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**ALGORITHMICALLY VULNERABLE CONSUMERS:
REDEFINING VULNERABILITY IN ACCESSING
HEALTH SERVICES IN CHINA**

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Algorithmically vulnerable consumers: Redefining vulnerability in accessing health services in China

Prepared for Eleventh Meeting of the UNCTAD Research Partnership Platform

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Why is it important for policy makers and regulators?

- Who are vulnerable customers defined by algorithm?

- What factors cause consumers' vulnerability?

- What are implications for future policy of consumer protection?

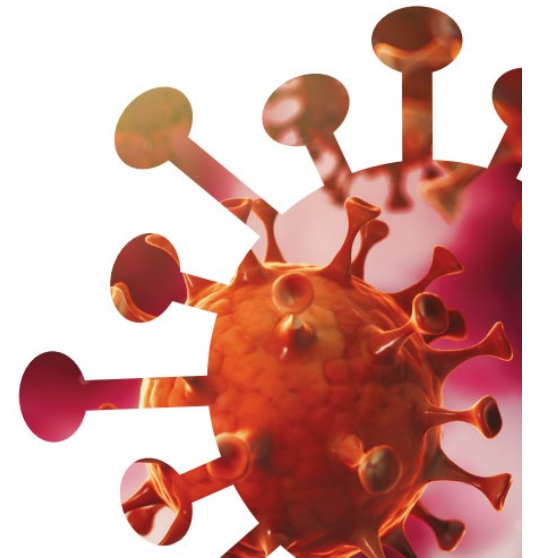# What is *algorithmically vulnerable consumer?* And why now?

- Technologies such as AI have started to change our understanding of '**consumers**' and '**vulnerable consumers**'

- COVID provides a timely opportunity to extend the scope of accessible '**public utility**'

- An example to illustrate algorithmic consumers: **eHealth in China**

Introducing new risks of vulnerability among consumers

Factors	Features of vulnerability	Impact on policy making and regulatory implementation

Biological factors (e.g. disability) (Cartwright 2015)
 	
Psychological factors (e.g. mental health) (Stephens, et al., 1994; Brennan)
 	
Socio-demographic factors (e.g. gender, race, education, financial situation) (FCA, 2019, 2020)
 	
Resilience (awareness, skills of self-management, capacity to seek redress) (Baker, et al., 2005)
	• Unable to control to unfair treatment
	   • Unable to choose or access(EC, 2016) products/services
	   • Incapable to maximise his/her well-being (EC, 2016)
		Currently available policies often target specific groups of consumers

Algorithmic bias (Gal & Elkin-Koren, 2016; Whittaker, et al., 2019)	• Unable to control to unfair treatment
	   • Less autonomy
	   • Unfairly represented
	   • Likely discriminated
		The increasing risks of marginalising certain groups of consumers

Algorithmically vulnerable consumers

are those who are harmed or receive unfair treatment due to mis-designed machine learning algorithms and/or biased large-scale data, i.e. input data for machine learning that is not representative of consumers in our real society, which in turn causes algorithms to develop a systematic bias towards certain groups that is not obvious from the algorithm's description itself.
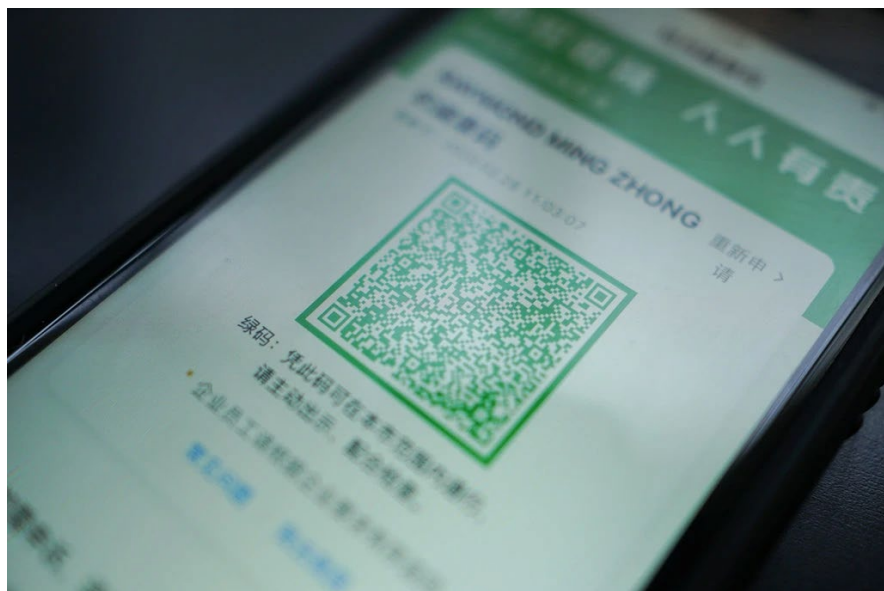
The QR code inside the Alipay app. Green is good, and allows the holder to travel freely. Credit.Raymond Zhong/The New York Times
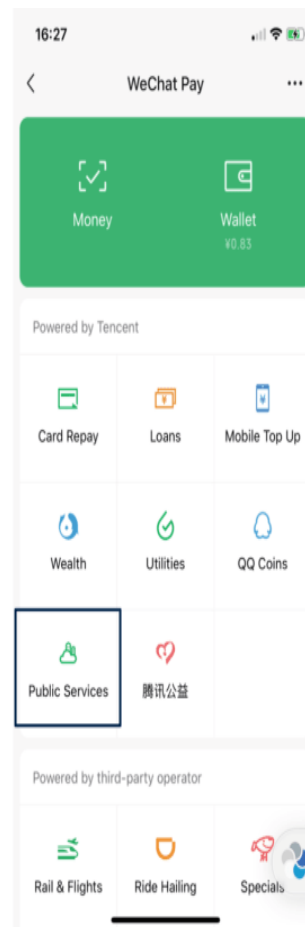

【绿码】

【黄码】

【红码】

Appointment booking & telehealth

Search by hospital, physician, specialty, and condition.

Pre-Visit Consultation, starting at $1.5.

Personal health records management

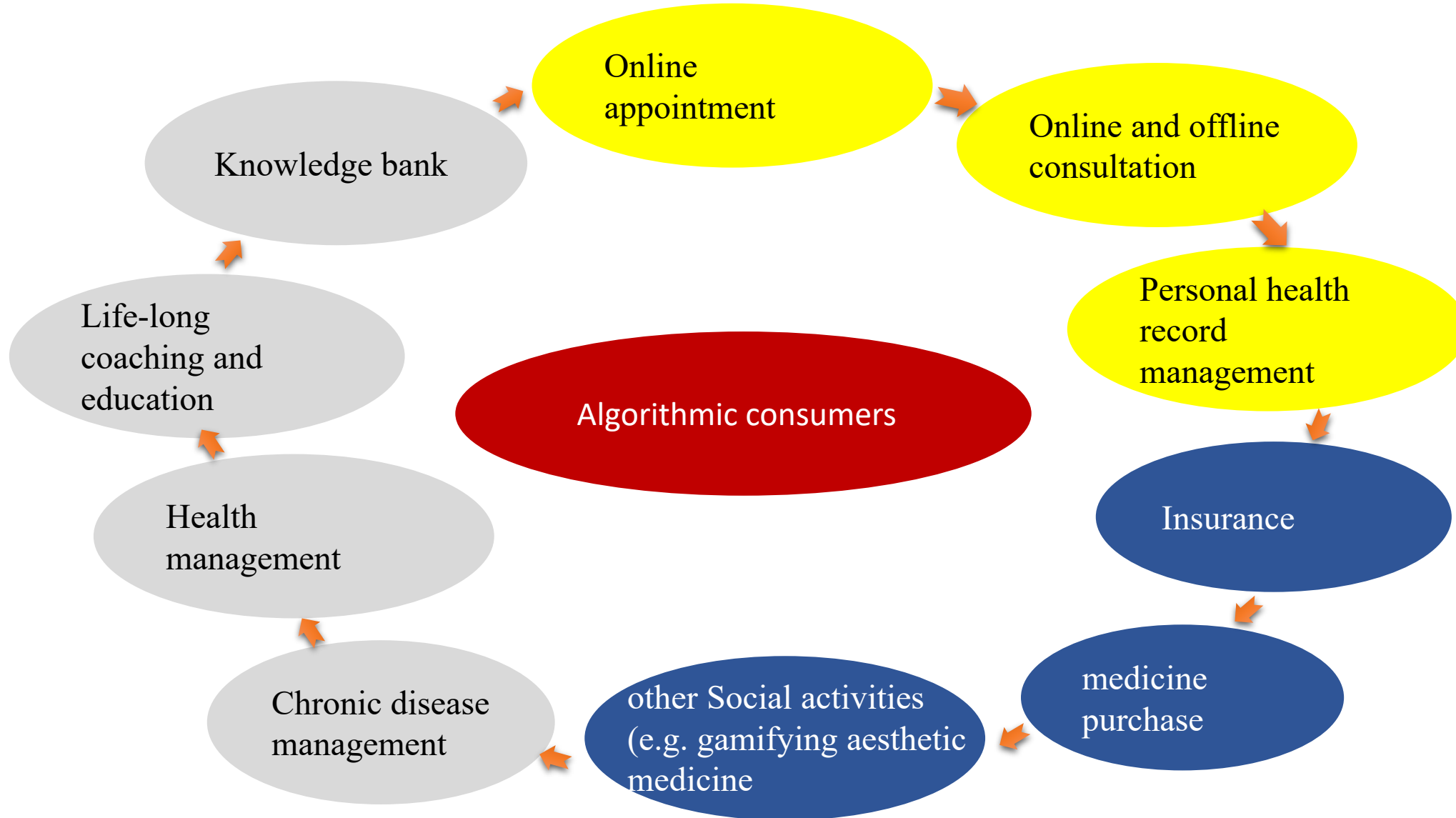Pay for ambulatory visits

Read diagnostics results

Check health records

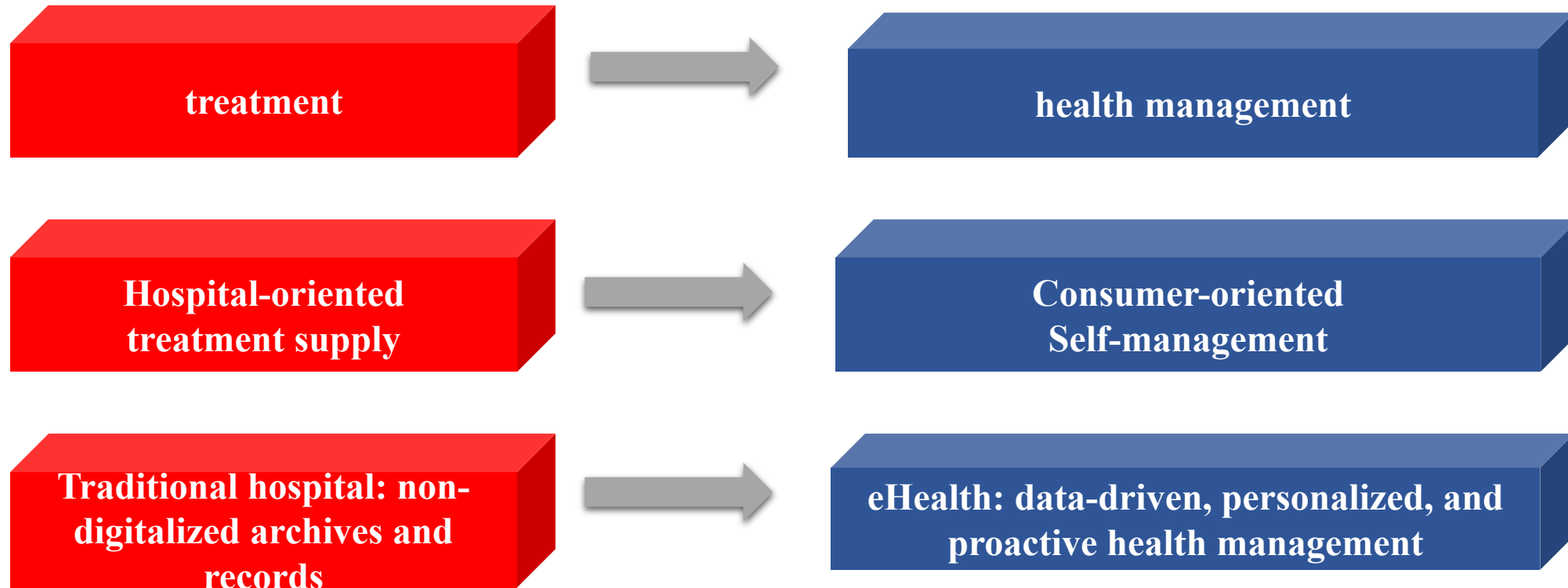## Consumers-facing knowledge platform

Group-buying healthcare products & services

By cbinsights.com

New models for Chinese consumers to access health resources

Features of eHealth evolvement in China

treatment	→	**health management**
Hospital-oriented treatment supply	→	**Consumer-oriented Self-management**
Traditional hospital: non-digitalized archives and records	→	**eHealth: data-driven, personalized, and proactive health management**

Categorization of data collected from consumers and used for training data

Meta data

Interactional data

Registration data

Profiling data

Biometrical data

Attribution data

Relational data

Expression data

Attitude data that indicates what users believe and expresses their thoughts

Behaviors, sports and health

Algorithmically vulnerable consumers

Behavioral data

Context data

Payment data

Scenario data

Trend data

Card info

Transaction data

(Xue, 2016, adapted from on the work of Edwards, and Leimbach, *et.al*.[1]

Policy implement and future implications: Reflections on Chinese experience

Awareness

- Increase local regulatory authorities' awareness of long-term social impact
- Guidelines for algorithm developers and operators with providing examples of fairly designs
- Guidelines to increase consumers' knowledge of vulnerability caused by algorithm

Regulatory effectiveness

- Policy incentives to encourage the service providers with fairly designed algorithm
- Policy incentives to encourage technology-enabled protection mechanisms for consumers

THANK YOU!