

Evaluation of Hospital Pandemic Control Strategies of a Chinese Tertiary Care Hospital During the Late Phase of COVID-19 Pandemic

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INTRODUCTION

- China experienced a major outbreak of COVID-19 in early 2020. The Chinese government took strict measures to control the virus and prevent it from spreading across the country.
- By mid-2020, the situation within the country had largely stabilized¹, the government gradually eased restrictions. However, sporadic outbreaks and localized clusters continued to occur, prompting swift local responses to contain the virus.
- Strict pandemic control measures were implemented in tertiary care hospitals across China following the initial outbreak of COVID-19². These measures aimed to protect healthcare workers, prevent healthcare-associated infections, limit nosocomial transmission, preserve healthcare capacity, and maintain public trust.
- Tertiary care hospitals had to delicately adjust their pandemic control measures as the situation evolved and find a balance between the requirements of pandemic control and maintaining medical services capacity following the COVID-19 outbreak.

OBJECTIVES

- To assess the impact of COVID-19 outbreak on the medical service capacity and financial metrics of Chinese tertiary care hospitals.
- To assess the financial impact of hospital pandemic control strategies in a Chinese top rank hospital

METHODS

Study design

- Retrospective study

Study cohort

- Three different levels of tertiary hospitals (provincial, city, and county level).
- Usage of medical services in the administrative database of the three hospitals, and financial statements of the three hospitals in the three defined stages.

Data source

Data analysis methods

- Descriptive statistical methods to analyze the medical service capacity and financial metrics of the three hospitals by ranks.
- constructed a decision analytic model to assess the impact of pandemic control strategies on the utilization of hospital services and hospital financial metrics in a Chinese top rank hospital (Xiangya Hospital).

RESULTS: CHANGES OF UTILIZATION OF HOSPITAL SERVICES AFTER THE OUTBREAK OF COVID-19

Medical service	Outbreak phase vs. Pre-outbreak phase			Post-outbreak phase vs. Pre-outbreak phase		
	Provincial tertiary hospital	City tertiary hospital	County tertiary hospital	Provincial tertiary hospital	City tertiary hospital	County tertiary hospital
Outpatient visits	-53.4%	-37.8%	-26.4%	9.6%	6.2%	4.3%
Emergency room visits	-33.8%	-50.1%	-50.3%	-11.6%	8.0%	-46.5%
Hospitalizations	-43.0%	-26.4%	-22.8%	8.7%	-10.2%	15.0%
Surgery volume	-45.7%	-24.3%	-31.5%	18.6%	9.3%	10.2%
Intensive care utilization	-43.7%	-20.2%	Not applicable	0.6%	-5.4%	Not applicable

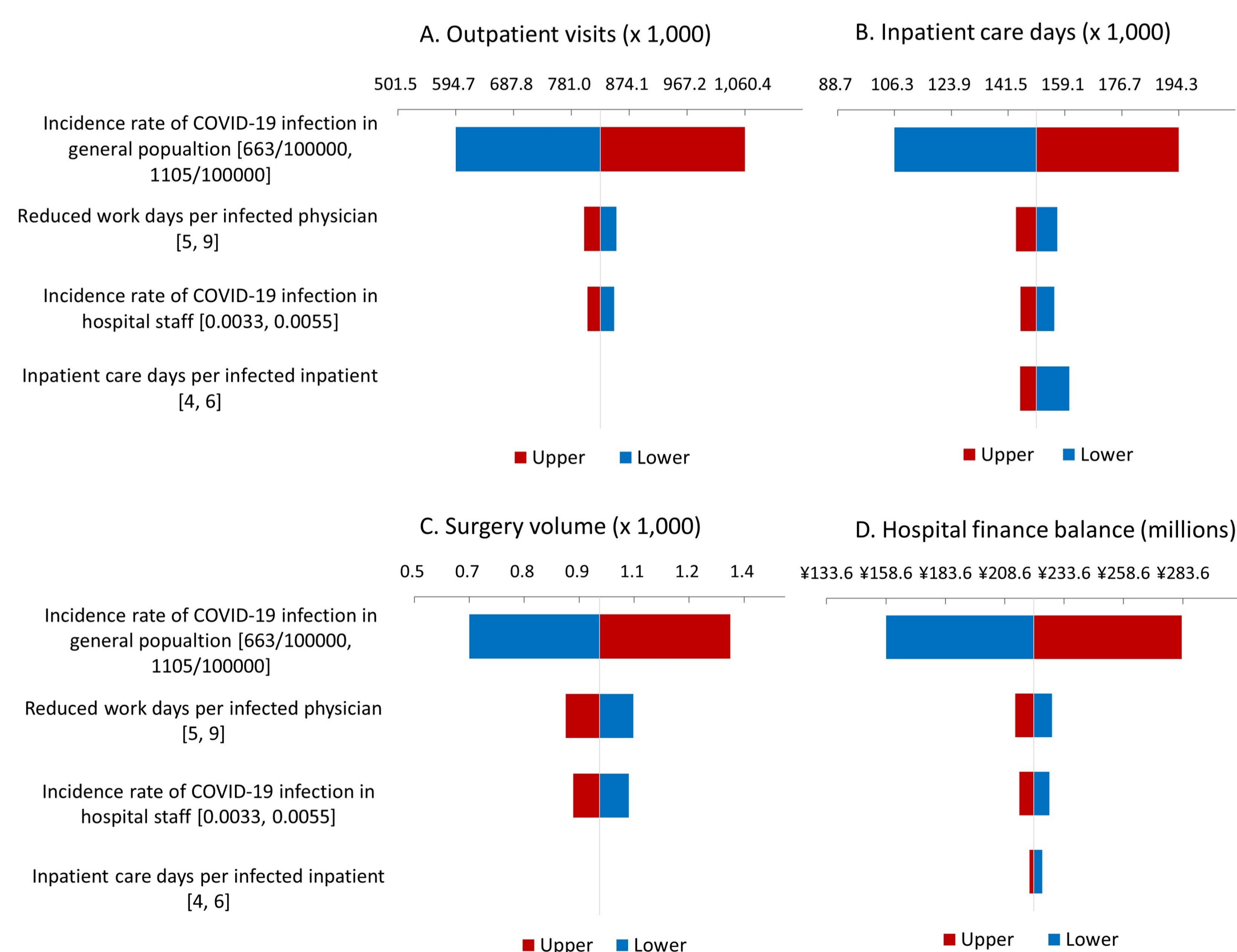
RESULTS: CHANGES OF THE HOSPITAL FINANCIAL METRICS AFTER THE OUTBREAK OF COVID-19.

Financial metrics	Outbreak phase vs. Pre-outbreak phase			Post-outbreak phase vs. Pre-outbreak phase		
	Provincial tertiary hospital	City tertiary hospital	County tertiary hospital	Provincial tertiary hospital	City tertiary hospital	County tertiary hospital
Total revenue	-40.1%	-17.9%	-24.80%	4.80%	7.30%	15.00%
Outpatient service income	-46.2%	-30.6%	-22.70%	4.70%	3.50%	11.90%
Inpatient service income	-45.5%	-17.1%	-25.10%	3.70%	4.40%	20.20%
Basic government financial subsidy	97.3%	-25.0%		37.20%	1.40%	
Project-based government subsidy	214.5%	63.4%		5.80%	259.30%	
Total expenditure	-15.4%	-14.8%	-14.80%	1.10%	3.10%	3.10%
Employee salary	34.2%	-8.5%	-1.50%	3.30%	12.40%	34.60%
Drug costs	-47.6%	-24.6%	-27.50%	-11.90%	-9.10%	0.60%
Medical supply costs	-39.1%	-23.0%	-21.90%	27.00%	7.60%	19.60%

RESULTS: BASE CASE ANALYSIS ASSESSING THE UTILIZATION OF HOSPITAL SERVICES AND HOSPITAL FINANCIAL METRICS PER QUARTER: LOOSE CONTROL VS. STRICT CONTROL

Pandemic control strategy	Loose control	Strict control	Difference
<i>Total number of infected patients</i>	18904	18904	0
<i>Number of infected outpatients</i>	13543	13543	0
<i>Number of infected inpatients</i>	5361	5361	0
<i>Hospital services (x 1,000)</i>			
<i>Outpatient visits</i>	853.652	26.15	827.502
<i>Inpatient care days</i>	237.096	86.758	150.338
<i>Surgery volume</i>	29.765	28.781	0.984
<i>Reduced health services due to infected physician (x 1,000)</i>			
<i>Outpatient visits</i>	103.822	931.324	-827.502
<i>Inpatient care days</i>	25.635	201.451	-175.816
<i>Surgery volume</i>	0.345	1.329	-0.984
<i>Hospital revenue (million)</i>			
<i>Outpatient care</i>	¥524.05	¥16.05	¥508.00
<i>Inpatient care</i>	¥828.68	¥303.23	¥525.45
<i>Surgery</i>	¥222.20	¥214.85	¥7.35
<i>Infected inpatient care</i>	¥43.53	¥0.00	¥43.53
<i>Government financial subsidies</i>	¥19.45	¥19.45	¥0.00
<i>Total revenue</i>	¥1,637.92	¥553.59	¥1,084.33
<i>Hospital expenditure (million)</i>			
<i>Outpatient care</i>	¥422.67	¥12.95	¥409.73
<i>Inpatient care</i>	¥668.36	¥244.57	¥423.80
<i>Surgery</i>	¥102.89	¥99.49	¥3.40
<i>Infected inpatient care</i>	¥35.11	¥0.00	¥35.11
<i>Pandemic control</i>	¥1.60	¥10.08	¥-8.48
<i>Fixed operation costs</i>	¥357.98	¥357.98	¥0.00
<i>Total expenditure</i>	¥1,588.61	¥725.06	¥863.56
<i>Financial balance (millions)</i>	¥49.31	¥-171.47	¥220.78

RESULTS: ONE-WAY SENSITIVITY ANALYSIS FOR THE UTILIZATION OF HOSPITAL SERVICES AND HOSPITAL FINANCIAL METRICS PER QUARTER: LOOSE CONTROL VS. STRICT CONTROL



CONCLUSIONS

- The COVID-19 pandemic control measures significantly reduced the utilization of hospital services and resulted in financial losses for Chinese tertiary care hospitals, regardless of their rankings.
- A less stringent pandemic control strategy in Chinese tertiary care hospitals might be more appealing, as it allows for maintaining hospital service capacity and ensuring a healthy financial status.

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