FP-MCI-005-ID036 Designing Herbal Cosmetics Marketing Channel

Preuk Petsophonsakul¹ and Chutima Waisarayutt^{2,*}

- ¹ Department of Agro-Industial Technology, Faculty of Agro-Industry, Kasetsart University, Bangkok, Thailand; preuk.p@gmail.com
- ² Department of Agro-Industial Technology, Faculty of Agro-Industry, Kasetsart University, Bangkok, Thailand; chutima.w@ku.ac.th
- * Correspondence: chutima.w@ku.ac.th; Tel.: +66-2562-5093

Received: 4 August 2018; Accepted: 26 December 2018; Published: 6 January 2020

Abstract: Nowadays, the demand of herbal cosmetics has been growing in Thailand because Trend of health and wellness. Consumer would prefer the natural or herbal based products. There are a many products on the market from the global and local manufacturers which affects to high competition in term of products quality, price and marketing channels. Therefore, the competitive advantage from competitors depends on brand strategy. This research aims to examine consumer in both generation X and Y, their behaviors, life styles on market channel, design and develop appropriate market channels that deliver value of cosmetic products and develop business strategy by experiment using oral herbal product as a case. The business research included in-depth interview, market survey research, segmenting consumer life style by using cluster analysis technique. The result indicate that either customer in generation X or Y, both generations interested products made from natural and prefer originality. Consumer's life style, and product knowledge are key factors affecting the marketing channel preference. The implication of the research will provide the deep understanding, create channels that respond consumer needs and herbal cosmetics business growth.

Keywords: herbal cosmetic; channel design; business research; Thailand

1. Introduction

Thailand has a potential for herbal based production because Thailand locate in the tropical area with high biodiversity; [1] consequently, there are many natural herbal materials with high production capacity and growth rate ranked number 8th in the world. Herbal used as many type of products including medicine, used as food ingredients, supplements and cosmetic base. The utility of herbal base substitute chemical and support from the expansion of related industries affect the growth of herbal in country. [2] Market overview in 2016 herbal and traditional products is worth almost US\$ 37 billion about 17% of global consumer health industry.

The Herbal cosmetic products about 70% used ingredients form herbs [3] in year 2015 products sale volume is 5.5 hundred thousand tons and expandable about 2.2 % form year 2014. The amount of value opportunity, many major and minor manufacturers had come to this market with competitive technologies process and ingredients for herbal cosmetics. Affects to high competition in term of products quality and price war. Therefore, the competitive advantage from business sector depends on marketing strategy.

Most studies focus only on factors affecting decision on herbal product. In additional most segmentation studies of market channel have been conducted in the United States [4] despite cultural differences among countries. Only a few studies on market channel in Thailand, mainly studies on online channel.

The relevant decision for consumer segmentation, is consumer 's life style. [5] The individuals with similar socio-demographic characteristics can have different behaviors. [6] Only socio-demographic characteristics are not sufficient for the analysis of consumer behavior. [7] Lifestyle are psychographic variables that distinguish patterns of personal or social beliefs or even characteristics represented by a

set of particular activities and [8] lifestyle are variables that refer to the perception of life, attitudes, opinions, hobbies or interests.

Therefore, the main objective of this study is to perform a segmentation to identify groups of herbal oral cosmetic consumers in each generation in terms of Demographic and lifestyle. This important factor to use to design market channel for consumer Generation and Generation Y.

The following hypotheses are proposed.

- H1. Consumer's generation has affect to heterogeneous among their life style according to herbal oral cosmetic.
- H2. Consumer's life style of cluster in each generation are heterogeneous.

2. Materials and Methods

2.1. Sampling and fieldwork

A questionnaire was developed based on a literature review on market channel and consumer behavior and in-depth interview. The target is [9] consumers generation X, age 38-53 years old and generation Y, age 18-37 years old who use oral herbal products. Data were collected by face-to-face interview, this study the data were use to segment consumer lifestyle in each generation. The questionnaire consisted of five parts. The first part captured the demographic profile data of respondents, including gender, age, educational level, occupation, income per month and hobby. The second part captured the consumer's behavior on the herbal oral product including product type, recommended information, purchase frequency, the market channel used. The third examined consumer's lifestyle by five points Likert scale; respondents were asked to indicate their agreement/disagreement (from 1 indicating strongly disagree to 4 indicating strongly agree and 0 indicating disagree). The forth examined factors influencing on buying decision towards oral herbal products by five points scale; respondents were asked to indicate their affected / not affected (from 1 indicating strongly not affected to 4 indicating strongly affected and 0 not affected). The fifth examined problems from the consumer on each market channel; the market channel includes internet or online channel, pharmacy store, trade show, herbal store, dental clinic, shopping center, agent or direct sale, supermarket, and convenience store. The descriptive analysis of the data is shown in Table 1.

	· · · ·	011		
Variable	Categories	Percentage		
Gender	Men	27.7%		
	Women	72.3%		
Age	Generation Y (18-37)	50.0%		
	Generation X (38-53)	50.0%		
Marital status	Single	61.4%		
	Married, no child	9.1%		
	Married with child	29.5%		
Educational level	High school	37.3%		
	High Vocational Certificate	6.4%		
	B.A. (Bachelor of Arts)	45.9%		
	Over Bachelor of Arts	10.5%		
Employment status	Student	43.2%		
	Government officer	7.1%		
	Company employee	12.4%		
	Business owner	11.3%		
	Employee	14.6%		
	Retired	11.4%		

Table 1. Herbal oral cosmetics consumer demographic' profile

	0 1 1	. ,
Variable	Categories	Percentage
Household income per	Under 10,000 baht	42.3%
month	10,000 – 20,000 baht	25.5%
	20,000 – 30,000 baht	20.5%
	Over 30,000 baht	11.8%

Table 1. Herbal oral cosmetics consumer demographic' profile (continued)

The target population in this survey shows that herbal oral cosmetic consumer is mainly female, although there was different from men about 44.6 % more women than men. Furthermore, we separate the sample into to Generation Y (18-37 years of age) 50% and Generation X (38-53 year of age) 50%. The group was mainly single (61.4%). In terms of educational attainment, the majority of the group had a Bachelor of Arts (45.9% of the sample) and 43.2% of the sample was the student. Income per month, mainly under 10,000 baht (42.3%) of the population.

2.2. Technique and research variables

The population from a survey questionnaire, 220 respondent we test the hypothesis by using statistic ANOVA. First, we test hypothesis H1 to confirm that consumer's generation affects to heterogeneous among their lifestyle. Then after segmentation consumer generation, we test the hypothesis H2 to confirms cluster differentiate.

Two-step cluster analysis was used to determine the number of segment and segment result. The cluster analysis examines the relationships among variables to establish a grouping of individuals. This research used the quantitative data, consumer's demographics including gender, age, educational level and Household income per month and qualitative data, consumer's lifestyle to identify segment. The method used to measure distance is Log likelihood and determine the number of the cluster by determining automatically.

3. Results

3.1. Segmenting customer

To examine hypothesis H1, in which Consumer's generation has affected to heterogeneous among their lifestyle according to herbal oral cosmetic. In the ANOVA test, generation of customer affects to their lifestyle which was statistically significant (p=0.000), as indicated by the ANOVA results. It can be concluded that hypothesis H1 can be accepted, which means that generation of consumer affects to heterogeneous among their lifestyle according to herbal oral cosmetic.

The segmented of consumer' generation base on demographic and lifestyle who use oral herbal cosmetics. The mean scores on a scale 0 – 4 for each of variable and groups included in the analysis were calculated to find the main differences between segments. By using a two-step cluster analysis, there are four clusters and each generation has two clusters. The result shows that the cluster quality is good for generation Y and X. We use ANOVA test to confirm that two clusters in each generation, it can be concluded that hypothesis H2 can be accepted how that consumer's lifestyle of Cluster in each generation are heterogeneous were statistically significant (p=0.000). The clusters result (Table 2) generation Y, cluster Y-2 was the largest, representing 47.2% of the sample, and generation X, cluster X-1 was the largest, representing 77.3% of the sample.

	Generation Y		Generation X	
Life style	Cluster Y-1	Cluster Y-2	Cluster X-1	Cluster X-2
	-47.20%	-52.80%	-77.30%	-22.70%
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Nature	2.83 a ± 0.66	$3.62 \text{ b} \pm 0.42$	3.27 c ± 0.52	2.26 d ± 0.56
Innovative	$1.92 = \pm 0.42$	2.55 ь ± 0.55	2.43 b ± 0.56	1.62 c ± 0.49
Conservative	2.73 a ± 0.37	3.08 b ± 0.29	2.97 ь ± 0.31	1.90 c ± 0.36
Healthy herbal	1.65 a ± 0.57	2.41 ь ± 0.54	2.21 ь ± 0.52	1.30 c ± 0.48

Table 2. Segmentation of consumer's life style base on demographic and life style

Note: a b c the mean difference is significant at the .05 level.

From table 2, consumer's lifestyle was divided into four categories including Nature (consumer who prefer natural products which fewer additives and chemical ingredient), Innovative; a group of consumer who interested in product that has new innovation and/or gimmick, Conservative is a category of conservatism consumer and prefer biodegradable packaging, and the last category is Healthy herbal (consumer who like to go to herbal shop and search and/or attend about herbal's news).

- **Cluster Y-1:** The consumer's lifestyle score in this generation are lowest all of category, the lowest score is *healthy herbal*. It's mean that consumer's lifestyle in this cluster had few unconcerned herbal products but they more concerned in nature category. In term of socio-demographic, this group the main consumer are female (80.8%), single (96.2%). For education level is high school (75.0%), they are a student (88.5%) and household income per month are under 10,000 baht (73.1%).
- **Cluster Y-2:** The consumer's lifestyle score in this generation are highest all of category, with the highest score is *nature*. Cluster member in this group mainly member are female (87.9%), most of them are single (96.6%) and enrolled in high school (60.3%). They are a student (84.5%) and household income per month are under 10,000 baht (69.0%).
- **Cluster X-1:** The largest cluster member in generation X with lifestyle core are highest all of category including *nature, innovative, conservative* and *herbal*. The highest score is *nature* similarity cluster Y-2 but the score is below than cluster Y-2. The cluster profile mainly is female (60.0%) and married with child (51.8%). Educational level mainly are Bachelor of Arts, work for employee (25.9%) and household income per month are 20,000 30,000 baht (37.6%)
- **Cluster X-2:** The smallest cluster member consist with lower consumer's lifestyle score all of the categories, the lowest score is *healthy herbal* and high score is *nature* similarity cluster Y-1. The most member are female (60.0%), married with child (72.0%) and had an education level Bachelor of Arts (52.0%). Mainly member worked on business owner and employee (24.0%) and household income per month are 10,000 20,000 baht (40.0%).

Overall, generation Y, consumer's lifestyle in cluster Y-1 and Y-2 all category has significantly different with a high score in cluster Y-2, Generation X, both cluster has significantly different with the highest score in cluster X-1. It's mean consumer in cluster Y-2 and X-1 matches on this lifestyle including nature, innovative, conservative and healthy herbal. In both generations, all categories in cluster Y-2 and X-1 are on significantly different except for nature category is significantly different.

Table 3. Segmentation of the different cluster according to socio - demographic variable.

Variable	Categories	Cluster Y-1	Cluster Y-2	Cluster X-1	Cluster X-2	
		47.2%	52.8%	77.3%	22.7%	
Gender	Male	19.2	12.1	40.0	40.0	
(chi-square: 3.828; sig = 0.148)	Female	80.8	87.9	60.0	60.0	

		Generation Y		Generation X	
		(n=:	110)	(n=110)	
Variable	Categories	Cluster	Cluster	Cluster	Cluster
		Y-1	Y-2	X-1	X-2
		47.2%	52.8%	77.3%	22.7%
Marital status	Single	96.2	96.6	27.1	24.0
(chi-square: 12.404; sig = 0.002)	Married, no child	0.0	1.7	21.2	4.0
	Married with child	3.8	1.7	51.8	72.0
Educational level	High school	75.0	60.3	3.5	20.0
(chi-square: 8.216; sig = 0.042)	High Vocational Certificate	0.0	0.0	12.9	12.0
	B.A. (Bachelor of Arts)	19.2	31.0	70.7	52.0
	Over Bachelor of Arts	5.8	8.6	12.9	16.0
Employment status	Student	88.5	84.5	0.0	0.0
(chi-square: 19.057; sig = 0.008)	Government officer	3.8	1.7	11.8	16.0
	Company employee	0.0	8.6	15.3	20.0
	Business owner	1.9	0.0	23.5	24.0
	Employee	3.8	0.0	25.9	24.0
	Retired	1.9	0	23.5	16
Household income per month	Under 10,000 baht	73.1	69	12.9	16
(chi-square: 10.883; sig = 0.012)	10,000 – 20,000 baht	21.2	22.4	25.9	40
	20,000 – 30,000 baht	5.8	5.2	37.6	28
	Over 30,000 baht	0	3.4	23.5	16

Table 3. Segmentation of the different cluster according to socio - demographic variable (continued)

After the segmentation consumer's generation was identified according to their lifestyle. And, the socio-demographic variables (gender, marital status, education level, employment status, and household income per month) is used to examine the relationship between socio-demographic and cluster by using the chi-square statistic test (table 3). The result shows that only gender variable has no relationship with clusters.

Table 4. Segmentation of the different cluster according to consumer's behavior variable.

			Generation Y (n=110)		Generation X (n=110)	
Variable	Categories	Cluster	Cluster	Cluster	Cluster	
		Y-1	Y-2	X-1	X-2	
Product type	Herbal toothpaste	73.8	77.5	75.2	79.3	
	Herbal mouth wash		15.5	10.5	10.3	
	Herbal mouth spray	6.2	5.6	3.8	3.4	
	Herbal Tooth polishing powder	4.6	1.4	10.5	6.9	
Product brand	Salz - herbal + salt	16.7	13.9	14.9	16.9	
	Colgate	24.7	20.3	21.3	28.6	
	Systema herbal + Fluoride	11.8	12.7	11.2	7.8	
	Darlie	9.7	11.6	15.5	10.4	

		Genera	ation Y	Genera	tion X
T 7 • 1 1	Categories -	(n=1	110)	(n=110)	
Variable		Cluster	Cluster	Cluster	Cluster
		Y-1	Y-2	X-1	X-2
With Fluoride	Dentiste	10.2	13.9	7.9	7.8
	Twin lotus	10.8	9.2	14.9	19.5
	Abhaiherb	3.8	2.8	2.1	0
	Bamboo	0	0.8	0.3	1.3
	Viset- viset-				
	Niyom	2.7	3.2	3.3	0
	Tepthai	3.2	3.2	4	2.6
	Kok-liang	1.6	2.4	0.9	1.3
	Kolbadent	2.2	1.6	1.2	1.3
	Tip-Niyom	1.6	1.2	1.5	0
	Other	1.1	3.2	0.9	2.6
Acknowledge	Internet	31.2	30.4	13.3	15
information	Trade show	6.5	10.4	14.7	15
	Media	36.6	30.4	48	52.5
	Herbal store	3.2	11.2	10	5
	Family / Friend	21.5	14.4	10.7	7.5
	Other	1.1	3.2	3.3	5
Purchase	Every week	5.8	1.7	2.4	4
frequency	Every 2 week	11.5	6.9	17.6	12
	1 time per month	53.8	67.2	60	72
	2-3 time per month	28.8	24.1	20	12
When	Monday - Friday	32.7	29.3	60	72
purchasing	Saturday - Sunday	51.9	67.2	31.8	24
products	Holiday – Festival	15.4	3.4	8.2	4
Purchasing	Purchase used brand	47.3	42.9	50.7	58.3
behavior	Purchase when promotion	35.2	26.7	22	22.2
	Purchase when new product				
	available	3.3	10.5	6	2.8
	Purchase when trail product	9.9	10.5	13.3	11.1
	Unconditional purchase	3.3	6.7	5.3	5.6
	Other	1.1	2.9	2.7	0
Payment	Cash	78.1	83.8	79.2	92.6
-	Credit / Debit card	20.3	13.2	19.8	7.4
	E-payment	1.6	2.9	10	0
Marketing	Internet	3.3	2.4	2	1.4
channels	Pharmacy	11.3	15.1	6.9	2.9
used	Herbal store	2.7	7.8	3.2	5.7
	Dental Clinic	1.3	1.8	0.4	1.4
	Department store / Shopping mall	29.3	28.3	26.2	0
	Agent / Direct sale	3.3	2.4	2	32.9
	Hypermarket / Supermarket	20	16.3	20.2	4.3

Table 4. Segmentation of the different cluster according to consumer's behavior variable (continued).

	Categories		Generation Y (n=110)		Generation X (n=110)	
Variable		Cluster	Cluster	Cluster	Cluster	
		Y-1	Y-2	X-1	X-2	
Marketing	Convenient store	22.7	21.7	25.8	12.9	
channels used	Trade show	2.7	2.4	6	27.1	

Table 4. Segmentation of the different cluster according to consumer's behavior variable (continued).

Note: blue color: highest percentage in each variable

Table 5. Segmentation of the different cluster according to consumer's behavior variable by ranking.

Variable		Generation Y (n=110)		Generation X (n=110)		
variable		Cluster Y-1	Cluster Y-2	Cluster X-1	Cluster X-2	
The most	No.1	Convenient store	Convenient store	Convenient store	Convenient store	
channels	No.2	Hypermarket	Hypermarket	Hypermarket	Department store	
used	No.3	Department store	Department store	Department store	Hypermarket	
	No.1	Product features	Product features	Product features	Product features	
Reasons to	No.2	Reasonable price Necessary product	Reasonable price	Necessary product	Necessary product	
purchase	No.3	Standard certification	Necessary product	Standard certification	Reasonable price	

The consumer behavior in a different cluster (table 4). Cluster Y-1, the most consumer in this cluster used herbal toothpaste (73.8%) with Colgate brand (24.7%). They acknowledge from media channel such as television, brochure (36.6%), purchasing every month for 1 time (53.8%) and mainly purchasing on Saturday – Sunday (51.9%). For purchasing behavior, purchase used brand or brand royalty (47.3%), payment by cash (78.1%), they use market channel majority are Department store or shopping mall (29.3%). Cluster Y-2 this cluster consumer's behavior profile quite similar cluster Y-1 except for acknowledging information, they attend on media and internet (30.4%). Cluster X-1 majority consumer used herbal toothpaste (75.2%) with Colgate brand (20.3%). They acknowledge from media channel such as television, brochure (48.0%), purchasing every month for 1 time (60.0%) and mainly purchasing on Monday – Friday (60.0%). Purchasing behavior includes purchase used brand or bran royalty (50.7%), payment by cash (79.2%), they use market channel majority are Department store or shopping mall (26.2%). And cluster X-2 this cluster consumer's behavior profile quite similar cluster X-1 except for they use marketing channel on an agent or direct sale (32.9%). The suggestion of marketer, consumer generation Y and X, their usually purchase herbal toothpaste more than another, the majority they use the herbal product that mix fluoride, can connect information with them by internet and media, most of them had brand loyalty marketer should find the way to retain customers.

In table 5, the first variable is the most channels used. The result shows that the most channels used of cluster Y-1, Y-2, and X-1 are the same which No.1 is a convenient store, No. 2 is hypermarket, and No.3 is the department store. For, Cluster X-2 consumer selected convenient store in first ranked follow by the department store and hypermarket. Overall in the market channel, can be said that the marketer can launch the product on three channels including the convenience store, hypermarket, and department store. In term of reasons to purchase herbal oral cosmetic all of cluster selected by product feature in the first rank but another rank are the different reasons. In the second rank, both generations are different. Generation Y both clusters are reasonable price only cluster Y-1 has two reasons in similar rank. For generation X, the main reason that both clusters purchase the product because it is a necessary product. From the above information, the marketer or developer should focus on the product feature, however, the main reason that consumer purchases the product because it is the necessary product.

4. Discussion

This research uses the data from each cluster to determination and/or design the suitable market channel to deliver herbal oral cosmetics which had interested point below.

- Two clusters of generation Y were no significantly different due to consumer in this generation has knowledge and understand about herbal. the interesting of herbal and natural products was medium level which related with previous research; [10] studied about herbal knowledge and understanding of consumer and majority of population (67.5%) had age range between 20 to 35 years old (generation Y), the result indicated average of consumer who had knowledge and understand about herbal at 62.25% in addition new generation consumer has high variation of products that sell in different market channel while generation X consumer show significantly different on different clusters by the cluster who interesting in herbal products had 70% follow up the new information about herbal because most of they familiar with herbal and often used herbal oral cosmetics related with [11] studied about consumer's attitude and usage-purchasing behavior toward the herbal toothpaste.
- The studied about market channel, both generation selected convenient store as 1st rank which major of population was female related with research of [12] studied about the market channel on a convenience store. Place and conveniences such as has car parking or easy to reach were a factors that effect to making a decision of consumer.
- For determination and/or design market channel, [13] said business that has varied market channel was enhance competitive opportunity and can reach consumer more than single market channel due to the increasing of convenience to reach consumer needed goods.
- Consumer buying behavior on herbal oral cosmetic, majority consumer consider on products feature and buying the same brand that they use before or brand loyalty related with [14] studied about multi-channel shopping found that service quality and product quality are the most significant determinants affecting loyalty.

5. Conclusions

Consumer indicated that age is the important factor that affects to consumer's lifestyle which divided in to 2 generations; generation Y (age 18-37) and generation X (age 38-54) then the generation were segmented, both of generations had 2 significantly different clusters which divided by different score of herbal interesting (Y-1 and X-2 were low levels while Y-2 and X-1 were high levels of herbal interesting). Now we know the consumer target from socio-demographic (table 3), understand what they concern/unconcern and can create content to connect the consumer target by their lifestyle (table 2), how to approach them and which channel should be select (table 5). This data will be used for determination and/or design market channel for sale herbal oral cosmetics and it also benefit for the marketer, developer or entrepreneur, guideline the optimal solution helps them get opportunities for competition and sustainable business.

References

- 1. Busakorn P. Thai Herbs Wisdom to the World Market. Bangkokbiznews, available online: http://www.bangkokbiznews.com/news/detail/772552. August 25, 2018.
- 2. Sureeporn Sahawat. Thai Herbs on Threshold of a New Economy. Thai herb innobiz network, 2017.
- 3. Department of Industry Promotion (DIP), Ministry of Industry of Thailand 2017. Industry Trends and 230 Market Size of Herbal Businesses. Available online: https://bsid.dip.go.th/download-content/quality-control/qs-trensherbsproduct. August 25, 2018.
- 4. Ruiz, J.P., Chebat, J.C., Hansen, P., 2004. Another trip to the mall: a segmentation study of customers based on their activities. Journal of Retail. Consumer. Serv. 11 (6), 333–350.
- 5. González, A.M., Bello, L., Muñiz, N., 2000. Orientación de la empresa turística del s. XXI a los valores personales y los estilos de vida de los turistas. Cuad. Cienc. Econ. Empresa.39, 59–86.
- 6. Du Preez, R., Visser, E.E., Zietsman, L., 2007. Profiling male apparel consumers: life style, shopping orientation, patronage behaviour and shopping mall behavior. Manag. Dyn. 16 (1), 2–19.

- 7. Green, G.T., Gordell, H.K., Betz, G.J., 2006. Construction and validation of the national survey on recreation and the environment's lifestyles scale. J. Leis. Res. 38 (4),513–535.
- Valentine, D.B., Powers, T.L., 2013. Generation Y values and lifestyle segments. J. Consum. Mark. 30 (7), 597– 606.
- 9. Novak, J. 2012. The six living generations in America. Available Source: http://www.marketingteacher.com /the-six-living-generations-in-america/, March 4, 2017.
- 10. Reungtorsang C. Factor Affectig Herbal Cosmetic Consumption Behaviors. Master's degree Thesis, Master of public administration Burapha University, Chonburi, 2015.
- 11. Thitinart J., The effect of marketing communication exposure on the Bangkok metropolitan consumer's attirude and usage-purchasing behavior toward the herbal toothpaste. Master's degree Thesis, Master of Marketing Communication University of the Thai Chamber of Commerce, Bangkok, 2006
- 12. Wantana R., Market channel analysis on convenient store in Changmai province. Master's degree Thesis, Master of Economics changmai university, Changmai, 2005.
- 13. Scnoenbachler, D.D. and Gordon, G.L. (2002). Multi channel shopping: Understanding what drives channel choice. Journal of Consumer marketing 19(1): 42 53.
- Chummanond N. and Rotchanakitumnuai S. 2010. Determining the Online Purchasing Loyalty for Thai Herbal Products. Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering. 228 4 (4), 393-396.



© 2018 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (http://creativecommons.org/licenses/by/4.0/).