

# **Chapter 1**

## **Introduction**

### **1.1 Background**

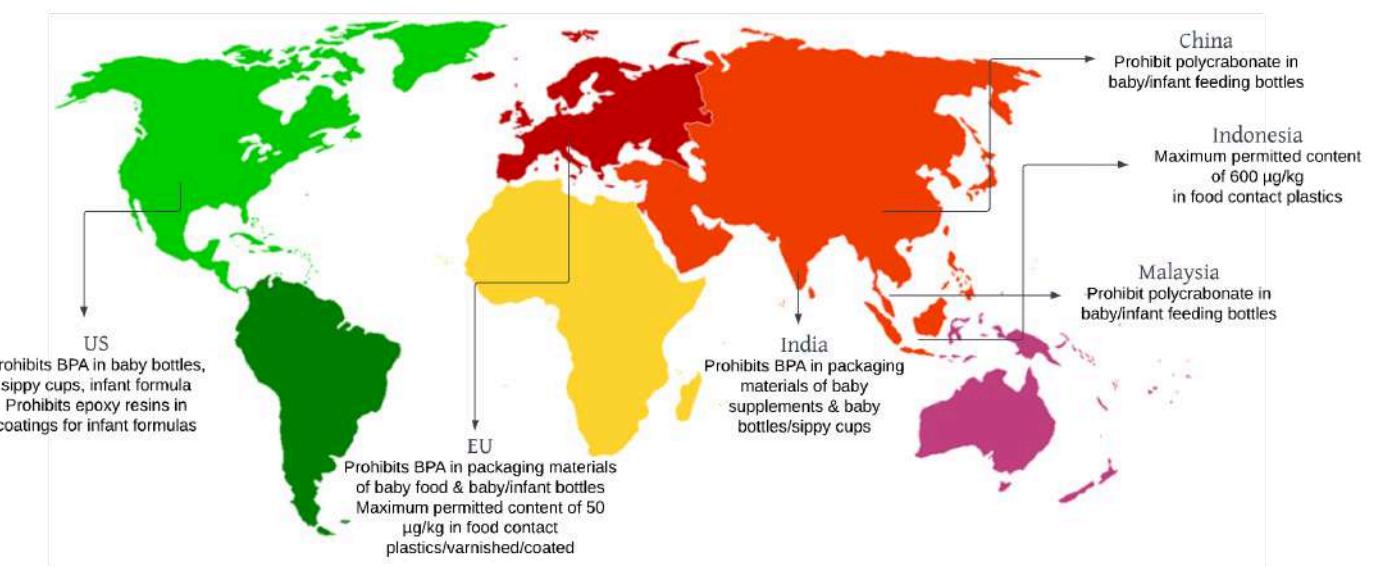
Bisphenol A, also known as BPA, is a common chemical that was made industrially as the coating that provides protection for several materials such as steel drums, pipes, medical equipment, PVC, plastics, and food packaging. It was initially manufactured in 1891 and was later developed in the 1940s to produce the hard plastic polycarbonate as well as epoxy resins that are used to line metal food cans, household products, and commercial products (Wazir & Mokbel, 2019). According to Vasiljevic & Harner (2021), BPA is one of the most used synthetic compounds worldwide with an estimation of global production over 8 million tons per year. However, controversy regarding BPA toxicity and its effects are still debated till this day with particular emphasis on whether or not BPA used in food packaging is safe for human health.

The main source of human exposure to Bisphenol A is tainted foods and drinks from materials which come into contact with food, such as the packaging itself. BPA is considered to be toxic since it has hormone-like characteristics that can cause endocrine disruption, leading to negative impacts on immune system regulation, reproduction, hormone-dependent cancers, and metabolism (Cimmino et al., 2020). Adults are most likely to be exposed by BPA from consumption of canned foods on a daily basis, meanwhile infants and young children are exposed through breast milk and polycarbonate baby bottles which can disrupt their growth, development, and puberty (Braun & Hauser, 2011).

With the many potential health risks that come from BPA, many countries have been making an effort in reducing the use of BPA by banning it from specific products. Canada and almost all of the European Union has prohibited bisphenol A from being used in polycarbonate baby bottles since

2011, extended the ban to all products intended for infants and young children in 2018 and thermal receipts since 2020 (Parkinson, 2023). Moreover, the Food and Drug Administration (FDA) of the United States has prohibited the use of BPA in infant formula packaging materials, children's spill-proof cups, and baby bottles since 2012 (The Food and Drug Administration, 2012), followed by China, Malaysia, and Philippines. On the other hand, Indonesia has only issued a mandatory regulation for BPA in mandatory labeling of BPA in bottled water, as mentioned in BPOM regulation No. 20/2019 regarding food packaging, with the BPA migration limit requirement in polycarbonate plastic packaging of 0.6 ppm and has not banned BPA in any other products which is summarized in

**Figure 1.**



**Figure 1.** Comparison of BPA regulations in different countries  
Source: <https://www.europosters.fr/> (modified by Author), 2024

The role of society often has a significant impact on the preparation, determination, as well as monitoring and evaluation of regulations and policies, including in food safety laws. With justifiable reasons, the society has the right to impose strict food safety regulations, thereby improving people's quality of life in accordance with BPOM regulation No. 25/2022 regarding procedure for forming

legislation within the drug and food control agency and BPOM regulation No 28/2022 regarding service standards within the drug and food control agency. High risk perception of a certain chemical, such as BPA, can be considered as a justifiable reason for stricter regulations. Individuals with a high risk perception will seek mitigation to reduce the likelihood of occurrence. Individuals with low-risk perceptions, on the other hand, face no mitigation effort (Hidayati et al., 2018). Several factors that can promote the society's risk perception of Bisphenol A is through awareness and knowledge, which has a high potential in affecting their attitude and behavior.

## **1.2 Research Question**

The research question was developed based on the research background, which is: "How do awareness, knowledge, and risk perception influence attitudes and behaviors regarding Bisphenol A (BPA)?"

## **1.3 Objectives**

The objectives of this study are as follows:

1. To present a general understanding of awareness, risk perception, attitudes, and behavior of the society towards the use of BPA.
2. To offer insights regarding public awareness, behavior and attitudes towards BPA exposure to support the development of appropriate policies on BPA usage in Indonesia.

## **1.4 Hypotheses**

There are sets of hypotheses in this study:

Awareness on attitude

- **H01:** Society's awareness towards BPA does not have a positive and significant influence on attitudes towards BPA.

- **HA1:** Society's awareness towards BPA has a positive and significant influence on attitudes towards BPA.

Knowledge on attitude

- **H02:** Society's knowledge towards BPA does not have a positive and significant influence on attitudes towards BPA.
- **HA2:** Society's knowledge towards BPA has a positive and significant influence on attitudes towards BPA.

Risk perception on attitude

- **H03:** Society's risk perception towards BPA does not have a positive and significant influence on attitudes towards BPA.
- **HA3:** Society's risk perception towards BPA has a positive and significant influence on attitudes towards BPA.

Awareness on behavior

- **H04:** Society's awareness towards BPA does not have a positive and significant influence on behaviors towards BPA.
- **HA4:** Society's awareness towards BPA has a positive and significant influence on behaviors towards BPA.

Knowledge on behavior

- **H05:** Society's knowledge towards BPA does not have a positive and significant influence on behaviors towards BPA.
- **HA5:** Society's knowledge towards BPA has a positive and significant influence on behaviors towards BPA.

Risk perception on behavior

- **H06:** Society's risk perception towards BPA does not have a positive and significant influence on behaviors towards BPA.

- **HA6:** Society's risk perception towards BPA has a positive and significant influence on behaviors towards BPA.

#### Attitude on behavior

- **H07:** Society's attitude towards BPA does not have a positive and significant influence on behaviors towards BPA.
- **HA7:** Society's attitude towards BPA has a positive and significant influence on behaviors towards BPA.

#### **1.5 Scope of Activity**

The scope of work of this research are:

- Consumer awareness, knowledge, and risk perception towards attitude and behavior on Bisphenol A.
- Regulatory and policy analysis of several countries in comparison to Indonesia government policies of Bisphenol A.

#### **1.6 Expected Output (Outcome)**

The expected outcome of this research are:

- Thesis document for the completion of Master degree in Biomanagement.
- Submission to National/International Indexed Journal for publication.