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Mobile Health in China: Well Integrated or a New Divide?

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Abstract

The application of mobile health holds promises of achieving greater accessibility in the evolving health care sector. The active engagement of private actors drives its growth, while the challenges that exist between health care privatization and equitable access are a concern. This article selects the private internet hospital in China as a case study. It indicates that a market-oriented regulatory mechanism of private mobile health will contribute little to improving health equity from the perspectives of egalitarians and libertarians. By integrating the capability approach and the right to health, it is claimed that mobile health is a means of accessing health care for everyone, where substantive accessibility should be emphasized. With this view, this article provides policy recommendations that reinforce private sector engagement for mobile health, recognizing liberty, equity, and collective responsibility in the Chinese context.

Keywords: mHealth; health care privatization; capability approach; justice; the right to health

Introduction

The question of how to enhance health equity and address social determinants of health is crucial for every country in the world.¹ The combination of new technology and health care, such as mobile health (“mHealth”), is expected to contribute to this issue by making health care more accessible and sustainable.

The term *mHealth* refers to “medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices,” according to the World Health Organization.² In contrast to in-person care at conventional hospitals, mHealth is particularly beneficial to home care. By providing a broader geographical scope to efficient and personalized services, mHealth expands both accessibility and availability of health care. These added values place mHealth in a unique position for future health care service delivery.

In China, mHealth is growing vibrantly. Tech giants and startups are actively entering this new area, driven by novel technologies and favorable policies.³ The involvement of private actors, a key driver of mHealth, points toward a new phenomenon in health care privatization. Within this evolving health care context, various services are being commodified in mHealth provided by the private sector, allowing individuals to purchase them as desired. How do we address the relationship between private mHealth and health equity?

Studies on health care privatization in China have predominately examined social policies from the perspective of economic theory.^{4,5} Ethical theory, however, plays an equally important role in analyzing the private sector and formulating health policies. In health, justice is intrinsically related to equity and equality. Equity and justice are also among the core principles underlying China’s national health strategic plan, according to Healthy China 2030. Therefore, this article attempts to discuss the extent to

which private mHealth could realize equitable access to health care. In what ways should health policy be amended to manage mHealth in the private sector adequately?

For this purpose, the context of mHealth is introduced. Classical ethical theories, specifically egalitarian and libertarian are then applied to analyze the prevalent market-based, consumer-driven mHealth initiatives. It appears that the current practice of private mHealth contributes little to the achievement of health equity. Next, an alternative path to address private mHealth toward justice is provided by applying the capability approach (CA). Finally, some policy recommendations designed to manage mHealth in the private sector are put forward.

mHealth and Privatization of Health Care

The Health Service Delivery System

The health care sector in China provides an interesting case to discuss health care privatization. On the one hand, the government plays a primary role in managing all functions of the health care domain, including financing, oversight, regulation, and service provision.⁶ Under a state-led strategy, the country has achieved near-universal basic health insurance coverage for 1.3 billion people, with the out-of-pocket payment proportion decreasing from 35.29% in 2010 to 28.36% in 2019.⁷ The substantial progress reaffirms the role of the state in the public sector health care reform since 2009.^{8,9} On the other hand, much still needs to be done to improve this public-hospital centric system, considering the increased financial burden, the uneven distribution, and inefficient uses of resources.^{10,11} In the absence of strict referral rules, most patients tend to bypass primary health care, leading to overcrowding in large public hospitals in urban areas. In addition, disparities in social arrangements affect the outlook of health equity and the sustainability of this health care system.¹² These challenges undoubtedly require a mixed health service delivery system through private sector engagement.

mHealth in the Private Sector

The emergence of mHealth diverts private engagement to a promising area. The so-called internet hospital, one type of mHealth, is a particularly prominent emerging phenomenon in the field. The internet hospital is an integrated platform in the form of a mobile app, which provides one-stop health care services at the user's fingertips, including appointments, consultations, e-prescriptions, drug delivery, and health care management. Amongst these services, consultation is one of the most frequently used services provided by the internet hospital. Patients may consider to request online medical consultation before visiting a hospital in person. After an initial examination at a conventional hospital, patients can also choose an internet hospital for further consultation and subsequent treatment. As of January 2019, there were 130 registered internet hospitals, covering 73.5% of China.¹³ While approximately two-thirds of these internet hospitals are initiated by private enterprises, those owned by public hospitals are increasingly dominant in the market.^{14,15} Nevertheless, more than half of the users choose private internet hospitals for disease consultations.¹⁶ Given the success of the digital economy and the high penetration of mobile networks, tech companies are keen to advance mHealth.

Mobile health can provide timely, accessible, and convenient services, but it may lead to new problems. One of those problems is related to health equity. Private internet hospitals intend to be profitable. In a leading private internet hospital, patients can choose skilled doctors from top-level hospitals nationwide. As a result, the cost of services is higher than the standard rate of public hospitals. For example, a comparison of the medical service prices charged by two leading private internet hospitals shows that they vary widely, ranging from 50 RMB to 1,680 RMB.¹⁷ In contrast to the guided price (50–100 RMB) imposed by the government on public hospitals, private internet hospitals do not adopt a uniform pricing standard. Even doctors who are associated with the same public

hospital charge different service fees at different private internet hospitals. This outcome echoes some findings from earlier studies.^{18,19}

Private health care in low-income and middle-income countries is very heterogeneous.²⁰ The evidence supporting the claim that the private sector ensures equity of access is relatively weak, since it often leads to the exclusion of the poor²¹ and high levels of out-of-pocket payment.²² Yet whether private sector mHealth would impact health equity is dependent on the choice of regulatory strategy. What is more, the distinguishing features and added benefits of mHealth may suggest an arrangement that differs from previous settings in the private sector. It is, therefore, necessary to assess the current regulatory method for private mHealth.

The Current Regulatory Method and Likely Consequences from Egalitarian and Libertarian Perspectives

Market-Oriented Mechanism

As in some other countries, China has introduced different legislative measures and policies to regulate publicly and privately owned medical institutions. Realizing equal access to basic health care is the fundamental principle in Chinese law.^{23,24} As for the public sector, its primary task is to guarantee accessible basic health care. In the private sector, however, the distribution of health care is market-based, with emphasis on individual choices and meeting personal needs.²⁵ This market approach allows private medical institutions to set their own prices for various services, while the price list needs to be transparent and subject to further oversight. Consequently, medical expenses incurred in private medical institutions are mainly paid through out-of-pocket payments or reimbursed by commercial insurance companies. Private mHealth follows this market-oriented mechanism. Since the differences between mHealth and hospital in-person care are considerable, what are the possible implications of this pro-market policy for health equity?

Egalitarianism vs. Libertarianism

The concept of justice has long been applied to discuss equality and equal distribution of social goods. Those theories derived from values, ideals, and interests of different societies and cultures elaborate many dimensions of justice, suggesting that the application of only one camp to issues in health care may lead to an ideologically predetermined result.²⁶ In the priority setting of health care, the contrasting egalitarian and libertarian theories provide a good interpretation for the public and private divide.²⁷ Therefore, in this section, both egalitarian and libertarian views are considered to examine the possible consequences of this market-based mechanism for regulating private mHealth.

Egalitarianism foregrounds equal access as a key principle of justice. According to Rawls, fair distribution means meeting individuals' needs for primary goods.²⁸ A just society should ensure individual's "equality of opportunity," in particular for those who are less off than others.²⁹ In this sense, egalitarian theory recognizes the principle of need and equal opportunity of access to health care. Libertarianism, however, emphasizes individual rights and freedom. In Nozick's entitlement theory, a just distribution of goods is on a basis of the appropriate history, the rules of acquisition, transfer, and rectification.³⁰ Contrary to the principle of equal access according to need, Nozick's libertarian theory considers the process of distribution, in which such distribution is determined by the market. In the free market mechanism, the individual is in the best position to choose which goods to purchase by using personal wealth. Neoliberalism, used by scholars to modify *laissez-faire* libertarians, further advocates market competition and a strong regulatory capacity of the state to manage the participation of private actors.³¹ The introduction of these two views on justice indicates that egalitarian theory would be most applicable to examine the relationship between the private sector and equal access to health care, while libertarian theory would be best suited to test the performance of the private sector itself. In the next section, by applying these two theories, some speculative answers are provided as to how this market approach would affect health equity.

Egalitarianism: Ability to Pay as a Barrier to Access Health Care

Egalitarianism highlights equal access to health care according to individual medical needs. The key question here is how need is defined. The use of a market-oriented mechanism is ethically justified when the private sector aims to provide special services or intends to meet the preferences of individuals. For instance, individuals can receive a greater degree of personal care in accordance with their preferences and demands (e.g., VIP services or private maternity care) at a for-profit private hospital. These inpatient services can be easily differentiated from health care provided by public hospitals.

However, it may not be easy to draw the line between private internet hospitals and public hospitals in terms of some medical services. For instance, the primary medical service provided by internet hospitals is medical consultation. The service contents do not differ considerably from outpatient care provided by public hospitals. Furthermore, many doctors have dual practices. Chinese news media reported that a leading private internet hospital contracted with doctors from the top 100 public hospitals.³² Consequently, private internet hospitals create a new channel for patients to access services provided by skilled doctors from public hospitals. In other words, it appears easier for patients who can afford market prices to receive timely and medical consultations of good quality via private internet hospitals.

One might contest that a parallel system created by private internet hospitals does not restrict people from accessing health care at public (internet) hospitals. Indeed, the public sector is primarily responsible for basic health care, which should be accessible to all. Nonetheless, one can hardly deny that private internet hospitals offer an easier and quicker solution for patients to receive some health care services, given that public hospitals in big cities are nearly full. Even overcrowding and long waiting times could soon become a problem in public internet hospitals, since skilled physicians from top hospitals are generally overworked and overloaded.³³ Moreover, there are significant disparities in accessibility and quality of health care between urban and rural areas.³⁴ Thus, mHealth offers opportunities for people from underserved places to access quality services in a timely manner. When health care distribution is based on an individual's ability to pay, it may prevent some people from enjoying the major benefits that mHealth offers.

Libertarianism: Public–Private Divide but No Collaboration in Health Care

From a (neo)libertarian perspective, two elements may affect the performance of the private sector with respect to justice. The first element is the regulatory mechanism; the second element is market competition. Research shows that the regulatory framework for the private sector is weak.³⁵ Furthermore, there are wide local variations, leading to deficiencies in government stewardship mechanisms.³⁶ This governance approach may pose a challenge to local governments in less-developed areas, which have only a limited workforce and experience to oversee the health care sector. Given that more resources are allocated to the public sector, attention to scrutinize medical practices at private internet hospitals would have to be reduced.

In terms of competition, most private hospitals in China are currently not capable of competing with large public hospitals, mainly because of the uneven distribution of resources and the shortage of highly skilled health care workforce.³⁷ The “dual practice” policy does enhance the mobility of doctors who work in large public hospitals, allowing them to practice in multiple hospitals across the country. It is, nevertheless, an interim proposal. The situation that the private sector relies heavily on skilled doctors of the public sector for quality services remains unchanged. In a nutshell, private mHealth is unlikely to compete with the public sector under this condition.

A more likely scenario is that private mHealth competes within the private sector. To obtain a competitive position in the market, a growing number of internet technology giants are increasing their investments in mHealth. With the trend toward offering novel products and personalized medicine, health care expenditure in this area is likely to increase in the future. Some high-tech-driven mHealth interventions would presumably target the affluent who are willing to pay, given a profit-seeking incentive. This trend would ultimately create a sharp public–private divide in health care, making the private sector's contrition to health equity almost null.

Overall, this assessment in light of both egalitarian and libertarian perspectives reveals that the market-oriented regulatory approach in private mHealth appears problematic. The individual's financial capacities may have an impact on her opportunity to access health care via mHealth in the private sector. Although the original intent of engaging the private sector is to diversify health care services and release the burden of the public sector, the outcome might not be satisfactory. As an innovative intervention, mHealth will expand its service types and play an increasingly important role in home care service delivery. Considering its future development, this regulatory practice needs to be changed. Is there any alternative path worth considering?

The Capability Approach (CA)

While egalitarian and libertarian views can be employed to assess both the public and private health care sectors, a direct application of either approach is unlikely to provide a plausible solution for regulating mHealth. The most prominent problem of strict egalitarianism is the conflict with the scenario that stresses the individual's choice and responsibility.³⁸ In private mHealth, it is as difficult to adopt the direct egalitarian view as it is in the public sector. Furthermore, the allocation of health care through market mechanisms does not take into account social-economic disparities among individuals. Health equity is not only about the fair distribution of health and health care, but also it refers to broader issues of justice in social arrangements.³⁹ Poverty, poor education, and pollution all influence health and the health of the least-advantaged groups, in particular.⁴⁰ To achieve health equity in the context of private mHealth, Sen and Nussbaum's sufficiency of capability approach (CA) may provide better solutions.

Although Sen recognized the value of the market economy and free market mechanisms, he realized that the market itself cannot distribute health care services. The CA stresses the freedom of individuals, requiring every individual to have a real opportunity to pursue a (healthy) life according to her own desire.⁴¹ In addition, Sen defends the notion of "basic capability" by shifting attention from the equitable distribution of primary goods to what goods do to human beings.⁴² By changing the focus from means to ends, this theory considers how social arrangements may impact the individual's abilities as she pursues the ends.⁴³ Given scarce resources and inequalities between different groups, a sufficiency of capabilities approach is further specified in Nussbaum's theory of justice. It develops a threshold of basic human capabilities, indicating that the individual's capabilities should be guaranteed to a sufficient level.⁴⁴

The CA is also closely associated with human rights and the right to health.^{45,46,47} Sen indicates that both human rights and capabilities link to freedom.⁴⁸ "Opportunity" and "process" are two aspects of freedom, while capability concentrates on the substantive opportunity of freedom and human rights.⁴⁹ Since the CA cannot address adequately the process aspect of freedom, the right to health perspective may help to fill. Respect for the individual's access to health care is the fundamental principle in health care, which should be observed by both public and private actors. The realization of the right to health unfolds two aspects of justice: substantive and procedural. Specifically, it calls for equality of accessible health care on a non-discriminatory basis, with priority given to the most vulnerable or marginalized groups.⁵⁰ In addition, it requires a transparent, explicit and fair process for people's participation.⁵¹ Furthermore, the human rights based approach to health emphasizes a state's accountability and the collective responsibilities of non-state actors.⁵² The state should take measures to ensure that privatization of the health sector does not pose a threat to the realization of the right to health.⁵³ Seeing through the lens of the right to health may help complement the substantive focus and the process aspect of the CA and extend the connections to complex, evolving health care practices such as mHealth.

The CA could provide insights into the regulatory mechanism of private mHealth for several reasons. This idea is not closely tied to a particular cultural and historical tradition, thereby creating a universal language that is applicable to any given situation.⁵⁴ By emphasizing the freedom of individual choice and equality in health capability, this framework recognizes liberty and equality as co-existing values in health care.⁵⁵ It respects the individual's ability to choose health care services they deem appropriate while indicating that we should not ignore the equitable accessibility of

disadvantaged groups. Thus, the CA fits the context of mHealth which values both individual choice and accessibility of health care.

Moreover, the CA can be applied to justify a two-tiered system created by private mHealth. A tiered system allows individuals to purchase access to medical services that others with the same needs may not be able to afford.⁵⁶ Nevertheless, a sufficiency of CA would argue that we could respect the freedom of individuals to pay for medical services above a certain threshold.⁵⁷ In this sense, a potential compromise between egalitarian and libertarian perspectives is provided. It takes into account the constrained societal resources and recognizes individual liberties by mixing public and private sectors to achieve health care sufficiency. By extending Nussbaum's approach, scholars point out certain criteria under the norms of justice. For instance, what needs to be included in the first tier would be subject to its influence—whether the services will make a substantial difference to a sufficient level of capabilities.⁵⁸ In addition, satisfying personal preferences are not considered as necessary health care beneath the threshold.⁵⁹

Furthermore, the use of mHealth is reliant upon the capability of the individual. The concept of mHealth reflects redefined health as “the ability to adapt and to self-manage, in the face of social, physical and emotional challenges.”⁶⁰ As a user-driven intervention, the efficacy of mHealth depends on the individual's capability to make choices and take action to access health care. According to the CA, if a person has a less real opportunity to achieve things that she has reason to value, her individual advantage is determined to be lower than that of another.⁶¹ Thus, a just society should provide actual opportunities for the individual to seek autonomy and determine the (healthy) life plans she pursues. In the next section, the implications of the CA on the regulation of private mHealth are discussed.

Applying the Capability Approach to Manage mHealth in the Private Sector

By distinguishing means and ends, the CA examines to what extent social arrangements may impact the realization of an individual's capabilities. To design a regulatory strategy for private mHealth, it is first necessary to answer how we perceive mHealth and the role of the private sector in the realization of the right to health.

mHealth and Access to Health Care

Mobile health is essentially a means for individuals to access health care. The ubiquity and personal nature of mobile technology (devices) is the first reason to uphold this statement. The widespread use of information and communication technologies and affordable mobile devices allow individuals to pursue instant access to health care services almost everywhere. In other words, allowing individuals to receive efficient, accessible, and personalized health care are distinguishing features of mHealth. The second reason relates to its substantive focus on the individual. Mobile health is a user-driven intervention, which is first and foremost meaningful for individuals. Mobile health would be particularly useful for individuals living in rural areas and for older adults who suffer from chronic diseases. Costs and transportation convenience are key factors that affect the choices of rural residents for seeking health care.⁶² By using mHealth, they have more options of accessing quality health care that is otherwise mostly concentrated in large cities. Meanwhile, older adults age 65 account for 18.7% (264.02 million) of the country's entire population.⁶³ The rapidly aging population means that China will soon encounter an increasing demand for home care services. Given these salient features and facts, mHealth is not just a solution for seeking convenient and efficient care, it also provides opportunities for the poor and the vulnerable to access health care.

In the view of the CA, whether or not the individual has real opportunities of achieving the ends affects the ultimate realization of these ends. Perceiving mHealth as a means of accessing health care suggests that the individual must be provided with the real chances to pursue health and healthy lifestyles she values most. By linking mHealth to the realization of the right to health, it reflects the requirement of accessibility under General Comment 14 that mHealth is meant to benefit not merely a specific group but

every individual.⁶⁴ Simply increasing health care coverage via mHealth without taking into account the substantive accessibility of the disadvantaged is not sufficient. In this new health care context, it is vital to prevent the disadvantaged from being left behind once again. Therefore, a design of policy governing mHealth needs to consider every individual's substantive possibility (and the disadvantaged in particular) of using mHealth to access essential health care.

The Private Sector as an Integral Part

How we define the role of the private sector in health care is the other prerequisite for designing the regulatory measures of private mHealth. While the public sector is primarily responsible for basic health care services, it does not necessarily mean that the private sector should restrict itself to the provision of non-basic health care. The collaboration of the public and private sectors is reiterated throughout Chinese Health Law. For instance, the law encourages non-public medical institutions to provide basic medical services.⁶⁵ Also, for-profit medical institutions are supplements to the health care system.⁶⁶ This means that the private sector is seen as an integral part of this system. Furthermore, private actors should not be detrimental to equitable access to health care. This is the requirement under General Comment 14, which recognizes the collective responsibility of facilitating access to health care. Therefore, as an integral part of the health care system, the future development of the private sector needs to be aligned with a shared vision toward achieving health care accessibility.

Policy Recommendations: Meeting Basic Health Care Through the Public-Private Mix

Mobile health serves to access health care for everyone, given its distinguishing features and substantive focus. Meanwhile, the private sector shares the responsibility of fulfilling health care accessibility. Therefore, the accessibility of private mHealth should not be limited to privileged groups. Everyone needs to have real opportunities to benefit from necessary services provided by private mHealth. To strengthen this substantive accessibility of mHealth, there are some recommendations to be made inspired by the CA point of view.

First, it is important to define the extent to which medical services provided by private internet hospitals are deemed as basic health care. This can be facilitated by a fair participatory process with some substantive criteria. Both public stakeholders (regulators, patient representatives, physicians) and private actors should be invited to participate in the meeting. Through joint decision-making, it can determine the scientific appropriateness of online medical services, recognize the necessary needs of individuals and explore the common interests between different parties. With regard to substantive criteria, policymakers may consider whether the choice of different services could have a substantial impact on health (e.g., quicker access to skilled doctors for serious conditions). Having set the first step, the second step is to design a differentiated pricing mechanism for private internet hospitals. In the case of non-basic health care services, the market scheme can continue playing its role in determining the cost of medical services. This approach respects individual liberty and encourages technological innovations. As for basic health care services, the cost of medical services would be reimbursed by social health insurance or commercial insurance. It is worth mentioning that this commercial insurance needs to be different from most commercial insurance plans in China. This special commercial insurance should be affordable and accessible to all age groups, irrespective of individual health conditions. The good news is that this type of commercial insurance is emerging in some cities.⁶⁷ In addition, many internet hospitals offered free medical consultations during the COVID-19 pandemic. Free consultations could be encouraged on a regular basis by receiving a tax deduction in return. Last but not least, the integration of private mHealth into chronic disease management (basic health care) would be a direction. By creating an independent professional team and providing affordable services, it could share the burden of the public sector and meet the growing demand for home care in an aging society. Profitability would also be achieved, given the large population base.

Conclusion

Technological innovations have enabled individuals to have more choices to access health care. Mobile health is seen as a promising approach. The ethical analysis in this article points out that the individual's ability to pay may have an impact on the use of private internet hospitals under the market-oriented scheme in China. However, mHealth has distinguishing features that transform the way health care is being delivered. Mobile health holds promises of making health care accessible to everyone. This is particularly relevant for people living in remote rural areas and older population with limited mobility. By applying the CA to complement the right to health, this article proposes some recommendations for policymakers to regulate private mHealth. In doing so, it could guarantee equal access to health care and freedom of choice. The collective responsibility of the private sector is also recognized. Despite a forward-looking evaluation, the findings and suggestions of this article may help mHealth fulfill its promise and ultimately improve health equity.

Conflicts of Interest. The authors declare none.

Notes

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