Biostat 504 Term Project

For this quarter, the health exposure I focused on is the food contamination problem. Bacteria, chemicals, microorganisms, and toxins can contaminate food through food growing, transporting, and processing. Eating contaminated food can cause severe foodborne illness, including diarrhea, food poisoning, parasites, hormone problems, disabilities, and even cancers. Each year, there are **600 million people ill and 420 thousand death because of food contamination. Because food contamination can cause such severe effects and**food is necessary for maintaining society to operate and is the foundation of the economy, c**ountries and organizations are putting more and more focus on improving this problem.**

**As we learned this quarter, the problem can be analyzed in different aspects, and various factors work in this problem. First, the environmental factor can affect the food contamination problem. The contamination source may come from the natural environment, including environmental pollution, pesticides, fertilizers, and etcetera. After human beings or animals have some drug, their excreta may contain heavy metal and drug components and pollute the water and soil. Then, the food which contacted the polluted water or soil will be contaminated. Also, heavy metals as contamination sources can contaminate food when farmers use pesticides and fertilizers during food growing. The heavy metals can stay in the soil and water for a long time and contaminate both fishes and plants**. The toxic effects of the contamination also vary from the stage of food getting contaminated, contaminated way, and contamination source.

Not only the environmental factor work in the food contamination problem, the society and policy factor also impact the problem. Different countries have different food cultures and therefore have different food preferences. Some cultures may have a higher risk of food contamination compared to others because of that. For example, the Japanese like to eat sashimi or sushi which use raw fish, and the American like to eat salad and cuisine that may contain raw vegetables. The raw food products are always riskier than the cooked product since high-temperature can kill many dangerous bacteria and microorganisms. However, Japanese culture also has the custom to eat sashimi with soy sauce and wasabi, killing bacteria and reducing food contamination risk. Also, Japan has strict food policies and the world's best hygiene process because of its food culture. Government and its agencies are responsible for using the laws, policies and regulations to reduce the risk of food getting contaminated. In the United States, The U.S Food and Drug Administration and the Department of Agriculture make safety protocols and inspections to the supply chain's food business. They are responsible for reducing the risk of food contamination by ensuring the food business follows the protocols properly. Both policy and culture can affect the food contamination situation in that country.

Last but not least, focusing on equity, diversity, and inclusion is vital in improving this question. It seems that people's racial and socioeconomic class may also affect their risk of being affected by food contamination. Based on the foodNet data, minority racial and ethnic populations have a higher risk of exposure to food contamination. For example, Asians and Hispanics have a greater incidence rate of Salmonella than Caucasians. It may be due to these two populations have less food safety knowledge and behavior. It is also hard for researchers to research these minority racial and ethnic populations because of the language barriers. Until recently, many food processing knowledge surveys did not have a Hispanic version, and the researchers could not collect data about it. Similarly, the lack of knowledge of the minority population is possibly due to many food safety texts only in English. Researchers also assume that the lower socioeconomic class is experiencing a higher risk of food contamination because of how they are getting retailed food and foodservice. Because of their income, they are not as likely to pay for the professional hygiene process. Even for high-risk food, they tend to process the food by themselves since it is cheaper. Combining with the previous situation, it is crucial for the minority population since they may have less food safety knowledge, making the risk of exposure to food contamination becomes much higher. Therefore, we should consider improving the minority population's situation to reach equality and diversity in the problem.

After learning different public health topics, I understand that we should not just play with the numbers without thinking. There are so many factors in only one public health condition, and we should keep in mind when we are researching any disease. The research should not only focus on scientific sense and but also need to be constructed with clear thinking in different aspects. These things cannot be done by computers or coding, but only biostatisticians who have both scientific knowledge and understand how public health problems are complicated relating to different factors. Therefore, if I can hopefully become a biostatistician, I will pay more attention to how public health conditions are associated with the various trends, relations, and concepts in this world.

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