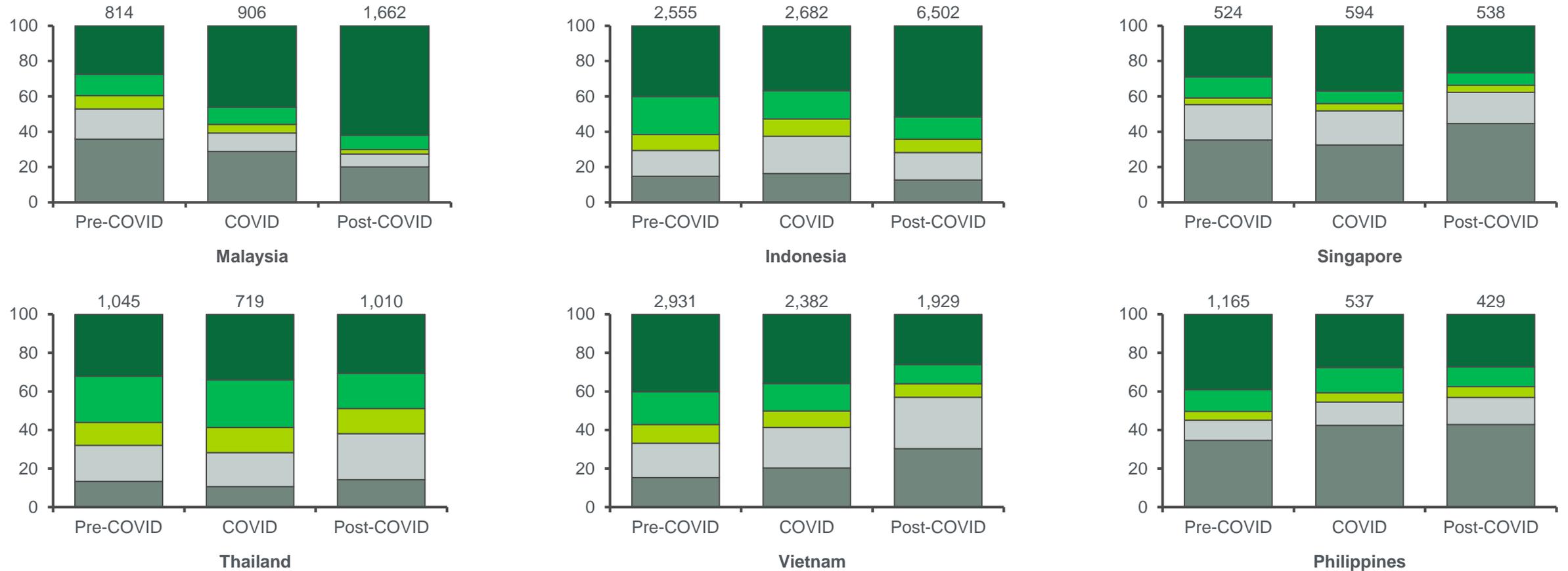
# Comparing post-COVID to pre-COVID, hospitals in Malaysia and Indonesia improved in overall perception while those in other markets experienced weakened overall perception

## Sentiment analysis overview, by market

### Number of online reviews

Percentage breakdown by sentiment category

Very negative Negative No sentiment Positive Very positive



Note: Pre-COVID refers to Jan 2018 – Dec 2019, COVID refers to Jan 2020 – June 2021, post-COVID refers to July 2021 – current  
Source: L.E.K. research and analysis

# Across most markets, perception of staff professionalism weakened the most while staff competency saw the greatest improvement post-COVID

Sentiment analysis, by market

## Net change in NPS across categories (post-COVID vs. pre-COVID)

Category	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Billing/reimbursement/administrative services	-3	90	-7	41	-6	-40
Facilities/environment	5	60	-13	-38	-6	-32
Service efficiency	18	54	8	-6	-19	-36
Service quality	13	77	-32	-16	-9	-49
Staff competency	18	63	28	40	-26	-28
Staff professionalism	6	80	-48	-17	-34	-46
Value for money	-37	12	-55	0	-7	-32

Improved perception   Weakened perception   Relatively stable perception (<10)

- The decline in perception of staff professionalism may be attributed to the **shortage of healthcare personnel in hospitals post-COVID**
  - SEA, which has seen some of the worst COVID caseloads, is considered to be among the most difficult environments for healthcare workers
  - Consequently, this has led to high resignation rates of healthcare workers during this period
- Furthermore, movement restrictions during the pandemic have likely also **affected patients' perception of facilities/environment** due to overwhelmed hospitals
- **Weakened perception of value for money across most markets** (except for Malaysia and Singapore) may also suggest **inflating healthcare costs**

Note: Pre-COVID refers to Jan 2018 – Dec 2019, post-COVID refers to July 2021 – current  
Source: L.E.K. research and analysis

# Resource shortages and inflating costs are key drivers of weakened patient sentiment while hospitals with highly qualified doctors and well-accredited services are well perceived

Sentiment analysis, by market

## Perceptions of hospital service components

### Staff professionalism

- **Manpower shortage and high workload due to COVID have adversely affected staff professionalism, resulting in low perceived service quality**

“... “... Aware that [there] is very serious shortage of manpower, understood maybe due to COVID, but nurses seem to be very hot tempered when enquir[ing] something with them...” Feb. 27, 2022, Singapore

“... Awful. Extremely busy with probably the most inefficient service I’ve ever experienced. Sick patients laying in the corridors dying, queuing for everything ... Doctor looked overwhelmed with paperwork and didn’t have much time to listen...” Dec. 9, 2021, Thailand

### Value for money

- **With rising healthcare costs, hospitals face the challenge of increasing quality of care to ensure value for money in healthcare services**

“... Money comes first and their charges are too expensive and overly high. Furthermore, their doctors are not that good, and they are constantly pushing for procedures and operations to boost their income and make profit ... even the medication is overly charged and can get the same medication for less than half the price at pharmacy. Very bad experience here...” Dec. 28, 2021, Malaysia

“... Highly overpriced and the service is somewhat sloppy...” Feb. 14, 2022, Vietnam

### Staff competency

- **Highly qualified doctors and well-accredited services** underscore hospitals’ staff competency levels among patients

“... Top hospital! The headquarters of advanced equipment and the most updated & qualified consultant specialist...” March 30, 2022, Indonesia

“... Dr. General Hospital. Mohammad Hoesin Palembang is very good, with qualified specialists [and] services that have been accredited nationally and internationally...” Dec. 30, 2021, Indonesia

“... Dr. Lam Kai Huat is an excellent doctor [who] explains very well ... the Cardiology Unit Staff are very competent and hardworking ... ” April 11, 2022, Malaysia

Category with weakened perception

Category with improved perception

# Across all hospital settings, perception of value for money suffered; in contrast, perception of administrative services has demonstrated improvement

Sentiment analysis, by setting

## Net change in NPS across categories (post-COVID vs. pre-COVID)

Category	Private chain hospitals	Private independent hospitals	Public hospitals
Billing/reimbursement/administrative services	13	3	6
Facilities/environment	15	12	-18
Service efficiency	25	5	-6
Service quality	26	10	-13
Staff competency	33	44	-3
Staff professionalism	33	0	-23
Value for money	-7	-48	-33

■ Improved perception
 ■ Weakened perception
 ■ Relatively stable perception (<10)

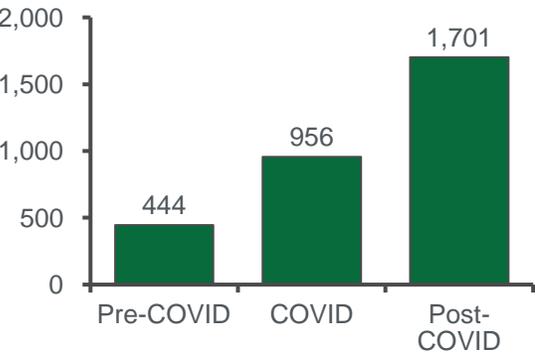
- Perception of private hospitals generally saw an improvement while perception of public hospitals suffered across most categories
- Perception of value for money declined across all settings, particularly among private independent hospitals
  - This may be due to hospitals' passing on rising cost pressure as procedure volumes drop due to COVID restrictions

Note: Pre-COVID refers to Jan 2018 – Dec 2019, post-COVID refers to July 2021 – current  
Source: L.E.K. research and analysis

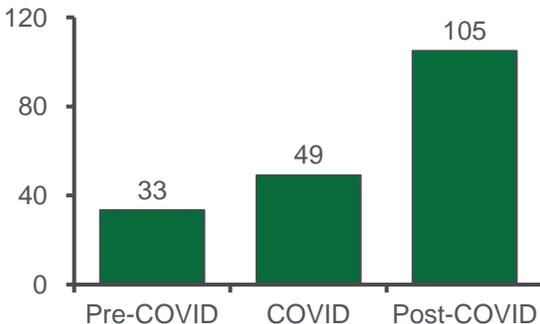
# COVID accelerated the significant expansion of telehealth app usage in SEA; growth in monthly active user count was strongest in the Philippines largely driven by DOH support

## Average MAU

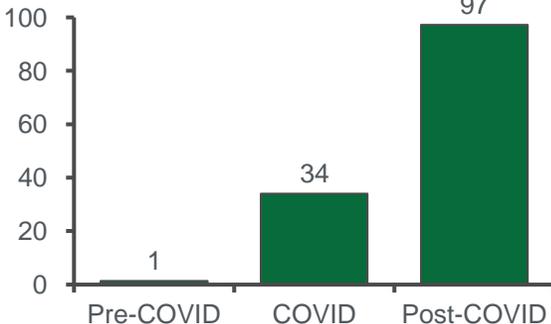
Average number of MAU (in thousands)



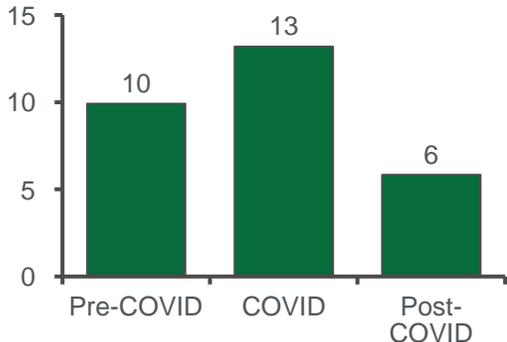
Indonesia



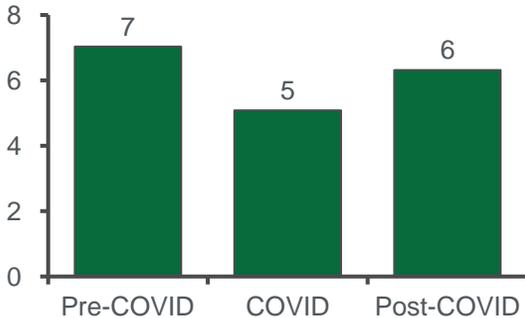
Malaysia



Philippines



Singapore



Thailand

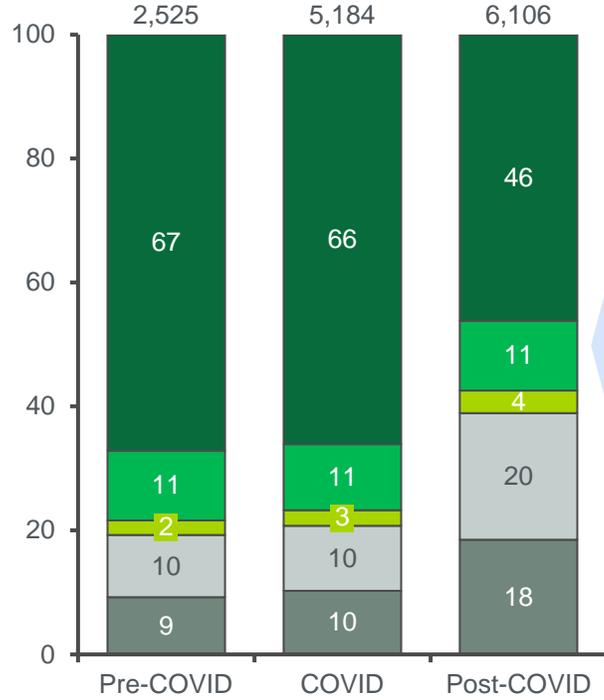
Limited information on usage of telehealth apps in Vietnam

- Telehealth apps have seen a surge in MAU during COVID, largely due to limited access to health services as restrictions kicked in
- Growth in MAU was strongest in the Philippines, driven by the DOH's partnership with telehealth providers to boost telemedicine services

Note: MAU=monthly active users; DOH=Department of Health; Pre-COVID refers to Jan 2018 – Dec 2019, COVID refers to Jan 2020 – June 2021, post-COVID refers to July 2021 – current  
Source: L.E.K. research and analysis

# Despite increase in usage and user count, telehealth apps saw an increase in negative perception during COVID and post-COVID, driven by weak sentiments on technical robustness

**Number of online reviews**  
Percentage breakdown by sentiment category



**NPS scores by service categories across periods**

Category	Pre-COVID (Jan 18 – Dec 19)	COVID (Jan 20 – June 21)	Post-COVID (July 21 – current)
Technical robustness	-54	-49	-68
Service efficiency	77	50	11
Value for money	80	85	35
Billing/reimbursement/administrative services	18	-45	-67
Staff competency	89	85	32
Staff professionalism	83	69	60
User experience	77	76	44

- While the number of positive sentiments increased during COVID, there was a large decline post-COVID
  - Limited healthcare options during COVID likely drove positive sentiments on telehealth apps
  - However, sentiments took a hit when shortcomings became apparent, highlighting challenges faced by telehealth apps in fulfilling patients' needs comprehensively
- Technical robustness seems to be a key issue across all periods, underscoring the importance of functionality and reliability of apps
- Sentiments on billing/reimbursement/administrative services also weakened, likely due to issues in rapid scaling up to meet the unprecedented demand

Very negative   
  Negative   
  No sentiment   
  Positive   
  Very positive   
  Lowest 2 NPS scores in each period



# Perceptions of all service component categories in telehealth apps weakened from pre-COVID to post-COVID, especially for administrative services and service efficiency

## Net change in NPS across categories across periods

Category	COVID vs. pre-COVID (Jan 20 – Jun 21 vs Jan 18 – Dec 19)	Post-COVID vs. COVID (Jul 21 – current vs Jan 20 – Jun 21)
Technical robustness	6	-20
Service efficiency	-26	-39
Value for money	5	-51
Billing/reimbursement/ administrative services	-62	-23
Staff competency	-4	-53
Staff professionalism	-13	-9
User experience	-1	-31

■ Improved perception  
 ■ Weakened perception  
 ■ Relatively stable perception (<10)

- Generally, sentiments across all categories suffered across periods, especially toward the end of COVID
- Billing/reimbursement/administrative services and service efficiency experienced weakened perception across all periods
  - This is likely due to challenges in scaling up rapidly as a result of the unprecedented demand surge during COVID
  - Reviews associated with billing/reimbursement/administrative services mainly pertain to payment features
  - Reviews associated with service efficiency often highlight long waiting times when using the app

Note: Pre-COVID refers to Jan 2018 – Dec 2019, COVID refers to Jan 2020 – June 2021, post-COVID refers to July 2021 – current  
 Source: L.E.K. research and analysis



# Weakened patient sentiments mostly stemmed from underperformance of telehealth apps in core functionalities throughout the patient journey

## Perceptions of telehealth app service components

### Billing/ reimbursement/ administrative services

- **Providing comprehensive services throughout the patient journey – from teleconsultation to reimbursement options and medicine delivery – is critical in establishing the perception of the quality of telehealth apps**

*“... unfortunately, I can't link my insurance with this application ... and a disappointing customer service with chat hanging for hours without any solution...” Aug. 23, 2021, Indonesia*

*“... delivery status has not been updated since I ordered the medicine almost 3 hours ago ... Nobody in customer service picked up the phone and acted slow in answering line chat ... Order was only completed in 4 hours ... Very disappointed, virtual consultations by hospitals might be better....” July 24, 2021, Thailand*

### Technical robustness

- **Performance issues such as constant app crashes, long loading periods and unreliable functionality affect user retention and indicate the ability of the app to meet patients' needs**

*“... the app either has bugs or is poorly developed. It's not user friendly at all and the app keeps lagging and hangs at times ... Also, I tried checking out the wellness program – it says click the test below to view more details and I pressed every millimetre of the screen, but nothing happened...” Feb. 1, 2020, Malaysia*

*“... app is very unreliable ... Cannot connect to make videocalls with my doctor, not even regular calls without video. It just keeps saying 'trying to reconnect' ...” Aug. 11, 2020, Philippines*

### Service efficiency

- **Long waiting times and lack of updates contribute to poor sentiments on service efficiency among patients**

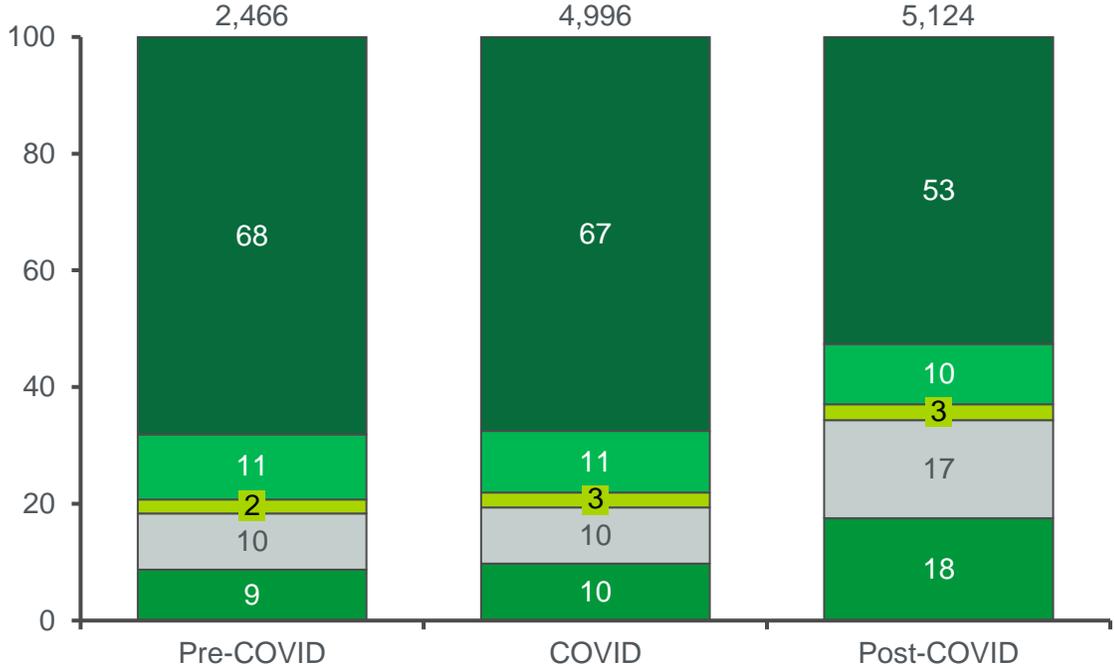
*“... terrible app ... estimated waiting time was 30 minutes, but I waited for 1 hour and still got no access to doctor nor update from clinic ...” Dec. 13, 2021, Singapore*

*“... The app makes you set a time for your consultations. However, when you log into the app at the agreed consultation time, it turns out you're still put into a queue with other patients with no guarantee of when it will be your turn. I have been waiting for my appointment for 30 minutes and counting now....” March 1, 2021, Philippines*

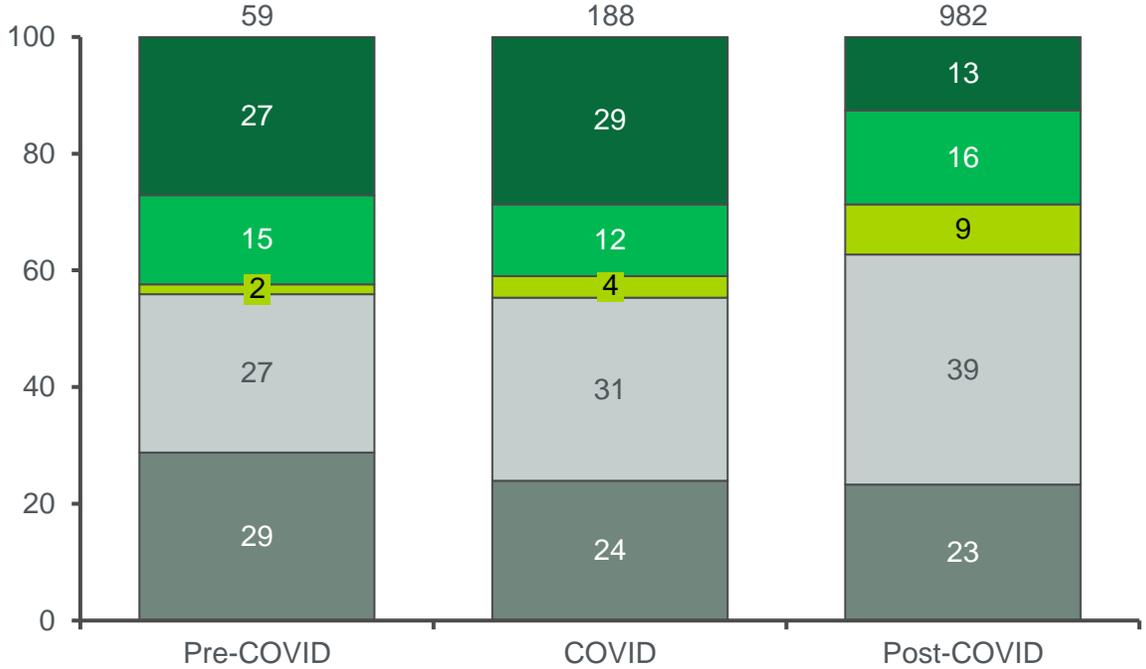
# While independent apps have a larger proportion of positive sentiments, there is a greater drop in proportion of positive sentiments post-COVID compared to apps developed by traditional providers

**Number of online reviews**  
Percentage breakdown by sentiment category

Very negative Negative No sentiment Positive Very positive



**Independent apps**  
Apps developed by pure digital players



**Provider-developed/government apps**

Note: Pre-COVID refers to Jan 2018 – Dec 2019, COVID refers to Jan 2020 – June 2021, post-COVID refers to July 2021 – current

Source: L.E.K. research and analysis

# Compared to telehealth apps developed by traditional providers, apps developed by pure digital players experienced a greater decline in NPS across categories post-COVID

Net change in NPS across categories across periods, by app type

Category	COVID vs. pre-COVID (Jan 20 – Jun 21 vs Jan 18 – Dec 19)		Post-COVID vs. COVID (Jul 21 – current vs Jan 20 – Jun 21)	
	Independent apps	Provider-developed/ Government apps	Independent apps	Provider-developed/ Government apps
Technical robustness	7	-10	-20	13
Service efficiency	-20	-76	-36	20
Value for money	5	33	-41	-60
Billing/ reimbursement/ administrative services	-64	<i>Limited pre-COVID reviews for analysis</i>	-25	0
Staff competency	-3	0	-54	0
Staff professionalism	-14	23	-7	-15
User experience	0	10	-24	-55

■ Improved perception  
 ■ Weakened perception  
 ■ Relatively stable perception (<10)

- Sentiments on independent apps (apps developed by pure digital players) generally took a hit post-COVID
  - This could be due to increasing difficulties in coordinating with partner doctors as they resume health services post-COVID, resulting in slower services and deteriorating staff competency

Note: Pre-COVID refers to Jan 2018 – Dec 2019, COVID refers to Jan 2020 – June 2021, post-COVID refers to July 2021 – current  
 Source: L.E.K. research and analysis

## Appendix

- Hospital keyword association analysis– categories and keywords
- Classification of hospitals
- Telehealth app keyword association analysis– categories and keywords
- Classification of telehealth apps

## Appendix: Hospital keyword association analysis – categories and keywords

Service efficiency	Staff professionalism	Staff competency	Facilities/environment	Billing/reimbursement/ administrative services	Service quality	Value for money
delay wait long time slow stuck queue convenient quick fast smooth efficient inefficient waste	attitude attention impatient attentive unattentive friendly unfriendly helpful unhelpful warm cold rude caring rushed kind assuring/reassuring accommodating professional unprofessional courteous uncourteous respect disrespect dedicated polite customer service	informative knowledgeable experienced effective competent incompetent proficient ineffective inexperienced good doctor expertise qualified expert	clean dirty food crowded overload quiet noisy washroom toilet parking facilities room bed environment state of the art spacious cramped comfortable modern	admission registration billing processing invoice payment good coverage insurance forms admin	one star five star hotel good quality world class luxury exceptional hospitality exemplary service prestigious leading	expensive charges affordable worth the money price cheap overcharge

## Appendix: Classification of hospitals (1/4)

### Singapore (N=8)

Public	Private chain
Tan Tock Seng Hospital	Mount Elizabeth Novena Hospital
Singapore General Hospital	Raffles Hospital
Ng Teng Fong General Hospital	Thomson Medical Centre
Khoo Teck Puat Hospital	
Sengkang General Hospital	

### Malaysia (N=20)

Public	Private chain	Private independent
Kuala Lumpur General Hospital	Gleneagles Kuala Lumpur	Putra Specialist Hospital
Pusat Perubatan Universiti Kebangsaan Malaysia	KPJ Sentosa KL Specialist Hospital	Loh Guan Lye Specialists Centre
University of Malaya Medical Centre	Columbia Asia Hospital - Setapak	Assunta Hospital PJ
Sultanah Aminah Hospital, Johor Bahru	Mahkota Medical Centre	
Melaka Hospital	Pantai Hospital Penang	
Penang General Hospital	Sunway Medical Centre	
Queen Elizabeth Hospital, Kota Kinabalu	Columbia Asia Hospital - Petaling Jaya	
Sarawak General Hospital		
Tengku Ampuan Rahimah Hospital, Klang		
Taiping Hospital		

 Hospitals with a focus on medical tourism

## Appendix: Classification of hospitals (2/4)



### Philippines (N=30)

Public	Private chain	Private independent
Baguio General Hospital and Medical Center	Marikina Valley Medical Center	GoodSam Medical Center
Philippine General Hospital	Davao Doctors Hospital	Makati Medical Center
Philippine Heart Center	Riverside Medical Center Inc.	Chong Hua Hospital
National Kidney and Transplant Institute	Cebu Doctors' University Hospital	Chinese General Hospital and Medical Center
Bicol Medical Center	Mactan Doctors' Hospital	VisayasMed Hospital
Vicente Sotto Memorial Medical Center	Our Lady of Lourdes Hospital	Cardinal Santos Medical Center
Southern Philippines Medical Center	St. Luke's Medical Center- Quezon City	Asian Hospital and Medical Center
Dr. Jose Fabella Memorial Hospital	St. Luke's Medical Center- Global City	Perpetual Succor Hospital
East Avenue Medical Center	The Medical City Clark	VRP Medical Center
San Lazaro Hospital		
Northern Mindanao Medical Center		
Dr. Jose N. Rodriguez Memorial Hospital		



### Thailand (N=30)

Public	Private chain	Private independent
Siriraj Hospital	BNH Hospital	Hua Chiew Hospital
Ramathibodi Hospital	Bangkok Hospital	The Bangkok Christian Hospital
Phra Nakhon Si Ayutthaya Hospital	Kasemrad Hospital Bang Khae	Bumrungrad International Hospital
Sena Hospital	Bangpakok 9 International Hospital	Mueang Narai Hospital
Ban Mi Hospital	Paolo Hospital Phaholyothin	PRINC Hospital Ubonratchathani
Maharat Nakhon Ratchasima Hospital	Phyathai 1 Hospital	Chiangmai Klaimor Hospital
Phimai Hospital	Kasemrad Hospital	
Sunpasitthiprasong Hospital	Rajthanee Rojana Hospital	
Bangkok Ratchasima hospital	Ubonrak Thonburi Hospital	
Nakornping Hospital	Bangkok Hospital Chiangrai	
Sansai Hospital	Bangkok Hospital Hat Yai	
Hatyai Hospital		
Thalang Hospital		

 Hospitals with a focus on medical tourism

## Appendix: Classification of hospitals (3/4)



Indonesia (N=62)

Public	Private chain	Private independent
Dr. Cipto Mangunkusumo National Central Public Hospital Emergency Room	Siloam Hospitals Kebon Jeruk	Advent Hospital Medan
Bethesda Hospital, Yogyakarta	RS Siloam Sriwijaya - Palembang	Restu Ibu Hospital
Dharmais Cancer Hospital	Siloam Hospitals Labuan Bajo	Yos Sudarso Hospital
Gatot Soebroto Army Hospital	Siloam Hospital Makassar	Balikpapan Baru Hospital
Rumah Sakit Anak dan Bunda Harapan Kita	Siloam Hospitals Dhirga Surya	Urip Sumoharjo Hospital Bandar Lampung
Pertamina Central Hospital	Siloam Hospital Kupang	Santosa Hospital Bandung Central
Rumah Sakit Umum Daerah Dr. Soetomo	Hermina Pandanaran Hospital	Murni Teguh Memorial Hospital
Central General Hospital Dr. Kariadi Semarang	Hermina Makassar Hospital	RS Martha Friska Medan
Aloei Saboe	RSU Hermina Samarinda	Al Islam Hospital
Sanglah General Hospital	RSU Hermina Palembang	Bina Sehat Hospital
Central General Hospital Dr. Mohammad Hoesin	RSU Hermina Medan	Adi Husada Undaan Hospital
Dr. Hasan Sadikin Central General Hospital	Mitra Keluarga Hospital West Bekasi	RSU Bidadari
RSUD Dr. SAIFUL ANWAR MALANG	Rumah Sakit (RS) Mitra Keluarga - Kenjeran	Lamongan Muhammadiyah Hospital
Abdul Wahab Sjahranie Hospital	Mitra Keluarga Kemayoran	
Dr. M. Djamil Central General Hospital	Rumah Sakit Mitra Keluarga Waru	
Rumah Sakit Umum Daerah Prof. Dr. Margono Soekarjo Purwokerto	Primaya Hospital Bekasi Barat	
Dr. Sardjito General Hospital	Primaya Hospital Sukabumi	
RSUP Prof. Dr. R. D. Kandou Manado	Primaya Hospital Bhakti Wara	
General Hospital H. Adam Malik	Mayapada Hospital Tangerang (MHTG)	
Dr. Pirngadi Regional General Hospital	BMC MAYAPADA HOSPITAL	
Hospital Grandmed	RS EMC Alam Sutera	
Rumah Sakit Umum Daerah Abepura	Surya Husadha Hospital	
Regional General Hospital Sidoarjo	Rumah Sakit Sari Asih Serang	
Rumah Sakit R.K. Charitas	Awal Bros Sudirman Hospital	
	RS Premier Jatinegara	

## Appendix: Classification of hospitals (4/4)

### Vietnam (N=49)

Public	Private chain	Private independent
Bệnh viện Bạch Mai	Vinmec International Hospital	Hanoi French Hospital
Vietnam Germany Hospital	Hong Ngoc Phuc Truong Minh Hospital	Hung Việt Cancer Hospital
Hanoi Medical University Hospital	MEDLATEC Hospital	Thu Cuc International General Hospital
National Hospital of Tropical Diseases	Tam Anh Hospital	City International Hospital
National Cancer Hospital K1	Vinmec Hai Phong International Hospital	FV Hospital
108 Military Central Hospital	Vinmec Central Park International Hospital	MeKong Obstetrics and Gynecology Hospital
Bệnh viện Nhi Trung ương	Hoan My Saigon Hospital	Tam Duc Heart Hospital
Thai Nguyen General Hospital	Hong Duc Hospital	AIH - American International Hospital
Bệnh viện Hữu nghị Việt Tiệp	Tam Tri Saigon General Hospital	Thai Hoa International Hospital
Bac Ninh General Hospital	Columbia Asia Hospital - Binh Duong	Happiness International Hospital
Cho Ray Hospital	Van Phuc Hospital	
Tu Du Hospital	Bệnh viện Đa khoa Tâm Trí Đà Nẵng	
Thong Nhat Hospital	Hoan My Da Nang Hospital	
People's Hospital 115	Bệnh viện Đa khoa Quốc tế Vinmec Đà Nẵng	
Military Hospital 175		
Hospital for Tropical Diseases		
University Medical Center		
Can Tho Central General Hospital		
Dong Nai General Hospital		
Binh Duong General Hospital		
Hue Central Hospital		
Da Nang Hospital C		
Vietnam – Cuba Dong Hoi Friendship Hospital		
Quang Nam Central General Hospital		
Quyhoa National Leprosy Dermatology Hospital		

## Appendix: Telehealth app keyword association analysis – categories and keywords

User experience	Technical robustness	Service efficiency	Staff competency	Staff professionalism	Billing / reimbursement / administrative services	Value for money
convenient easy inconvenient profile smooth stress fail appointment book difficult confusing simple easier experience hassle data privacy available unavailable interface support helpful unhelpful	hang issue not responding crash connect/connection bug disconnect lag time OTP unreliable reliable error stuck update feature install upgrade not working/not work freeze function upload register login option	wait delay slow fast quick queue waste efficient inefficient responsive assistance prompt immediately	informative knowledgeable experienced proficient renowned quick diagnosis effective quality ineffective inexperienced good doctor expertise qualified competent good service bad service poor service	kind friendly unfriendly rude caring busy rushed assuring nice reassuring professional unprofessional courteous uncourteous respect disrespect customer service nurse	processing delivery medicine delivery billing payment covered insurance forms refund admin	expensive charge economical affordable price useful useless save

## Appendix: Classification of telehealth apps

Sr. no.	Telehealth app	App type	Country of HQ
1	Doctor Anywhere	Independent app	Singapore
2	MyDoc		
3	Speedoc		
4	WhiteCoat		
5	MaNaDr for Patient		
6	WhatsDoc		
7	DoctorOnCall		Malaysia
8	Teleme		
9	DOC2US		
10	Doctor2U		
11	BookDoc		
12	Halodoc		
13	Alodokter		
14	Good Doctor		
15	KlikDokter		
16	YesDok		
17	ProSehat		Indonesia
18	HealthNow		
19	NowServing		
20	mWell PH		
21	AIDE		
22	KonsultaMD		
23	VieVie		
24	Jio Health		Philippines
25	Doctor Raksa		Vietnam
26	Chiiwii		Thailand
27	Minmed Connect	Provider-developed/government app	
28	DigiHealth		
29	Homage		
30	Healthway Medical Group		
31	Raffles Connect		
32	Sổ sức khỏe điện tử		
33	MyVinmec		
			Singapore
			Vietnam

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