

**S**ystemic challenges for the UK and Global healthcare markets and your understanding for the need for frugal innovation approaches.



## ABSTRACT

Global health markets varies greatly, ranging from the market based US models to the nationalised Cuban model. The UK model offers a national health service system combined with a small percentage of non-NHS providers. Each of these models share the inherent challenges of the healthcare market as well as issues arising from the changing global society, such as the growing global population, lack of access to healthcare and increasing healthcare cost.

With finite resources and finance, the most appropriate solution to such global systematic challenge is through innovation. However, not all innovations takes into account the economic and social dynamics of the market.

This essay discusses the fundamental make ups and challenges facing the UK and global health market and seeks to explore how frugal innovations can effectively address these challenges.

## 1.0 Introduction

The health market is the interaction of the healthcare users (consumer) and healthcare providers (supplier), be it directly or indirectly through intermediaries. Such interaction determines the cost of healthcare products and services being exchanged<sup>1</sup>. This can vary greatly in different market conditions.

The way in which health services are delivered also varies. In the global context, this ranges from the market-based model as seen in the US, where services are paid directly by patients or patients' health insurances; to the fully government-financed model, such as the national health system in Cuba. Others include markets that are supported through development aid, or smaller markets that are supported through charities or volunteering organisations.

The UK operates in between the highly privatized US market and the fully nationalized Cuban model, with an overall National Health System and a small mix of independent sector providers (ISP) - including social enterprises, local authorities and for-profit providers. Approximately 10% of the government health spend goes to such non-NHS providers<sup>2</sup>.

Each of these systems share the inherent challenges of the healthcare market as well as issues arising from the changing society, such as the growing global population, lack of access to healthcare and the increasing healthcare cost.

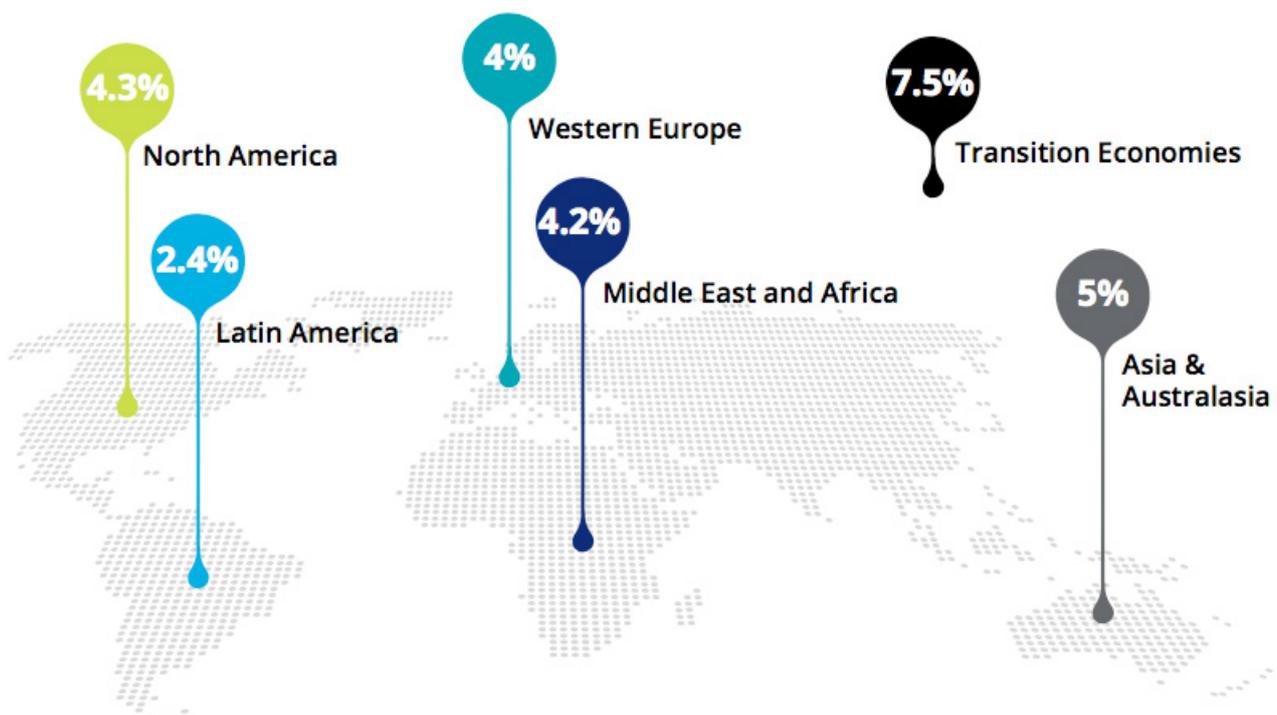
The following chapters look firstly at the fundamental make-up of the market economy in the healthcare sector and address its inherent challenges. It then discuss the benefits of frugal innovation, before addressing the role innovation play in the healthcare market.

## 2.0 Challenges of the Health Market

Globalization created interdependencies between all nations and brought many common healthcare challenges, the need to work together and on the determinants of health is ever more important. Evident in the domino effect of financial crises in 2008 and the speed at which global epidemics spread - from the current Zika outbreak to the 2014-16 Ebola epidemic. As the world 'shrinks' and medical, science and technology advances, world population grows rapidly and people live longer. The 7 billion human population is expected to increase to 9.5 billion by 2075<sup>3</sup>, all sharing the precious and finite resources: food, water and energy; and all demanding the fundamental human needs: health and wellbeing.

The emerging economies brought with them a large group of health care consumers estimated to consume one-third of global health expenditure<sup>4,5</sup>, with concerns that not necessarily aligning with the traditional US, European and Japanese markets. The infrastructure of the global healthcare market is complex and forms a major economic sector in its own right, accounting for US\$9.59 trillion according to pwc analysis<sup>6</sup> and \$8.7 trillion by 2020 according to Deloitte<sup>7</sup>.

One of the major challenges facing the health market, globally as well as within the UK, is the rising cost of healthcare. In an ideal free-market, it would be assumed that demands and



Health Care Growth Rates Through 2022. Showing Uniform increase in demand globally. Source: Deloitte.

supplies would inevitably find a balance and allocate resources effectively, thus settling on an equilibrium price.<sup>9</sup> However, the reality and the nature of the healthcare market system mean that such equilibrium is an unrealistic proposition, as, inherently, the healthcare system is far from an ideal competitive market<sup>10,11</sup>.

Professional licensing and regulations, long and costly training processes, expensive investment requirements, variation on quality and cost of care are some of the barriers that contravenes a level playing field for smaller and more recent entries to the market, or indeed, for exiting the market.

Thus, the healthcare market is prone to manipulation, imbalance or failure. As a result, major players in the healthcare system often have the power to control the market and set prices for products and services. Evident in examples where a pharmaceutical company gains patent on a drug - thus permits it, in effect, the monopoly of the market for the duration of the patent.

Furthermore health, in itself, is not a product or services in a traditional sense, as it cannot be exchanged between consumers nor does it necessarily provide satisfaction<sup>12</sup> (conditions of a patient may worsen or procedures can be painful). The demand for health is much dependent on the individual's willingness to regain good health<sup>13</sup>. Therefore, this poses a fundamental challenge

for the market, as it is more difficult to determine prices and quantities.

Another key challenge for the healthcare market is the inherent flaws in what economically understood as 'information asymmetry'<sup>14</sup>, such that one party within a transaction possesses more knowledge or information than the other party. In a doctor-patient context, the doctor as a provider of a service would, at the same time, be acting on behalf of a patient's interest.

This opens up potential risks for the 'supply induced demand'<sup>15</sup> where an individual controls the decision making process on both the supply and demand of a product. The scandals in NHS with GP practices profiting from funding is a clear example of "supply induced demand" driven by selfish profit making and the conflict of interest<sup>16</sup>.

It has been argued that such misalignment (information asymmetry) is a result of economic scarcity<sup>17</sup>, and many believe the best way to address information asymmetry is by encouraging free-market institutions and deregulation of healthcare industry thus opening up competition and encourage innovation<sup>18</sup>. As with the UK government's Health and Social Care Act 2012, a political decision that aimed to extend a market-based approach for the NHS.

But such argument is based on the assumption

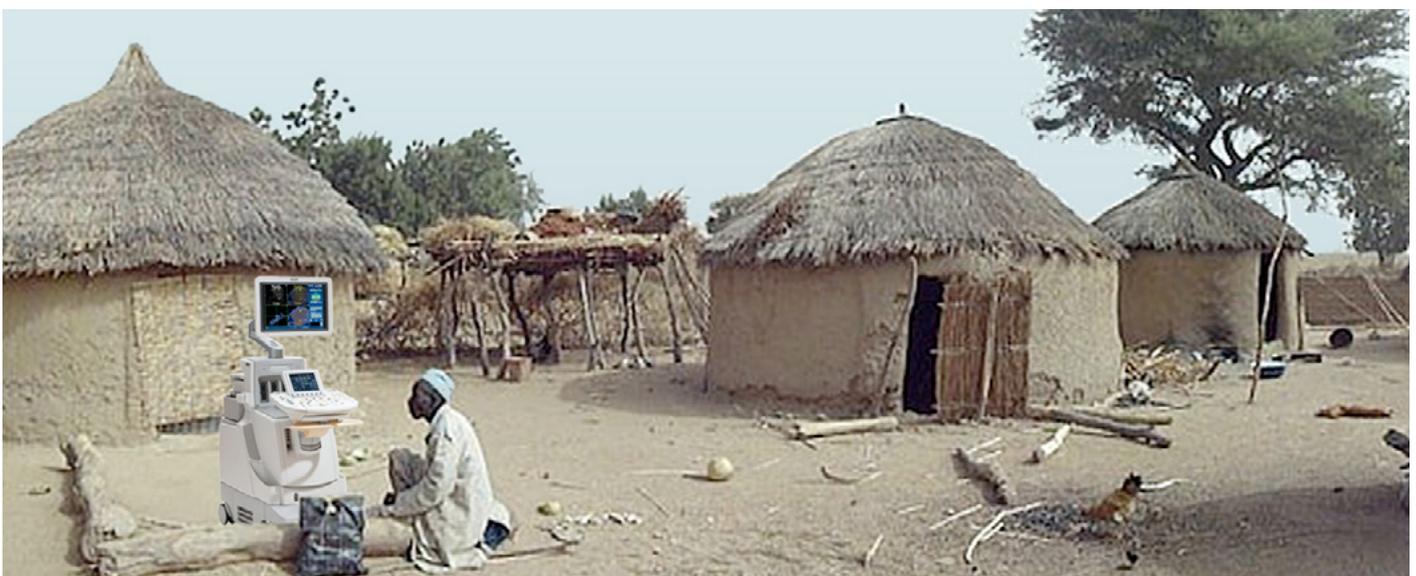
of an ineffective and non-incentivized central government and the belief that the profit driven private sector is the best vehicle to achieve efficiency and incentivize innovation. This argument is also dependent on one's political and social stance, and raises the question: Is healthcare a commodity, which can be consumed and can be traded; or is it a fundamental human right, that shall be accessible to all?

Fortunately, there is a growing consensus around the world that indicates a trend to greater inclusivity of healthcare system and awareness of healthcare being a right<sup>19</sup>. The way to increase universal access and achieve inclusivity is through innovations that are cost effective yet achieves the optimum goal. As will be discussed later, this leads to what was termed frugal innovation, a system of innovation initiated in resource scarce emerging markets and benefited non-affluent populations, before finding its way into developed markets<sup>20</sup>.

### 3.0 Frugal Innovation in Healthcare

Innovation can be defined as a novel yet appropriate solution to a problem<sup>21</sup>. Within the context of healthcare, therefore, an innovation shall fulfil the current healthcare market demand, namely that it shall alleviate the pressure of population growth, address the inherent imbalanced market, address raising cost, and deliver better health access and services for all. These challenges can be addressed with the three key characteristics of frugal innovation, as it brings substantial cost reduction, focuses on functionalities and maximises performance level<sup>22</sup>.

In simple terms, an innovation that is frugal shall 'do better with less for more'<sup>23</sup> by maximizing its value to resources ratio. Thus the concept of frugal is not dissimilar to the concepts of economic efficiency and sustainability, but a frugal innovation encompasses a wider consideration that includes economic and societal impact<sup>24</sup>.



A traditional ultrasound unit found in hospitals in developed nations is not necessarily useful in rural villages of developing countries, where scarce resources and lack of basic infrastructure is, in itself, a challenge to overcome.

Same thing cannot be said for all forms of innovations. As Weyrauch and Herstatt (2016) identified, an innovation is only considered frugal when it reduces cost, increases functionality and enhances performance. It therefore has a further impact on serving patients in all corners of the world, from the shanty towns in India to global capitals in the West.

An example of a frugal innovation is the Vscan ultrasound device from GE Healthcare, produced by its local team in China, which helped to address one of the key challenges identified in United Nations Millennium Development Goals - improve maternal care<sup>25</sup>.

Rural villages in emerging economies often lack hospital infrastructures, as recent as 2015, only half of the women in the world received the recommended antenatal care<sup>26</sup>. In order to cater for women in rural areas, GE Health produced a portable battery operated ultrasound device that

omitted large ultrasound machines, found in hospitals in the West. At the launch in China in 2008, the Vscan was on the market for 15% of the cost of a lower-end traditional ultrasound unit<sup>27</sup>. At the same time as benefiting the developing worlds, the clear advantages of such device also started to eat away market shares from the premium traditional counterparts in US<sup>28</sup> and has been implemented in the UK since 2016<sup>29</sup>. Such example demonstrated the effect of a reverse effect of frugal innovation<sup>30</sup>.

Other frugal innovation can be found across the world, from the use of common paper clip instead of Raney clips in surgeries in India<sup>31</sup>, to using power drills for orthopaedic surgeries in Africa<sup>32</sup>. Such innovations are frugal, as they in no way compromises quality or safety of the conventional alternatives, rather the functionalities and performances are retained and often enhanced while, importantly, vastly reducing the cost.



A typical surgical drill. £20,000 - £30,000



A household drill with autoclavable covering. Approx. £1600

One London hospital recently placed an order for 11 drills, with 30% discount, the order cost £234,000. The same order with the adopted household drill with autoclavable covering would cost £18,000. A 92% cost saving. Information source: The Guardian

## 4.0 Innovation and the Health Market

Having defined the key challenges of the healthcare market and understood the benefit of the frugal innovation, it is important to touch on the central role innovation plays in the healthcare economy. As discussed earlier, the healthcare market does not follow the conventional economic model. Simply providing service or product innovations does not necessarily bring financial benefits.

Studies have shown technology innovations for healthcare developed in large organisations brings little in terms of value for money, whether such product is developed in a developed or developing country, and has little effect on improving quality or result<sup>33</sup>. Many argued that advance in technology actually contributed to expenditure growth<sup>34</sup>. In part, this is the result of technology and treatment innovations that increased demand without reducing cost of delivery.

Theoretically, innovations such as magnetic resonance imaging (MRI) and computer tomography (CT) machines, for example, would enable early detection and thus lead to lower cost for treatment and care overall. However, this has not been the case in the United States, which possesses the greater number of such machines<sup>35</sup>. Furthermore,

despite continued innovation in healthcare related technology and services over the past few decades, around the world the cost of overall healthcare continues to rise.

In the context of the UK market, the benefits of innovation is widely understood, evident in the introduction of the London Centre of Innovation Excellence in 2013, with a focus on healthcare<sup>36</sup>. Equally as important would be for policy makers in UK and around the globe to recognise the commercial adaptability of an innovation<sup>37</sup>.

The example of Vscan showed the effectiveness of an innovation which satisfied all three criteria of a frugal innovation identified by Weyrauch and Herstatt (2016). Compared with a traditional model, the Vscan dramatic increased its affordability (with 85% cost reduction), increased the functionality (ease of use and portable) and maximised its performance (providing quick diagnosis for villagers in developing economy as well as city dwellers in global capitals). Such example successfully demonstrated the effectiveness of a frugal innovation and how its adaptability to different markets bring benefits to a wide audience.

## 5.0 Conclusion

As demonstrated in this report, the nature of the healthcare market presents inherent difficulties and systemic imbalance. Furthermore, the rapid increase of population and the growing cost of healthcare exacerbated the challenges to ensuring a sustainable healthcare market. Whether in the UK or globally, understanding the economics of the health market matters.

Whilst certain innovations and technological advances brings enhancements in functionality and/or performance, it may also contribute to the growing increase in healthcare cost. Ultimately, frugal innovation is the most effective solutions to the challenges we face, with its ability to provide cost effective solutions that are high in functionality and performance and its ability to adopt and integrate into existing healthcare systems.

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