

# The Growth of Online Consultations in China: A 10-year Sequential Cross-sectional Study of 65,305 Clinicians

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## Background

- The COVID-19 pandemic significantly elevated the utilization of online consultations, one of the key components of telemedicine.
- Online consultations have emerged as a pivotal aspect of patient-centric care, garnering substantial attention within the field.<sup>1,2</sup>
- As a result of the heightened acceptance of online consultations in China, this platform is becoming a costeffective and feasible way to provide equitable access to healthcare services and bridge the gap between rural and urban medical services.<sup>3</sup>

## **Methods**

Study design

• This is a sequential cross-sectional survey-based study to evaluate the usage of online consultation among clinicians from different specialties between 2014 and 2023 (Figure 1).

#### Study population and recruitment:

- Clinicals were recruited from 31 provinces covering Eastern, Central, and Western regions in Mainland China (Figure 2).
- Stratified random sampling was applied to invite participants according to the geographic distribution of registered clinicians. Inclusion criteria:



Figure 2. Distribution of participants in China



• The landscape of online care and consultations in China is vast and diverse. Yet, there is limited comprehensive research on the trends and utilization of online consultations in China.

# **Objective**

This study aims to investigate the nationwide trends of online consultations over 10 years in China.

- Clinicians who worked at the rank of medical officer or above from Tier II and Tier III hospitals
- Have experience providing advice to patients through the Internet, indicated by having time spent on online consultations over the weeks.

#### Data collection and analyses

- The basic demographic information on gender, age, career levels, the specialties of practice, hospital levels across the region and city, and time spent on work-related online activities were collected.
- The average time spent on online consultations per week was the main outcome.
- Univariate and multivariate analyses were conducted to compare the profile differences of using mobile health applications.

## Results

#### **Respondents' characteristics**

- A total of 65,305 clinicians from 39 clinical specialties from over two thousand hospitals were anonymously surveyed in the past ten years (Figure 1).
- There were more participants in the provinces near the eastern parts of China, including Shanghai (4.7%), Zhejiang (7.5%), and Shandong (9.7%), than those in the western provinces, such as Xinjiang (0.9%) and Qinghai (0.3%) (Figure 2).

### Time spent by clinicians on online professional activities

- On average, clinicians spent 36.5 hours per week on online activities in 2023 which increased from 20.7 hours per week in 2014.
- They engaged around half of their online activity time (from 46.4% in 2014 to 49.5% in 2023) in professional activities, including medical consultation, career networking, and self-learning (Table 1).

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## Table 1. Online Professional Activities among the Survey Participants between 2014 and 2023.

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Figure 3. Trends of Average Online Consultation Time across (A) Internal Medicine, (B) Surgery, (C) Other specialties between 2014 and 2023.



-Cardiology — Endocrinology — Gastroenterology & Hepatology — General Medicine — Neurology --- Respiratory Medicine COVID-19 period (2020-2022)



		No. of Clinicians	(n=47,037)	(n=55,499)	(n=65,139)	(n=65,305)
Specialties						
Internal Medicine	General Medicine	1,688(6%)	2.4 ± 3.1	2.5 ± 2.6	14.0 ± 11.5	17.9 ± 14.4
	Respiratory Medicine	3,566(12%)	2.4 ± 3.0	2.4 ± 2.6	14.3 ± 11.5	18.0 ± 14.4
	Neurology	3,705(13%)	2.4 ± 3.0	2.6 ± 2.9	14.3 ± 11.7	18.2 ± 14.4
	Endocrinology	3,550(12%)	2.4 ± 3.0	2.3 ± 2.5	14.1 ± 11.9	17.9 ± 14.5
	Cardiology	4,804(17%)	2.3 ± 3.2	2.3 ± 2.8	13.7 ± 11.3	17.2 ± 13.9
	Gastroenterology & Hepatology	4,454(15%)	2.4 ± 3.1	2.3 ± 2.5	13.6 ± 10.8	17.3 ± 13.3
	Others*	7,120(25%)	2.4 ± 3.2	2.4 ± 2.6	14.5 ± 11.8	18.3 ± 14.4
Surgery	General Surgery	2,288(15%)	2.1 ± 2.6	2.2 ± 2.3	11.8 ± 9.7	15.2 ± 12.0
	Breast Surgery	594(4%)	2.4 ± 2.9	2.2 ± 3.0	12.0 ± 9.8	15.6 ± 12.5
	Neurosurgery	933(6%)	1.9 ± 2.0	2.2 ± 2.1	11.9 ± 10.1	15.1 ± 11.8
	Orthopedics & Traumatology	4,137(27%)	1.8 ± 2.5	1.9 ± 2.0	10.7 ± 8.6	13.5 ± 10.3
	Gastroenterology & Hepatology	1,647(11%)	2.0 ± 2.3	2.0 ± 2.1	11.5 ± 8.6	14.3 ± 10.3
	Cardiothoracic Surgery	1,118(7%)	1.8 ± 1.9	1.8 ± 1.8	11.2 ± 8.8	14.0 ± 10.2
	Others*	4,783(31%)	2.1 ± 2.7	2.1 ± 2.2	11.5 ± 9.3	14.7 ± 11.3
<b>Other Specialties</b>	Primary Care	1,594(8%)	2.9 ± 3.9	2.8 ± 3.2	14.9 <b>±</b> 12.8	19.5 ± 16.3
	Paediatrics	2,388(11%)	2.6 ± 3.5	2.3 ± 2.7	13.7 ± 11.9	17.4 ± 14.8
	Obstetrics & Gynaecology	2,512(12%)	2.5 ± 3.9	2.2 ± 2.5	13.1 ± 11.4	16.9 ± 14.1
	Psychiatry	1,531(7%)	2.8 ± 4.5	2.6 ± 2.8	14.4 ± 11.8	18.8 ± 14.8
	Oncology	5,173(25%)	2.4 ± 2.8	2.5 ± 2.7	14.9 ± 11.8	18.8 ± 14.3
	Dermatology & Venereology	997(5%)	2.9 ± 4.0	2.6 ± 2.9	13.6 ± 12.4	18.5 ± 15.5
	Others*	6,723(32%)	2.2 ± 2.9	2.3 ± 2.6	13.3 ± 11.0	16.7 ± 13.3

### Trend of time spent on online consultation among clinicians

- Time spent on online consultation has increased over the past 10 years from 1.1 to 2.9 hours with an average annual growth rate of 26%.
- Dermatology & Venereology was the top-ranked specialty in online consultations usage in 2014, while primary care and paediatrics clinicians were the top-ranked in 2023.
- A general trend of increased time spent on online consultation can be observed with a particular spike during COVID-19 (2020-2021) (Figure 3).

#### Channels used to deliver online consultation

- Mobile health has become popular for online consultation on portable devices.
- WeChat is the most common platform used (81.4%) (Figure 4).



- Figure 4. Different Channels (WeChat, Mobile App and Website) used for Online Consultation
  - Website, Mobile Apps & WeChat users (19.3%)
  - Website & WeChat users (14.2%)
  - Website & Mobile Apps users (5.0%)
  - Website only users (3.1%)
  - Mobile Apps & WeChat users (22.8%)
  - Mobile App only users (10.4%)
  - WeChat only users (25.1%)

## Conclusion

- Online consultations have become popular across different clinical disciplines in China over the past 10 years.
- Online consultations encourage remote health management under the supervision of healthcare professionals.
- There is a good acceptance of using mobile health for online consultations, and it may further enhance the accessibility of healthcare services, especially for patients who live in rural areas. Cost-effective analysis of mobile health research is recommended.

## References

- 1. Li J, Wilson LS. Telehealth Trends and the Challenge for Infrastructure. Telemed J E Health 2013; 19: 772–9.
- 2. Wilson LS, Maeder AJ. Recent Directions in Telemedicine: Review of Trends in Research and Practice. Healthc Inform Res 2015; 21: 213
- 3. Gao J, Fan C, Chen B, et al. Telemedicine Is Becoming an Increasingly Popular Way to Resolve the Unequal Distribution of Healthcare Resources: Evidence From China. Front Public Health 2022; 10: 916303

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