

Does Digital Healthcare Improve the Utilisation of Public Hospitals in the Emirate of Dubai?

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Objectives

- Patients have been using public hospitals less than private hospitals in the Emirate of Dubai.
- In 2016, digital healthcare of public hospitals was launched in the Emirate of Dubai, allowing patients to book appointments, consult doctors and get prescriptions online.
- This study examines whether digital healthcare encourages more patients to choose public hospitals.

Data

Datasets

- Dubai Annual Health Statistics 2010-2021

Sample

- 6 public hospitals
- 28 private hospitals

Measurements

- Average in-hospital stay length
length = total days of all inpatients / total number of inpatients
- Hospital bed occupancy rate
rate = total occupied beds / total available beds

Methods

Difference-in-difference

- Difference-in-difference (DID) is used to measure the policy effect of the launch of digital healthcare.
 - Treatment group: public hospitals
 - Control group: private hospitals

Models

1. The effect of digital healthcare on hospital stay length

$DID_hospstay = \beta_0 + \beta_1 dgthc * time + \Sigma \beta_2 X + \varepsilon$
 $DID_hospstay$: hospital stay length
 $dgthc=1$: provided digital healthcare
 $dgthc=0$: provided no digital healthcare
 $time=1$: year \geq 2016
 $time=0$: year $<$ 2016
 β_1 : the effect of digital healthcare on hospital stay length
 X : covariates
 $\Sigma \beta_2$: coefficients of covariates
 β_0 : constant term
 ε : error term

2. The effect of digital healthcare on bed occupancy

$DID_bedoccup = \alpha_0 + \alpha_1 dgthc * time + \Sigma \alpha_2 X + \mu$
 $DID_bedoccup$: hospital bed occupancy
 α_1 : the effect of digital healthcare on hospital bed occupancy
 $\Sigma \alpha_2$: coefficients of covariates
 α_0 : constant term
 μ : error term

3. The time effect of digital healthcare on hospital stay length

$DID'_{hospstay} = \beta'_0 + \beta'_1 dgthc * Y2016 + \beta'_2 dgthc * Y2017 + \beta'_3 dgthc * Y2018 + \beta'_4 dgthc * Y2019 + \beta'_5 dgthc * Y2020 + \beta'_6 dgthc * Y2021 + \Sigma \beta'_7 X + \varepsilon'$
 $\beta'_1, \beta'_2, \beta'_3, \beta'_4, \beta'_5$ and β'_6 : digital healthcare effects on hospital stay in 2016, 2017, 2018, 2019, 2020 and 2021 respectively

4. The time effect of digital healthcare on bed occupancy

$DID'_{bedoccup} = \alpha'_0 + \alpha'_1 dgthc * Y2016 + \alpha'_2 dgthc * Y2017 + \alpha'_3 dgthc * Y2018 + \alpha'_4 dgthc * Y2019 + \alpha'_5 dgthc * Y2020 + \alpha'_6 dgthc * Y2021 + \Sigma \alpha'_7 X + \mu'$
 $\alpha'_1, \alpha'_2, \alpha'_3, \alpha'_4, \alpha'_5$ and α'_6 : digital healthcare effects on bed occupancy in 2016, 2017, 2018, 2019, 2020 and 2021 respectively

Results

DID results

Table 1 Effects of digital healthcare and public hospital utilisation

Variables	(1)	(2)
	Average stay	Bed occupancy
Digital healthcare * time	4.61***	13.38***
R-squared	0.157	0.019

Notes: ***, ** and * indicate p<0.01, p<0.05 and p<0.1 respectively.

- In table 1, digital healthcare increases average stay in public hospitals by 4.61 days and bed occupancy in public hospitals by 13.38%.

Table 2 Time effects of digital healthcare on public hospital utilisation

Variables	(1)	(2)
	Average stay	Bed occupancy
Digital healthcare * Y2016	1.51*	19.85***
Digital healthcare * Y2017	1.52*	15.80**
Digital healthcare * Y2018	2.79**	23.26***
Digital healthcare * Y2019	6.02	14.36**
Digital healthcare * Y2020	5.68***	5.39
Digital healthcare * Y2021	6.02**	3.53**
R-squared	0.002	0.006

Notes: ***, ** and * indicate p<0.01, p<0.05 and p<0.1 respectively.

- In table 2, the effect of digital healthcare on average stay in public hospitals climbs with time, reaching the largest (6.02 days) in 2021.
- The effect of digital healthcare on bed occupancy in public hospitals drops with time, from the largest (23.26%) in 2018 to the least (3.53%) in 2021.

Conclusions

- Digital healthcare improves public hospital utilisation in the Emirate of Dubai.
- The improved utilisation is because patients can consult their health problems online first to get faster triages for public hospital services.
- With the improved utilisation, digital healthcare contributes to the elimination of healthcare inequality and to the achievement of good health and wellbeing in the Emirate of Dubai.