# International Comparison of Pre-distribution Systems for the Potassium Iodide (KI) Against Radiological Emergency

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## 1. Introduction

Since the Fukushima nuclear accident, interest in Potassium Iodide (KI), one of the public protective actions, has also increased as domestic concerns about radiological emergency have increased. KI is a medicine taken to prevent internal exposure due to ingestion or inhalation of radioactive iodine released into the environment in the event of a nuclear power plant accident. KI is managed in many countries for the purpose of preparing for nuclear power plant accidents.

In the case of Korea, a law on the stockpiling, management, and distribution of KI has been enacted and implemented in Article 35-2 of "ACT ON PHYSICAL PROTECTION AND RADIOLOGICAL EMERGENCY" in 2021. In addition, detailed procedures were specified through the enactment and revision of related guidelines from 2021 to 2022. However, since the related law and guidelines were enacted in 2022, there is no experience in implementing the KI pre-distribution system. Therefore, in order to implement pre-distribution, it is necessary to investigate current state of the overseas KI pre-distribution system.

Japan, the United States, and Canada have established and implemented systems for the stockpiling, management, and distribution of KI. These countries are considering not only emergency distribution that distributes medicine in case of an emergency, but also a pre-distribution system that distributes medicine to residents before an emergency. Therefore, in this study, the current status of the pre-distribution system of KI in foreign country was investigated.

## 2. Methods and Results

In this study, we investigated the status of Japan, the United States, and Canada, which adopted and implemented the KI pre-distribution system.

### *2.1 Japan*

In the case of Japan, the Nuclear Regulatory Agency stipulates stockpile and distribution of KI. It is suggested that KI should be stockpiled in consideration of not only local residents but also temporary residents such as workers and travelers. In the case of stockpile locations, places such as evacuation centers, schools, hospitals, and health centers are suggested, and distribution is possible at stockpile locations in the evacuation routes [1].

In the case of Shimane Prefecture, Japan, as the Shimane nuclear power plant exists, guidelines for the distribution and intake of KI are stipulated in preparation for a radioactive disaster.

The Shimane Prefecture guidelines suggest the target, quantity, procedure, etc. for pre-distribution as shown in Figure 1 [2].

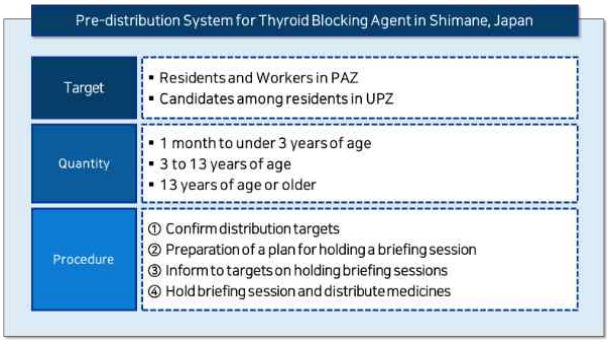


Fig. 1. Pre-distribution System for Potassium Iodide in Shimane, Japan

### *2.2 The United States of America (U.S.A)*

In the case of the United States, the stockpile and distribution of KI are considered in states where nuclear power plants are located nearby, and KI policies were different for each state as shown in table 1. A total of 17 states, including California, adopted stockpiling and pre-distribution policies. 4 states, including Alabama, adopted stockpile of KI for emergency distribution after the accident, but the pre-distribution system is not adopted [3].

Table I: Status of Potassium Iodide Distribution System in the U.S

| System | U.S. State | |
|---|---|---|
| · Stockpiling<br>· Pre-distribution | · California<br>· New Hampshire<br>· South Carolina<br>· Connecticut<br>· New Jersey<br>· Tennessee<br>· Delaware<br>· New York<br>· Vermont | · Illinois<br>· North Carolina<br>· Virginia<br>· Maryland<br>· Ohio<br>· West Virginia<br>· Massachusetts<br>· Pennsylvania |

| | | |
|---|---|---|
| · Stockpiling | · Alabama<br>· Florida | · Mississippi<br>· Arizona |

In the case of Connecticut, Tennessee, and Maryland, the pre-distribution was completed by reflecting the characteristics of each state, such as selecting different stockpiling locations [3].

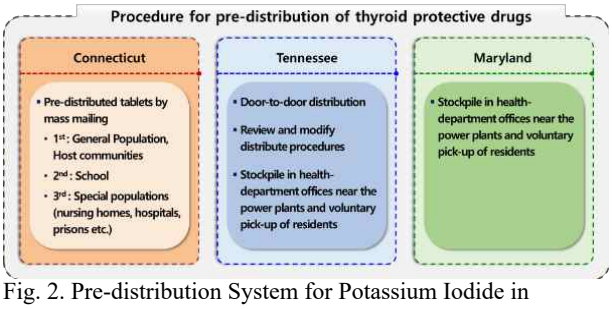


Fig. 2. Pre-distribution System for Potassium Iodide in Connecticut, Tennessee, Maryland

### *2.3 Canada (Ontario)*

In the case of Ontario, Canada, as the Darlington and Pickering nuclear power plants exists, guideline for the distribution of KI is stipulated.

The Ontario guideline recommends pre-distribution in consideration of the effectiveness and timing of taking KI and suggest pre-distribution target areas, stockpiling locations, and distribution procedure as shown in figure 3 [4].

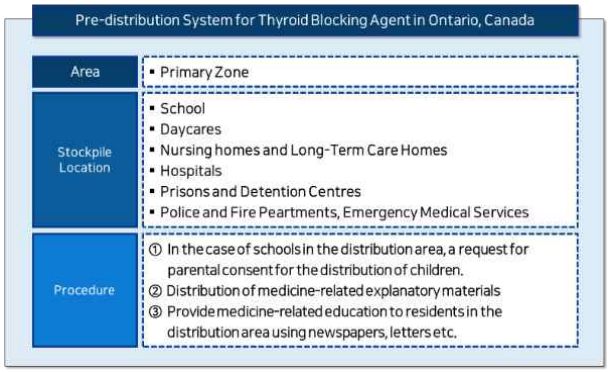


Fig. 3. Pre-distribution System for Potassium Iodide in Ontario, Canada

## 3. Conclusions

In this study, we investigated the current state of the overseas KI pre-distribution system. As a result of investigation, it was found that the range, quantity, location, and method were established differently in consideration of the characteristics of each region, such as face-to-face distribution or only distribution to institutions.

The results of this study can be used as basis for implementing KI pre-distribution in Korea.

## REFERENCES

[1] 安定ヨウ素剤の配布・服用に当たって, 原子力規制庁, 2022.
[2] 島根県安定ヨウ素剤配布計画, 島根県健康福祉部, 2020.
[3] D. J. Tollerud etc., Distribution and Administration of Potassium Iodide in the Event of Nuclear Incident, National Research Council, 2004.
[4] Potassium Iodide (KI) Guidelines, Ontario Ministry of Health and Long-Term Care, 2014.