Socio-Economic Investigation and Analysis of Wildlife Hunting Behavior

Chen Qiao

College of Economics and Management, Hunan University of Arts and Science, Changde 415000, Hunan, China

Jingren Wang[*]

College of Life and Environment, Hunan University of Arts And Science, Changde 415000, Hunan, China
[*]Corresponding author (E-mail: 945205531@qq.com)

Abstract: In order to make the wildlife survive better and protect the diversity of wildlife, some hunting behaviors of hunters and the living conditions and economic conditions of villagers in surrounding areas are analyzed to find out several important factors of hunting behavior of hunters, so as to take certain measures to ensure the abundance of wildlife in the region. The results show that the main factors affecting hunting behavior are the species of animals and the commercial purpose of hunting. Moreover, hunters of different ages use different hunting tools, and the resulting benefits are also affected by wildlife species. In the study, it is also found that hunters also have the choice to protect during hunting, but the hunting tools they used are more random and cannot predict the species of wildlife. This behavior has little impact on the economic situation of the African region, and a certain degree of hunting is helpful to ensure biodiversity. Therefore, to some extent, the hunting behavior of wildlife in Africa can ensure the biodiversity of the region and the long-term development of hunting behavior.

Key words: Wildlife, Hunting, Biodiversity, Behavioral Surveys, Socioeconomic Analysis

1. Introduction

Nature is regarded as an ecosystem of harmonious development, and its healthy development is closely related to wildlife. It is also an important resource for human further development. However, with the development of economy and society and the change of people's dietary consumption concept, the behavior of "game-eating", "fur-selling" and "ivory-selling" has been prohibited repeatedly but still happens frequently, which has also resulted in the brutal killing of many wildlife.

Eco-balance refers to the dynamic equilibrium relationship established by the interaction between organism and environment and between organism and organism in natural ecosystem, also known as "natural balance". In nature, whether it is forest, grassland or lake, it is composed of biological components such as animals, plants, microorganisms and abiotic components such as light, water, soil, air and temperature. Each component does not exist in isolation, but is a unified complex of interrelated and interdependent constraints. They achieve a relatively stable equilibrium state through interaction, which is called ecological balance. Consequently, the protection of wildlife is to protect human ecology and consequently to protect the nature on which human beings depend.

Socio-economic survey is an activity and process of systematically collecting information generated and needed when people engage in social and economic activities. This activity and process can help to carry out or improve people's decision-making behavior, correct people's subjective cognitive bias, and help people find the right way and means to achieve their goals. Usually, the socio-economic analysis of agriculture, rural development and some social conditions with greater impact plays a very important role in the management and resource integration after that.

Therefore, the socioeconomic investigation and analysis of wildlife hunting behavior can make people have a certain understanding of the socioeconomic situation of a certain region. Moreover, the hunting of some non-endangered species can not only ensure the biodiversity of the region, but also enable the hunting behavior to achieve sustainable development.

2. Literature Review

Wildlife protection regulations are a guarantee for wildlife protection. Certain hunting guarantees biodiversity, while illegal and excessive hunting will lead to the disappearance of the world's precious species. Xiao et al. pointed out that excessive hunting and trade pose a great threat to wildlife. For example, pangolins, elephants and other wildlife with certain economic value have been involved in illegal trade activities. This has not only caused serious damage to the current biological resources, but also has a great impact on their future survival and development. Therefore, people need to have a deeper understanding of the impact of excessive or

illegal hunting on precious species and endangered species, to further understand the importance of animal protection, and to propose some countermeasures. Zheng pointed out that China's illegal hunting and illegal trade activities have led to the continuous reduction of wildlife resources, and the corresponding legal provisions are not perfect, which is also an important reason for the frequent prohibition of wildlife hunting in China. Therefore, in this study, the behavior of destroying wildlife is further analyzed, so as to improve the relevant legislation, establish a wider legal system for the audience, and curb the related illegal activities to a certain extent. Luo Zhuozhen analyzed the current situation of wildlife protection in China, and put forward countermeasures for wildlife resources protection.

With the continuous development of the global economy, social and economic survey has become the main tool for the government, enterprises, non-profit organizations and individuals to obtain social and economic information. To grasp accurate social and economic information will help to improve the decision-making ability, management level and the ability to integrate resources of organizations and institutions, thus guaranteeing the safety of the land. Regional economy has been developing for a long time. Li Jing's application of statistics in social and economic surveys not only ensures the validity of the survey results, but also enables the application of statistical methods in social and economic surveys to develop steadily, thereby improving the efficiency of the survey. Zhang Rui et al. found the changes of social life, social pension and social security in the past 30 years by investigating and analyzing the production and life of peasants over a period of time. They scientifically analyzed the basic situation of rural development and put forward their own views and suggestions.

To sum up, the current literature is focused on wildlife, as well as the socio-economic survey of people's livelihood. Few literatures have provided socioeconomic analysis of wildlife hunting. Therefore, in this study, socioeconomic analysis is applied to wildlife hunting behavior, in order to ensure biodiversity and the sustainability of hunting behavior, so as to ensure the long-term development of wildlife to a certain extent.

3. Socio-Economic Analysis of Wildlife Hunting Behavior

3.1. Necessity of Wildlife Conservation

In recent years, illegal elements often hunt wildlife illegally, eat wildlife, and sell parts of certain animals. Wild animals are regarded as the cream of nature. Many countries have promulgated a series of laws to protect wildlife. However, due to the imperfection of the law and the insufficient punishment, some illegal people still hunt wildlife illegally, which leads to the endangerment or extinction of many wildlife and has affected the ecological balance to a certain extent. If this goes on, the ecological balance will be really destroyed [1].

When hunting wildlife, people usually aim to eat, because the nutritional value of wildlife is very high. Consequently, wildlife will be massively killed to satisfy some people. On the other hand, because wildlife is very expensive, not only meat can be eaten, their fur, horns and other parts can also be made into a variety of products, and finally sold at a high price. As the saying goes, "No business, no killing". Driven by interests, many lawbreakers hunt wildlife illegally, thus gaining a lot of profits [2]. In this study, the relevant situation of wildlife is analyzed. The related data of animal species in China accounted for the total number of animals in the world are shown in figure 1. The analysis of illegal wildlife trading channels in the top six open cases in China from January 2015 to May 2016 is shown in figure 2.
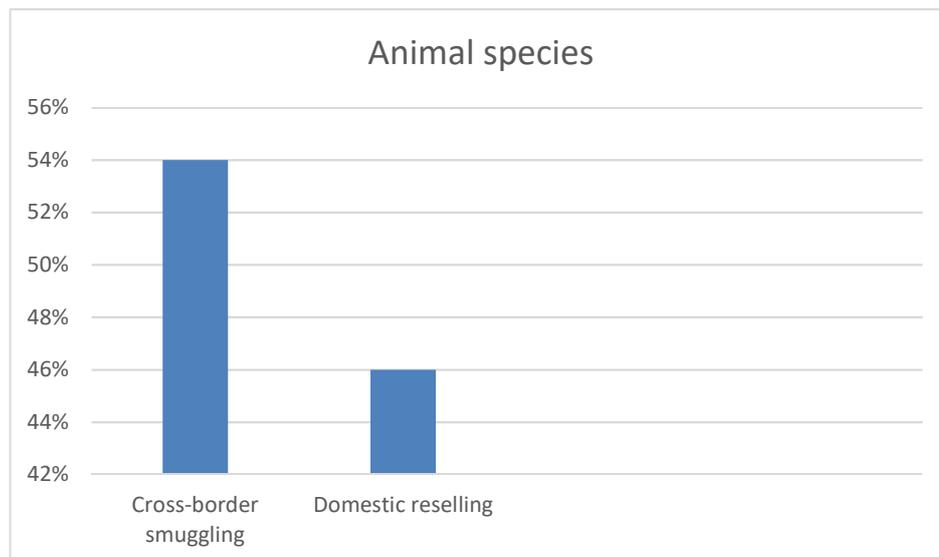

Figure 1. The proportion of animal species in the world total in China (source: internet research institute)
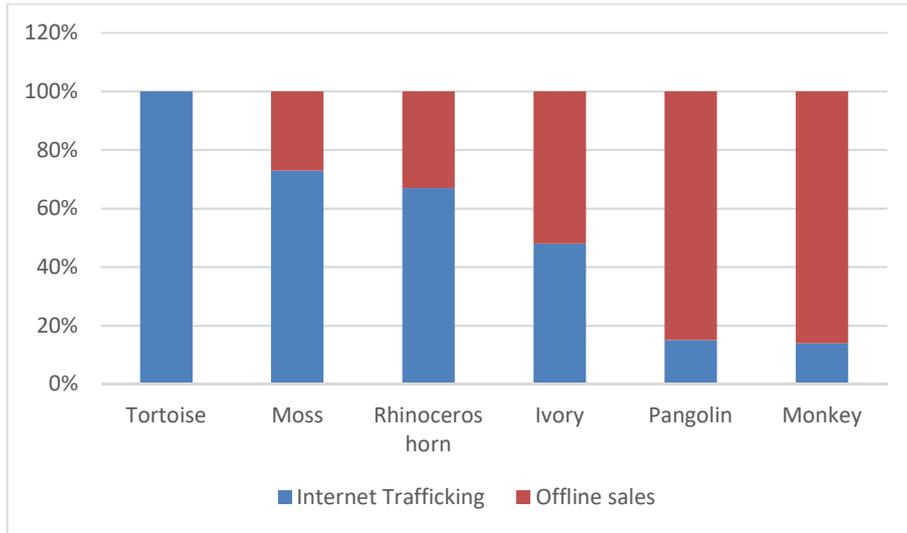
Figure 2. Trading channels for illicit wildlife in the top six public cases from January 2015 to May 2016 (source: internet research institute)
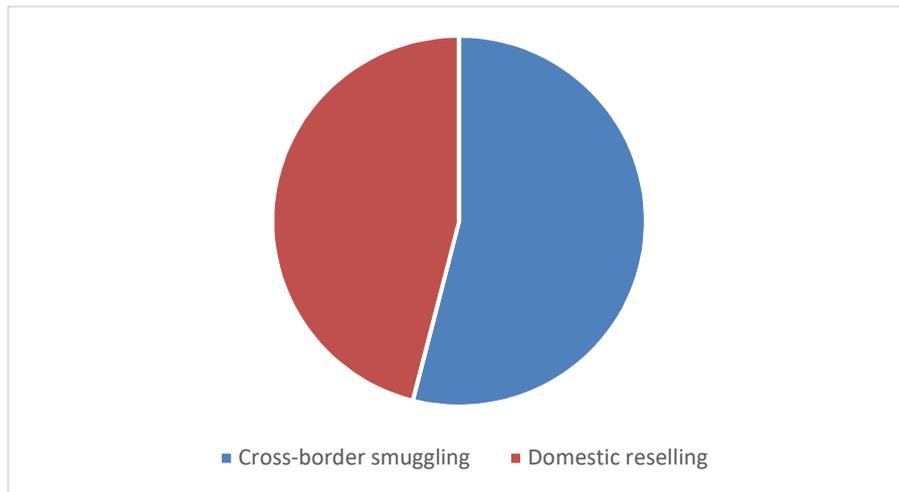

Figure 3. Geographical situation of wild contraband trading cases from January 2015 to May 2016 (source: internet research institute)

Figure 4. Antler products (the picture comes from the internet)

Figure 5. Illegal ivory seized (the picture comes from the internet)

According to the public statistics of 2016, 54% of the cases of wild contraband trade are reselled in China, while 46% of the cases are smuggled abroad. Among them, nearly 50% of illegal transactions start in Africa, Malaysia, Vietnam and other foreign countries. They use these products to make expensive crafts, as shown in figures 4 and 5.

From these maps, it can be imagined that a large number of illegal hunting needs to hurt a lot of wildlife.

The consequences are as follows. Firstly, it will destroy the food chain in nature, leading to the degradation, extinction and explosive reproduction of other wildlife associated with it. Secondly, it will also damage the ecological environment, which will affect plants that rely on wildlife to spread their populations. Thirdly, it destroys the diversity of organisms, forcing the evolution of the wildlife to be interrupted. Fourthly, after killing wildlife in large quantities, it will destroy the ecological balance, which also increases the direct conflict between wildlife and human beings, especially those wild predators, who will attack human beings in the absence of food. Finally, the massive and illegal killing of wildlife will make human partners less and less, and human beings will become more and more lonely, so that in the future world, more advanced technologies such as cloning may be used to restore the extinct biological populations caused by human killing, so that future generations can really see the wildlife once existed on the earth, and the contradiction between human itself can be alleviated [3].

Figure 6. Wildlife on African grasslands (the picture comes from the internet)

Wildlife is the product of nature, which is composed of many complex ecosystems. If a plant disappears, the insects that feed on it will disappear. When the insect is extinct, birds that feed on it will starve to death for lack of food. Finally, the death of birds affects other animals associated with them. The food chain in this biological world will become shorter and shorter, and eventually large-scale wildlife destruction will lead to more serious chain reactions, resulting in more serious consequences [4].

Usually, a certain amount of killing can maintain the level of organisms in the food chain, and will not cause the increase or decrease of other organisms, thus maintaining the balance of the food chain. This is

because in the ecosystem, there is a need to maintain stability between production, consumption and decomposition. If one of the components changes too dramatically, a series of chain reactions may occur, which will destroy the ecological balance [5]. For example, if a large number of plant-eating animals are killed, then carnivorous animals will lack this kind of plant-eating animals as a food source, so the number of carnivorous animals less than plant-eating animals will face the situation of reduction or even extinction. Natural species will decrease and ecological diversity will decline. In addition, if carnivorous animals are killed in large numbers, the phytophagous animals will lack the threat of natural enemies, the quality of life of the group will decline, and they will be lack of competitiveness, which will lead to the death of the phytophagous animals themselves, or even death. Moreover, phytophagous animals need more plants to meet their food needs. There are more phytophagous animals and the demand for food will increase. Moreover, in the absence of natural enemies, this is also a devastating blow to plants [6].

Therefore, the protection of wildlife is also to ensure the diversity of biological species, thus ensuring the ecological balance. The diversity of ecosystem is a natural complex of organisms and their surroundings. Not only do species depend on each other, but also they restrict each other, and organisms interact with various environmental factors around them. From a structural point of view, ecosystems are mainly composed of producers, consumers and decomposers [7].

The function of ecosystem is to circulate all kinds of chemical elements on the earth and maintain the normal flow of energy among the components. The diversity of ecosystem mainly refers to the diversity of ecosystem composition, function and various ecological processes on the earth, including habitat diversity, biological community and ecological process diversity, etc. [8-10]. Among them, habitat diversity is the basis for the formation of ecosystem diversity, and the diversity of biological communities can reflect the diversity of ecosystem types. Biodiversity is also the basis for the survival and development of human society. Many aspects of human clothing, food, housing, transportation and material and cultural life are closely related to the maintenance of biodiversity [11-13]. First of all, biodiversity has provided many raw materials for human life and production, and has made great contributions to improving people's quality of life. Secondly, biodiversity also plays an important role in maintaining the various soils, water sources and climatic environment on which people depend. It not only guarantees the beautiful natural environment of people's lives, but also helps people withstand many disasters [14-16]. In addition, biodiversity plays an important role in the regulation of atmospheric composition, earth surface temperature, redox potential of surface sediments and PH value. For example, a certain concentration of oxygen on the earth can provide people with the necessary substances for survival, which is also closely related to photosynthesis of plants. Finally, the maintenance of biodiversity can protect some rare and endangered species to a certain extent, so that future human beings can also see more real species like today's human beings, which is also of great strategic significance for future scientific research [17, 18].

3.2. Socio-Economic Investigation and Analysis of Wildlife Hunting Behavior

In many countries, people hunt wildlife after solving their own food and clothing problems, more to obtain the fur or parts of those animals to meet the needs of individuals. Therefore, the state prohibits large-scale and excessive wildlife hunting. However, Gabon, in central and Western Africa, is the richest, most stable and most diverse country in the world. Its government has created an ecological protection network, which covers 13 national parks, and nearly 11% of the land is protected by the state. The government not only strengthens wildlife law enforcement, but also proposes a zero tolerance policy against wildlife crime. These conservation policies face challenges from ivory poachers, loggers and poor wildlife-dependent populations.

The African continent is located near the equator with a mild climate and fertile soil. The plants here also absorb sunlight and water very well. Such a suitable environment has become the most ideal habitat for wildlife. There are African elephants, African lions, black rhinos, giraffes, zebras, hippos, ostriches, gorillas, chimpanzees, antelopes and bison and other unique animals and rare animals in Africa. These animals are also known as the food preference of some refugees because of their high nutritional value. Especially in rural areas of Gabon, many villagers live by hunting, and their hunting behavior also affects the survival of wildlife in the region.

Through the analysis of the living conditions of rural villagers in Gabon, it can be known that the main hunting force is the local male villagers. Because of the lack of local food, they depend more on eating wild animal meat to survive. Therefore, the men in the villages are called the main hunters. Usually, they hunt with guns. Of course, there will be some villagers who think that using guns is more dynamic and static, so they will use trap hunting machine instead. However, in the study, it is found that hunters of different ages adopt different ways and choose different hunting ranges. They usually hunt and sell the trophies on the market, and the price of the products varies according to the region, the distance from the market and the variety of the products themselves. Previously, people also decide the price because of the degree of congestion on the way to the market.

Based on the state's protection of rare species, villagers will try to avoid hunting those rare species when hunting. However, sometimes if the trap model is used, the randomness of this hunting method is strong, and the situation of unpredictable prey will appear.

The hunting situation of some villagers in Gabon has been understood, such as the composition of hunting, the main purpose of hunting, the main species of animals hunted, the main methods of hunting animals, the main areas of hunting animals and the ways of using animals after hunting. It is found that the hunting conditions in this area should be carried out in a certain number of hunting, so that the hunting behavior can be carried on for a long time to ensure their lives and certain economic benefits.

Among them, the hunting purpose of villagers of every age group is also the most important factor affecting their hunting behavior. Villagers aged 60-70 go hunting. Their main purpose is to support their families and ensure their basic survival and living conditions. Villagers aged 51-60 go hunting with the main purpose of protecting land. Villagers aged 31-50 go hunting mainly because they have certain occupations and occupational needs. Among these hunting villagers, the predominant is the hunters aged 41-50. They are physically able to support their hunting work, and may be just their profession, so they will be more involved in hunting activities.

It is known that the main animals they hunt are Cephalophus Monticola, Atherurus Africanus and Cephalophus sp. In the hunting process, they will also have some economic pressures. The price of prey will affect their income on that day. Especially if they inadvertently hunt some more valuable wildlife, they may not have any income to ensure their life on that day or in recent days.

However, through investigation and analysis, it can also be found that many experienced hunters will judge the current situation of this kind of animal roughly by the species of wildlife they hunt, and will pay more attention to other animals in subsequent hunting operations to ensure the number of most wildlife in the region, so as to maintain the number of most wildlife in the region and the ecological balance of wildlife in the region.

To sum up, villagers in some regions will choose to hunt some wildlife. The hunters will try to avoid killing wildlife that is especially forbidden by national laws and policies and some conservation organizations, even the world's rare wildlife. Moreover, they will directly sell or eat the results of hunting on that day to meet the needs of survival and life, which ensures the diversity of wildlife in the region, and to a certain extent, ensures the diversity of organisms, and provides protection for hunting activities in the future.

4. Conclusions

With the continuous development of social economy, residents in most areas can guarantee their most basic survival problems. However, in some parts of Africa near the equator, due to the particularity of the geographical environment, they need to rely on hunting to ensure the survival of their families and all kinds of life, to solve the problem of food and clothing by eating wildlife with high nutritional value, and to obtain certain benefits by selling or consuming hunted products to protect the life of their families. In the course of the research, there are few studies on specific hunting animals, and no detailed analysis of the specific selling price is made. This will be further discussed in the future research, so as to enrich the research content. The socioeconomic investigation and analysis of wildlife hunting behavior will help to study the biodiversity of the region, provide a certain basis for the hunting behavior of villagers in the region, and also support the wildlife conservation work in other similar regions.

Acknowledgements

References

[1] Pöysä, H., & Väänänen, V. M. (2018) "Changes in the Proportion of Young Birds in the Hunting Bag of Eurasian Wigeon: Long-Term Decline, But No Association with Climate", *European Journal of Wildlife Research*, 64(2), pp.20.

[2] Mbaiwa, J. E. (2018) "Effects of the Safari Hunting Tourism Ban on Rural Livelihoods and Wildlife Conservation in Northern Botswana", *South African Geographical Journal*, 100(1), pp. 41-61.

[3] Borgerson, C., Rajaona, D., Razafindrapaoly, B., Rasolofoniaina, B. J. R., Kremen, C., & Golden, C. D. (2017) "Links between Food Insecurity and the Unsustainable Hunting of Wildlife in a Unesco World Heritage Site in Madagascar", *The Lancet*, 389, pp. S3.

[4] Cerri, J., Ferretti, M., & Coli, L. (2018) "Where the Wild Things are: Urbanization and Income Affect Hunting Participation in Tuscany, at the Landscape Scale", *European Journal of Wildlife Research*, 64(3), pp. 23.

[5] Lesniak, I., Franz, M., Heckmann, I., Greenwood, A. D., Hofer, H., & Krone, O. (2017) "Surrogate Hosts: Hunting Dogs and Recolonizing Grey Wolves Share their Endoparasites", *International Journal for Parasitology: Parasites and Wildlife*, 6(3), pp. 278-286.

[6] Elbroch, L. M., Feltner, J., & Quigley, H. (2018) "Human–Carnivore Competition for Antlered Ungulates: Do Pumas Select for Bulls and Bucks", *Wildlife Research*, 44(7), pp. 523-533.

[7] Mensah, J. T., & Elofsson, K. (2017) "An Empirical Analysis of Hunting Lease Pricing and Value of Game in Sweden", *Land Economics*, 93(2), pp. 292-308.

[8] Linnell, J., Trouwborst, A., & Fleurke, F. (2017, September) "When is it Acceptable to Kill a Strictly Protected Carnivore? Exploring the Legal Constraints on Wildlife Management within Europe's Bern Convention", *in Exploring the Legal Constraints on Wildlife Management within Europe's Bern Convention*, 12(21), pp. 129-157.

[9] Supriadi, D., Agustin, H., & Sirait, R. A. (2018, November) "The Role of Online and Social Media Communications in Building Environmental Myths", *in Journal of Physics: Conference Series*, 1114(1), pp. 12067.

[10] Johar, M., Soewondo, P., Pujisubekti, R., Satrio, H. K., & Adji, A. (2019) "In Data We Trust? An Analysis of Indonesian Socioeconomic Survey Data", *Bulletin of Indonesian Economic Studies*, 55(1), pp. 61-82.

[11] Kino, S., Bernabé, E., & Sabbah, W. (2017) "Socioeconomic Inequality in Clusters of Health-Related Behaviours in Europe: Latent Class Analysis of a Cross-Sectional European Survey", *BMC Public Health*, 17(1), pp. 497.

[12] Caetano, A. J., & Dias, J. G. (2018) "Socioeconomic Classification of the Working-Age Brazilian Population: a Joint Latent Class Analysis Using Social Class and Asset-Based Perspectives", *Social Indicators Research*, 139(1), pp. 119-146.

[13] Emrouznejad, A., & Yang, G. L. (2018) "A Survey and Analysis of the First 40 Years of Scholarly Literature in DEA: 1978–2016", *Socio-Economic Planning Sciences*, 61, pp. 4-8.

[14] Montano, D. (2017) "Association between Socioeconomic Determinants and the Metabolic Syndrome in the German Health Interview and Examination Survey for Adults (DEGS1)–a Mediation Analysis", *the Review of Diabetic Studies: RDS*, 14(2-3), pp. 279.

[15] Wise, A., Geronimus, A. T., & Smock, P. J. (2017) "The Best of Intentions: a Structural Analysis of the Association between Socioeconomic Disadvantage and Unintended Pregnancy in a Sample of Mothers from the National Longitudinal Survey of Youth (1979)", *Women's Health Issues*, 27(1), pp. 5-13.

[16] Mondor, L., Cohen, D., Khan, A. I., & Wodchis, W. P. (2018) "Income Inequalities in Multimorbidity Prevalence in Ontario, Canada: a Decomposition Analysis of Linked Survey and Health Administrative Data", *International Journal for Equity in Health*, 17(1), pp. 90.

[17] Lana, R. M., Riback, T. I., Lima, T. F., da Silva-Nunes, M., Cruz, O. G., Oliveira, F. G., & Codeço, C. T. (2017) "Socioeconomic and Demographic Characterization of an Endemic Malaria Region in Brazil by Multiple Correspondence Analysis", *Malaria Journal*, 16(1), pp. 397.

[18] Booth, H. P., Charlton, J., & Gulliford, M. C. (2017) "Socioeconomic Inequality in Morbid Obesity with Body Mass Index More than 40 Kg/M2 in the United States and England", *SSM-Population Health*, 3, pp. 172-178.