Soonman KWON – President, Korea Health Industry Development Institute (KHIDI)

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21.03.2022

Tags: Korea, KHIDI, R&D, Investment

KHIDI's Soonman KWON outlines the public health R&D funding landscape in Korea, plans to increase Korea's capacity to develop and produce its own vaccines in the wake of the COVID-19 pandemic, and how Korean infrastructure and expertise is helping train up scientists from low- and middle-income countries.

Can you begin by introducing yourself and your mandate at the Korea Health Industry Development Institute (KHIDI)?

I am the president of KHIDI, a government agency under the Korean Ministry of Health and Welfare. I am on leave of absence from a professorship of health economics at Seoul National University. KHIDI has around 500 staff members and our main task is supporting the health industry and increasing its competitiveness via R&D funding. More than 90 percent of the R&D funding of Ministry of Health and Welfare as well as some of the Ministry of Food & Drug Safety and the Korea Disease Control(KCDC) is channelled through KHIDI, and we manage around USD 700 million in R&D funding every year.

KHIDI provides funding to researchers and research-based hospitals as well as to the pharmaceutical and devices industries and has bureaus dedicated to R&D Management, Industry Development, Policy Development, and Global Health. The organisation aims to support the entire

life cycle of health industry, from policy development, R&D, to direct funding, ecosystems for innovation, global exports, and global health.

USD 700 million seems a relatively modest figure for healthcare research funding in a country like Korea. How was this figure arrived upon and is it enough to make a significant impact?

Korea is one of the top two countries globally in terms of overall R&D expenditure as a percentage of GDP (4.64 percent, behind only Israel (4.93 percent) in 2021, according to data from the Korea Ministry of Finance). Moreover, in terms of public R&D as a percentage of GDP, Korea is in number one position globally with 1.09 percent, ahead of Norway (1.02 percent) and Germany (0.98 percent). In 2022, the total government R&D funding planned is around USD 27 billion.

However, KHIDI's focus is on healthcare R&D, which accounts for less than ten percent of Korea's total R&D, meaning that our spending is lower than some equivalent institutions in other countries, such as the National Institutes of Health (NIH) in the US. However, KHIDI's budget is increasing year on year and we are confident of having a big impact on Korea's healthcare R&D ecosystem. Ministry of Science and ICT and Ministry of Trade, Industry and Energy also provide R&D funding to the health sector.

Where does Korea stand on the spectrum between the USA (rapid innovation but high medicine prices) and Europe (slower innovation but more affordable healthcare)? How do you balance these opposing tensions?

There is no one answer. I believe that tension always exists and that there is always a trade-off to be made between health policy goals and industrial policy goals. The US is an exception in that it spends a lot but has the capacity to do so. However, most other countries, such as those in Europe struggle between balancing innovation in the biohealth sector with the financial sustainability of the system, and Korea is no exception.

How does KHIDI set priority areas for its budget?

KHIDI is an implementation agency of health industry policy, working closely with the Ministry of Health and Welfare and Ministry of Finance for priority setting. We tend to take incremental

approach but consider context and policy priorities – such as the COVID-19 pandemic. Therefore, there was a big increase in the share of R&D funding targeted at COVID-19 vaccines, treatments, and diagnostics last year.

Following the COVID pandemic, Korean President Moon has pledged to invest two billion dollars into locally researched and manufactured vaccines. Can you outline the goals of this project and KHIDI's role within it?

Korea boasts multiple companies developing COVID-19 vaccines at various stages of development but does not currently have any Korean-developed and produced vaccines on the market. SK Bio's vaccine candidate is in Phase III clinical trials, while a few other Korean manufacturers are producing vaccines on a contract basis. Samsung Biologics is producing vaccines for Moderna, SK Bio produces the AstraZeneca and Novavax vaccines, Huons Global is working on the Sputnik V vaccine, while Hanmi Pharmaceutical and Enzychem Lifesciences have manufacturing agreements in place for the ZyCoV-D product

One of the targets, in the short term is to extend this production capacity for contract manufacturing but in the medium term, the government hopes that Korean manufacturers can develop their own vaccines.

With national elections on the horizon, do you foresee this policy remaining in place even if there is a change in government?

I do not foresee a significant shift in government policy toward vaccines or the biohealth industry, regardless of the administration. While it is impossible to predict the future, this policy is not particularly ideology-driven and the COVID-19 crisis has fostered a better understanding of the importance of biohealth industry amongst both the general public and government.

In February, the World Health Organization (WHO), the Republic of Korea and the WHO Academy announced the establishment of a global biomanufacturing training hub to serve all low- and middle-income countries (LMICs) wishing to produce biologicals, such as vaccines, insulin, monoclonal antibodies and cancer treatments. Can you outline the potential impact of this project?

The establishment of this training hub is great news for Korea and our global standing. While not a global leader in the traditional medicines sector, Korea is one of the world's best for biologics and biopharma.

Korea can train personnel from LMICs, thereby strengthening those countries' own pharma industries and contributing to improved access to medicines and vaccines in the globe. We know that nobody is safe from COVID-19 until everybody is safe, but vaccine nationalism remains a barrier to global access; something we hope that this new hub will help change.

Beyond vaccines, in many LMICs the capacity to produce even very simple medicines is very low. Therefore, a global effort to strengthen pharmaceutical sector capacity in LMICs is needed. The new Korea hub can make a big contribution and is hopefully only the beginning.

Korea is quite record breaking in terms of official development assistance (ODA) as one of the few countries that used to be heavily dependent on ODA and is now in a position to provide assistance to others. We have experience as an LMIC ourselves, and therefore understand the needs of LMICs.

Does KHIDI itself engage in the training of foreign personnel?

KHIDI is supporting many programs but does not directly train people. However, for example, we support the National Institute of Bioprocessing Research and Training (NIBRT) program, which we recently launched at Yonsei University, one of the leading universities in Korea, and manage its public funding.

The medtech industry seems to be booming in Korea; to what do you attribute this to?

The device industry in Korea has a full spectrum of companies, from very small to very big. Additionally, COVID-19 has seen a global surge in demand for in-vitro diagnostics and test kits, meaning that exports increased substantially for several Korean companies able to meet this demand.

The Korean healthcare system is based on national health insurance that covers the entire population. This insurance is publicly funded, but about 90 percent of hospitals are private. Due to the relatively generous benefit packages and service coverage that Korean health insurance offers to diagnostics, devices, and high-tech service providers, this sector has long been relatively well-developed in the country; even before COVID-19. Additionally, our experience with Middle East

Respiratory Syndrome (MERS) created an increased awareness of the importance of testing kits.

KHIDI has moved to set up international offices around the world; what is the rationale behind these operations?

We currently have four country offices: in Shanghai, China; Almaty, Kazakhstan; Abu Dhabi, UAE; and Boston, USA. Each centre has a slightly different focus. For example, the main mission of our Boston office is to promote Korean biopharma companies in the USA, help them set up offices, and collaborate with the myriad global pharma companies with a big presence there.

In Abu Dhabi on the other hand KHIDI collaborates with the UAE government around training programs for local doctors and dentists. They receive specialist training for a few years in Korea and are then board certified from Korea. UAE government also sends patients to Korea.

In Kazakhstan, the focus was – until COVID struck – on inbound patients from Central Asia and Russia visiting Korea for treatment. A similar approach was taken in China until recently, although we are now focusing on development and collaboration between the Korean and Chinese pharma/device industries.

Korea's population tends to have long lives and be relatively healthy. Does KHIDI have a particular focus on supporting Korea's ageing population?

The health industry is quite broad, covering medicines, devices, as well as health services. KHIDI provides significant support to (health and care) services and industry in relation to population ageing, and has teams dedicated to the topic. Our R&D support in this area includes robots, personal assistant-type devices and digital health services around care at home, smart care, and smart hospitals. We also provide direct support to the manufacturers of devices that help older people to function better. In terms of medicines, we have R&D funding streams for areas like non-communicable diseases; R&D support and industry development for health and care services in an era of rapid ageing is a very important part of our mission.

How well has KHIDI been performing in terms of promoting translational science? What could be better?

Overall, KHIDI has played a key role in funding Korean R&D and promoting the Korean health industry. However, it must be remembered that there are several components to R&D. The starting point is basic science, and the Ministry of Science and Technology has its own R&D program, but KHIDI and the Ministry of Health and Welfare, tends to support applied R&D/translational research. Basic science is very important, but our main focus is on how it results effectively on the development side.

Tangible outputs are very important for overall development and for Korea to avoid the valley of death in the R&D life cycle. There's sometimes a missing link between good science and technology and product development. My hope is that health sector R&D funding, especially towards translational research, will continue to increase in Korea, and we will need to work harder and more effectively at the product development stage. Hospitals, especially teaching hospitals, need to be more actively involved in R&D.

Talent is an important component in bringing R&D to fruition; what are some of the challenges that Korea is facing on that front?

Unlike some other countries, brain drain is not a big problem in Korea overall.

However, compared to other high-income countries, Korea does not have enough doctors, and clinical work is regarded as more lucrative (guaranteeing more stable income) than research and development related to the biohealth industry.

In Korea, the majority of medical school graduates become clinicians. The government is cognizant of this problem and has allocated funding for medical school graduates to pursue their careers in biohealth R&D, rather than clinical work. Our hope is that there will be more CEOs in bioventures with medical backgrounds, as this is a key area in which we are lacking.

Do you have any final messages for our international executive audience?

We cannot avoid the fundamental tension between incentives for innovation and the policy goal of system sustainability in biohealth industry. Optimal incentives for innovation should be provided because if we pay too high a price for innovation, it can threaten system sustainability in the long run. However, if too low a price is offered, there will be few innovations. There is no gold standard, and each country has its own context. KHIDI will continue to play a key role to promote the competitiveness of health industry and contribute to population health and system sustainability.

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