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An Upcoming Threat to Public Health

A case study on obesity and the structural challenges present in Indonesia

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Abstract

Obesity rates have been increasing at an alarming pace across the globe however, little has been done to address the issue even in high income countries. To further problematize this issue, many researchers and public health officials have conceptualized obesity as being individually based, rather than analyzing it from a structural perspective. This challenge will be extended to developing countries if objectives and policies are not undertaken to control the rising rates of obesity. The case of Indonesia is an example of this, with many people living in urban areas being exposed to high risk factors associated with obesity, which may later contribute to increasing patterns of non-communicable diseases. The aim of this study will be to analyze external factors which influence individual agency regarding nutrition in the context of Indonesia. In doing this, the socio-ecological model will be adopted to identify indicators that are related to external systems, which may affect individual nutritional behavior or attitude. The results imply that interpersonal relationships, community and institutional operations, and health governance, all to a certain extent, play a role in impacting an individual's perception and decision on nutritional health and obesity. The conclusion summarizes these results, in addition to positioning this topic in the field of public health and development. A discussion is then opened to demonstrate how this research can be applied to structural obesity interventions and what could be further researched within this area.

Keywords: Obesity, Nutritional health, Indonesia, Public health, Socio-ecological model

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List of Abbreviations

- **Bappenas** - National Development Planning Agency (*Badan Perencanaan Pembangunan Nasional)*
- **BMI** - Body mass index
- **GERMAS** - Community Movement for Healthy Living (*Gerakan Masyarakat Hidup Sehat*)
- **IFLS** - Indonesian Family and Life Survey
- **JKN** - National Health Insurance Program (*Jaminan Kesehatan Nasional*)
- **MoH** - Ministry of Health
- **NCD** - Non-communicable disease
- **NGO** - Nongovernmental organization
- **PIS-PK** - Healthy Indonesia Program with a Family Approach (*Program Indonesia Sehat dengan Pendekatan Keluarga)*
- **Puskesmas** - Community health clinics (*Pusat Kesehatan Masyarakat)*
- **PROGAS** - National School Meals Program (*Program Gizi Anak Sekolah*)
- **RPJMN** - National Medium Term Development Plan (*Rencana Pembangunan Jangka Menengah Nasional*)
- **RPJPN** - National Long Term Development Plan *(Rencana Pembangunan Jangka Panjang Nasional)*
- **WFP** - World Food Programme
- **WHO** - World Health Organization

1. Introduction

The prevalence of overweight and obesity has rapidly increased over the past five decades, with the global rate almost tripling since 1975 (WHO, 2020). This has not just become a problem to the western world but is increasingly affecting developing countries as well. The issue of overnutrition and obesity also contributes to the global challenge in combating the rise of non-communicable diseases (NCDs), which account for nearly 70 percent of all deaths worldwide (WHO, n.d. b). This new health pattern poses a threat towards individuals, communities, and especially health systems, making NCD prevention a crucial objective within public health and development.

This case in Indonesia is particularly interesting, because like many other developing countries, they are suffering from the unintended consequences of the nutrition transition which has led to an alarming increase in child and adult obesity. Globalization and the introduction to highly processed foods containing oils and sweeteners have essentially changed dietary habits and consumption patterns for many living in urban areas (Popkin et al., 2012). In addition to this, high levels of overnutrition coexist with high levels of malnutrition, commonly known as the double burden of malnutrition, which is applying more strain to an already fragile public health system (Hanandita and Tampubolon, 2015). The current trend of obesity in Indonesia displays a gradual increase affecting all age groups. There is a stronger association of obesity in women, those who reside in urban areas, and families who have a higher income level or socio-economic status. The prevalence rate of obesity was recorded to be 23.1 percent; data also shows that there is a higher percentage of women who are obese, compared to men, which is around 11.7 percentage points (Harbuwono et al., 2018). These findings present the basic conditions in which public health officials are expected to improve, however this may only be accomplished if the problem or challenge is addressed through the right angle.

Obesity prevention and intervention schemes are necessary if health officials are determined to reduce the rate of obesity and associated NCDs. Therefore, it is imperative to examine the causes, determinates, and principles of how people perceive obesity and what influences this behavior. Obesity is a systemic issue, thus stating that the problem of obesity arises as a result of

multiple factors. Oftentimes, the community and public health advocates frame obesity as an individual problem, applying a strong focus on individual based solutions and problematizing weight rather than general health (Ramos Salas, 2015). Not only does this create a stigma for obesity, but this conceptualization is also targeting the wrong areas for intervention, leading to little or no change in nutritional health. The complexity of obesity calls for structural interventions, primarily paying close attention to household, community, environmental, and institutional structures. Personal agency is also incorporated into this frame, however to a lower degree compared to external aspects (Backholer et al., 2014). Therefore, the significance of this study is aligned with this argument, using the case of Indonesia to illustrate the need for structural intervention to improve nutritional health among individuals.

1.1 Aims and research questions

The purpose of this study is to emphasize the importance of nutritional health regarding the current state of obesity in Indonesia, by suggesting the need for structural interventions. Therefore, the aims of this study will be aligned with this purpose and in specifically investigating areas where structural interventions may be applied. The primary aim of this study will be to analyze external factors which contribute to influencing nutritional health attitudes and behaviors of individuals in Indonesia. Previous research has drawn upon specific risk factors which are associated with obesity however, the aim in this study will provide an extended outlook by including an assessment of independent factors which indirectly contribute to personal behavior. Utilizing the socio-ecological model will also strengthen this aim by providing a guidance frame for the analysis; this will further be explained in the *theoretical framework* section. The external factors analyzed in this study include interpersonal relationships, community and public health involvement, and subnational health governance, all of which will be defined as structural factors. Furthermore, the exact definitions of each factor in the context of this study will be provided in the following subsection. Lastly, research within the field of nutritional management is essential to understanding the challenges and hinderances of improving healthy, nutritious behavior among households and communities, therefore this study will contribute to this field by providing a justification and insight on strengthening obesity interventions. The research question to be answered is as followed, as well as a sub-question to further link together the detail.

1) *In reference to the socio-ecological model, what external systems influence individual agency regarding nutrition and obesity in Indonesia?*

    a) *How do these external systems contribute to the trend of obesity between the years of 2005 and 2020?*

1.2 Definitions

There are multiple terms and concepts which are referred to in this study that may have significantly different meanings in other contexts. Therefore, this subsection will provide the exact definition used in this thesis.

This study is centralized on **obesity** which is classified as a medical disease which is diagnosable. It is noted as a disease since it is a risk factor for other diseases and can also be a cause of death itself (Conway and Rene, 2004). One can be diagnosed as being obese if their body mass index (BMI) is 30 or over. If an individual's BMI is over 25, they are considered overweight (WHO, n.d. c). **Overnutrition** is used interchangeably with obesity in this study, however this is defined as an excess consumption of nutrients which leads to obesity.

The term **interpersonal relationship** is applied within the socio-ecological model, including the first two systems closest to the individual. These are relationships and interactions between the individual and care givers, family, friends, peers, teachers, and colleagues. These people are usually found within one's household, school, or work environment.

The structure of health governance is usually divided into two sectors. **Subnational** is defined as structures belonging to provinces, districts, cities, and communities. Therefore, this includes public community clinics, commonly known as *Puskesmas,* hospitals and district health offices. **Central governance,** in context to health governance, refers to the national development agencies and the Ministry of Health (MoH).

1.3 Delimitations

The context of this study discusses obesity in Indonesia from a national level. The majority of the population who are obese or have high risk factors of becoming overweight do reside in urban areas. This is not to say that obesity does not exist outside of urban areas, however most data collected from secondary studies is centralized in provinces with large urban populations (e.g., East Java, Central Java, West Java, Jakarta). Throughout the analysis there is data which is referenced towards specific cities. Furthermore, the discussion of health systems in this thesis refers to public health systems and governance. Indonesia has a strong private health sector, however the community and subnational context in this study always concerns the publicly available facilities, clinics, institutions, and resources. Additionally, this study refers to obesity (having a BMI 30 or higher) and not central or abdominal obesity (having a high waist to hip measurement ratio). Sources which discussed central obesity were omitted from this study to keep the data consistent.

1.4 Disposition of thesis

This thesis is organized into four different sections which will outline background information, the research plan and analysis. The first section provides a broad overview of Indonesia, including background information on population health, the health system and providing a view from pre decentralization to present day. Nutritional trends across the country will also be discussed, mainly focusing on obesity, and other nutritional challenges. The following section will focus on previous research which has been conducted within the field. The main themes which are implied include, the debate on framing obesity, nutritional changes in developing countries, social determinates related to obesity in Indonesia, and possible interventions which have been suggested to reduce poor nutrition habits and behaviors.

The third section of this thesis will identify the theories and concepts used to examine influential factors which effect obesity rates in Indonesia. The socio-ecological model is the primary frame used in this study to identify the external factors which impact nutritional health and how these relationships effect individual health attitudes and behavior. This model consists of four external systems, however the analysis condenses this to three external factors which effect individual agency. The principal – agent framework will also be applied to specifically analyze the

relationship that exists between subnation and central health structures. This element will also be incorporated into the socio-ecological model when discussion health governance and policies. Following this section, methodology will be discussed by providing the research design, collection of data and sources used, ethical considerations, and the limitations to this study.

In the final section, an analysis will be provided which will justify the claim that obesity is a systemic issue that requires examination of external factors which influence individual agency related to overnutrition. This will be achieved by using the theoretical approaches as a guide in this study. The analysis is structured so it follows indicators which are included in the socio-ecological model. An in-depth description is provided for each external factor along with supporting evidence which all relate back to individual patterns of behavior or decisions. Finally, a conclusion will give a short summary of this thesis, as well as opening a discussion. The topic of nutritional health will be applied to the wider field of public health and development by describing the interrelated objectives which all fields share.

2. Background

This section illustrates the contextual features of health, nutrition, and health systems within Indonesia. The information provided here is essential to understanding the current trend of nutritional health in Indonesia, and in understanding how actions and patterns have changed over time. Additionally, background knowledge in these areas have helped in constructing the issues of nutritional health on a more defined level, such as including target factors of over nutrition and public health systems.

2.1 Demographics and population health

Indonesia is a largely unique country with a population exceeding over 260 million people across 34 provinces. With the addition of 700 different languages and 300 different ethnic groups, this makes Indonesia a highly diverse country (WHO, 2017, pp. 4). From this demographic data, one can realize the true extent to how health, education, and labor may vary across different regions. In 2015, more than half of the total population lived in urban areas, which has resulted in a growing working class, as well as more people working in the informal sector (WHO, 2017, pp.

5; Agustina et al., 2019). With this change, it may seem evident that the populations perception of healthcare and healthy wellbeing has also changed. Those employed in the informal sector usually do not have insurance or any type of welfare, therefore many people have to pay high out of pocket fees when they visit health facilities (Sparrow et al., 2014). Adding to this issue, the burden of NCDs are rising, putting more people at risk. Between 2008 and 2012, the deaths associated with NCDs increased from 64 percent to 71 percent; 37 percent of those deaths were due to cardiovascular diseases, and 6 percent due to diabetes. In urban areas, mortality rates associated with stroke, diabetes, and heart disease are more prevalent (Schröders et al., 2017). This data is consistent with the rising trends on the global scale, but also with many low and middle income countries as well. Although this is explained from a broad scope, it is also important to consider that malnutrition, overnutrition, and obesity are high risk factors for developing these medical diseases and conditions (Schröders et al., 2017).

2.2 Historical view of the health sector

Prior to decentralization, the 1980s to 1990s marked Indonesia as having poor health performance due to the lack of funding, provision, and order. The health system was mainly controlled by the central government but was under resourced, leading to many public facilities being understaffed or the majority of health workers having limited training (World Bank, 2016). Additionally, many health facilities also imposed informal fees which led to more people refusing to use public care facilities (Liberman and Marzoeki, 2002). As a result of this, the private health sector gained huge support, however cost of care increased immensely for those who were not covered under insurance plans, especially in larger cities where private facilities dominated primary care for families (Kristiansen and Santoso, 2006). Today, the central government still controls much of the public health sector in terms of policy planning and strategy, however there are still many overlapping functions between the central government and subnational governments. Legally the central government has absolute control over foreign affairs, security, fiscal affairs, and religious affairs, however under Law No. 22/1999 and No. 32/2004 local governments have the responsibility over health services (Purwanto and Pramusinto, 2018; Nasution, 2016). Included in health services are functions relating to health financing, resources, medicines, logistics, and management (Purwanto and Pramusinto, 2018).

2.3 Obesity and the double burden of malnutrition

Nutritional health trends vary across Indonesia as many regions have diverse populations and dietary habits, as well as differing food accessibility. Indonesia is one of many developing countries which suffers from a phenomenon known as the double burden of malnutrition. This is defined as both under-nutrition and overnutrition being present across different populations within the country (Maehara et al., 2019). Under-nutrition is associated with stunting, a ratio of low height compared to age, and wasting, a ratio of low weight compared to age, mainly in children. The rate of under-nutrition has gradually declined over the past twenty years, however it is still a prevalent issue in the rural and poorer areas of Indonesia (UNICEF, 2018, pp. 8). Overnutrition or overweight in adults has become a growing issue as the rate has remarkably increased, including in children under 5 years. This case has contributed to an increased risk and rising levels of NCDs. Overweight and obesity have predominantly been an issue of those in the higher wealth quintile, making education, employment and income the main determinates which influence overnutrition (UNICEF, 2018, pp. 8; Hanandita and Tampubolon, 2015). Furthermore, the likeliness of becoming overweight or obese is also related to food consumption and physical inactivity. Consumption of instant noodles and fried snacks are quite common in urban households, especially in children, which gives individuals a 34 percent higher risk of becoming overweight. Likewise, adults who engage in physical activity or labor decrease their odds of becoming overweight (Oddo et al., 2019). Given that these causes are all related to social factors, the case in reducing levels of overnutrition can be prevented.

3. Existing Research

This section will review previous research which has been conducted relating to the challenge of global obesity and within Indonesia. The common themes shared between multiple academic articles have been recorded to view the position of this topic within the health and development field. Themes such as, obesity framing, nutritional shifts, obesity risk factors, and nutritional interventions have been identified as significant topics for the purpose of this study. It is important to review this information as it builds the foundation in claiming obesity as a structural issue within urban Indonesia.

3.1 Framing obesity intervention

Obesity and the rising rate of NCDs associated with this have already been identified as being a threat towards public health and health systems in many high-income countries, including the United States, Canada, the United Kingdom, and Australia. Despite governments and public health officials being aware of this issue, there is still a struggle in finding effective ways in controlling the rising rates (Yach et al., 2006). This has been an ongoing discussion within the public health community, raising questions related to whether national governments should intervene, what the economic consequences will be, or at what age should interventions be introduced. Currently, there is no successful model in which a country can follow, therefore researchers have been looking into tobacco intervention strategies to see if there are similar patterns that may help in controlling consumption of unhealthy foods and lowering the rate of overweight and obese individuals. Even comparing strategies is not as effective due to the different market incentives of tobacco sales, thus adding to the difficulty of creating basic nutrition regulations and principles (Yach et al., 2006). Other researchers have expanded outside of this concept and have focused more on environmental factors.

Swinburn et al. (2005) and Kumanyika (2019), have both explored the underlying issues which influence obesity and have proposed general ideas towards creating a framework for obesity prevention. Swinburn et al. (2005) argues that an evidence based action and prevention strategy is most effective for positive outcomes, compared to those policies which are influenced by political and economic forces. In doing this, policies must be coordinated, monitored, and evaluated to ensure optimal results. Kumanyika (2019) proposes a similar approach, being in favor of an equity oriented framework that will support ideas which promote increased nutritional equity. This framework mostly focuses on improving accessibility to healthy foods in schools, workplaces, and stores, in addition to providing options for physical activities whether it is in school and work environments, or recreational areas. After reviewing both theoretical lens', it becomes apparent that universal approaches do not lead to sustainable outcomes. Key indicators need to be determined such as the specific problem at hand, the target group, and the point of action in order to build a case for obesity intervention (Swinburn et al., 2005). Especially when promoting health equity, identifying specific societal structures and marginalized groups become necessary. Overall, these research plans have pointed out distinct

factors which are essential to analyzing and developing obesity prevention policies. Despite both models being discussed in a generalized context, either approach may be applicable for low- and middle-income communities.

3.2 The nutrition transition

To first understand how overnutrition and obesity became a challenge in Indonesia and other developing countries, many researchers sought to investigate when and why changes in diets occurred. The nutrition transition, as described by Barry Popkin (2003), consists of three stages in which the overall outcome is a change in behavior which effects household diet and nutrition. This process first starts with urbanization and a rise in disposable income among a growing middle class. Thus, this encourages the consumption of new affordable foods which are higher in calories, sugars and fats; an increased usage of edible oils, animal fats, animal products, and added sugars were due to cheap production cost and imports. Overall, this change has introduced societies to obesity and other disabilities (Popkin, 2003). This study has suggested that the low cost and availability of fats and oils is the main contributor to diet changes in predominantly urban areas. Moreover, this concept supports diet trends and food consumption patterns in Indonesia which may explain a sudden rise in obesity and NCD mortalities.

Lipoeto et al. (2012), has exemplified the nutrition transition theory in the case of Indonesia by examining the changes in dietary habits and food culture among urban and rural households. Through their fieldwork interviews, the researchers were able to discover that there was an 18 percent increase in fat intake due to an increased of animal meat and dairy between 1983 and 2007. This was common across the majority of households, however households who lived in urban areas consumed snack foods 17 percent more than rural households. This was due to an expansion in food variety and the development of western style fast food restaurants (Lipoeto et al., 2012). This study has highlighted the general theme of nutritional and dietary shifts which has impacted obesity rates across Indonesia and the developing world. This data helps in providing a foundation for consumption patterns and leads to a deeper understanding of the individual and structural challenges which influence obesity in society.

3.3 Social determinates of overnutrition

An extensive amount of research on defining the issue of obesity, in addition to analyzing factors which are associated with overnutrition have been conducted in Indonesia, mainly on the larger island of Java. A study conducted by Rachmi, Li and Baur (2017) revealed specific demographic and socioeconomic risk factors which were associated with obesity in Indonesia. They were able to conclude that living in urban areas, having a higher socioeconomic status, having low levels of physical activity, and consuming high amounts of fried foods were associated with a higher chance of becoming overweight. Additionally, between 1993 and 2007, obesity increased by 11 percent in men and 16 percent in women which was above average compared to the rest of the world (Rachmi et al., 2017). Statistical analyses using information provided on by the Indonesian Family and Life Survey (IFLS) have also shown how nutritional differences exist across gender, education, and geographic location. Educational levels in adults have been shown to have a positive relationship with health knowledge therefore, suggesting that those with high educational achievement are more likely to be within a healthy weight range. This is consistent with data from Indonesia as obesity rates in women are much higher compared to men, most likely due to the fact that women tend to have lower educational status (Roemling and Qaim, 2012). In this same study, a regression analysis showed that there was a positive coefficient of 0.38 between women that were married and their increased chance of being overweight or obese (Roemling and Qaim, 2012).

Specific research regarding obesity risk factors among adolescents has also been prominent within this field. Studying this age group between the ages of 11 to 16 is important because this is a critical period of development where basic dietary habits can have a large impact leading into adulthood (Canavan and Fawzi, 2019). Data collected from middle school aged adolescents from three communities in Java revealed that certain activities in which adolescents participate in lead to higher rates in obesity. A significantly higher number of obese adolescents were linked to those who spent more than three hours on the computer each day, however low-income families were less likely to spend as much time on the computer, therefore suggesting the majority of obese adolescents live in urban areas (Collins et al., 2008). This is also followed by only 44.6 percent of adolescents coming from low-income families consume fast food, compared to 80.2 percent of adolescents coming from higher income families (Collins et al., 2008). Much of this

research supports obesity as being a systemic issue in which preventative care is needed, however there is lack of understanding in why this has not yet been addressed by health officials.

3.4 Nutrition related interventions

Since there has been an increasing rate in overnutrition, many public health researchers have classified obesity and the rise of NCDs as being a public health threat. This challenge is not exclusive to Indonesia, but rather a growing issue in developing countries across South Asia and Africa. Although not widely viewed, some researchers have suggested comprehensive policies that may fit the context of Indonesia that may lower the rate of obesity and other related NCD risk factors. Basic national policies that may promote healthier choices and nutritious diets can include taxing foods high in sugar and fats, regulating food labels to be clearer and easier to understand by consumers, restricting advertisements aimed at children and adolescents, or even subsidizing health foods to be more accessible to others. These interventions are not very uncommon in the field of public health and have been proven successful in other countries including Mexico, Malaysia, Thailand and Chile (Kusuma et al., 2019). These interventions are not necessarily categorized as structural solutions, however they are aimed to educate and empower people on an individualized level.

Oddo et al. (2018), researched the effectivity of certain nutrition programs which specifically targeted adolescents. Their study explored both nutrition specific and nutrition sensitive interventions which ranged in helping stunted to overweight adolescents. In regard to overweight and overnutrition, they did record that there were no nutrition education programs or diet related interventions for adolescents (Oddo et al., 2018). This comes as a surprise considering education based interventions are one of the most effective ways in spreading awareness on the consequences of obesity (Puhl and Heuer, 2010). In addition to immediate interventions, some researchers have briefly mentioned the concept of improving preventative care to tackle the issue of rising obesity rates. Taking steps to develop screening and surveillance programs for both adolescents and adults may decrease the risk for individuals to develop cancers, diabetes, and cardiovascular diseases (Kusuma et al., 2019).

The previous studies provide an extensive background review to the challenge of obesity in a developing context. The key themes which have been identified in these articles, including environmental perspectives, consumption changes, social status, and general interventions have helped in formulating a foundation for a structural approach. By thoroughly examining these texts, it becomes clear that obesity is and will become a larger challenge to developing countries if individuals and public health officials choose to ignore this problem. This current study seeks to build upon this information by framing obesity as being a systemic issue to Indonesian society.

4. Theoretical Framework

Two theoretical models were chosen to guide this study in analyzing the multiple relationships which impact overnutrition and obesity in Indonesia. Thus, this may be used to support the case of structural factors being the underlying cause of increasing obesity rates. The socio-ecological model will be the primary framework used in this study to analyze multilevel external factors which may influence obesity trends among adults, adolescents and children. These factors range from close interactions among household members to broader societal factors such as governance. The principal – agent model will be used as an additional frame to further analyze the relationship between subnational agencies (i.e., district health offices, public health facilities, hospitals) and the central government. A detail explanation will be provided in the following subsections, as well as the approach used in this context. Overall, these models guided the approach in which the analysis was conducted.

4.1 The socio-ecological model

The socio-ecological model was initially a human development model used to explain and analyze internal and external forces which influence an individual. These factors are divided into five systems starting with the microsystem, followed by the mesosystem, exosystem, macrosystem and finally the chronosystem (Kilanowski, 2017). The variables indicated in each system vary according to the field, thereby this study will adopt a framework characterized by health contributors. Additionally, a critical approach will be used to identify both positive and negative factors which effect to nutritional health.

This framework has guided multiple studies in the field of public health and is key in explaining complex systems with numerous structural elements. This model emphasizes the social and environmental aspects to health promotion and disease prevention, in contrast to medical or pharmaceutical determinates. Researchers have argued that the use of examining societal structures is most beneficial when focusing on how community institutions interact with one another and to what extent this impacts those individuals living in these communities (Golden and Earp, 2012; McLeroy et al., 1988). This is especially applicable to current health discourse as many health agencies have shifted their focus to understanding chronic diseases such as diabetes and respiratory issues, rather than infectious diseases (McLeroy et al., 1988).

The socio-ecological model will complement the analysis in this study by providing an explanation to the complexities of obesity. A model has been outlined for this study to include the external systems as well as the variables which will be specified in the analysis, as depicted in *Diagram 1.* The inner most circle represents an individual along with their personal behavior and decisions which may contribute to poor nutrition. Household and family factors include any of those interactions which may influence the individual's nutritional choices. School and work environment are those factors that take place within these areas including education programs or routine schedules. Community and social institutions are any laws, social norms, or organizations which exist within the individual's society. Lastly, subnational decisions and policies are any regulations which are established by subnational governments. Since the analysis is structured by this model, the subsections have been grouped together, as represented in the diagram. These four external factors indirectly involve those actions and behavior of the individual.

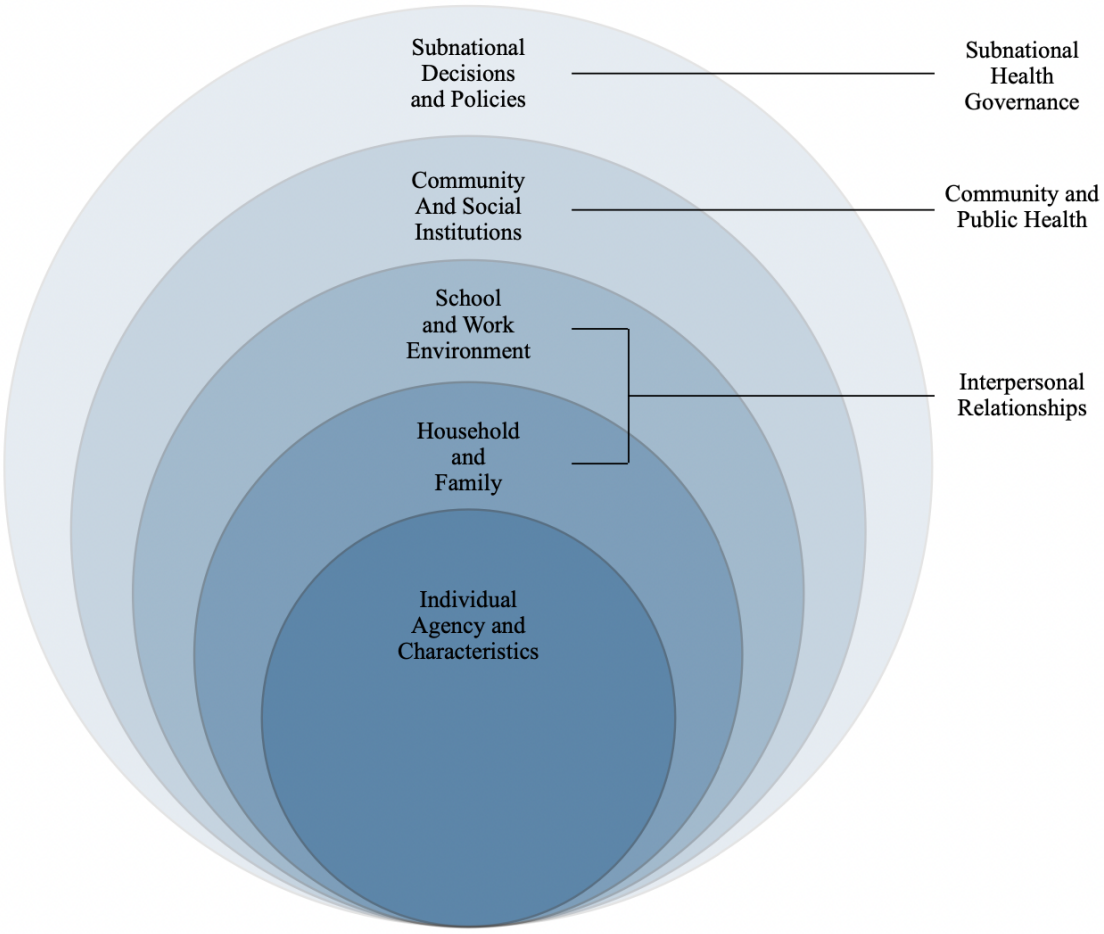

Diagram 1. Socio-ecological model

4.2 The principal – agent model

The principal-agent framework was developed to explain the economic relationship that exists between one actor who initiates a contract (principle) and another actor who is obligated to follow that contract (agent). Generally, the principle's interest will be similar to the interest of the agent, thereby making the acceptance of the contract simple. However, there may be a case in which the agent has its own interest, where they will be able to capitalize off the expense of the principal (Bossert, 1998; Dranove and White, 1987). Using this approach, one can examine the relationship between two external actors and determine if there are any patterns or changes. The use of this framework is not limited to economists but has also been applied by political scientists to measure intergovernmental relationships within countries and by health policy

analysts to examine the relationship between care provider and patients (Dranove and White, 1987).

In this case, the principal – agent model helps in explaining governance systems within health and healthcare. In recent years the WHO has argued for improved health governing systems as this will lead to enhanced management and accountability of care and services (WHO, n.d. a). This is a rather straight forward claim, however, to improve health governance one needs to investigate the multidimensional actors which influence services and performance. By analyzing the relationship between state actors, health providers, and citizens, this opens the discussion of addressing the capacity and responsibilities that each actor has in delivering equitable healthcare (Brinkerhoff and Bossert, 2014).

In relation to this study, only two actors, the state government and subnational agencies, will be applied to this framework to represent the principal – agent relationship, as shown in *diagram 2*. State actors are identified as state policy makers, the central government, and the MoH, while the subnational agencies are the health providers, district health facilities, and public hospitals. This is most applicable to this study as state actors have the responsibilities of funding, providing resources, training staff and directing objectives. In return, the subnational agencies must monitor these directives to ensure quality health is being delivered or to further request new or improved resources which fit the need of the population (Brinkerhoff and Bossert, 2014). Overall, this places the responsibility on both actors, therefore making it necessary to evaluate the relationship from this perspective. As this is a supplementary model to the socio-ecological frame, it will be applied to the outermost system corresponding with subnational decisions and health governance.

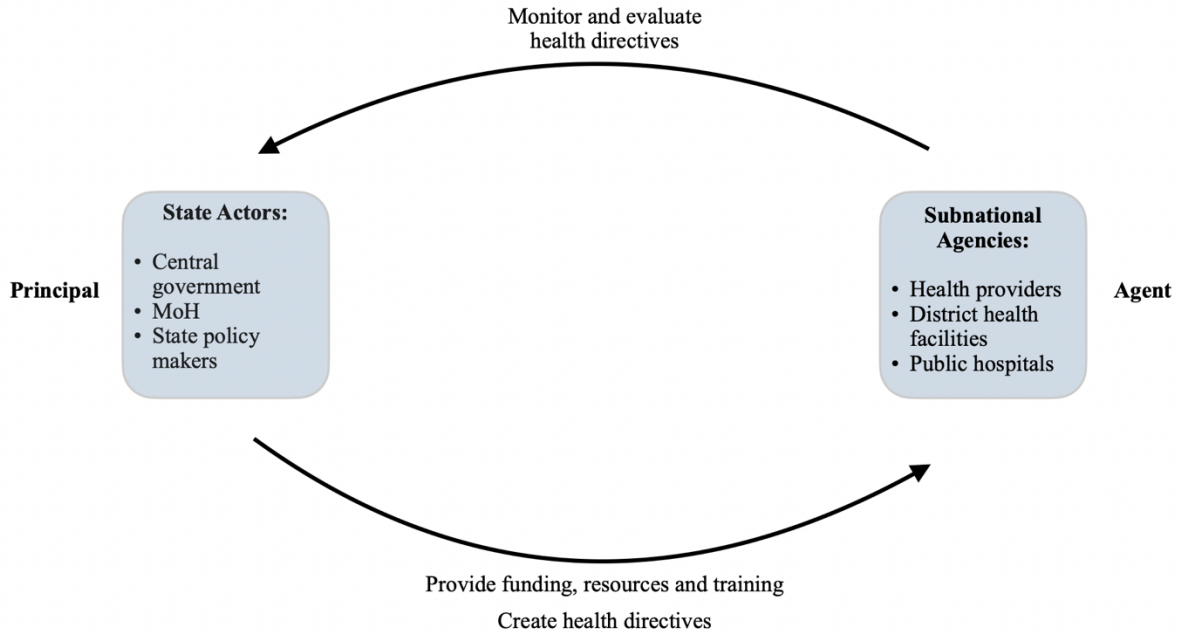

Diagram 2. Principal – agent model

5. Methodology

5.1 Research design

This thesis is designed as a single case study, drawing upon qualitative data to gain a comprehensive view of the Indonesian health sector at the subnational level. A case study will allow for an in-depth analysis of the context, while still providing a holistic view or perspective of the topic (Punch, 2014, pp. 119-124). In this case, the use of secondary data will provide a holistic view of the subnational health sector and will consist of analyzing specific societal structures ranging from household interactions to district health governance. Additionally, this thesis will seek to provide an understanding of how obesity and overnutrition may be perceived as a structural issue in Indonesia. Moreover, the collection of thorough data, in the form of a case study, will assist in analyzing the emergence of these structural or societal issues (Desai and Potter, 2006, pp. 184). To further strengthen this case, quantitative data will be used alongside the primary source of qualitative data. The use of both quantitative and qualitative data in mixed methods will assist in creating validity and reliability within research, such as supporting qualitative data with recent statistics (Desai and Potter, 2006, pp. 201). All qualitative sources were to be coded into specific indicators which would narrow the field of literature to be

analyzed. All coding which was completed in this study were in relation to indicators of the socio-ecological model (i.e., interpersonal relations, community elements, health governance). Coding for the principal – agent framework were done in relation to health directives, monitoring, and evaluation. The use of descriptive codes is necessary in condensing data and to determine any patterns or themes that occurred throughout the literature (Saldana, 2015, pp. 7).

5.2 Sources and data collection

The primary source of data collected is qualitative data, in the form of secondary sources and literature. The majority of this data has been collected from multilevel organizations, such as WHO, UNICEF and the World Bank, in addition to national policy documents and reports published by the government of Indonesia and MoH. These reports were chosen because of the clear data that is presented within the 2005-2020 timeframe. More in-depth information from district health facilities and health governments were provided through these reports and assessments. Additionally, most public health research is conducted at the national university, which is then reported back to these institutions. Some government documents were assessed to double check the framing and interpretation from secondary sources. Data from secondary sources including academic articles and journals were also used to provide context specific details. This data mostly provided information on a local level regarding household interactions, as well as condensed statistical analyses. Moreover, the data gathered from academic articles was assessed according to the theoretical lens used in this thesis. The reports and articles have been chosen in a systematic way which relates to the specific context. Only sources which contained key indicators were picked for the analysis which included those that were categorized within the socio-ecological model. The key indicators included, household interactions, school or work environments, public health facility operations, accessibility, and health governance. The use of quantitative data in the form of statistics will also be used to support and confirm the existing qualitative data. This data has been collected from the Ministry of Health's Basic Health Research Report, *Riskesdas*, which is firsthand data collected from national surveys. This may be the most accurate health data on a national scale and was used in this analysis to strengthen specific arguments. This information is publicly available on government websites mainly in the native language, *Bahasa Indonesia*, with some pages published in English. All data which had to be translated firsthand was completed by a native speaker. The overall data which has been

collected is spread across a fifteen year timeframe from 2005-2020. These years represent a period when subnational agencies have been autonomous and when the most recent census data has been collected.

5.3 Ethical considerations

To ensure a clear and transparent study, ethical considerations have been accounted for throughout the whole process of research design and data collection. When using and interpreting data from secondary sources it was certain that no personal or sensitive information was released that would risk or harm the subject. Additionally, the data collected from government reports and organization assessments are publicly published, following those ethical requirements of the respective agency or organization. Overall, this study has been reviewed to reflect values of reliability and honesty as suggested by The Swedish Research Council (2021).

5.4 Limitations

There are possible limitations based on this research design which have been taken into consideration throughout this process. The option of conducting a case study is a limit in itself as research tends to become generalized within the topic and its context. This study analyzes the subnational level of nutritional health in Indonesia, therefore this information is only relevant for this context and may not extend towards others regions or communities. Furthermore, the use of secondary sources also constitutes as a limitation as data can be vague or incorrect, however the sources and literature used in this research have been screened for credibility and reliability to the best of ability to reduce any bias that may be present.

6. Analysis

The aim of this research will be to investigate how nutritional health management at the subnational level has affected the rate of obesity within Indonesia between the period of 2005 and 2020. This will be explained upon by applying the socio-ecological model and analyzing to what extent overnutrition and obesity is caused by structural issues in society. This analysis will be divided into three subsections which follow the systems of the socio-ecological model: Interpersonal relationships, community involvement, such as factors relating to the subnational

government, and health governance. To further justify those actions, or lack of action, by the subnational government, the principal – agent model will be adopted which is incorporated under the outermost system of the socio-ecological model.

6.1 Interpersonal relationships

To fully comprehend the scope of this study, an analysis on close societal relationships will be discussed to understand how these interactions may influence an individual's dietary and nutritional habits. Interpersonal relationships within this context are defined as those connections that one may have within their household, school, or work environment; this is significant, especially towards children, as these interactions are with individuals who one commonly comes in contact with (Thompson and Gordon-Larsen, 2012).

Insufficient intake of nutrients and poor dietary habits can be developed by children due to the environment they live in and the food culture which is present in their household. Being introduced to these habits, especially at a young age can severely impact their behavior and health in the future. According to a study conducted by Green et al. (2019), 60 percent of children age 24-35 months consumed any type of snack food three or more times per day. They additionally discovered that 38 percent of mothers allowed their children to consume these snacks because the child either wanted or demanded it (Green et al., 2019). In relation to the socio-ecological model, this shows that within a household, a child's nutritional habits are generally influenced by their mother and their judgement on what to feed their child. One may further argue that this is a result of poor access to healthy foods in urban areas, leading to more children not consuming enough fruits and vegetables per day (Arif et al. 2020, pp. 8). There has been a rapid rate of urbanization in Indonesia within the past decade, with around 53 percent of the population residing in cities in 2015 (WHO, 2017). With high population densities, it becomes harder for people to access fruits and vegetables due to very little available space. However, it is evident that many families are now changing their diets towards a higher consumption of carbohydrates, fats and sugars. In addition to this it has been recorded that families are also spending more on packaged and processed foods compared to staple foods like rice (Arif et al., 2020, pp. 17-18). Therefore, it has become clear that consumption of non-

healthy foods is not strictly dependent on family relationships, but also an unintended consequence of urbanization and market systems.

In 2013 it was recorded that the national average of overweight and obese children was around 11.8 percent. In 13 provinces this percentage exceeded that of the national average; this being more prevalent in highly urbanized provinces. However, by 2018 this decreased to 8 percent (Ministry of Health, 2018). One factor that could explain this gradual change is an increased support of school related nutrition programs. Government supported school feeding programs have existed in Indonesia since 1991 and have been evolving throughout the years to achieve new goals related to nutritional health. Despite there being a gap between the years of 2002 and 2010, due to complications with decentralization processes, the Indonesian government has reinstated a new school feeding program in 2015, known as PROGAS (Sekiyama et al., 2018). Today, this program extends across multiple provinces to provide nutritious meals to primary aged children, in addition to educating them on the importance of nutrition and hygiene. Data from the PROGAS endline survey revealed that student's knowledge of nutrition improved by 16.5 percentage points. In addition to this, students had a better understanding of types of nutritious foods they should consume for each meal of the day and are able to identify types of nutrients and vitamins in specific foods (WFP, 2018, pp. 8). Despite there not being any available long-term data regarding obesity, due to the recency of program implementation, this data suggests that school related interventions may have an impact on children's perception and understanding of healthy nutrition. Thus, the application of interventions in school and work environments suggest that the interpersonal relationships, such as those between students, teachers, and peers, have capable strength in influencing an individual's personal choice, as referenced in the socio-ecological model.

6.2 Community and public health

In many cases people have a negative perception of obesity, where they are quick to judge "lazy" individuals for their poor choices. This creates a strong stigma within society which discourages many from getting help. Framing obesity as a systemic issue, rather than classifying it as personal responsibility, will promote awareness and highlight the importance of self surveillance and prevention (Puhl and Heuer, 2010). Addressing this issue requires an in-depth understanding

of community norms and institutions which have the potential to influence healthy behavior. Public community health clinics, rather known as *Puskesmas* in Indonesia, and public hospitals are two institutions which play a major role in delivering and promoting health services, thus assessing their capacity in managing nutritional health is significant in investigating the structural elements of obesity.

Since decentralization in 2001, there has been drastic changes in health system operations, including the allocation of funding and resources between public health facilities (Heywood and Choi, 2010). For a sustainable health system to function, it is essential for facilities to meet the demands of the community, especially in health transitions, such as a rapid increase in obesity and an increasing mortality rate due to NCDs. Without proper management, communities may face additional challenges such as increased expenditure (Kirk and Penney, 2013). Healthcare workers are an essential factor to providing proper care for patients and this includes having staff trained and available. According to the WHO, it is strongly recommended for there to be a minimum ratio of physicians to population size to have adequate coverage for the community. This ratio is still relatively low in Indonesia, especially in rural and densely populated cities (Mahendradhata et al., 2017). Also, in order for public facilities to inform and provide care to patients regarding the dangers of overnutrition and underlying NCDs, it is crucial to have specialists who are trained and have experience in the nutrition field. In Central Java the total population is over 33 million, however in terms of healthcare staff, there are only 777 nutritionists. In addition to this, it was found that some nutritionists did not receive specific nutrition related training during the past six years (UNICEF, 2018, pp. 29). These findings reveal that public health facilities do not have the appropriate human resources needed to actively promote nutrition health. Moreover, without a trained workforce, facilities are not able to offer any type of health surveillance or prevention programs which would advise patients about the long-term consequences of overnutrition and poor dietary habits. The issue of poorly trained health personnel is not limited to nutrition specialization but is extended to district health managers as well (UNICEF, 2018, pp. 25). Decentralization reforms required district health managers and Puskesmas leaders to be responsible for planning and designing nutrition programs, in which would meet the needs of the community. This transfer of responsibility was meant to improve service delivery through a community-based approach, however health

managers did not have sufficient knowledge or training in planning effective nutrition programs and policies (UNICEF, 2018, pp. 26). Given this information, it becomes clear that Puskesmas and district health offices are not utilizing resources to its full potential. Thereby programs may not be well aligned with community needs, leading to ineffective nutrition management. Overall, the immediate issue relates to the capacity in which district health can operate, making this structural factor a hinderance in achieving obesity and NCD reduction.

Included as a structural barrier within nutritional management is equity and accessibility to health services. This factor may determine whether patients can afford to visit health facilities or even receive treatment. In the past ten years Indonesia has been progressing to achieve universal health coverage under their newly established health insurance scheme, *Jaminan Kesehatan Nasional* (JKN). As a result of this, in-patient and out-patient utilization has increased however, nearly 20 percent of the population, mainly those employed in the informal sector, are not covered under JKN due to it being a contributory plan (Rajan et al., 2021, pp. 7).This insurance plan covers the financial cost of primary care doctors who provide general health services in addition to personalized education and screening services (Hartono et al., 2020). Ideally, providing individuals with free access to nutritional education would increase the awareness of risks associated with obesity. One study, using survey data from IFLS showed that of 10,580 people who were classified as being overweight, 44.52 percent were not covered under national health insurance (Hartono et al., 2020). The reasons for not having coverage are unknown, however out of pocket health costs tend to be expensive, discouraging many individuals from visiting hospitals or health clinics (Rajan et al., 2021, pp. 10). Obesity is a high risk factor for both hypertension and diabetes. Among these two NCDs, prevalence rates have increased by 56 percent and 32 percent, respectively, between 2013 and 2018 (Ministry of Health, 2018; Kusuma et al., 2019). These statistics represent those who have been diagnosed by a doctor, however there are still many who have not. Regular screening would increase early detection of NCDs, making it possible to treat before serious complications develop. Increased access to healthcare will help with diagnosis, as well as creating preventative treatment plans for those medical conditions (Aalst et al., 2019). In regards to the socio-ecological model, there is a high probability in which patients would receive screening or surveillance if it were subsidized or covered by insurance (Agustina et al., 2018), thereby suggesting that accessibility to health

services and facilities is an institutional factor which may impact one's judgement regarding nutrition.

6.3 Subnational health governance

Governance of health systems play a major role in the decision making process and in the allocation of resources and funding. Included in this are any laws or regulations that have been established and any conditionalities that district level facilities and hospitals must oblige by. Health officials at the central and subnational level also have to authority to implement policies which generally effect the public (World Bank, 2016, pp. 46). All of these components are categorized in the outermost chronosystem of the socio-ecological model. Together with the principal – agent model, one will be able to further examine the relationships that exist outside an individual's environment, but still contribute towards the general feelings and perceptions of obesity. Moreover, the key focus areas of health governance are related to accountability, service performance, and the long-term sustainability of nutritional interventions (Brinkerhoff and Bossert, 2014). This subsection will highlight the capacity in which the subnational government can handle nutrition management, and how national policies have influenced subnational governance and individual agency.

Supporters of fiscal decentralization claim that district autonomy will lead to higher levels of social welfare through good governance reforms, however this can be contested stating that district autonomy will not necessarily lead to quality service performance (Oates, 1993). The process of decentralization throughout the 2000s has limited the ways in which policies and regulations are carried out and to some extent has impacted the opportunities that community members want to achieve. Although district governments are responsible for the planning, allocation, and management of multiple public health services, the central government still has leverage in terms of financing and conditions (Green, 2005). The public health sector is mainly financed by central government funds, in East, West and Central Java, this is over 50 percent. (Heywood and Harahap, 2009). As a result of this, the district governments have no control over how funds are allocated, thereby making it difficult to address the community needs. The largest expenditure for public health offices are salaries for staff and personnel. The central government finances 66 percent of staff, mainly those employed as permanent civil servants, which is 53

percent of the total funds which are given by the central government to subnational districts. In addition to this district governments must allocate enough revenue to support salaries for non-civil servants (Heywood and Harahap, 2009). This data explains the one-way relationship that exists between the principal and the agent. It becomes clear the subnational government becomes reliant on central systems in part due to their obligation, but they are also incentivized to follow objectives in hopes to receive larger funding (Brinkerhoff and Bossert, 2012). Therefore, this hints that there is a structural issue of policy and resource negotiation between the subnational and central governments, which effects the type of care patients may receive at health facilities. Also, limited discretion over how funds are allocated leaves many district health offices with no support on community projects and programs.

The second relationship described in the principal – agent model relates to the responsibilities taken by the subnational agencies. Health providers, district health facilities, Puskesmas and public hospitals are expected to monitor and evaluate programs and services and report back to the state; this improves accountably and transparency between the two actors, overall strengthening health governance (Brinkerhoff and Bossert, 2014). The biggest weakness presented in the case of Indonesia is the lack of communication and transparency between all sectors and across all levels of governments; this is quite evident when comparing multilevel government documents across sectors of development, health, and education (Kristiansen and Santoso, 2006). The central government is mainly responsible for drafting national development plans which then is supposed to trickle down to district levels. In the case of health, the Ministry of National Development Planning, *Bappenas* designed the Long Term Development Plan (RPJPN 2005-2025), which is composed of separate Medium Term Development Plans (RPJMN). The nutrition targets which are specified in RPJMN 2015-2019, which are national targets, are not included in the ministerial plans by the MoH. This break between the two institutions further leads to the specific nutrition targets not being included in district health plans. In an assessment measuring nutrition capacity in 7 different provinces, it was found that only one province had included some of the nutrition targets listed in RPJMN 2015-2019 (UNICEF, 2018, pp. 16). A clear translation of objectives and collaboration between different government sectors, would lead to more districts incorporating these targets in community plans. In addition to this, the district's capacity to monitor services is also weak due to poor health

training and experience, as mentioned in the previous subsection. This disconnection across national systems further exemplifies the need to strengthen health governance, from a horizontal approach, which in turn would help in improving community nutrition.

Lastly, nationally implemented policies and programs also play as a contributing factor for community and individual health. Although the government has done little to address overnutrition and obesity specifically, there are overarching programs which cover aspects in promoting healthy living and lifestyles. In 2016 the government introduced The Community Movement for Healthy Living Program (GERMAS), which is a communication campaign to encourage people to participate in healthy activities and behaviors. This program focuses on preventative care, specifically promoting increased physical activity, consumption of fruits and vegetables, and regular visitation to health clinics; the overall objectives are to reduce the rate of NCDs and reduced extra financing costs for health services (Moeloek, 2017). As a collective policy, the government also introduced the Family Approach (PIS-PK), which would work alongside GERMAS in promoting family education for health living and promote individualized health clinic visits (Febriawati et al., 2020). Due to the recency of policy implementation, most program evaluations are not conclusive, however few districts have measured their capacity to implement some of the highlighted objectives. In the urban city of Yogyakarta, the district government recorded having a capable bureaucratic system in planning and monitoring of policies, strong partnerships and human resources, and effective communication strategy among the community and across other central and district sector (Wibowo et al., 2020). In the rural area of Maluku, the district government has drafted a plan for the GERMAS program, however considered few factors as an obstacle for delivering efficient services. They pointed to financial constraints as being a possible hinderance for not being able to provide healthy foods for communities to purchase or grow. In addition to this, geographical location and lack of technological resources make it difficult for contacting and communicating with households in rural areas; since this is a public communication campaign, not being able to reach the majority of the population is a major challenge (Yuniar and Fibrianto, 2019). The fundamental concept of the GERMAS program is to encourage community empowerment through participation with the intention of influencing community health behaviors. As described in these two cases, the districts capacity to implement this policy, let alone any policy, is dependent on those challenges

present within community and public health institutions, as well as weaknesses in health governance.

Throughout this analysis it is evident that the socio-ecological model explores the complexities to obesity. This is demonstrated by the identification of multiple factors, which to some degree have an impact on individual choice and behavior surrounding nutrition. It is important to emphasize that all systems: household, school, work environment, community, public health institutions, subnational decisions, and policy, are all interrelated and dependent on each other thus, not only influencing individual characteristics, but the system as a whole. Understanding the crucial pieces of nutritional health at each level, including health accessibility, equity, and promotion, will assist in formulating specific interventions based on sustainable practices.

7. Conclusion

The discussion presented in this thesis draw on important elements that need to be addressed in order to properly assess the challenge of obesity in Indonesia. The rate of obesity is rapidly increasing across the developing world which pose a threat to health systems if the proper steps are not taken. This also is a major risk factor for many non-communicable diseases, which account for nearly 70 percent of all deaths worldwide. Moreover, obesity is a systemic issue that requires structural change in order to make an impact on nutritional attitude and behavior.

Reflecting on previous studies has revealed key focus areas in the research field of obesity and nutrition. From these findings it is clear to see that there has been a shift in disease patterns, as a result of globalization and the rise of a working middle class relocating to urban areas. Changes in lifestyle and behavior have also occurred, contributing to different eating and food consumption patterns. It is no surprise that an increased variety of high calorie and sugary foods at affordable prices has changed the dietary habits of those in urban areas, especially in younger ages. Despite there being suggestions on nutritional interventions, there is yet to be comprehensive policies or action taken which are effective in reducing the rate of overnutrition. To further contribute to the field of obesity and nutrition, this study uses indicators provided in the socio-ecological model to examine obesity through a multisystem perspective. In using this

theoretical model, one can argue and justify the need for structural interventions, such as addressing those issues related to health accessibility, equity, and education, to prevent and lower rates of obesity. Furthermore, this model was used in structuring the analysis of this study by providing in-depth detail of relationships which may influence an individual's nutritional habits and behaviors. The use of the principal – agent model complimented this approach by providing a frame for analyzing the relationships that exists with the subnational government, which is also interrelated with the outermost elements of the socio-ecological model.

The overall results of this study revealed the extent to which external factors impact one's nutritional decisions and habits. The analysis focuses on key areas such as access to food, nutritional education, health operations and capacity, healthcare accessibility, and health governance as being significant factors which can affect one's nutritional health. When reviewing the analysis, it is clear to see that one's nutritional health can be influenced by close household interactions but may also be extended to determinates which are affected through health governance. The data collected from multilevel organizations and academic articles draw on specific examples which further demonstrated the need for structural intervention within these areas. Close interpersonal relationships are the most direct influences when exploring the individual behaviors associated with food and nutrition. In children this ranges from prominent factors such as maternal care and learning environment, however in adults this maybe be extended to their level of education or their accessibility to food. Community interactions, including the dependency on public health institutions are next when analyzing structural agencies. Puskesmas and public hospitals are the primary institutions in this context as they are the ones who provide service to the community. Their level of capacity or functionalism is the main factor since healthcare personnel, nutritional planning, and accessibility must all provide care to a certain extent which meets public needs. The final area which is explored is the strength of health governance and whether central and subnational governments can work to deliver appropriate results. Even though this is a wide ranging area, with an extensive scope, these factors still influence an individual's perspective or treatment of nutritional health.

This study was conducted to explore the issue of obesity in Indonesia and to provide further knowledge and suggestions on overcoming this challenge. The main theme in this study places emphasis on framing obesity through a structural perspective. Compared to previous studies, this research provided a greater holistic outlook on factors which may contribute to obesity. Previous research on general obesity has focused on individualism while assessing this issue, while overlooking a structural approach. Not only does this study identify key obstacles which hinder the improvement of nutritional health, but it also provides a framework for formulating structural interventions. The challenge of improving community health relies on multilevel interventions which can only be addressed by further investigating specific key factors in each area. Lastly, the general theme of this study identified key areas which influence nutritional health, however when analyzing each area separately, it becomes apparent that these systems may also positively influence other sectors including health, education, and governance. Analyzing obesity is a small area in the field of nutrition, however it contributes to a wider purpose in helping improve NCD health, personal wellbeing, community empowerment, and overall development.

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