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Urban Food Deserts in Japan



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Preface

The Purpose of This Book

The purpose of this book is to introduce the Japanese urban food desert (FD) in English. We published a book in Japanese in 2017 (Iwama 2017). The content of this English book is almost the same as the Japanese original. However, we have also added some new information about current Japanese socio-economic environments that strongly connect with FDs.

In Japan, the issue of the worsening living environments of elderly people in poor food-access areas such as rural districts and suburban living complex built in 1960s–70s is drawing attention. These issues are well-known as ‘kaimono-nanmin’ or ‘kaimono jakusya’, which in translation means ‘disadvantaged shoppers’. We believed that many elderly residents had difficulty shopping in poor food-access areas. Therefore, the Japanese government adopted many countermeasures, such as operating vehicle-based mobile shopping services, shopping bus services, and internet shopping services using mobile terminals (tablets). Local people in many areas also started managing their own support services, such as open-air markets.

However, these services have few users and their business is unprofitable. The managers of these services often say: ‘We offer services in poor food-access areas, but few people use our service. Where is “kaimono-nanmin” and “kaimono jakusya”?’¹ Recently, increasing numbers of people have questioned the existence of ‘kaimono-nanmin’ and ‘kaimono jakusya’. Extensive statistical data certainly suggest that many elderly persons suffer from malnutrition caused by unhealthy eating habits (Ministry of Health, Labour and Welfare 2016). However, few academic studies show clear evidence that the decreased number of nearby grocery shops causes residents’ unhealthy eating habits. We have to reconsider elderly people’s living environment from an academic perspective.

We are convinced that the most severely impacted living environments are in the central areas of big cities where many elderly people (especially those in single-person households) live and the ties with local communities are very weak. Therefore, in this book, we chose three case study areas—the central area of Tokyo, a prefectural capital city, and a small city (a provincial city)—to clarify the actual state of urban

FD issues through statistical analyses and field surveys. In addition, we discuss countermeasures to FDs (support services for disadvantaged shoppers) that are conducted in many cities. Then, we introduce some remarkable countermeasures.

Definition of the Food Desert Issue

In a broad sense, food deserts (FDs) can be defined as ‘the specific areas where many (socially vulnerable) residents’ healthy eating habits have deteriorated greatly because of the worsening of their living environments’. Usually, each city has some districts where many of the residents have bad eating habits. Eating habits tend to be worsened by various individual factors, such as food likes and dislikes, unhealthy lifestyle habits, poverty, etc. On the other hand, local factors such as food access and ties with family and neighbours also have a significant influence on residents’ eating habits. As regards the former, approaches to each and every person in the form of dietary education and social welfare support are useful. As regards the latter, if we improve the environmental factors (for example, if new shops are opened), residents’ eating habits will improve throughout the neighbourhood. FD issues relate to the latter case and it is safe to say that FDs come under geographical and sociological research topics.

We estimate some factors around people’s living environment that hinder people’s healthy eating habits. In Japan, we generally consider that elderly people’s poor eating habits occur due to lowered food access (decrease of nearby grocery shops). It is clear that food access is one of the most important factors in this problem. However, our research points out that decreased social ties with families and local communities (local-level social capital²) is also a significant environmental factor that increase elderly people’s risk of malnutrition.

Therefore, in this book, we narrowed the definition of current Japanese FDs according to the following two conditions: (1) many socially vulnerable people (especially the elderly) live in a given area, and (2) there is a marked deterioration of shopping environments (a decreasing number of nearby grocery shops and declining food access) and/or the dilution of local ties with families and neighbours (decreased mutual assistance and decline of local social capital).³

An Elderly Lady’s Eating Habits

We met with Mrs. A in the central area of a prefectural capital city in 2012. She was in her late sixties and lived alone in public housing near the city centre. Her daughter and son-in-law lived in a different prefecture far from her city. Because there were few shops near her house, she always went shopping at a distant supermarket. Through the city council, we requested that she consent to being interviewed/surveyed. She kindly accepted my request and spent about three hours for my interview survey.

She was a good walker and took a walk for about two hours every day. Therefore, her range of activities was very large. She is familiar with this city and informed me clearly about this city's scenic sites and out-of-the-way restaurants. She also told me about her memories of short trips with her old schoolmates and an overseas trip with her daughter and her son-in-law. She had a good geographical sense, so her stories about her trips were very interesting. However, she had moved to this place recently (a few years ago) and knew few of her neighbours. In addition, she did not like neighbourhood communication. She was alone the whole day. She also had problems with her eating habits. Because she was in the workforce for a long time, she did not have much experience of cooking meals. In addition, she did not like fresh vegetables and fish. So, she usually ate ready-to-eat meals and retort or packaged foods. She was concerned about malnutrition. However, few other people worried about her health. We found many elderly people living in similar situations in the area. We were surprised that such areas exist in the centre of big cities.

We often see elderly people walking slowly along lonely shuttered streets to distant supermarkets. Malnutrition caused by the worsening of living environments has increased among elderly people. Eating is a physiological need and a very important part of our lives. We live in a modern and prosperous country where food delivery systems have developed adequately. Therefore, it is safe to say that it is our basic right to get a sufficient quality and quantity of daily food. However, now, when food is plentiful, many people cannot enjoy this basic right. The number of these disadvantaged people is increasing. We can see similar issues in developed countries in Europe and the Americas, such as the UK and the US. In these countries, the main victims of FDs are so-called low-income persons without private cars represented by foreign unskilled labourers living in the inner areas of big cities. European and American FDs are caused by many factors, including the decrease in neighbourhood grocery shops (poor food access), lack of educational opportunities (lack of knowledge about healthy eating), lack of employment opportunities (expansion of poverty, increase of fast food restaurants), etc. In Europe and America, these worsening living environments are related to eating habits and are recognized as social exclusion (socially vulnerable) issues.

Features of FDs differ in Japan when compared with those in Europe/America. Japan is an aging society and FD issues are most serious among the single elderly. In Japan, FD is generally recognized only as a poor food-access issue. The Ministry of Economy, Trade and Industry (METI) defines 'kaimono-jakusya' as an elderly person over 60 years of age who has difficulty in doing daily shopping (METI 2010). The definition of 'kaimono-nanmin' is not clear, but this word usually has the same meaning as 'kaimono-jakusya'. METI estimates that the population of 'kaimono-jakusya' comprises about 6 million people in Japan. On the other hand, the Ministry of Agriculture, Forestry and Fisheries (MAFF) reported more detail and collected research data in 2011. MAFF calculated the number of elderly people over 65 years of age without a car whose house is much more than 500 m from the nearest grocery shop. And they pointed out that the population of 'kaimono-jakusya' is about 3.8 million in Japan. That research considered this issue only as a problem of food access. However, FD is based on social exclusion and the features of Japanese FD

must therefore be more diverse in their extent. We must consider the Japanese FD issue from multiple viewpoints.

Disadvantaged Shoppers' Support Services

In Japan, many kinds of disadvantaged shoppers' support services (such as mobile commercial food vans, food and meal delivery services) operate in many poor food-access areas. In particular, mobile food vans have supported many elderly people's daily life. The staff of these services are not interested in making a profit for their activities. We are very impressed by their passion to support disadvantaged elderly people.

However, most services do not have enough customers and operate in the red. Many services went bankrupt within a few years of startup. A commercial food van goes around the streets where Mrs. B lives. Although some of her neighbours use this service, she never does. This vehicle also operates in the red. A problem is that these services do not know clearly who needs shopping support, and what kind of support they need. Many staff operate their support services by trial and error and will go bankrupt soon. To consider sustainable and effective countermeasures to tackle FD issues, first we have to consider this issue from an academic viewpoint and clarify who the most serious FD victims are, in what way they suffer from this issue, and where these people live.

Improvements on Our Previous Book

We published our first book 'Japanese food desert issue' in 2011, and newly revised edition in 2013 (Iwama 2011, 2013). In those books, we introduced Japanese food desert studies of the day. At that time, we considered FDs as poor food-access problems (Iwama 2011, 2013). Therefore, in that book, our study focused on poor food-access areas such as those in small cities where shops along central shopping streets had mostly closed down, rural areas where there were few grocery shops, and large-scale housing complexes built in the 1960s on the outskirts of cities, where many residents were over 65 years of age in 2011. We investigated elderly residents' eating habits and shopping behaviours in those areas. As a result, we found that many elderly people did not go shopping frequently and had unhealthy eating habits in local cities and housing complexes. On the other hand, many rural area residents retained good eating habits despite their food access being very poor. Although food access is one of the most important factors of FD, there must also be other factors. In that book, we suggested that ties with neighbours might be another important factor. However, we did not analyse the relationship between social ties and healthy eating habits statistically (not based on evidence).

During the five years since we published our first book, FD studies have developed in Japan. The first development is the advance in social capital (SC) studies. For more detail about SC, please see Chap. 3, Sect. 2. SC refers to ties with family members, friends, neighbours, and so on. If people's SC decreases, their risk of isolation from society becomes higher. As we will mention later, many medical scientists and epidemiologists have pointed out that enriched interactions with friends and families have a good influence on elderly people's health conditions, including depression, self-rated health, nursing care level, and fall incidence rate. SC is generally considered to be an individual factor, but individual forms of SC such as ties with neighbours often accumulate in local areas. Recently, some academic papers have clarified that the quality and quantity of local-level SC are different in each small area such as town streets (For more detail, please see Chap. 3, Sect. 2). And elderly person living in a low-SC area has a higher risk of compromising their health than those in high-SC areas. These research results mean that SC might be an important factor in the occurrence of FDs. If we are isolated from society, it will be difficult to get daily support such as sharing meals with neighbours. These supports are essential for elderly people to maintain healthy eating habits. In addition, the isolation might deprive people of their will to live and may reduce health awareness.

The second development is the interest in urban FDs. As Chaps. 4–6 show, large-scale FDs exist in big cities such as Tokyo and prefectural capital cities. Moreover, the population of elderly residents keeps increasing rapidly in urban areas. This fact means that FDs will expand more in big cities in the near future. To protect elderly people's living environments, we have to analyse the occurrence factors of urban FDs and clarify correctly where the FDs actually exist.

The third development is quantitative and empirical research using large-scale data. Recently, socio-economic research using big data has shown good progress. Governments also support this research and they are building platforms for big data databases with protection for personal information. So, it is becoming more convenient for us to use these big data for academic research. Actually, measuring food access has becoming easier because of big data. Although measuring SC is still difficult, it will be easier in the near future.

This book is the sequel to our previous book and introduces our new FD studies undertaken since 2011. The features of this book are as follows:

- (1) Redefinition of Japanese FD issues from the viewpoints of food access and SC.
- (2) Empirical research in central areas of big cities (central Tokyo, prefectural capital city, and local city).
- (3) Understanding of actual conditions underlying Japanese FDs and factor analysis (development of new FD maps based on food access and SC).
- (4) Introduction of remarkable measures to combat FD issues.

Development of New FD Maps

One of the main subjects of this book is answering the question, ‘where are the FDs located?’. I think many would ask the same question. If we have accurate FD maps, we can offer suitable support services to the people who really need help. Geographers have a responsibility to make these maps correctly. This is a very heavy and difficult responsibility. Many kinds of living-environment factors relate to the elderly people’s unhealthy eating habits (not only individual attributes such as poverty, solitude, and decreased strength, but also local factors including food access and SC). FD maps must include these factors.

The FD studies so far have been based on the blank areas of maps of grocery shop locations (so-called food-access maps). In our previous book, we called these maps ‘Food desert maps’. However, as we will mention later, there is not always an overlap of the location of poor food-access areas and the distribution of elderly people with poor eating habits (Chaps. 4–6). To understand FD issues correctly, we have to reconsider both food access and SC.

We can measure food access relatively easily. But there is no established statistical database about SC (individual data which show the ties with family members and neighbours), and to measure local-level SC by ourselves, we would have to conduct a large-scale questionnaire survey of all elderly residents within the research areas. To do this survey, full support of governments and self-government associations is necessary. In addition, significant funding is required to carry out the questionnaire survey.

In Chap. 3, we show two maps illustrating the distributions of disadvantaged shoppers in Tokyo 23 Wards and Minato Ward. Minato Ward is one of the richest areas in Tokyo 23 Wards. These maps are made using demand and supply balance data on residents and shops. In this chapter, we also describe how to make several types of food access maps. In Chap. 5, we show a new FD map created using two indexes: food access and SC. This map is revolutionary. However, we made this new map only in one city because of the difficulty of collecting each resident’s data about SC.

The Structure of This Book

The structure of this book is as follows. In Chap. 1, we outline FD issues. In particular, first, we discuss previous overseas studies. Then, we introduce recent Japanese FD studies and definitions of Japanese FDs.

In Chap. 2, we introduce problems associated with Japan’s aging society and analyse elderly people’s living environments using statistical data. In particular, we focus on the living environments within big cities.

In Chap. 3, we consider two important factors: food access and SC. With regard to food access, we introduce recent research trends and show some ways of making

food access maps. With regard to SC, we introduce recent research trends and show two types of measurement procedures of SC.

In Chap. 4, we consider the existence of FD and its features in central Tokyo, where the case study area is Minato Ward. Minato Ward has a complex population composition. Although Minato Ward is one of the richest areas in Japan, the problem of poverty is also remarkable there. Meiji-Gakuin University has researched the poverty problem in this area. In addition, we analysed the main factors of elderly residents' bad eating habits from two viewpoints: individual factors (age, gender, financial condition, etc.) and living environment (food access and SC). In this book, we introduce an outline of above research.

In Chap. 5, we introduce our research about the case study of a prefectural capital city located on the outskirts of the Tokyo metropolitan area. First, we clarify the distribution of elderly people with a high risk of malnutrition. Second, we look for main factors that seriously decrease elderly people's healthy eating habits using multilevel analyses. Third, we extract FDs and clarify their features.

In Chap. 6, we describe our study in a local city located on the outskirts of the Tokyo metropolitan area. This city has two different types of areas: a commuter town of Tokyo and a traditional agricultural area. In this chapter, we clarify the distribution of elderly people with a high risk of malnutrition and analyse main factors associated with elderly residents' unhealthy eating habits. In this chapter, we also consider the effectiveness of the support services for disadvantaged shoppers. A mobile food van service operates in this city. So, we make a comparison between the services offered and the actual conditions of FDs in the city. Then we suggest the advantages and disadvantages of this service, and point out some improvement plans.

In Chap. 7, we introduce some remarkable countermeasures (support services) to combat FDs in Japan and consider key ways of solving this issue. Typical countermeasures are mobile food vans, and food and meal delivery services. There are many kinds of services available. Their operating bodies are also diverse, including the Japanese government, local governments, private companies, and local residents. Unfortunately, almost all of these services are unprofitable. On the other hand, some people are trying to restructure their services effectively to secure their profitability. In this chapter, we organize Japanese countermeasures for FDs in systematic order and introduce some remarkable case examples.

Notes

1. METI reported 62.3% of businesses that operate support services for elderly people answered, 'I think disadvantaged shoppers must exist. But I do not know where they live'. <http://www.meti.go.jp/policy/economy/distribution/kai-monoshien2010.htm> (Japanese). Accepted 13 February 2020.
2. Social capital refers to social networks (ties with people and groups) and normative consciousness based on trust and reciprocity. More detail, please see Chap. 3 sect. 2.
3. In our previous book (Iwama 2011), we defined the food desert issue as 'socially vulnerable groups' health problems that often occur in places that meet the

following two conditions: (1) fresh food supply system is broken, and (2) many socially vulnerable groups reside here' (p1). In this definition, we defined condition (1) based on the following two factors: spatial factor (the extent of the physical distance between the residence and the nearest grocery shop) and social factor (the extent of the economic and mental distance caused by poverty and social isolation). However, we have not paid enough attention to the social factor. Therefore, in this book, we redefine Japanese FD issues from the viewpoints of food access and social capital.

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Tokorozawa, Japan
Mito, Japan
Hiroshima, Japan
Toyohashi, Japan
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Chapter 1

The Definition of Japanese Food Desert Issues



Abstract In this chapter, we introduce Japanese food desert (FD) issues and their socioeconomic backgrounds. In a broad sense, FDs can be defined as ‘specific areas where many (socially vulnerable) residents’ healthy eating habits have deteriorated greatly because of the declining quality of living environments (local factors).’ However, for a strict definition of FDs, we must consider living environments carefully. We have researched many locations, such as central Tokyo, other large cities, dormitory suburbs, smaller cities, remote agricultural and mountainous areas, and disaster-stricken areas. Then, we narrowed the current definition of Japanese FDs according to the following two conditions: (1) many socially vulnerable people (especially the elderly) live there and (2) there is a marked deterioration of shopping environments (a decreasing number of nearby grocery stores and declining food access) and/or the dilution of local ties with families and neighbors (decreased mutual assistance and decline of local social capital).

Keywords Definition of Japanese food desert issues · Socially vulnerable people · Poor food access · Dilution of local ties with families and neighbors

1.1 What Are Food Desert Issues?

1.1.1 Isolated Elderly People Who Live in Big Cities

Mr. B drew my attention to the issue of Japanese urban food deserts (FDs). We met him in 2012. He was over 80 years old, and he lived in the center of a prefectural capital city with his wife. A staff member at the city office of the senior citizens’ welfare division invited him to talk to us and gave us his address in the center of the downtown district. It was not our home city, but we were familiar with it. Although we did not believe there were any private homes in the area, we arrived at the address 30 min before the appointment. The address was in a backstreet to the main shopping street. There were many fashionable bars and miscellaneous goods shops, as well as fountain and water features. There were many seats and a large clock tower. This area appeared to be under redevelopment by the government. The backstreet was very busy at night with young office workers. As expected, we could not find any private

houses there. We asked some clerks from the nearby miscellaneous goods shops, but no one knew his address. We were in trouble and we called him directly by phone. He soon answered and kindly gave us directions. He told us, 'I am sorry, but I have serious back pain and I cannot pick you up. Please look behind the clock tower and you will find our house's entrance soon.' Therefore, we looked behind the tower and found a small door with his nameplate in the hedge. Although Mr. B is an elderly man aged over 80 years, he was energetic and quiet. During the survey interview, we found him clever and erudite. We admired and respected him. His house is located in a bustling street mainly composed of fashionable pubs and miscellaneous goods shops. However, this street used to be a typical shopping street comprising many kinds of stores selling goods such as groceries, commodities, and clothing. He had managed a stationery store with his wife for a long time. This store was next to his house, and it had been a long-established shop that had lasted for three generations. His wife was a good partner and she managed the business in general, performing tasks such as waiting on customers and stocking up on stationery. They were extremely busy when running the business and had no time to cook for themselves. Therefore, they usually bought ready-cooked meals/dishes at neighboring food stores and ate them with their family. Now, they have closed their stationery store and let the property to a tenant. The couple have two daughters. The elder daughter lives in Tokyo and the younger one lives in a suburb of this city.

Mr. B was very busy caring for his wife, who suffers from dementia. Until 2007, he and his wife went to a nearby welfare center for the elderly and enjoyed chatting and singing karaoke with their friends. Because of the worsening of his wife's symptoms, they had to stop going to the welfare center. Although she suffers from dementia, Mrs. B has sufficient stamina to go outside and often wanders. Sometimes, she is found by the police in faraway cities and Mr. B goes to pick her up by taxi. Once, she was even mistakenly arrested by the police for shoplifting in a large store. For patients with dementia, nursing home fees are higher than for others. In addition, few nursing homes accept them, so he had no choice but to care for his wife by himself. The only time he can relax is just half a day per week when his wife goes for a short stay at the day care center for seniors. He kindly sacrificed his important leisure time for us and talked about their living environment for three hours. We really appreciated his kindness. He told us, 'I understand that nursing homes are too busy to care for dementia patients like my wife. However, our society should understand our tough living environment better.'

There used to be many independent stores along this street, and their owners and their families lived in the district. They maintained good relationships in this community and established their own local association. However, after the deregulation of large stores in the 1990s (for details, please see Chapter 1, Sect. 1.2.3), independent stores disappeared one after another, and chain establishments, such as pubs and convenience stores, have been established in the shopping streets. Mr. B's street has also changed dramatically. The clerks at the chain stores usually live in suburban residential districts and commute to the stores from their houses every day. The local population has rapidly decreased. Now, few elderly families like that of Mr. B and

his wife live in this area. Their local association has dissolved, and he has not met his neighbors for a long time.

Mr. B has trouble with his back and must care for his wife throughout the day, so he has too little time and mental stamina to go shopping and cook by himself. His daughters live far from this city and it is difficult for them to take care of their parents. In addition, Mr. B and his wife's ties with their neighbors are very weak. He has few friends and relatives on whom he can rely in times of trouble. He uses a private food distribution service on weekdays. The meals are too large for him, so he shares them with his wife. There is no service on weekends, so he usually buys bread and lunch from nearby convenience stores. He is very concerned about his own and his wife's eating habits, but he has no other choice.

After the study of FD issues in this city, we held a briefing session for the office staff of the prefectural government office and city hall. In this session, I mentioned that many elderly people with poor eating habits, such as Mr. B, live in the city center. Then, one officer asked us, 'The city center is an upper-class residential area. Do such elderly people really live there?' I was very surprised that some local officers did not recognize the seriously deprived living environment of the elderly residents of the city center. Certainly, there are many shoppers and lively cityscapes in the center. The current trend of people returning to the city center has caused the number of high-rise apartments to increase. Many of their residents are relatively young and rich. The officer had good reason to believe that FD issues do not arise in the city center. However, in apartments above chain stores and in the back streets, many people such as Mr. B live in the shadows and need support. In addition, less noticeably, many low-income people live in decrepit houses left behind after urban development. Many of these people are elderly. With a declining birth rate and an aging population, it is estimated that the number of elderly people will increase further in urban areas such as Tokyo. The encounter with Mr. B became an important turning point for our study of FDs in Japan.

1.1.2 The Definition of 'Food Deserts'

Almost all cities have areas where concentrations of people with unhealthy eating habits live. An internist from a regional hospital told us in 2012, 'I can't show you the patients' charts. But it seems that the residential districts of the patients with diseases associated with diet, such as kidney disease and obesity, are concentrated in specific areas.' This means that elderly people's eating habits may be affected by geographic factors. Eating habits certainly deteriorate because of individual attributes or factors such as food preferences, irregular lifestyles, or economic conditions (e.g., Yagi et al. 2019). On the other hand, living environments (local factors), such as districts where there have been decreases in the number of nearby grocery stores, also have a severe impact on daily eating habits. In the former case, promoting social welfare services, such as nutritional education, is important for improving eating habits. In the latter

case, if we alleviate geographical and spatial problems, the eating habits of residents will improve at the regional level.

In a broad sense, FDs can be defined as ‘the specific areas where many (socially vulnerable) residents’ healthy eating habits have deteriorated greatly because of the worsening of their living environments (local factors).’ However, to define FDs more strictly, we must consider living environments more carefully. Current FD studies tend to focus only on food access (the declining number of nearby grocery stores) (e.g., Yakushiji 2015; Ohashi et al. 2017; Kikushima and Takahashi 2018). However, the FD issue is not simple. It is a highly complex social problem based on social exclusion. There are many local factors that may have negative influences on residents’ eating habits. The most influential local factor may be different in each area, region, and country.

We have researched many places, such as central Tokyo, other large cities, dormitory suburbs, smaller cities, remote agricultural and mountainous areas, and disaster-stricken areas (Iwama 2011, 2013). The most serious victims of Japanese FDs are elderly people isolated from their families and neighbors. If they are isolated from society, it becomes very difficult to obtain support for tasks such as shopping, sharing food and meals, dining with families and neighbors, receiving advice on healthy eating habits, and so on. Intellectual activities are essential to maintain independence and an intellectual life; for example, exploration, creative pursuits, and leisure activities. Isolation often drains the energy that elderly people require to live and impedes the intellectual activities that are important to maintain independent lives (Kumagai 2011). The residents’ eating habits easily deteriorate where ties with families and neighbors are weak, even where there is adequate access to food. These areas constitute FDs. On the other hand, in some areas with poor food access, residents procure food through bulk purchases by private car, sharing food and meals with neighbors and receiving support from children who live nearby. These do not constitute FDs.

From these points, we narrowed the definition of current Japanese FDs according to the following two conditions: (1) many socially vulnerable people (especially the elderly) live there and (2) there is a marked deterioration of shopping environments (fewer nearby grocery stores and declining food access) and/or the dilution of local ties with families and neighbors (decreased mutual assistance and decline of local social capital¹).

1.2 The Structure of Food Deserts

1.2.1 *Declining Nutrition of Elderly Residents*

Although we are living in what is called a ‘satiation period’, a form of malnutrition is spreading among elderly people in Japan. However, it is often difficult for young people to notice the existence of elderly people with shopping disadvantages and poor eating habits. The weakening of connections within local communities also hides the

existence of these elderly people. Fortunately, some recent media broadcasts have reported this issue in Japan and FD issues are generally recognized by many people. However, FDs are invisible and sometimes misunderstood. Many people blame large retail companies and the government for emptying traditional shopping streets and expanding FDs. However, FDs are a structural problem stemming from many factors related to the aging population and changes in lifestyle. Therefore, I am sure that the FD issue is not the fault of specific companies or the government.

Figure 1.1 shows the relationship between FDs and elderly people’s poor eating habits. This model is based on past research (Iwama 2011, 2013). Socially vulnerable people, such as the elderly and the poor, have always existed. So far, environments with minimum living standards, such as easy access to grocery stores and hospitals, have been maintained by the government. Moreover, families and neighbors have protected elderly people. Therefore, the socially vulnerable can maintain a certain quality of life. However, many elderly people’s eating habits have recently deteriorated dramatically. Poor eating habits directly increase the risk of malnutrition. Individual and local factors have contributed to this problem. Individual factors are

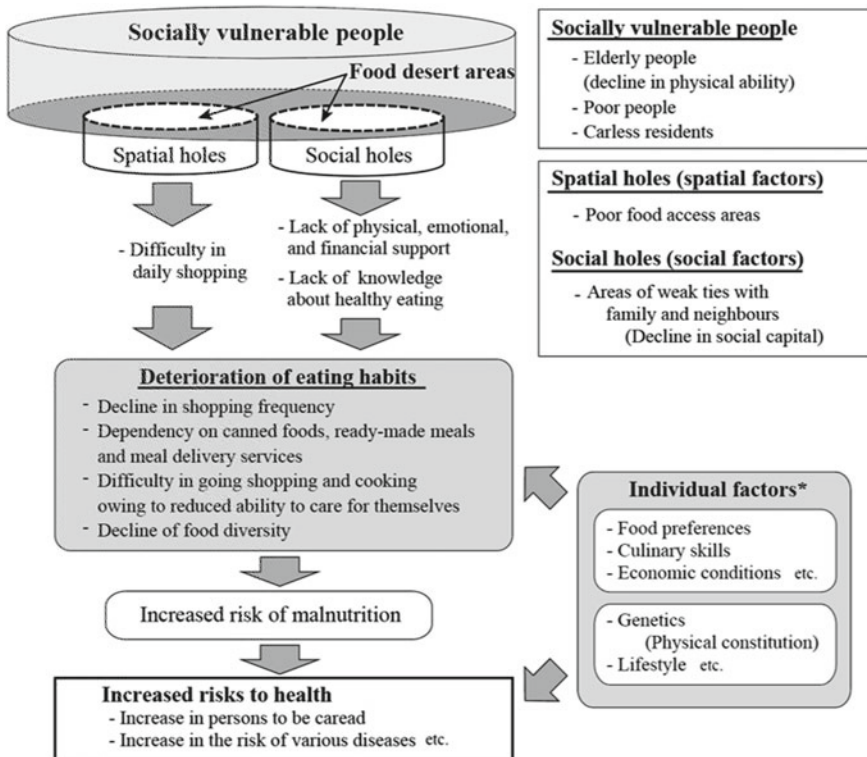


Fig. 1.1 Relationship between food desert issues and elderly people’s poor eating habits. *Source* Iwama ed. (2017). *Note* Individual factors are personal attributes and circumstances. However, social factors also influence individual factors (Kondo 2007)