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BRIEF

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## *Dynamics in Public Health Infrastructure: Hospital Beds and Covid-19*

### *Policy Puzzle No. 2\**

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#### **Snapshot:**

- Hospital beds are a prominent component of a healthcare system, notably in terms of its infrastructure and delivery of services.
- The number of hospital beds is relevant for providing a timely access to hospital services and maintaining efficient utilisation of healthcare/hospital resources.
- Excessive supply of hospital beds potentially increases the cost of services and can indicate system inefficiencies.
- Over-supply of hospital beds has been an issue of the South Korean health system. In 2018, South Korea had 12.27 beds per 1,000 inhabitants – second only to Japan among the OECD countries.

#### **Systemic Foundations of the Puzzle**

Health policy is a fundamental component of public services with an essential contribution to societal and individual well-being. Infrastructure and delivery of health services constitute its key factors. A prominent feature that interlinks both factors is the number of hospital beds.

From an infrastructural point of view, hospital beds concern timely access to in-patient healthcare services (Wilson et al. 2018). Moreover, from the service delivery perspective, hospital beds point to the efficiency and utilisation of hospital resources (Oh 2015).

\* The 'GlobalStat Policy Puzzle' Series is edited by Gaby Umbach and addresses an unusual data-related phenomenon – the puzzle – identified through data anomalies within a specific theme – the policy. It exemplifies the puzzle through a single case and highlights comparative elements where appropriate. The main goal of the analysis is to draw attention to a potential policy puzzle and to highlight why it should deserve analytical attention. The analysis serves as a pointer to further need for analysis. The main outcomes of the analysis are thus specific research recommendations on how to further unravel and examine the puzzle.



The definition of the number of hospital beds includes those available for immediate use (bed as physical furniture) as well as the availability of services to support and accommodate a patient (bed capacity) (Wilson, Fitzgerald, and Mahon 2010). Types of beds include curative, rehabilitative, long-term care and other beds (OECD 2020b).<sup>1</sup>

Intuitively, higher numbers of hospital beds are desirable within a health system, meaning that the system meets general demand for (and provides access to) healthcare. This is especially relevant in the context of unexpected and substantial increase in demand that occurs, for example, during a pandemic.

However, excessive numbers of beds may also diminish the quality of healthcare (Soo-Youn 2018) notably through non-efficient utilisation of hospital (and public health) resources and consequent inflation of healthcare costs (Oh 2015).

The main postulate of the policy puzzle in this analysis builds on multifaceted features of hospital beds within a public health system.

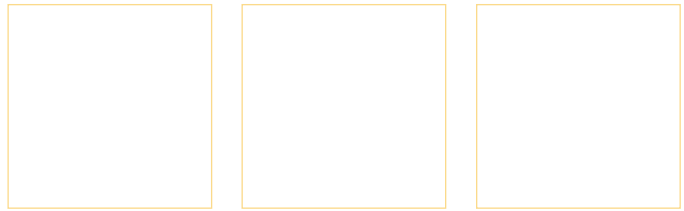
In analytical terms, this phenomenon bears the hidden potential to deepen the understanding of the structural foundations of a health system (administrative organisation, financing, and service provision), as well as its functioning and the dynamics within.

Understanding the structural foundations of a health system also helps explain its “response” capacity in disruptive circumstances, such as the spread of COVID-19 (Coronavirus) in 2019/20.

A prominent indicator concerning hospital beds and their role in a health system is the number of **hospital beds** per 1,000 inhabitants (OECD 2020). We use the OECD data (2018 or latest available) for this indicator to provide an empirical insight into the policy puzzle.

To exemplify the policy puzzle, we select South Korea for closer inspection. As shown in Figure 1, South Korea (12.27) is second to Japan (13.05) in terms of the number of hospital beds per 1,000 inhabitants (data for 2017). Statistically, both countries constitute an outlier as shown by the outlier plot in Figure 2.

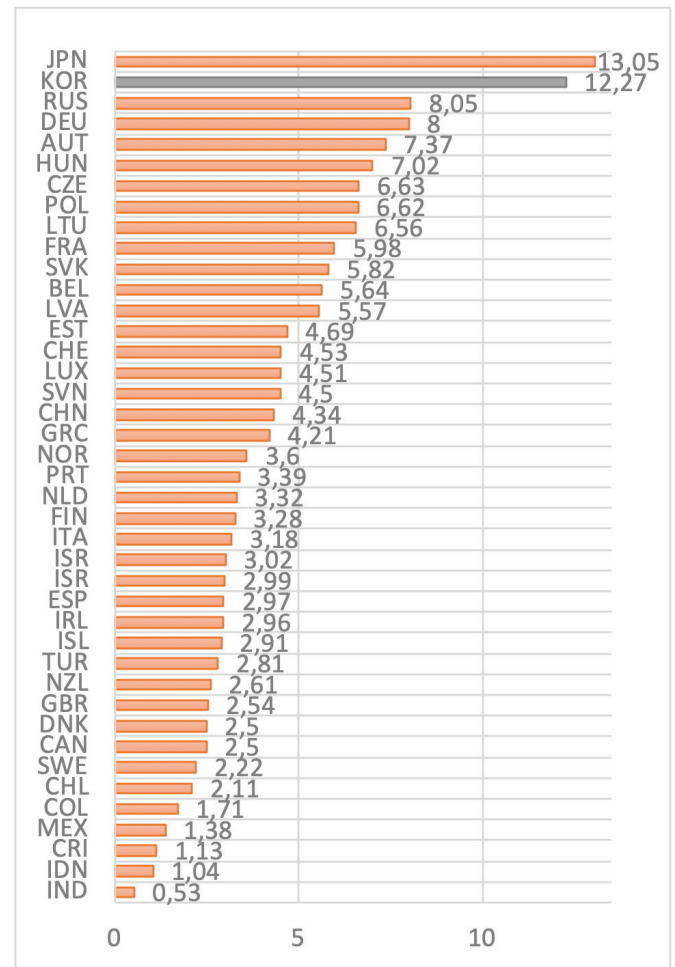
<sup>1</sup> For the present analysis, it would be also useful to have the official, systematic and consistent country data on intensive care units (ICU). WHO’s data on acute care hospital beds may serve as a reference.



South Korea is favoured as the case study over Japan due to the contemporary relevance put on public health policy in light of the COVID-19 crisis. Reportedly, South Korea (together with Singapore) is deemed a best policy practice in both treating and preventing the spread of the Coronavirus, considering that most of the countries have surpassed the (first wave) peak.

In sum, the two phenomena – effective South Korean approach to the COVID-19 pandemic and the intriguingly high number of hospital beds – serve as pragmatic starting points for a closer look at systemic foundations of the South Korean health system. The analysis uses the systemic foundations as an interlinkage and explanation of these outstanding phenomena in the South Korean health system.

**Figure 1: Hospital beds per 1,000 inhabitants**  
(Source: adapted from OECD)

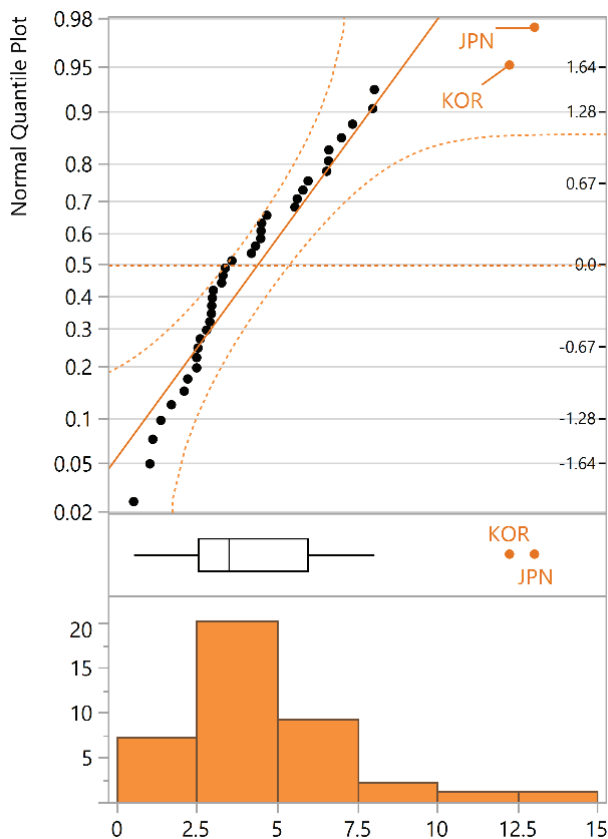




## Illustration of The Puzzle: South Korea

The development of the South Korean public healthcare system has been a success. In a short period of time, South Korea has gone from humble medical infrastructure and limited coverage (in 1977) to universal coverage (in 1989) and one of the highest life expectancies globally (OECD 2016; Park et al. 2016)

**Figure 2: Outlier plot - distribution of hospital beds per 1,000 inhabitants indicator**  
(Source: adapted from OECD)



In 2000, health insurance schemes were merged and centralised, creating the single payer national health insurance system (WHO 2015). The South Korean system is financed (and administrated) by a single not-for-profit agency (National Health Insurance Corporation) under strict supervision of the Ministry of Health and Welfare (Kwön et al. 2015; Park et al. 2016).

However, it is vital to emphasise that the provision of services and healthcare resources, such as hospitals, is predominantly privately managed (Lee et al. 2008).

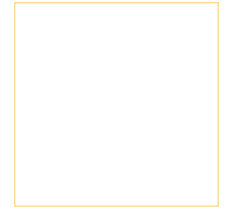
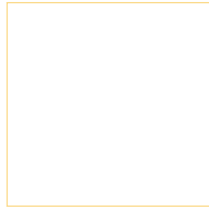
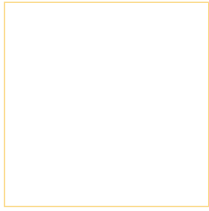
Private healthcare service provision functions on the basis of a fee-for-service payment system (WHO, 2015). Hence, South Korea has one of the highest shares of out-of-pocket spending for health (34% in 2017) on a global scale (OECD 2019). Patients pay 20% of the cost for in-patient services under the national health system (WHO 2015). For patients who are unable to pay the services, the government has initiated the Medical Aid Programme to cover their costs (Song 2009). In comparison, patients in the US pay only around 11% (data for 2017) out-of-pocket while private insurers cover the rest (OECD 2019; see also Kim 2010).

Overall, the system is financed through contributions, government subsidies, and a surcharge on tobacco (Song 2009). Globally, South Korea **spends less on health** as a portion of GDP than other advanced economies. In 2018, South Korea spent 8.1% of GDP on health expenditures while, for example, the US spent 16.9%, Germany 11.2%, Japan 10.9%, and Italy 8.8% (OECD 2020a).

Despite its sophistication, the South Korean healthcare system faces long-term and “immediate” challenges. The former include rapid ageing, increasing inequalities and regional disparities (WHO 2015; see Song 2009).

“Immediate” challenges *inter alia* concern high out-of-pocket payments, an induced demand for new, non-insured services and technologies by private providers, high pharmaceutical expenditure as well as the below optimal governmental regulation of the supply side of health care expenditures (Jong-Chang 2003; WHO 2015).

Most importantly, (since the mid-1990s) the “chronic” issue within the South Korean system has been an over-supply of hospital resources, notably hospital beds. Over-supply concerns both acute hospital beds and, to a smaller extent, long-term beds (Oh 2015). To this end, the growth in bed supply has exceeded the rate of increase of the average length of hospital stays, which contributes to system inefficiencies notably in terms of spending (Oh 2015; see Lee 2003). On the other hand, the over-supply produces an over-provision of hospital treatments that harm the system’s quality by absorbing the health care budget (OECD 2016).



A prominent cause of the over-supply is the role of the private sector, which manages the large majority of health resources (Lee 2003). Since 2012, around 94% of hospitals in South Korea were privately owned (WHO 2015). In 2004/05, private hospital beds constituted more than 80% of total number of beds. As a consequence, the ratio of public beds is as low as 17.5% (data for 2004/2005; see Lee et al. 2008) which is seemingly only 17-22% of the optimal level (Oh 2015). Countries such as Japan, the US and the UK exemplify the opposite trend (see WHO 2015).

Demand inducement and (subsequent) cost inflation are immediate repercussions of the over-supply. As the system operates on the fee-for-service principle (WHO 2015), private providers seek to induce the demand for health services, especially those including hospital stays (Kim 2010).

Moreover, due to inefficient regulation, private providers can purchase expensive and technologically advanced medical devices, the usage of which is often not covered by the health insurance. On the one hand, high-tech devices contribute to demand inducement and an increase in (private) hospitals' profits (WHO 2015). On the other hand, however, they inflate the costs of the service due to the high pay-out-of-pocket ratio and fee-for-service operation (see Oh 2015).

Considering that the over-supply of beds is concentrated in urban areas, the above supply-related issues additionally exacerbate a long-lasting issue of regional disparities and thus potentially increase inequality (WHO 2015), without necessarily improving the quality of service (Kwon 2008).

On a positive note, despite the major role of profit-seeking interests, the health policy process in South Korea has become more inclusive. This has encouraged a socially favourable policy change, in which civil society groups counter-balance dominant private interest groups (Kwon 2008; see Lee 2003). The Korea Alliance of Patient Organizations (KAPO) and the Health Right Network (HRN) are examples of such organisations. Citizens were also consulted on the benefit expansion policy through the Citizen Council for Health Insurance pilot project (WHO 2015).

Overall, considering the issue of over-supply, the public-private dynamic is more of an obstacle than an advan-

tage for the South Korean health system. However, the recent (ongoing) experience with the COVID-19 pandemic has highlighted its advantages.

Arguably, South Korea represents best practice when it comes to the prevention and treatment of the virus. The South Korean strategy consisted of extensive testing, tracking, tracing and treating. To this end, it is vital to highlight one of the most prominent factors of the strategy's success – namely, public-private cooperation (Pardo 2020).

The private sector led the manufacturing of testing devices, the development of communication channels (e.g. mobile applications), and the designing of online learning platforms (UNDP Seoul Policy Centre 2020). Moreover, multinational corporations, such as Samsung and LG, transformed parts of their infrastructure into [dormitories](#) for low-risk patients in order for hospitals to remain available to high-risk patients.

The public-private cooperation, together with voluntary efforts made by citizens, left South Korea with 11,902 COVID-19 cases and (only) 276 [deaths](#) (data for June 10, 2020; Johns Hopkins Coronavirus Resource Centre n.d.). These numbers are outstanding, considering its proximity to and ties with China, where the virus originated.

Compared to this experience, Italy is on the other extreme. On June 10, Italy counts more than 235,000 cases with 34,043 [deaths](#) (the most in the EU; Johns Hopkins Coronavirus Resource Centre n.d.). The Italian strategy to prevent and treat the spread of COVID-19 was substantially different from the South Korean.

Italy has a predominantly public health service provision (around 30% of hospital beds is privately managed; OASI 2017), which also suffers from regional disparities similar to South Korea (France, Taroni, and Donatini 2005; Frisina Doetter and Götze 2011).

Due to a highly de-centralised public health system (see Adinolfi 2014), the Italian response to the pandemic was more differentiated and incoherent. For [example](#), the most affected northern regions – Lombardy and Veneto – had vastly different responses. While Lombardy had low testing rates and investment in tracing and monitoring, Veneto immediately opted for a multi-pronged response with extensive testing, proactive tracing and monitoring (Pisano, Sadun, and Zanini 2020).



Overall, data paucity due to regional incoherence was a prominent factor weakening the Italian response to the pandemic that eventually resulted in a nation-wide lockdown. In contrast, data abundance (to which the private sector significantly contributed) was a vital success factor in the South Korean response to the pandemic.

### **Main Take-Aways for Further Research**

In sum, excessive numbers of available hospital beds in South Korea point to persistent challenges of the structural foundations within the South Korean health system, as far as the regulatory capacity and, more specifically, public-private sector dynamics and cooperation channels are concerned. Although public-private cooperation may be an obstacle to the efficiency of a healthcare system in normal times, under certain (disruptive) circumstances it may in fact turn into an advantage.

Against this backdrop, the analysis suggests specific recommendations for further research on the above policy puzzle that can potentially be applied outside the South Korean context.

### **Recommendations for Further Analysis:**

- Criteria and strategies for optimisation and evaluation of health care supply chains (including the capacity to sustain a shock) need to be developed.
- Regulatory principles, including counting, categorising, and standardisation of hospital beds need to be revisited, notably within regional (or local) demand contexts.
- Regulatory and negotiation responsiveness of national authorities concerning the costs and quality of health services need to be addressed.
- Assessing the effects of the autonomy of private (for-profit) service providers in procurement procedures, and the role of national authorities therein, is essential.
- The impact of a more inclusive policy-making process that could generate positive policy change needs to be addressed and operationalised.

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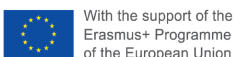
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