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Research Article

Effectiveness, Consumer's Perception, and Behavior Towards Healthier Choice Logo on Indonesian Instant Noodles in Jakarta

Melania Febriana Kumarga[1], Tjahja Muhandri[1,2], Uswatun Hasanah[1,2*]
[1]Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Bogor 16680, Indonesia
[2]Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Bogor 16680, Indonesia

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***Corresponding Author:**
tel: +6281281138183
email: uswatun.hasanah@apps.ipb.ac.id

ABSTRACT

This study was conducted to identify the availability of instant noodle products with and without the Healthier Choice (HC) logo that reflects Indonesian instant noodles nutrition labelling uptake by the food industry as well as to investigate the logo's effectiveness in influencing customers to choose healthier noodle products and consumers' perception and behavior toward the HC logo. Quantitative research consists of a market survey on HC logo usage in 120 instant noodle variants with different brands and an online consumer survey with a voluntary sampling technique involving 458 consumers aged 18–68 years residing in Jakarta. Nutritional information data (total fat, saturated fat, sodium and sugar) in two groups of products (HC and Without HC (WHC) groups) was analyzed using t-test, while the consumer survey data was analyzed using t-test and ANOVA. The confidence level used in statistical analysis was 95%. Of only eleven products that featured the HC logo on the packaging, one did not fulfill the criteria. The t-test showed no significant differences between products "without HC logo" and "with HC logo" groups in all nutrition content except for sodium. The HC logo showed significant difference in effectiveness for different gender and age groups, it was better for women than man, and older (43−58 and 59−68) more effective than younger (16−26 and 27−42). The consumer perception and behavior was more affected the age group 43−58 and 59−68 than 16−26 and 27−42, the level of education group in elementary, junior, and senior high school also post graduate group more influenced than pre-university and bachelor, consumption pattern moderate and frequent better than seldom consumption. Further, the consumer behavior also more influenced all income level group except >IDR20 million group.

INTRODUCTION

is to reduce premature deaths caused by Non-Communicable Diseases (NCDs). In Indonesia, NCDs such as heart diseases, cancer, diabetes, and chronic respiratory diseases account for 73% of all deaths (WHO 2022). The World Health Organization (WHO) has published a global action plan to address the NCD issue. The global action plan includes regulation of Front-of-Pack (FoP) nutrition labeling to decrease population consumption of total fat, saturated fat, sodium, and sugar (Vargas-Meza *et al.* 2019), help consumers decisions towards healthier food choices, and encourage the industry to reformulate products towards healthier options (Kanter *et al.* 2018). FoP nutrition labeling has been implemented worldwide through government policies, such as The Choices Program logo or the Healthy Choices logo, which was first endorsed by European governments (Kanter *et al.* 2018).

The Indonesian FDA issued nutrition labeling regulations in Indonesia to address the NCD issue, but consumers are having difficulties

interpreting the information about nutritional value on Back-of-Package (BoP). In 2021, The Indonesian FDA introduced the Healthier Choice scheme as a FoP voluntary label starting with instant noodles and ready-to-drink products in 2019 (FDA 2021a). Instant noodles are Indonesia's most consumed food product (14,260 billion servings per year) in 2022 (WINA 2022). Instant noodle production uses raw materials and frying technology, which can increase the nutrition content of total fat, saturated fat, and sodium (May & Nesaretnam 2014). Those nutrients potentially increase NCDs risk; according to Syauqy *et al.* (2022), instant foods increase hyperglycemia in middle-aged (45–59 years) in Indonesia. Regulation is needed to push consumers to choose healthier instant noodles (Istiqomah *et al.* 2021) to reduce the NCDs in the Indonesian population.

Effectiveness is the degree to which something is successful in producing a success result. The effectiveness of the HC logo can be seen from the consumer's knowledge and awareness regarding the availability of the HC logo in noodle product also the confidence level towards Indonesian FDA (Vargas-Meza *et al.* 2019; Izzati *et al.* 2022). Perception is the ability to see, hear, or become aware of something through the senses, whereas behavior is the way in which one acts or conducts oneself, especially toward others. In this research, perception towards HC logo observed from the easiness of the logo to be understandable and shown in noodle product packaging, the impact of the HC logo in choosing the healthier noodle product, and the credibility of the HC logo (Fatimah *et al.* 2019; Fialon *et al.* 2022; Izzati *et al.* 2022). Consumer behavior toward HC logo define from the transformation of the consumption pattern that cause by the HC logo, the influence of the non-communicable diseases, effect of price and taste of the noodle product, and the impact of HC logo towards purchase decision (Méjean *et al.* 2013; Maemunah 2020; Izzati *et al.* 2022).

After four years of implementation, there is a need to examine the update on the HC logo uptake in instant noodle products, compare the nutritional values (total fat, saturated fat, sodium, and sugar) among the group of products with the HC logo (HC) and without the HC logo (WHC), as well as to evaluate the effectiveness, consumer perception, and behavior towards the HC logo on instant noodles. This research is needed for the government and policymakers to evaluate the effectiveness of the HC logo and the influence of the HC logo on consumer perception and behavior, which can improve their eating habits. The effectiveness of the HC logo in affecting consumer perception and behavior is essential to ensure that the objective of regulation about the HC logo is well achieved.

METHODS

Design, location, and time

The study was conducted in Jakarta, Indonesia, for five months (January to May 2023). The research consisted of: 1). A market survey to identify the availability of instant noodle products with and without the HC logo, and; 2). A consumer survey to determine the effectiveness of the HC logo in influencing customers to choose healthier instant noodles, as well as to understand the consumer perception and behavior toward the HC logo. The study protocol was approved by the Research Ethical Commission of IPB University for using respondents as the subject in document 900/IT3.KEPMSM-IPB/ SK/2023.

Sampling

The market survey used instant noodles available in the Jakarta retail market and in online stores as the sample of this research. The inclusion criteria were instant noodles produced locally, had Indonesian FDA approval, made with wheat flour, and provided nutritional information. The market survey obtained 19 brands (A to Z) with 120 products reflecting specific brands' flavors .

The eligibility criteria for the consumer survey were defined, including being aged 15−68 years, residing in Jakarta, and be an instant noodle's consumer. If the respondent did not meet one of the criteria, they would be excluded from the research. The respondents were chosen using a voluntary quota sampling technique. Taking into account of Jakarta's population size aged 15−68 years old, and employing the confidence level of 95% and a sampling error of 5%, the minimum sample size necessary for the study was calculated to be 400.

Data collection

Market survey. This stage involved collecting the instant noodles samples and categorizing them into two groups based on their eligibility to bear the HC logo: without the HC

logo (WHC) and with the HC logo (HC). Serving size and nutritional information, including total fat, saturated fat, sodium, and total sugar were based on the information displayed on the package and further calculated per 100 g. The nutrient contents were compared between HC and WHC to determine the differences in those groups based on the information displayed on the package.

Consumer study. This research used an online survey platform, Google Forms, and the participants were recruited via the researcher's network (WhatsApp). There were three sections in the questionnaire identifying the effectiveness, consumer perception and consumer behavior toward the HC logo. The respondent would answer the question in Likert Scale. All respondents had read the consent form and agreed to participate before starting the survey.

Data analysis

Data analysis was performed using Statistical Package for Social Sciences (SPSS) version 25 (SPSS Inc, USA). Pearson product-moment and Cronbach's alpha were used to determine the validity and reliability of the questionnaire. The questionnaire was based on an ordinal 5-point Likert scale that needed to be converted to an interval scale using the Z-table normal distribution method (Santoso 2015). An independent sample T-Test was used to determine the differences in four nutrients between WHC and HC groups and to analyze the differences in effectiveness, consumer perception, and behavior in gender groups. Analysis of Variance (ANOVA) and Tukey post hoc test were used to see the age, level of education, income, and instant noodle consumption group variance in the effectiveness, consumer perception, and behavior. Pearson's Chi-Square Test was used to determine the relationship between noodle consumption and income level. Data analysis was assessed with a 95% confidence interval and a 5% significance level, and statistical significance was accepted as $p<0.05$

RESULTS AND DISCUSSION

Market survey

Based on Annex IV of Indonesian FDA Regulation No. 26 of 2021 on Nutrition Labeling on Processed Foods (FDA 2021b), the criteria for healthier "instant noodles" were containing total fat ≤20 g/100 g and sodium ≤900 mg/ 100 g. Even though sugar and saturated fat were not the criteria for the HC logo uptake, these need to be analyzed because those nutrients might related to the NCD in Indonesia. Another fact was that the HC logo in Singapore uses saturated fat as the criteria for the HC logo application.

Table 1 showed a total of 120 samples of instant noodle products. Of 109 products (91%) categorized as WHC, 103 products were not eligible and 6 products were eligible to use the logo. From 11 products (9%) that used the HC logo, 10 products were qualified to feature it (all products from brands E, G, I, M, S, and 2 products from brand H), while 1 product was ineligible to use the HC logo (1 product from brand H due to sodium exceeding 900 mg/100 g). Despite being introduced four years ago, only 9% of Indonesian instant noodle products used the HC logo. The low uptake was suspected to be due to the voluntary nature of the HC logo; similar results were shown in a study of the voluntary HSR (Healthy Star Rating) uptake in New Zealand, where only 5.3% of products displayed the HSR logo two years after it was introduced (Ni Mhurchu *et al.* 2017).

Nutritional values (total fat, saturated fat, sodium, and sugar in 100 g portion size) of instant noodles products were grouped into 2: "with the HC logo" (HC) and "without the HC logo" (WHC). HC group included products that featured the HC logo on their FoP nutrition labeling. On the other hand, the WHC group consisted of products that did not use the logo, even if the product met the requirement. The result showed no significant differences between the two groups in all elements except sodium ($p<0.05$) (Table 2).

Table 1. Indonesian instant noodle products without and with thehealthier choice logo and its eligibility

Product category	Product amount		
	Eligible	Not eligible	Total product
HC	10	1	11
WHC	6	103	109

HC: Healthier Choice; WHC: Without Healthier Choice

Table 2. Range and average of nutritional composition for each brand of Indonesian instant noodles

Brand code	n	Portion size (/100 g)			
		Total fat (g)	Saturated fat (g)	Sodium (mg)	Sugar (g)
Without the HC logo (WHC)					
A	8	15.29–26.25	5.88–13.75	752.94–2042.86	0.00–5.88
B	3	23.53-25.00	7.50–11.25	1,200.00–1270.59	6.25–9.41
C	1	7.69	2.00	1,338.46	4.62
D	13	16.00–20.00	6.67–9.09	320.00–2,740.00	1.33–8.24
F	33	14.29–25.88	7.14–12.00	877.78–1,993.33	0.00–10.67
G	2	3.00–6.00	0.00–2.00	1,630.77–1,753.85	5.00–6.00
I	3	5.00-11.00	3.00–6.00	1,328.77–1,900.00	5.00–6.00
J	3	10.00–14.00	4.00–6.00	830.99–2,000.00	2.00–9.00
K	4	18.00–20.00	7.00–10.00	2,433.33–3,035.71	0.00–3.57
L	4	15.00–18.00	7.00–9.00	1,039.47–1,444.44	4.00–7.00
M	2	9.00–13.00	4.00–6.00	1,213.00–1,363.00	3.00–4.00
N	3	18.00–21.00	10.00	1,242.86–2,066.67	3.00–7.00
O	4	17.00–22.00	8.00–11.00	1,030.77–1,283.33	2.00–8.00
P	5	16.00–20.00	7.00–10.00	1,175.00–2,015.87	4.00–7.50
Q	17	14.44–21.05	5.75–9.33	627.91–1,800.00	1.61–7.78
R	4	17.00–31.00	9.00–14.00	1,157.14–1,373.33	3.08–6.00
Range		3.00–31.00	0.00–14.00	320.00–3,035.71	0.00–11.00
With the HC Logo (HC)					
E	1	5.00	4.38	500.00	6.25
G	1	7.50	3.13	737.50	8.75
H	3	1.00–4.00	0.00–2.00	539.47–925.53	1.33–4.00
I	3	5.00–9.00	2.00–4.00	787.50–847.06	4.00
M	1	13.33	5.56	633.33	8.89
S	2	10.00–19.00	3.00–9.00	737.50–862.50	5.00–8.00
Range		1.00–19.00	0.00–9.00	500.00–925.53	1.33–8.89
WHC Mean±SD		17.66±4.28[a]	8.39±2.35[a]	1,406.77±464.94[a]	4.95±2.33[a]
HC Mean±SD		7.54±5.11[a]	3.36±2.46[a]	740.75±134.63[b]	5.00±2.79[a]
p		0.376[a]	0.986[a]	0.021[b]	0.469[a]

a, b: The number in the mean and p-value column with the same letter indicated no significant differences in the significance level of 5%; n: the amount of variants in each brand; HC: Healthier Choice; WHC: Without Healthier Choice; SD: Standard Deviation

According to WHO recommendations, the maximum daily fat intake should not exceed 30% of the Total Energy intake (TE). If the energy requirement was 2,000 kcal/day, the maximum total fat intake should be less than 67 g/day (30% TE) (WHO 2020); in line with this, the Indonesian Ministry of Health suggested that total fat consumption should be less than 67 g/day (MoH RI 2019). The mean total fat content in the WHC group was 17.66±4.28 g/100 g, which was higher than the HC group (7.54±5.11 g/100 g). However, the total fat in both groups was lower than the WHO or Ministry of Health recommendation, and the total fat content between the two groups was not significant ($p>0.05$).

WHO recommends consuming less than 10 g/100 g of saturated fat daily, while the Indonesian Ministry of Health did not set a daily recommendation. Overall, this study showed that the saturated fat content of instant noodles in both HC (3.36±2.46 g/100 g) and WHC groups (8.39±2.35 g/100 g) was less than the WHO recommendation for daily consumption despite those nutrients not being the requirement in the HC logo criteria.

The Indonesian Ministry of Health stated that adolescents should limit sodium intake to up to 2000 mg/day (MoH RI 2019), the same as the WHO recommendation (WHO 2020). This study showed that soup-based noodles had higher sodium than fried noodles; since their seasoning must be diluted in water, adding salt will make it tastier. This result was in line with the study of Istiqomah *et al.* (2021) that Indonesian soup-based instant noodles tended to have higher sodium content than fried-based instant noodles, with the mean of both local instant noodle-based products being 1,258.22 mg/100 g from 305 products which was analyzed in 2019 to 2020 (Istiqomah *et al.* 2021). In this study, only eleven products had a sodium content of more than 2,000 mg/100 g, but the mean of WHC group (1,406.77±464.94 mg/100 g) and HC group (740.75±134.63 mg/100 g). Afterward, the mean sodium content in the HC group was significantly different ($p<0.05$) than in the WHC group, the significant difference is due to lower sodium content is mandatory requirement to obtain the HC logo criteria. Regarding nutritional composition per serving, it was generally observed that the sodium content was within the recommendations set by the Indonesian Ministry of Health. However, the limit was considered higher than other healthier choice criteria in the Southeast Asian countries, except Thailand which had a sodium limit of ≤2,000 mg/100 g.

WHO and the Indonesian Ministry of Health recommend that sugar intake per day should be less than 50 g/day; however, consuming less than 25 g of sugar/per day was preferable to increase public health (WHO 2020). This study showed that the mean sugar content in the two groups, WHC (4.95±2.33 g/100 g) and HC group (5.00±2.79 g/100 g), were not significantly different ($p>0.05$). The HC group had slightly higher sugar content than the WHC group. Adding sugar might make the noodle HC group tastier to compensate for lower sodium content (Istiqomah *et al.* 2021). However, in this study, the sugar content of both groups of instant noodles was within the limit set by the Indonesian Ministry of Health and was not included in the HC logo criteria for instant noodles product. Beverage and sweet snack products were identified as the primary sources of sugar intake for school-age children, adolescents, and adults (Andarwulan *et al.* 2021). Beverage products required 6 g/100 mL to utilized Healthier Choice logo, while the sweet snack products (biscuit, cookies, wafer) required sugar 20 g/100 g (FDA 2021b). Instant noodles were not considered the major contributors to the sugar intake (Andarwulan *et al.* 2021).

Consumer survey

The respondent profiles from the consumer survey are presented in Table 3. The HC logo was more effective in women than men (gender group). According to Lassen *et al.* (2016), adult Danish customers showed that women pay more attention to nutrition while men choose food based on price. The HC logo was also more effective among respondents aged 43−58 and 59−68 age than aged 18−26 and 27−42 (p-value<0.05). In a previous study, consumers aged 50−65 showed concern and higher effectiveness in FoP nutrition labeling than those aged 20−34 in the United States (Roark *et al.* 2022). The limitation of the current work should be acknowledged: one of the evaluations was the age group, which has a wide range. The HC logo was considered the most straightforward logo to understand, however it did not give thorough information about the products. Therefore, logo affected the lower income more, as demonstrated in a similar study conducted in Mexico (Vargas-Meza *et al.* 2019). In the current study, the HC logo effectiveness

Table 3. Effectiveness, consumer perception, and behavior toward the healthier choice logo

Respondent criteria	n (n=458)	Mean±SD		
		Effectiveness	Perception	Behavior
Gender				
Man	195	2.17±0.62[a]	2.11±0.59[a]	1.56±0.67[a]
Women	263	2.32±0.53[b]	2.20±0.57[a]	1.58±0.63[a]
Age				
18–26 years old	50	2.22±0.59[a]	2.00±0.50[a]	1.27±0.56[a]
27–42 years old	232	2.15±0.60[a]	2.03±0.64[a]	1.30±0.58[a]
43–58 years old	132	2.35±0.55[b]	2.32±0.48[b]	1.98±0.50[b]
59–68 years old	44	2.55±0.32[b]	2.50±0.24[b]	2.13±0.38[b]
Level of education				
Elementary, Junior & Senior high School	54	2.37±0.72[a]	2.34±0.64[a]	1.78±0.67[a]
Pre-University & Bachelor	283	2.22±0.56[a]	2.11±0.58[b]	1.53±0.65[b]
Post graduate	121	2.36±0.51[a]	2.24±0.45[a]	1.60±0.59[a]
Level of income				
≤IDR5 million	70	2.31±0.69[a]	2.29±0.63[a]	1.72±0.65[a]
IDR5–10 million	190	2.25±0.55[a]	2.12±0.57[a]	1.53±0.63[a]
IDR10–15 million	98	2.22±0.50[a]	2.13±0.54[a]	1.62±0.66[a]
IDR15–20 million	46	2.24±0.66[a]	2.22±0.59[a]	1.66±0.64[a]
IDR20 million	54	2.29±0.60[a]	2.11±0.58[a]	1.36±0.60[b]
Consumption Pattern				
Seldom (1–2x/week)	293	2.20±0.59[a]	2.09±0.59[a]	1.40±0.61[a]
Moderate (3–5x/week)	118	2.34±0.54[a]	2.27±0.53[b]	1.85±0.58[b]
Frequent (6–7x/week)	47	2.40±0.58[a]	2.32±0.57[b]	1.97±0.59[b]

[a, b]: Same letter in the same column indicated no significant differences in the confidence level of 95% ($p>0.05$)
IDR: Indonesian Rupiah
SD: Standard Deviation

was not influenced by the level of education, income, or consumption pattern ($p>0.05$). But, higher effectiveness of the HC logo was shown in women and respondent aged 43−68, they had better knowledge and awareness about HC logo, higher trust to the Indonesian FDA and aware of the purpose of the HC logo implementation.

In contrast to effectiveness, gender groups did not affect the consumer perception toward the HC logo on instant noodles ($p>0.05$). Similar to effectiveness, age group affected the consumer perception toward instant noodles more in aged 43−58 and 59−68 group compared to 18−26 and 27−42 group ($p<0.05$). In line with previous research, older Brazilian respondents believed that consuming healthier food could reduce the risk of developing NCDs in older age (Marsola *et al.* 2020). Respondents with pre-university and bachelor degree had the lowest score on perceptions towards the HC logo and were significantly different from all education groups ($p<0.05$). Previous study showed that the most uncomplicated logo, such as the green tick logo, affects the lower education group (Guthrie *et al.* 2015); interestingly, in our study, elementary, junior, and senior high school groups had higher scores among other education groups. Meanwhile, this research showed that income level did not influence consumer perceptions of the HC logo, even though another study stated that implementing the HC logo increased Malaysian consumers' willingness to buy; despite its higher price, they would choose products with the HC logo (Fatimah *et al.* 2019). Moderate and frequent consumption patterns of instant noodles affected consumer perceptions towards the HC logo compared to "seldom" consumption of instant noodles ($p<0.05$). Consistent with this, consumers who consume instant noodles more frequently were more concerned about choosing healthy instant noodles, and some people reduced their instant noodle consumption. In this research, consumer better perception towards HC logo was shown in respondent aged 43−68, with lower and very high education group (elementary, junior, and senior high school also post graduate), and among those who had moderate and frequent consumption pattern. They believe that HC logo was trusted, credible and had positive added value in noodle product packaging. They also noticed the HC logo message, realized the HC logo was associate with the nutritious and healthier product, and the HC logo could encourage consumer to choosing the noodle healthier product.

Similar to perception, gender did not affect consumer behavior in choosing instant noodles with the HC logo ($p>0.05$). Meanwhile, aged 43−58 and 59−68 group were better than 18-16 and 27−42 group at utilizing the HC logo to influence their choice ($p<0.05$). As shown in previous studies, the FoP nutrition schemes influenced behavior and promoted healthier diet patterns among consumers over 40 years in Portugal (Silva *et al.* 2022). Pre-university and bachelor groups were the group that significantly influenced by the HC among all education groups ($p<0.05$). One theory might explain why the elementary, junior, and high school education group had a higher score in consumer behavior towards the HC logo because the design was too simple and cannot provide a detailed product such as nutritional information; meanwhile, higher education wants more information when the lower education preferred the most uncomplicated logo like HC logo (Méjean *et al.* 2013). The group with the level of income >IDR20 million significantly different in consumer behavior compared to other income groups ($p<0.05$) and their consumption score was the lowest among the other income groups. A simple reason might be that this group had the most significant food options; thus, instant noodles were not a common choice. A previous study in Brazil showed that high-income consumers did not mind food prices, rarely buy fast food products (Marsola *et al.* 2020), and prefer healthy products (Vos *et al.* 2022). This study showed that the behavior of consumers with "moderate" to "frequent" consumption patterns was more influenced by the HC logo ($p<0.05$) than those who rarely consume instant noodles; this could be explained by previous research that there was an increase in consumer intention to purchase healthier products after the COVID-19 pandemic in Saudi Arabia (Hesham *et al.* 2021). To recap, the HC logo statistically affects the behavior of consumers in all groups except gender. In this research, consumer behavior associated with HC logo was shown in respondent aged 43−68, and among respondents with lower education group and very high education (lelementary, junior, and senior high school and post graduate), all level of income except those earned more than 20 million rupiah, and among consumers with moderate and frequent consumption pattern. They bought and

consumed the instant noodle with the HC logo, changed their mind because the HC logo and still bought the product even though the price was higher, but not all affected respondent want to sacrifice the taste of the instant noodle even when there was HC logo in the packaging.

Some limitations should be considered regarding using these data to monitor the implementation of the HC logo system, especially on instant noodles in Indonesia. First, product collection occurred in two supermarket stores in Jakarta, and the marketplace might not capture products that are maybe available in other stores. Second, despite listing saturated fat content on the Nutrition Facts Regulation was mandatory, the data available were only for 111 from 120 products. Third, the initial analysis was conducted utilizing data per 100 g. However, it should be noted that the actual serving sizes of these products fall below the 100 g threshold, and each product had a different serving size. Finally, because the number of products displaying the HC logo in the database was small (11 products out of 120 local products), caution should be exercised in interpreting data and drawing conclusions pending wider uptake.

CONCLUSION

One hundred-twenty Indonesian instant noodle products consisted of 91% (109 products) of the WHC group and 9% (11 products) of the HC group. There was one product displaying the logo was found to be not eligible to use the logo which shows lack of supervision after the logo was authorized for the product.

The HC logo was more effective for women aged 43−58, and 59−68 than men and younger (18−42). Meanwhile, consumer perception toward instant noodles and consumer behavior in age group 43−58 and 59−68 was more affected than aged 18−26 and 27−42. Elementary, junior, senior high school and post graduate group was more influenced than pre-university and bachelor. Moderate and frequent consumption was more affected than seldom consumption. Further, all group in income level was more influenced in behavior toward instant noodles except in income >IDR20 million) both the market survey and consumer survey in this study, further research on HC logo effectiveness could use larger samples of products and broader respondents to better represent the Indonesian population.

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DECLARATION OF CONFLICT OF INTERESTS

The authors have no conflict of interest.

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