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## Determination of breakfast habits and knowledge of foreign undergraduates studying at Selcuk University in Turkey

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### TITOLO

Abitudini e conoscenze relative alla prima colazione in un gruppo di studenti presso l'Università di Selcuk, Turchia

### KEY WORDS

Breakfast, breakfast habits, nutrition, undergraduates

### PAROLE CHIAVE

Prima colazione, abitudini alimentari, nutrizione, studenti universitari

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### Summary

Regular breakfast habit is important for the health and development in adolescence. This study aims to determine the breakfast habits and knowledge of foreign undergraduates studying at Selcuk University in Konya, Turkey. The population of the study consisted of 123 out of 533 foreign undergraduates studying in Selcuk University. The data was collected with a cross-sectional questionnaire form composed of three parts. The regular breakfast frequency was found 48.8%. 58.5% of participant undergraduates had breakfast between 06:00-08:00 am. It was determined that over half of the undergraduates (55.0%) feel in a good mood when they make breakfast, and they (51.2%) generally make breakfast at home. Significant statistical relationship and differences were determined between regular breakfast habit and breakfast time, feelings, and breakfast venue values at the levels of  $r:0.45$ ,  $p<0.000$ ;  $r:-0.23$ ,  $p<0.005$ ;  $r:0.43$ ,  $p<0.000$ , respectively. The mean score of undergraduates in breakfast knowledge test was found as  $(x\pm SE)$   $58.0\pm 0.494$ . Foods consumed as breakfast by highest percentage of undergraduates resulted respectively margarine (45.5%), patty-pastry (42.3%), molasses-tahini (37.4%), vegetables (34.1%) and cereals (32.5%). Drinks consumed as breakfast by highest percentage of undergraduates resulted respectively green tea (60.2%), fruit juice (29.3%), coffee (28.5%), milk (26.8%) and black tea (17.1%). Among the reasons why undergraduates do not make breakfast regularly, the most common ones were "lack of time" and "in-existence of breakfast habit" (36.5%). Study results indicated that the undergraduates had enough knowledge about breakfast, but their habit for regular breakfast should be promoted.

### Riassunto

Fare colazione regolarmente è importante per la salute e la crescita durante l'adolescenza. Questo studio ha avuto lo scopo di determinare le abitudini e le conoscenze relative alla prima colazione di un gruppo 123 studenti stranieri presso l'Università di Selcuk a Konya, Turchia. I dati sono stati raccolti con un questionario che investigava le caratteristiche personali, le abitudini e le conoscenze relative alla prima colazione. Il 48.8% degli studenti ha dichiarato di fare colazione regolarmente e il

58.5% di fare colazione tra le 6:00 e le 8:00 del mattino. Più della metà degli studenti (51.2%) ha dichiarato di fare colazione a casa e il 55.0% di ritenersi di buon umore quando fa colazione. La variabile fare colazione regolarmente è risultata positivamente associata alle variabili orario della colazione e luogo della colazione ( $r=0.45$ , e  $p<0.000$ ;  $r:0.43$ ,  $p<0.000$  rispettivamente) e negativamente associata alla variabile sentimenti relativi alla colazione ( $r:-0.23$ ,  $p<0.005$ ). Il punteggio medio degli studenti nel test sulle conoscenze riguardanti la colazione è risultato pari a ( $\bar{x} \pm SE$ )  $58.0 \pm 0.494$ . Gli alimenti consumati quotidianamente per colazione dalla maggior percentuale di studenti sono risultati rispettivamente la margarina (45,5%), le "patty-pastry" ovvero paste ripiene salate (42.3%), le "molasses-tahini" ovvero paste ripiene dolci (37.4%), le verdure (34.1%) e i cereali (32.5%). Le bevande consumate quotidianamente per colazione dalla maggior percentuale di studenti sono risultate rispettivamente il the verde (60.2%), il succo di frutta (29.3%), il caffè (28.5%), il latte (26.8%) e il the nero (17.1%). Tra le ragioni per le quali gli studenti universitari hanno dichiarato di non fare regolarmente colazione, le più comuni sono risultate "la mancanza di tempo" e "l'inesistenza dell'abitudine di fare colazione" (36.5%). Il livello di conoscenze relative alla colazione è risultato sufficiente tra i partecipanti; si ritiene tuttavia necessario promuovere abitudini di prima colazione regolari.

## Introduction

Breakfast is qualified as the most important meal of the day, yet it is the most skipped meal. Breakfast habits and consumption have an important role in healthy lifestyle during adolescence (1). Many studies emphasized that regular meal pattern and breakfast can improved mental health and daily diet quality (2-5). Especially, regular breakfast habit during adolescence; provides energy, balanced daily dietary diet in addition to active, stabile and more efficient

training (e.g. learning) abilities. Approximately, body consumes the stored energy during twelve hours between dinner and breakfast. In this period, body uses its own storages in the night and the breakfast replaces these storages again. Skipping breakfast may have public health consequences for adolescents (6-11). Compared to breakfast consumers, those who skipped breakfast receive lower intakes of many nutrients, including vitamins A, E, C, B<sub>6</sub>, and B<sub>12</sub>, folate, iron, calcium, phosphorus, magnesium and dietary fiber (8),

that are rarely compensated for at other meals (1; 12-14). On the other hand, skipping the meals in a day results in less use of amino acids and it increases the absorption of glucose and glycogen synthesis in the body and it causes decrease in fat metabolism and fat deposition of body (15). Nowadays, obesity is dramatically higher in especially adolescence in the world and it depends on environmental factors like nutrition habits rather than genetic factors. In this content, long term effects of having a regular breakfast on

the prevention of obesity and other chronic diseases in the future life are examined (16). From this regard, this study aims to determine the breakfast habits and knowledge of foreign undergraduates studying at a university in Turkey.

## Material and method

### *Study design and setting*

The research was designed in general survey model. The questionnaire method was used to collect the data of the research. The data was collected in April and June 2010 at the Selcuk University, Konya, Turkey.

### *Study sample*

The study population was composed of 533 foreign university undergraduates who came to Turkey from Asia countries to pursue a bachelor degree in Selcuk University. A total of 533 participants were registered during the data collection period, representing a response rate of 23% (n=123). The nationality rates of foreign undergraduates are; 19.5% Kazakhstan, 27.6% Turkmenistan, 11.4% Uzbekistan, 20.3% Mongolia, 4.9% Kirghizstan, 8.9% Azerbaijan, 5.7% Indonesia, 1.6% Korea.

### *Study procedure and measures*

Study data was collected by a questionnaire form including 24 questions for determining the breakfast knowledge and habits of undergraduates. A survey questionnaire was divided into three main parts. Demographic features were investigated in the first part, while, breakfast habits were handled in the second part and knowledge level was in the third part.

The appropriateness of weight for height and age were assessed as follows: first, Body Mass Index (BMI) was calculated by dividing weight (kg) by squared height (m<sup>2</sup>). Next, because BMI is expected to increase as children and adolescents mature, the appropriateness of BMI for age, gender, and height was evaluated by calculating percentile ranking according to WHO adolescent anthropomorphic standards (17).

The knowledge about breakfast was assessed using a five item Likert-type scale ranging from "Totally Agree: 5", "Agree: 4", "No idea: 3", "Disagree: 2" to "Totally Disagree: 1" scores. The items of scale were prepared by Dietary Guidelines for Turkey. The scale consisted of fifteen statements prepared to define participants' knowledge about the breakfast. Three knowledge statements were

graded in just the opposite manner. The results were scored for each item and general, and then their average values were taken. A 5-item scale (everyday, 2-3 times a week, once a week, once in two weeks, rarely) was used to determine the consumption rates of nutrients at breakfast and the results were evaluated as frequency and percentage.

### *Statistical analysis*

The data gathered from the survey forms were evaluated in Statistical Package for Social Sciences (SPSS) 18.0 version. The subsequent tables of frequency and percentages were made regarding the variables, and chi-square ( $\chi^2$ ) testing method was used to determine the relations between the variables. The Likert scale of breakfast knowledge level assessed frequency, percentages and averages of total scores in each questions and the total of all questions. In addition, logistic regression was also applied to results, and the findings were evaluated concerning the significance level. The significance margin was set to 0.05 for all the statistical analyses.

## Results

Results obtained from the study data indicated that 49.6% (n=61)

of undergraduates were male, and 50.4% (n=62) were female. The mean age of the undergraduates was (x±SE) 21.5±0.197 years, height 1.71±0.007 m, body weight 64.0±0.940 kg. The mean BMI of undergraduates was 21.77±0.277 kg/m<sup>2</sup>, and 67.5% of them were normal, 18.7% were underweight, and 13.8% were overweight (Tab. 1).

Considering the monthly food expenditure, the majority of the undergraduates (61.0%) spent TL ≤100, while 39% of them had TL ≤250 and 51.2% had TL 250-500 monthly income. In addition, the average monthly income and food expenditure of undergraduates were TL 323±15.104, TL 120±6.604 (x±SE), respectively, and 64.2% stayed at home, 16.3% at public student residence, and 19.5% stayed at private student residences. Considering smoking and alcohol usage habits, 28.5% of them had smoking habit, and 14.6% drunk alcohol.

The rates of undergraduates who had and did not have regular breakfast habit were 48.8% (n:60), 51.2% (n:63). About 82% of undergraduates with breakfast habit had their breakfast between 06:00-08:00 hours, while the undergraduates with no such habit had their breakfast between 12:00-14:00 hours. More than half (55.0%) of undergraduates with breakfast habit stated to feel

**Table 1 - Demographic features of undergraduates (n:123)**

Variables		n	%
Gender	Male	61	49.6
	Female	62	50.4
BMI	Underweight	23	18.7
	Normal	83	67.5
	Overweight	17	13.8
Monthly Food Expenditure (TL)	< 100	75	61.0
	101-200	40	32.5
	201-300	8	6.5
Monthly Income (TL)	< 250	48	39.0
	251-500	63	51.2
	501-750	10	8.1
	> 751	2	1.6

Turkish Lira (TL): \$0.62 (June 2011)

in a good mood when they took breakfast. However, 46.0% of undergraduates with no breakfast habit stated to feel no difference. Significant differences were detected between regular breakfast habit and breakfast time, feelings and breakfast venue ( $\chi^2$ : 26.488, 14.991, 29.706; p<0.001, respectively). The difference between undergraduates who had and did not have regular breakfast habit considering BMI was not statistically significant ( $\chi^2$ :1.802, p>0.05) (Tab. 2).

The question “What is reason for not having breakfast regularly?”, 36.5% (n:23) of undergraduates answered “I don’t have time”, 9.5% (n:6) of undergraduates “I don’t like breakfast foods”, 17.5% (n:11) “It is because of my other harmful

habits”, and 36.5% (n:23) “I don’t have such a habit” (Data not shown).

In Table 3, a positive and moderate relation was detected between regular breakfast and breakfast time (r:0.45); however, the correlation between these two variables was calculated as r:0.33 after controlling other variables. A negative and low (r:-0.23) relation was determined between regular breakfast habit and feelings. There was a positive and moderate relation (r:0.43) between breakfast venue and regular breakfast habit. However, no significant difference was detected between BMI groups and regular breakfast habit (r:0.12, p>0.05). A moderate and significant relation was detected between regular breakfast habit of under-

**Table 2** - Breakfast habits, breakfast times, feelings and venue of undergraduates

Variables		Have a regular breakfast habit						$\chi^2$ and p value
		Yes (n:60; 48.8%)		No (n:63; 51.2%)		Total (n:123)		
		n	%	n	%	n	%	
Breakfast time	06:00-8:00	49	81.7	23	36.5	72	58.5	26.488
	09:00-11:00	10	16.7	31	49.2	41	33.3	.000
	12:00-14:00	1	1.6	9	14.3	10	8.2	
Feelings	No change	9	15.0	29	46.0	38	30.9	14.991
	Good mood	33	55.0	18	28.6	51	41.5	.001
	Helps maintain mental performance	18	30.0	16	25.4	34	27.6	
Breakfast venue	Home	39	65.0	24	38.1	63	51.2	29.706
	Dormitory Cafeteria	20	33.3	12	19.0	32	26.0	.000
	School Cafeteria	1	1.7	20	31.7	21	17.1	
	Other	n.d.	n.d.	7	11.1	7	5.7	
BMI	Underweight	13	10.6	10	8.1	23	18.7	1.802
	Normal	41	33.3	42	34.2	83	67.5	.406
	Overweight	6	4.9	11	8.9	17	13.8	

n.d.: Not detected

graduates and breakfast time, feelings, breakfast venue and BMI groups ( $R:0.579$ ,  $R^2:0.33$ ,  $p<0.000$ ). The results of t-test regarding the significance of regression coefficients indicated that all the variables except for BMI group had significant effects on regular breakfast habit (Tab. 3). Maximum score that can be obtained from the questions investigating the undergraduates' knowledge about breakfast is 75, while the minimum score is 15. The mean score of undergraduates in knowledge test was  $58.0\pm 0.494$  ( $x\pm SE$ ), and the lowest score was

**Table 3** - Regular breakfast habit and breakfast time, feelings, venue and bmi group of undergraduates

Variables	$\beta$	S.E.	Beta	r t	p	Zero- Order	Partial Order
Constant	.984	.189	-	5.197	.000*	-	-
Breakfast time	.259	.063	.333	4.093	.000*	.450	.353
Feeling	-.141	.049	-.216	-2.873	.005*	-.233	-.256
Breakfast venue	.158	.044	.293	3.621	.000*	.427	.316
BMI Group	.071	.067	.081	1.065	.289	.117	.098
	R:0.579		R <sup>2</sup> :0.335		F <sub>(4-118)</sub> : 14.843		p: .000

41, while the highest was 75. According to the table 4, "suitable breakfast should contain foods of

all nutrient groups", "breakfast is helpful to protect from chronicle diseases", "breakfast is important

**Table 4 - The breakfast knowledge of undergraduates**

Statements		Totally agree	Agree	Undecided	Not agree	Totally disagree	Score (x±SE)
Foodstuffs consumed at breakfast like milk, egg, cheese are helpful to meet daily protein requirement	n	54	43	16	5	5	4.10±0.943
	%	43.9	35.0	13.0	4.1	4.1	
Consumption of milk, fruit and oily seed besides cereals at breakfast contributes to vitamin and mineral intake	n	36	47	13	16	11	3.65±0.114
	%	29.3	38.2	10.6	13.0	8.9	
Over consumption of tea at breakfast could diminish the use of vitamin and mineral in foods	n	33	43	25	9	13	3.60±0.112
	%	26.8	35.0	20.3	7.3	10.6	
Skipping the breakfast contributes to lessen the calorie taken in the day	n	38	36	33	9	7	3.72±0.103
	%	30.9	29.3	26.8	7.3	5.7	
Sufficient and balanced daily consumption of breakfast could prevent vitamin and mineral deficiencies	n	22	42	28	21	10	3.36±0.107
	%	17.9	34.1	22.8	17.1	8.1	
Ideal breakfast could meet 25% of daily energy need	f	38	39	22	19	5	3.69±0.106
	%	30.9	31.7	17.9	15.4	4.1	
Breakfast is the most important meal of the day	n	30	47	34	9	3	3.74±0.089
	%	24.4	38.2	27.6	7.3	2.4	
Suitable breakfast should contain foods of all nutrient groups	n	72	35	9	5	2	4.38±0.082
	%	58.5	28.5	7.3	4.1	1.6	
Suitable breakfast should contain vegetables	n	33	28	33	18	11	3.43±0.114
	%	26.8	22.8	26.8	14.6	8.9	
Fruits should not be consumed at breakfast	n	33	39	40	9	2	3.74±0.089
	%	26.8	31.7	32.5	7.3	1.6	
Breads made of whole wheat flour should not be consumed at breakfast	n	n.d.	n.d.	33	52	38	4.04±0.068
	%	n.d.	n.d.	26.8	42.3	30.9	
Breakfast is important to protect and maintain the health	n	n.d.	n.d.	23	61	39	4.13±0.063
	%	n.d.	n.d.	18.7	49.6	31.7	
Breakfast is helpful to protect from chronicle diseases	n	70	40	11	n.d.	2	4.43±0.071
	%	56.9	32.5	8.9	n.d.	1.6	
Regular breakfast does not increase the efficiency and success at work/school	n	31	48	34	3	7	3.75±0.094
	%	25.2	39.0	27.6	2.4	5.7	
Breakfast is important for sufficient and balanced nutrient	n	n.d.	n.d.	24	45	54	4.24±0.068
	%	n.d.	n.d.	19.5	36.6	43.9	

n.d.: Not detected

**Table 5** - The food frequency in breakfast of undergraduates

Food and beverages	Every day		2-3 times a week		Once a week		Once in week		Rarely 2 weeks	
	n	%	n	%	n	%	n	%	n	%
Whole Bread	33	26.8	17	13.8	10	8.1	17	13.8	46	34.7
White Bread	1	0.8	2	1.6	1	0.8	7	5.7	112	91.1
Cereals	40	32.5	33	26.8	12	9.8	15	12.2	23	18.7
Patty-Pastry	52	42.3	20	16.3	19	15.4	17	13.8	15	12.2
Bagel	19	15.4	24	19.5	20	16.3	33	26.8	27	22.0
Olive	19	15.4	16	13.0	4	3.3	16	13.0	68	55.3
Jam-Marmalade	27	22.0	26	21.1	9	7.3	28	22.8	33	26.8
Honey	37	30.1	25	20.3	15	12.2	20	16.3	26	21.1
Molasses-Tahini	46	37.4	22	17.9	24	19.5	14	11.4	17	13.8
Chocolate	9	7.3	23	18.7	18	14.6	27	22.0	46	37.4
Cheese	9	7.3	13	10.6	9	7.3	31	25.2	61	49.6
Egg	14	11.4	22	17.9	7	5.7	40	32.5	40	32.5
Butter	24	19.5	24	19.5	7	5.7	33	26.8	35	28.5
Margarine	56	45.5	26	21.1	7	5.7	13	10.6	21	17.1
Meat Products	23	18.7	24	19.5	13	10.6	32	26.0	31	25.2
Fried Potatoes	13	10.6	29	23.6	8	6.5	48	39.0	25	20.3
Vegetables	42	34.1	27	22.0	10	8.1	15	12.2	29	23.6
Tomatoes	8	6.5	21	17.1	5	4.1	25	20.3	64	52.0
Fruit	33	26.8	18	14.6	13	10.6	27	22.0	32	26.0
Black Tea	21	17.1	5	4.1	3	2.4	6	4.9	88	71.5
Coffee	35	28.5	33	26.8	11	8.9	22	17.9	22	17.9
Milk	33	26.8	18	14.6	13	10.6	23	18.7	36	29.3
Fruit Juice	36	29.3	29	23.6	22	17.9	19	15.4	17	13.8
Green Tea	74	60.2	21	17.1	12	9.8	7	5.7	9	7.3

for sufficient and balanced nutrient” statements were found the highest average scores ( $4.38 \pm 0.082$ ,  $4.43 \pm 0.071$  and  $4.24 \pm 0.068$  respectively), whereas “sufficient and balanced daily consumption of breakfast could prevent vitamin and mineral deficiencies”, “ideal breakfast could meet 25% of daily energy need” and

“suitable breakfast should contain vegetables” statements were obtained the lowest average scores ( $3.36 \pm 0.107$ ,  $3.69 \pm 0.106$  and  $3.43 \pm 0.114$  respectively).

According to the Table 4 the highest scores were examined in “suitable breakfast should contain foods of all nutrient groups”, breakfast is helpful to protect from

chronicle diseases”, “breakfast is important for sufficient and balanced nutrient” items.

Foods consumed as breakfast by highest percentage of undergraduates resulted respectively margarine (45.5%), patty-pastry (42.4%), molasses-tahini (37.3%), vegetables (34.1%) and cereals (32.5%). Drinks consumed as breakfast by

highest percentage of undergraduates resulted respectively green tea (60.2%), fruit juice (29.3%), coffee (28.5%), milk (26.8%) and black tea (17.1%). About 27% of undergraduates were determined to consume bread made of whole wheat flour at breakfast, while 91.1% rarely consumed white bread. Daily consumptions of cereal, patty-pastry, molasses-tahini, margarine, vegetable, milk and green tea by undergraduates were determined as 32.5%, 42.3%, 37.4%, 45.5%, 34.1%, 26.8% and 60.2%, respectively. However, the rare consumption rates of olive, cheese, egg, butter, and black tea were 55.3%, 49.6%, 32.5%, 28.5%, and 71.5%, respectively. Fried potatoes had the highest consumption rate with 39.0% in every other week.

## Discussion

The percentage of skipping breakfast was found higher (51.2%) than the results of previous studies (18-21). Considering the BMI values, 67.5% of undergraduates were concluded normal, while 13.8% were overweight, and the mean BMI was  $21.77 \pm 0.277$  kg/m<sup>2</sup>. In another study (22), Finnish and Greek found male adolescents normal at 83.7% and 77.2% rates, and 3.7% of both were overweight. Studies per-

formed on undergraduates in Turkey indicated similar BMI values (13, 23-26).

According to the study results, the rate of undergraduates with regular breakfast habit was determined as 48.8%, which is higher than the findings of other studies (13, 23-24, 27). In a study implemented on adolescent students in Turkey, 45.6% of them were found to skip breakfast (27). Similarly, 24.1% of undergraduates were determined to always skip breakfast and the rate of undergraduates with regular breakfast habit was found 34.8%; in addition, being late for school (45.2%), waking up late (30.7%) and loss of appetite (26.3%) were stated among the reasons for skipping breakfast (28).

The majority (81.7%) of the undergraduates who had regular breakfast habit were determined to have breakfast between 06:00-08:00 hours, while 14.3% of them had their breakfast between 12:00-14:00 hours. 55.0% of undergraduates with regular breakfast habit stated to feel in a good mood when they had breakfast; however, 46.0% of undergraduates with no such habit stated to feel no difference.

In the study, the rates of undergraduates who had breakfast at home or dormitory canteen were determined 51.2% and 26.0%, respectively. Another study determined these rates as 44.4% and

24.1% for undergraduates (28), and both situations could be attributed to the fact that undergraduates generally lived either at home or student residence.

When the relations between undergraduates' habit of regular breakfast and breakfast times, feelings, breakfast venue and BMI groups were investigated by logistic regression analysis, all variables except for BMI groups were found significant; furthermore, a negative and weak correlation was detected between regular breakfast habit and feelings ( $r = -.20$ ,  $p > 0.05$ ). On the other hand, the results of similar studies (18, 20, 29-30) reported significant differences between undergraduates' regular breakfast habit and both BMI groups (especially with overweight group) (22, 31) as well as positive and negative feelings and cognitive functions. In addition, undergraduates' habit of skipping breakfast was not related to overweight or obesity, and it could be attributed to eating pathology (32).

Considering the results on the knowledge about breakfast demonstrated, the mean score of undergraduates was  $58.0 \pm 0.494$  ( $x \pm SE$ ) out of 75 point, and undergraduates were determined to have enough knowledge about breakfast. In terms of the nutrients consumed at breakfast, undergraduates did not prefer foods and beverages peculiar to Turkey, they



were not included in the breakfast pattern of Turkey, and they did not maintain the breakfast pattern of their own nation and the consumption behavior they previously attained. It is reported that university undergraduates consume white cheese-olive (67.4%), bagel-pastry (53.7%), egg (35.9%), honey-jam-molasses (34.4%) and black tea (85.6%) (28). On the other hand, daily black tea consumption of undergraduates was reported as 97.4% in a study (23) and 71.0% in another study (13); however, daily black tea consumption at breakfast was determined as 17.1%, while green tea consumption was 60.2%. Similarly, the rate of undergraduates consuming black and green olives, most common breakfast foods in Turkey, was determined as 15.4%. Asian countries are reported to have different breakfast practices, habits and patterns than other countries (33). Findings of the present study differ from the results of other similar studies in Turkey, which could be attributed to the fact that foreign undergraduates maintain the effects of their cultures and do not make much change in types of frequencies of foods and beverages they prefer at breakfast. In addition, it should not be disregarded that many sociological and cultural factors (e.g. migration, culture, socio-economic factors, and income levels) were

effective on the results obtained in this study (33-34).

### Conclusion

This study determined and demonstrated general typical features, knowledge and habits of breakfast among foreign undergraduates studying at university in Turkey. The results suggested that regular breakfast habits of foreign undergraduates were significantly related to the breakfast time, feelings and breakfast venue. The breakfast knowledge of foreign undergraduates was found sufficient. The consumption ratios of breakfast foods and beverages indicated that undergraduates applied their own cultural breakfast habits in Turkey without any change. But, results could be affected by some other factors (etc. migration, culture, socio-economic, and income level).

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