

Overcoming Delivery Challenges for National Deworming in the Republic of Korea

Introduction

The Korean Association of Parasite Eradication (KAPE), a small coalition of parasitologists and government officials, was established in 1964 with the objective of eliminating the then-pervasive problem of intestinal worm infection in the Republic of Korea. One of KAPE's first achievements was to assist the government in enacting a national law that mandated all primary and secondary schools to comply with the state's deworming campaign. In 1968, with the help of aid packages from Japan's Overseas Technical Cooperation Agency (OTCA, which would become the Japan International Cooperation Agency, or JICA), KAPE coordinated with the Ministry of Health and Social Welfare (MHSW) and the Ministry of Education and administered stool examinations and deworming pills throughout the nation's elementary and primary schools. Although the government and KAPE did not reach the initial objective of eradicating intestinal worms within a decade, intestinal worm infection rates fell from 77 percent in 1969, when the national program was launched, to below 1 percent in 1995, when program was brought to a halt. The nation was declared essentially worm free by the World Health Organization (WHO) in 1997 and did not witness in any surges in infection in the ensuing years.

Development Challenge

During the late 1960s, intestinal worm infections were prevalent in Korea, with close to 80 percent of the entire population infected with intestinal worms. These infections caused anemia and organ malfunction, impaired educational and development outcomes for children, and hindered the productivity of adult workers. Despite the availability of inexpensive and effective chemotherapeutics, the lack of vaccines and the contagiousness of parasitic infections made it difficult to prevent further infections.

Intervention

Worm eggs commonly contaminated cabbages—a main ingredient in the Korean staple dish *kimchi*—because of the wide usage of night soil (human feces) as a fertilizer. Common types of worms included soil-transmitted helminths (such as roundworms, hookworms, and whipworms) and schistosomes, which were “endemic in riverine areas of the country” (Kim 2019). The Korean government could not provide effective solutions for parasite control.

In 1964, a group of parasitologists and officials at MHSW founded KAPE and began to work together with the goal of reducing the national infection rate to zero within a decade. The government enacted a law in 1965 that mandated all schools to administer stool tests and deworming pills twice a year to all their students and that designated KAPE



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PROJECT DATA

SECTOR:
Health

DEVELOPMENT CHALLENGE:
Intestinal worm infection

DELIVERY CHALLENGES:
Awareness and Communication
Strategy; Stakeholder
Engagement; Financial Instability;
Skilled Manpower

COUNTRY:
Republic of Korea

REGION:
East Asia and Pacific

PROJECT DURATION:
1969–1997

This delivery note was adapted with permission by Kyuri Kim from an original case study by Prof. Dong-Young Kim. The original case study was prepared for the Ministry of Economy and Finance of the Republic of Korea (MOEF) and KDI School of Public Policy and Management for the Global Delivery Initiative. This adaptation presents a condensed version of the original case study. While the analytical apparatus of the delivery note draws on that of the case study, this note does not necessarily reflect the views of the original author, nor of the MOEF. The preparation of this delivery note was supported by the Korea Program for Operational Knowledge, a partnership between the MOEF and the World Bank Group.

as the main agency in charge of the national deworming program. KAPE and MSHW's strategy was to implement a nationwide mass inspection–mass treatment campaign through the nation's network of primary and secondary schools. This school-based regimen tested every school child and treated all children found to carry worms through stool tests.

Addressing Delivery Challenges

Despite the cooperation of the Ministry of Education in mobilizing and engaging the network of public schools in the mass campaign, and despite the availability of cheap technical solutions for stool tests and treatment of infections, KAPE faced several difficulties during implementation. This section elaborates on some of the major delivery challenges it faced, such as (a) a lack of public awareness and communication strategy, (b) financial instability and a shortage of skilled labor, and (c) difficulties engaging stakeholders.

- **Lack of awareness and communication strategy.** When the intervention was first launched, the general public considered deworming efforts futile. This skepticism was rooted in people's experience of repeated reinfection, which was inevitable given the complete contamination of staple vegetables with worm eggs. The belief was also widespread that intestinal worms were not only harmless, but even beneficial (for example, by supposedly helping digestion or rendering young children docile). This misconception was attacked through vigorous public awareness campaigns. One emblematic case occurred after an American doctor treated a fatal case of worm infection in a young girl, who carried more than 1,600 roundworms in her stomach. KAPE persuaded a newspaper to publish a high-profile article with a vivid photograph of the worms removed during the operation, framing intestinal worm infections as a symbol of national backwardness. The article had the effect of stigmatizing intestinal worm infections as signifying poverty and ignorance, contributing to shifts in public perception. The article was followed by larger public awareness efforts targeting schools and workplaces, which, for instance, conveyed the health burden of infections by calculating the value of lost nutrition.
- **Financial instability and skilled labor shortage.** In the early years of the campaign, KAPE's budget relied entirely on membership fees, donations from small domestic pharmaceutical companies, or small fees charged for stool tests. The low level of public participation, however, limited this revenue. In addition to the ensuing shortage of equipment and supplies, the association's activities were further hindered by the lack of skilled workers and means to recruit and train more personnel. In 1967, however, the president of KAPE negotiated a comprehensive aid package with OTCA. Through this partnership, KAPE was able to secure a supply of inspection toolkits and deworming pills ample enough for three years of mass campaigning. More importantly, OTCA also provided technical assistance for designing a training program for enhancing the capacity of KAPE-recruited technicians to carry out more up-to-date, accurate, and efficient campaigns,¹ dramatically saving both costs and time required for mass screening.
- **Stakeholder engagement.** Following the end of OTCA's three-year assistance, KAPE was faced with the task of securing sustainable support to continue the national program. Given the high infectiousness of the diseases, even a short-term discontinuation threatened the fruits of their past achievements. KAPE's strategy was to convince the government of the value of a nationwide intervention and to persuade it to commit to a longer-term initiative. KAPE was in possession of rich raw data, which it had carefully gathered during the school-based interventions to monitor the program's progress. The data clearly demonstrated the reduction of infection rates for each type of intestinal worm for each school, proving the benefits of a well-designed and properly carried out deworming effort. These data were supplemented by a series of nationwide surveys, which in turn showed the spillover effects of the program in reducing infections in the larger population. By accumulating data that could convincingly attest to the need for further support of the program, KAPE strengthened its appeal for continued government funding. The national program endured long enough for the national prevalence to fall to virtually zero, and it was suspended in 1995.

¹ Dr. H. Rim, the president of KAPE, learned a new test method directly from Dr. Kato Katsuya, the Japanese inventor of the cellophane thick smear method, when Katsuya came to Seoul in a visit organized by OTCA. Rim recalled in his memoir feeling tremendously impressed—even overjoyed—when he found that the new method's main ingredient—cellophane sheets—were extremely cheap and widely available in local markets (Rim 2013, as cited in Kim 2019). Rim later played a key role in facilitating the adoption of the method for mass campaigns in Korea.

Lessons Learned

Although KAPE and the government's initial plans to eradicate worm infections within the first decade proved to be overly ambitious, they made remarkable strides: infection rates dropped from nearly 80 percent in 1969 to less than 1 percent in 1995. More importantly, the national infection rate did not witness any surges since WHO's declaration of Korea as essentially worm free in 1997, and worm infections have been successfully contained as localized outbreaks, mostly in areas where consumption of raw freshwater fish is common.

Several lessons can be drawn from KAPE and the Korean government's experience over the decades, including key success factors that made it possible:

- **Public perception and participation.** The greatest challenge during the early years of the program was the widespread public perception that intestinal worms were not harmful and that deworming efforts were futile. Convincing large populations through awareness and education programs, which conveyed the health consequences of worm infection and the feasibility of a sustained national program, was critical in legitimizing the operations and ensuring active participation of the public.
- **Legal foundation.** The nature of nationwide school-based mass campaigns required the cooperation of multiple stakeholders, such as government ministries, local officials, and school administrators and teachers. A strong legal foundation was an important instrument in enabling stakeholders to coordinate with each other and sustain the momentum of the program.
- **Finance structure.** The government implemented a new structure of disbursement by providing budgetary support for the program to participating schools, which in turn compensated KAPE directly. KAPE thus collected its revenue and operational expenses from individual schools, for the number of stool tests carried out in each (one stool test cost around ₩10 Korean, or US\$0.02). This arrangement is thought to have empowered the schools and also promoted KAPE to demonstrate greater enthusiasm for the program (Kim 2019).
- **Voluntary organization.** The participation of an independent body such as KAPE in the national program brought skilled and dedicated practitioners to the table, and they were able to act with agility. Moreover, the voluntary nature of the organization saved costs.
- **Data collection and use.** KAPE diligently and meticulously collected data coming out of the school-based program so that it could closely monitor the progress of the campaigns. In addition, this wealth of data later became the grounds on which it could demonstrate the value of deworming programs to the government, leading to the enactment of specialized laws.
- **Technical cooperation.** The assistance from international donors was important not only as a source of financing for aid packages, but also in providing technical assistance in the form of policy consultation and training of personnel.

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