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Smoking, Drinking and Cold Temperature

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Abstract

Background: *The Japanese archipelago is widely distributed from north to south. In recent years, smoking rates have been decreasing throughout Japan, but smoking rates tend to be higher in colder regions. This study attempted to clarify the relationship between smoking and drinking rates and cold temperatures by examining the relationship between smoking and drinking rates and annual average temperatures by prefecture.*

Methods: *The values were downloaded from the Ministry of Health, Labour and Welfare and e-Stat; a portal site for Japanese Government Statistics.*

Results and Discussion: *Results showed a significant negative correlation between the average temperature and the rates of drinking and smoking, and a significant positive correlation between the rates of smoking and drinking. Multiple regression analysis suggested that lower outdoor temperatures may have a stronger effect on drinking rates than smoking rates. Higher drinking rates in the north may be due to the colder climate and shorter daylight hours. Drinking has also been reported to induce smoking, which may explain the higher smoking rates in colder regions.*

keywords: Smoking Rate, Drinking Rate, Cold Temperature

1. Introduction

The Japanese archipelago is long from north to south and belongs to a diverse range of climatic zones, from subarctic climates in the north to subtropical climates in the south. In recent years, smoking rates have been declining throughout Japan, but smoking rates tend to be higher in colder regions such as Aomori and Hokkaido. The author also finds a correlation between latitude and smoking rate of countries in the world in 2018. Drinking rates, on the other hand, have been reported to be associated with colder climates and shorter hours of sunlight worldwide. This study sought to clarify the relationship between smoking and drinking rates and cold temperatures by examining the relationship between smoking and drinking rates and annual average temperatures by prefecture in Japan [1,2].

2. Methods

2.1. Smoking and Drinking Rates and Annual Average Temperature

Smoking and drinking rates are based on the Comprehensive Survey of Living Conditions or National Health and National Nutrition Survey by the Ministry of Health, Labour and Welfare. The values were downloaded from the Ministry of Health, Labour and Welfare. The annual average values of ambient temperature by prefecture were from Social Indicators by Prefecture. The values were downloaded from e-Stat; a portal site for Japanese Government Statistics [3-5].

2.2. Statistical Analysis

Correlation and multiple regression analyses were conducted to determine the relationship between the relationship between smoking and drinking rates and annual average temperature by prefecture. $p < 0.05$ was considered as statistically significant.

3. Results

Figure 1 shows the trends in smoking rates for men and women in Japan (from the Comprehensive Survey of Living Conditions). Between 2001 and 2019, the rates for men fell from 48.4% to 28.8%, and for women fell from 14% to 8.8%, showing a linear downward trend in both cases.

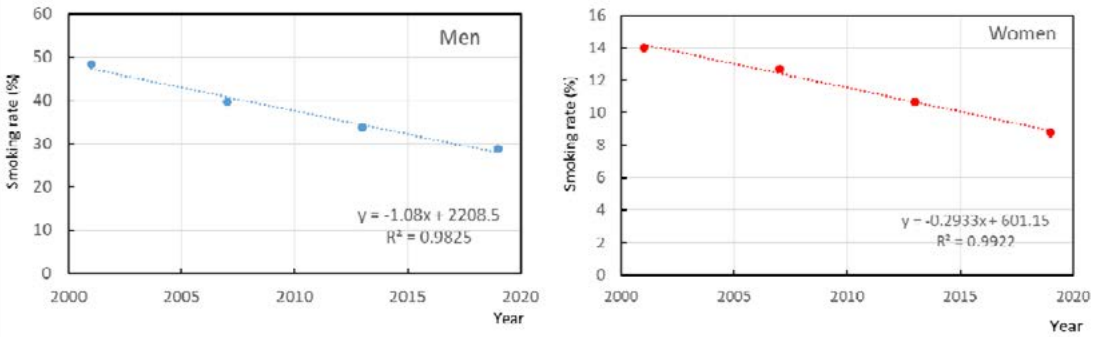

Figure 1: Trends in Smoking Rates for Men and Women in Japan

Figure 2 shows the relationship between the smoking rate of men and women (from the Comprehensive Survey of Living Conditions) and the annual average of ambient temperature by prefecture in 2001, 2007, 2013, and 2019. Both the smoking rate of men and women and the average annual temperature show a significant negative correlation, indicating that smoking rates tend to be higher in areas with lower average annual temperatures.

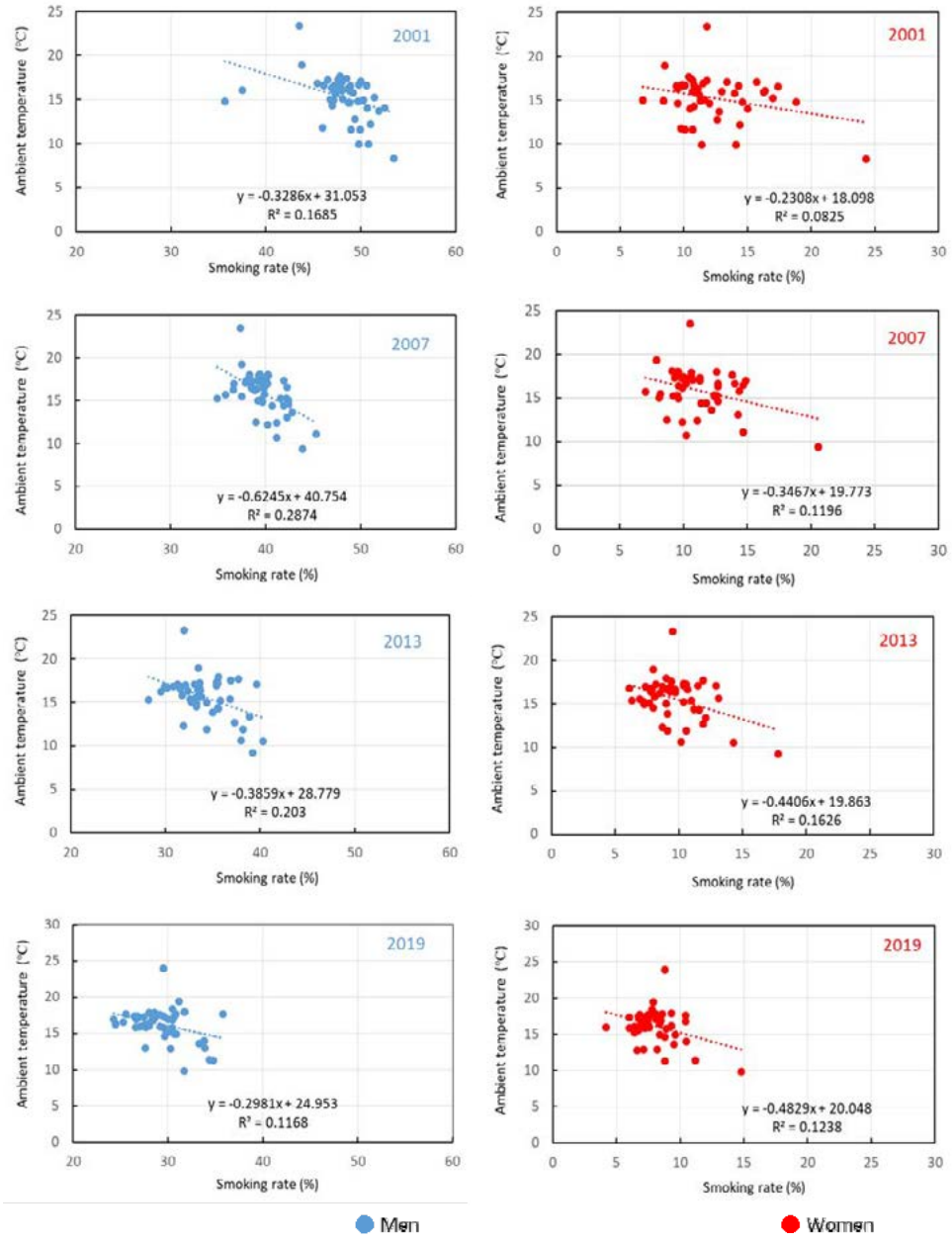

Figure 2: Relationship Between the Smoking Rate of Men and Women and the Annual Average of Ambient Temperature by Prefecture

Figure 3 shows the relationship between the average smoking and drinking rates of men by prefecture and the average temperature over the five-year period from 2006 to 2010 (National Health and National Nutrition Survey). A significant negative correlation was found between smoking rate and average temperature, and between drinking rate and average temperature, while a significant positive correlation was found between smoking rate and drinking rate. In a multiple regression analysis with drinking rate as the dependent variable and smoking rate and average temperature as explanatory variables, only average temperature was a significant negative explanatory variable. On the other hand, a multiple regression analysis with smoking rate as the dependent variable and drinking rate and average temperature as explanatory variables showed that average temperature was not a significant explanatory variable (Table 1, 2). and average temperature as explanatory variables.

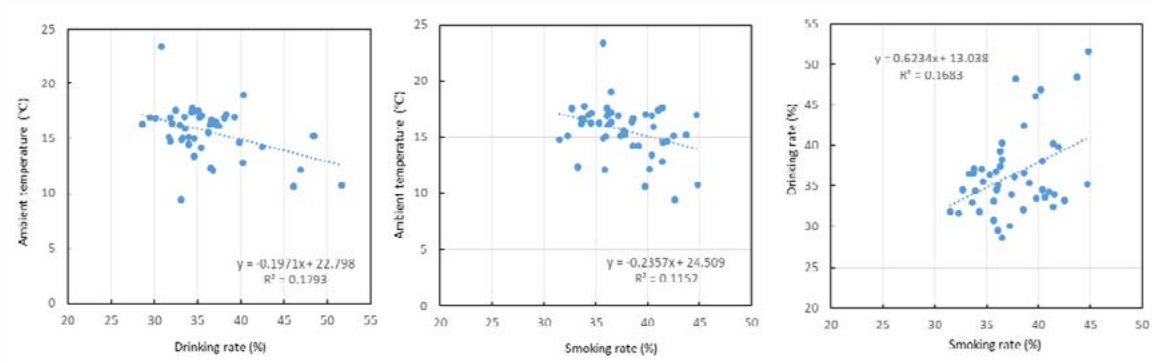

Figure 3: Relationship Between the Average Smoking and Drinking Rates of Men by Prefecture and The Average Temperature Over the Five-Year Period From 2006 To 2010

	Estimated Regression Coefficient, B	Standard Error, S.E.	Partial Regression Coefficient, B	Partial R	P- Value
Intercept	32.801	10.454	-	-	0.003
Ambient Temperature	-0.726	0.303	-335	-0.340	0.021
Smoking Rate	0.394	0.208	0.208	0.274	0.065
Drinking Rate as the dependent Variable, *Significant at p<0.05 **Significant at P<0.01					

Table 1: Multiple Regression Analysis with Drinking Rate as the Dependent Variable and Smoking Rate and Average Temperature as Explanatory Variables

	Estimated Regression Coefficient, B	Standard Error, S.E.	Partial Regression Coefficient, B	Partial R	P- Value
Intercept	35.708	5.987	-	-	0.000
Ambient Temperature	-0.319	0.219	-0.219	-0.215	0.152
Drinking Rate	0.191	0.101	0.285	0.274	0.065
Drinking Rate as the dependent Variable, *Significant at p<0.05 **Significant at P<0.01					

Table 2: Multiple Regression Analysis with Smoking Rate as The Dependent Variable and Drinking Rate

4. Discussion

In recent years, smoking rates for both men and women have tended to be higher in colder regions. Additionally, drinking and smoking rates for men by region showed a significant negative correlation with the annual average temperature. Multiple regression analysis suggested that low outdoor temperatures may have a stronger impact on drinking rates than smoking rates. However, it should be noted that the statistical analysis methods used in this study can only assess associations, not prove causation. The higher drinking rates in the north may be due to the cold climate and short hours of daylight. It has also been reported that drinking alcohol induces smoking. This effect of alcohol consumption may also be a reason why smoking rates are higher in colder regions [6-9].

5. Conclusion

In the Japanese archipelago, which is widely distributed in a north-south direction, significant negative correlations were found between regional average temperature and rates of drinking and smoking, while significant positive correlations were found between rates of smoking and drinking. The re-

sults of multiple regression analysis suggest that low outdoor temperatures may have a stronger effect on drinking rates than smoking rates. Higher drinking rates in the north may be due to the colder climate and shorter daylight hours. Drinking has also been reported to induce smoking, which may explain the higher smoking rates in colder regions.

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Disclosure of Conflict of Interest

The author declares that have no conflict of interest.

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