Tokyo Metropolitan Government Guidelines for Children on Chemical Substances

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1 Establishing the Tokyo Metropolitan Guidelines for Children on Chemical Substances

Chemicals are used in a variety of places in the environment surrounding children, not only in public places such as schools and parks but also in children's own living environment and in their dietary life – in the food and the utensils they use.

The Tokyo Metropolitan Government has been proactive in taking steps to control the use of chemical substances, conducting surveys and implementing necessary measures as provided for in the policies it has adopted: the Basic Policy on Control of Hazardous Substances (March 1995), the Basic Policy on Actions to Control Dioxins (November 1997), and the Policy on Environmental Hormones (July 1998). These policies are, however, aimed at the protection of citizens in general, and may not have sufficiently addressed children and the exposure routes and health effects to which they are uniquely vulnerable.

Developing children are generally considered to be more easily affected by chemicals than adults, and community concern about children's vulnerability to chemicals has been growing in recent years. In the West, considerable progress has been made with chemical substance control measures focused on children; but in Japan, child-specific exposure surveys and countermeasure actions have been somewhat lacking.

To rectify this situation and establish a society in which children are able to grow up healthily and citizens have hope in their future, the Tokyo Metropolitan Government decided to introduce as one of its policy priorities for 2002 the creation of its own guidelines aimed at forestalling effects on children's health from exposure to chemical substances.

The guidelines were drawn up by the relevant offices in consultation with experts in various fields. Namely, the Bureau of the Environment dealt with exposure in the outdoor environment and the Bureau of Social Welfare and Public Health dealt with exposure in the indoor environment and from food.

2 Formulation and Nature of the Guidelines

The Guidelines for Children on Chemical Substances are intended to provide citizens, business operators, and facility administrators with a clear policy on which they can base their own actions to control children's exposure to chemicals in order to reduce the health risks to children that such exposure can cause.

When examining effects on health, compared to adults the following physiological traits and behavioral patterns of children require particular attention:

- Children's nervous and immune systems are not yet fully developed.
- Children's inhalation of air and intake of food and water is greater as a proportion of their body weight than adults'.
- Children frequently come into contact with soil, trees and plants in the environment around them and then touch their mouths. This tendency is particularly strong in the earlier years.

In formulating the Guidelines, surveys were conducted

on the chemicals in use at various locations in the metropolitan area, including facilities frequently used by children, and on exposure to those chemicals taking into account children's lifestyles. Based on the results of those surveys, specific measures for reducing children's exposure to chemicals were included in the Guidelines. The process was as follows:

①Identify the chemical substances requiring special attention taking into account children's behavioral patterns and physiology;

②Examine, with due regard to children's behavioral patterns, children's exposure to those chemicals by surveying their use in children's homes and facilities frequently used by children, and their presence in food and other products;

③Evaluate the results of the surveys and consider measures that would reduce children's exposure to chemicals, such as reducing use of chemicals, shifting to alternative substances, introducing devices to prevent exposure, and ensuring proper use of chemicals and products containing chemicals.

3 Outline of the Guidelines for Children on Chemical Substances

(1) Paint Guidelines

Lead is known to cause damage to the nervous system. In our study of children's exposure to lead, the weekly intake of lead per kilogram of body weight was calculated to be 19.6 μg/kg, with intake via soil the major route (54% of all intake routes), a figure close to the FAO/WHO Provisional Tolerable Weekly Intake of 25 μg/kg.

Playgrounds, parks and day-care facilities are examples of places where small children frequently come in contact with soil, while playing for example. Yet paint with lead is commonly used for buildings and play equipment. To reduce children's exposure to lead, therefore, it was considered necessary to prevent soil around outdoor play equipment from being contaminated by flaking paint.

Findings such as this led to the formulation of the "Guidelines for Children on Chemical Substances: Paint" in July 2002. These guidelines are being used to inform administrators of schools, day-care facilities, playgrounds and parks about the use of lead-free paint and the adoption of measures to prevent lead-based paint from peeling off.

To further promote the use of lead-free paint, we requested the Japan Paint Manufacturers Association to urge its members to accelerate the development of lead-free paint and to encourage construction managers, architects and builders to specify lead-free paint for their projects. In the public sector, the Tokyo Metropolitan Government has taken the initiative of specifying the use of lead-free paint in its own projects, and favorable results have also been achieved in the private sector, where corporate cooperation has led to actions such as wider use of lead-free paint.

A further development has been the acceptance of lead-free paint products as eligible for the "Eco Mark" label.

Guidelines for Children on Chemicals: Paint

I Use lead-free paint in children's facilities and on equipment used by children

II Protect painted surfaces against paint peeling off

III When repainting, take proper measures to prevent scattering of stripped paint

(2) Indoor Air Guidelines

Because people normally spend most of their time each day indoors, improving the quality of indoor air is an imperative for a healthy life. Now that there is greater concern about health issues such as the "sick-house syndrome", measures to deal with indoor chemicals, one of the causes of the syndrome, have become important.

Our surveys detected a large variety of indoor chemicals, even at schools, day-care facilities, children's centers and other facilities for children. Some substances were found to be present in concentrations exceeding the Ministry of Health, Labor and Welfare's guideline figures.

The "Guidelines for Children on Chemical Substances: Indoor Air" were compiled on the basis of the results of these surveys and were released in January 2003. The guidelines suggest ways to reduce concentrations of indoor chemicals so that our children can spend their time in a safe indoor environment. The aim is to prevent any damage to children's health by encouraging the administrators of facilities used by children to keep concentrations of indoor chemicals within the recommended levels by taking measures to control chemicals.

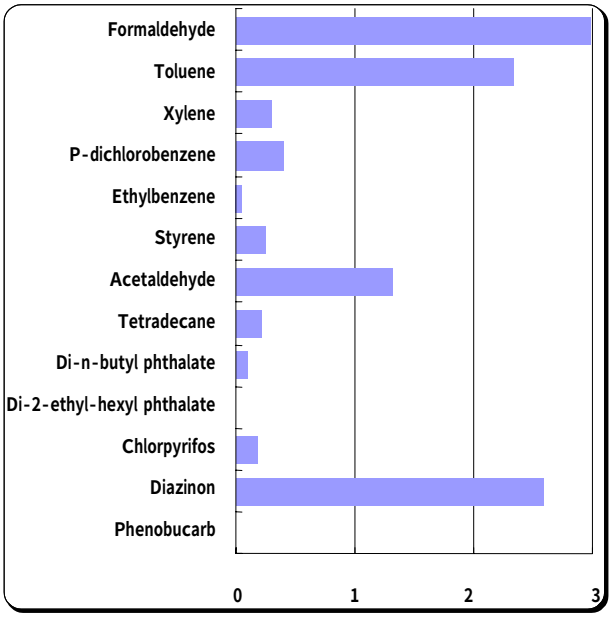

Table 1. Maximum indoor chemical concentrations detected in facilities frequently used by children. (Ratio compared to individual substance guideline values. Tokyo Metropolitan Government survey conducted 2002 fiscal year.)

Once the Indoor Air Guidelines were completed, we requested suppliers of educational materials and school furniture and industrial organizations involved in the operation and maintenance of facilities for children to cooperate in developing products designed with more attention to indoor chemicals and to provide us with relevant information.

Tokyo Metropolitan Government bureaus with responsibility for these matters strengthened their collaboration in working on control of indoor chemical substances and, in 2003 compiled a document outlining the appropriate measures to be taken to solve the problems caused by indoor chemicals at the metropolitan government schools. Some metropolitan municipalities have also begun work on establishing their own policies on the control of indoor chemicals.

Guidelines for Children on Chemical Substances: Indoor Air Guidelines

- **I Reduce chemicals in facilities by adequate maintenance**
- **II Carry out specific measures, such as frequent ventilation, after a renovation with paint or chemically treated wood**
- **III Measure the amount of chemical substances in buildings and make sure that the figure satisfies the guideline of the Ministry of Health, Labor and Welfare**
- **IV Pay a careful attention to children in sick as they may be sick due to chemical substances.**
- **V Engage in risk communication**

(3) Plant Pesticide Spraying Guidelines

From our survey on the use of pesticides on outdoor trees and plants at primary and junior high schools in the metropolitan area, it was found that three organophosphorous pesticides – trichlorfon, fenitrothion and isoxathion – were the most frequently used.

The Metropolitan Government conducted an experiment, actually spraying these three pesticides in the field to measure the chemical concentration in the air, in and on the soil, on the surface of the leaves at the time of spraying, as well as post-spraying residuals. Although the average wind speed at the time of the

experiment was 1.5m/sec and the concentration was below the lowest detectable level 20m downwind, the residual level on the surface of the leaves was high.

Based on the results of this experiment and other available information, children's intake of chemicals through inhalation, food and coming into contact with contaminated soil and plants was calculated.

The results showed that the daily intake of isoxathion (8.56 μg/kg/day) and trichlorfon (3.13 μg/kg/day) exceeded the acceptable daily intake (3 μg/kg/day and 2 μg/kg/day respectively). However, to allow for the maximum level of safety for children, these figures are calculated on the assumption of a child spending the entire day in the proximity of the plants right after the pesticide has been sprayed.

Among the various intake routes, oral intake, where children touch their mouths after touching a plant, was by far the most common – 60-80% of the total.

These findings led us to compile the "Guidelines for Children on Chemical Substances: Plant Pesticide Spraying", released in March 2004. This calls for children's carers to be provided with information in regard to pesticide spraying and for them to take measures to prevent children from entering sites where pesticides have been sprayed.

The Guidelines also provide suggestions for eradicating pests without using pesticides.

Copies of the Guidelines were distributed to schools and pest-control contractors. In response to this, the Metropolitan Board of Education announced its "Appropriate Use of Pesticides and Other Chemicals at Metropolitan Public Schools Policy". The policy advises schools to avoid spraying routinely and, even when a school finds that there is no alternative to spraying, the policy obliges schools to submit an application for assessment of the necessity for spraying.

Trials have also been conducted on administering pest control without using pesticides on some of the trees in metropolitan streets.

Guidelines for Children on Chemical Substances: Plant Pesticide Spraying Guidelines

I Exchange of opinions and provision of information on pesticide spraying

II Reduction of children's contact with pesticides caused by spraying

III Adoption of pest control methods without using pesticides

(4) Food Guidelines

Dietary intake is one of the major routes for human intake of chemicals. With this in mind, the "Guidelines for Children on Chemical Substances: Food" were compiled and released in July 2004 in the hope that our children will be able to enjoy their food with minimum exposure to chemicals. Among numerous chemicals exist in food that are eaten by children, this version set a guideline for dioxins, bisphenol-A, and nonylphenol as no specific guideline has been drawn up for these chemicals in food, and public concerns towards these chemicals are very high.

These guidelines were compiled with the intention of conveying basic knowledge on chemicals present in the food children eat and providing concerned parties with suggestions they may implement in order to reduce children's intake of the chemicals in question. To this end, the Guidelines set out the different volumes of dietary intake of chemicals at different stages of development and provide simple,

easy-to-follow explanations of measures based on the survey results that can be taken to reduce that intake. All parents and guardians, as well as food preparation staff at facilities providing care for children, and ultimately everyone involved in the care of children, are expected to refer to the Guidelines.

Guidelines for Children on Chemical Substances: Food

I Check daily that children are provided with well-balanced meals

II Ensure that adequate pre-cooking procedures, including washing vegetables with clean water, are undertaken

III Learn appropriate care for using plastic containers as chemical substances may seep out from the scratched surface or by putting boiled water into plastic materials.

This set of Guidelines consists of two parts. The first part is the main body and the second part, entitled “For those who wish to know more (Data Book on Chemicals in Food)”, contains detailed data accompanied by useful commentaries to be used in developing risk communication programs.

4. Conclusion

The Tokyo Metropolitan Government compiled four sets of “Guidelines for Children on Chemical Substances” during the two years, starting July 2002 and developed a series of campaign initiatives targeting the parties specified below.

① Product manufacturers have been urged to make efforts to develop alternative products for those containing chemicals and place adequate indications on the products containing chemicals to provide users with the cautions necessary when using such products.

② Residents are advised to acquire proper knowledge of the chemicals present in their everyday environment and be mindful of handling products containing chemicals with adequate care, so that the children are able to live a safe and healthy life.

③ Administrators of facilities are advised to take special care when selecting products containing chemicals when setting up facilities or in the course of their operation and maintenance, and also to take measures to reduce the use of such products and shift to safer alternative products.

Although the Tokyo Metropolitan Government cannot establish guidelines for all existing chemicals, we are currently doing what we can to protect our children’s health, mostly focusing on preventive measures that can be readily implemented.

Our focus is now on further disseminating the Guidelines series, and collecting and distributing up-to-date information on the chemical substances that are prone to affect our children’s health so that we can secure an environment, in which citizens of the metropolis will be able to lead a safe and healthy life.