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運転免許保有率の増加と
敬老乗車証利用率の将来推計に関する考察

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1.はじめに

本稿の目的は、公共交通機関における高齢者優遇支援措置としての敬老乗車証（いわゆる高齢者パス）の将来利用率を推計する場合の、理論的な定式化を検討するものである。仙台市の第6回社会福祉審議会老人福祉専門分科会（令和5年9月13日）の資料1では、「敬老乗車証事業等に係る将来推計について」とする資料が示されている。当該資料では、将来の高齢者の敬老乗車証の利用率は、高齢者の自動車「免許保有率は増加傾向」であることや「高齢者の免許保有率が上昇する場合、（敬老乗車証の）制度利用率が低下する可能性がある」ことが指摘されている。

当該資料では、将来免許保有率の補正（年齢階層別）として、

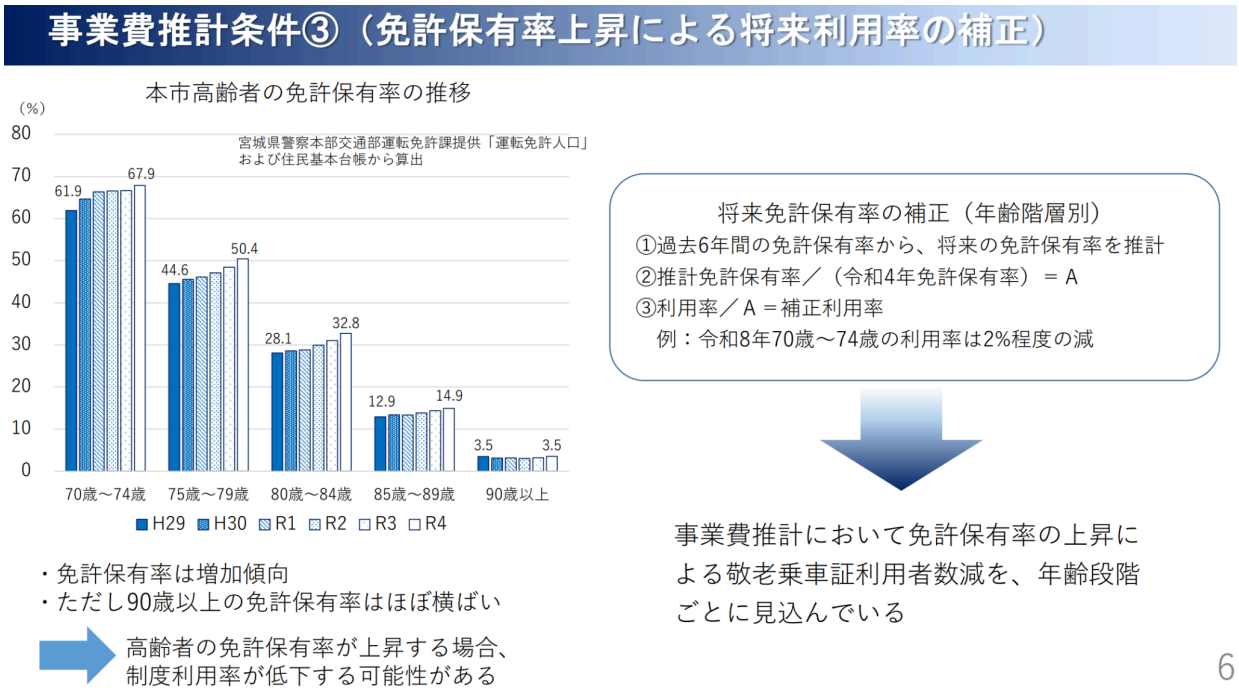
①過去6年間の免許保有率から、将来の免許保有率を推計

②推計免許保有率／（令和4年免許保有率）＝A

③(将来の敬老乗車証の)利用率／A＝補正利用率

という考え方が示されている（図1）。

図1　免許保有率と制度利用率に関する仙台市の考え方



（出所）仙台市第6回社会福祉審議会老人福祉専門分科会（令和5年9月13日）資料1、「敬老乗車証事業等に係る将来推計について」。
https://www.city.sendai.jp/korekikaku-kikaku/kurashi/kenkotofukushi/korenokata/fukushi/shingikai/bunkakai/documents/shiryou1-2023-6th.pdf

この考え方によれば、今後の高齢者の免許保有率の伸び（A）にしたがって、将来の敬老乗車証の利用率（補正利用率）はAによって割り引かれるという考え方である。例えば、免許保有率は10%の伸び（A＝1.1）の場合、現在の敬老乗車証の利用率（Bとする）はB／A＝B／1．1で0.91程度に低下すると仮定していることになる。この場合、免許

以下では、将来の敬老乗車証の利用率を推定する構造式を定義したうえで、理論的な推定方法を検討する。

2. 利用率を推定する構造式

2－1 基準年の利用率の定義

基準年の運転免許保有者をm人、非保有者をn人、仙台市人口総数をN人とすれば

$$N=n+m,$$

となる。ここで、運転免許保有者の敬老乗車証利用率を $\beta_m(0<\beta_m<1)$、非保有者の敬老乗車証保有率を$\beta_n(0<\beta_m<\beta_n<1)$とする。

このとき基準年の「平均」での敬老乗車証利用率γは

$$\gamma=\frac{\beta n\cdot n+\beta m\cdot m}{N},$$

となる。ここで高齢者の免許保有率をαとすれば、

$$\alpha=\frac{m}{N},$$

となるので、免許を保有していない高齢者の比率$\frac{n}{N}$は、

$$1-\alpha=1-\frac{m}{N},$$

$$=\frac{(n+m)-m}{N},$$

となる。したがって、「平均」での敬老乗車証利用率γは、

$$\gamma = \frac{\beta n \cdot n + \beta m \cdot m}{N},$$

であったから、

$$\gamma = \frac{m}{N} \cdot \beta_m + \frac{n}{N} \cdot \beta_n,$$

$$= \alpha\beta_m + (1-\alpha)\beta_n,$$

と表せる。

２－２　将来の利用率の定義

次に比較年（将来）における敬老乗車証利用率γ´をγ（又はα、β_n、β_m）を使って表す。
将来のの運転免許保有者率をα´（＞α）とすると、

$$\gamma' = \alpha'\beta_m + (1-\alpha')\beta_n$$

と表せる。ここで、仙台市の推計式のAにあたる推計免許保有率／（令和4年免許保有率）

$$\frac{\alpha'}{\alpha} = 1 + \rho \quad (\rho > 0)$$

とすると、

$$\alpha' = (1+\rho)\alpha$$

であるから、

$$\gamma' = \{(1+\rho)\alpha\}\beta_m + \{1-(1+\rho)\alpha\}\beta_n,$$
$$= \alpha\beta_m + \rho\alpha\beta_m + \beta_n - \alpha\beta_n - \rho\alpha\beta_n,$$
$$= \alpha\beta_m + (1-\alpha)\beta_n + \rho\alpha\beta_m - \rho\alpha\beta_n,$$
$$= \gamma - \rho\alpha(\beta_n - \beta_m),$$

となる。

上式からわかることは、将来の敬老乗車証の利用率γは、現在の敬老乗車証の乗車率γから、$\rho\alpha(\beta_n - \beta_m)$を引いたものとなる。定義により、$\beta_m < \beta_n$であったから、$(\beta_n - \beta_m) > 0$となり、ρが大きければ大きいほどγ´は小さくなることが分かる。しかし、将来の推計値γ´は、

$$\gamma / A = \gamma / (1+\rho)$$

ではなく、

$$\gamma - \rho\alpha(\beta_n - \beta_m)$$

であることがわかる。ここで、$\rho < 1$，$\alpha < 1$，$(\beta_n - \beta_m) < 1$とすれば、$\rho\alpha(\beta_n - \beta_m)$は非常に小さく、現在の利用率γを$(1+\rho) = A$で除するほうは将来の利用率を過大に割り引く可能性がある。

参考文献

仙台市(2023) 仙台市第6回社会福祉審議会老人福祉専門分科会（令和5年9月13日）資料1、「敬老乗車証事業等に係る将来推計について」。
https://www.city.sendai.jp/korekikaku-kikaku/kurashi/kenkotofukushi/korenokata/fukushi/shingikai/bunkakai/documents/shiryou1-2023-6th.pdf

Findings from the Survey on Awareness of Visual Protection and Improvement

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1. Introduction

As life expectancy increases and information and communication technology (ICT) continues to develop, we find ourselves excessively straining our eyes, notably through frequent smartphone use. Despite the growing trend of declining eyesight, the use of corrective eyeglasses can significantly help us address many of these related challenges. Our eyes serve as vital conduits for acquiring information, yet regrettably, we often underestimate the significance of safeguarding our visual health. This survey seeks to undertake academic research on the awareness of individuals in middle age and beyond concerning the preservation and enhancement of their visual well-being. This survey was conducted from June 27, 2023, to June 28, 2023, following the regulations of the Research Ethics Review Committee of the Graduate School of Economics and Management, Tohoku University. We collected 2,062 responses from the monitor members by equal distribution of gender and age (40s/50s/60s and older). Chen & Yoshida (2023) show the details of this survey. This work was supported by JST Grant Number JPMJPF2201.

In this study, we are summarizing the descriptive results with the expectation of gaining a comprehensive understanding of the facts for preserving and improving visual health.

2. Descriptive results

Q1. Please select each of the following that applies to your current eyesight status.

Table 1 Current eyesight status

		Total	Less than 0.3	0.3 or more but less than 0.5	0.5 or more but less than 0.7	0.7 or more but less than 1.0	1.0 or more but less than 1.2	1.2 or more	Do not know	Have not made any corrections
Naked eyesight (left eye)	N	2,062	893	236	263	231	153	120	166	0
	%	100.0	43.3	11.4	12.8	11.2	7.4	5.8	8.1	0.0
Naked eyesight (right eye)	N	2,062	908	223	238	239	165	122	167	0
	%	100.0	44.0	10.8	11.5	11.6	8.0	5.9	8.1	0.0
Eyesight after correction (left eye)	N	2,062	24	34	116	553	510	153	102	570
	%	100.0	1.2	1.6	5.6	26.8	24.7	7.4	4.9	27.6
Eyesight after correction (right eye)	N	2,062	18	25	121	543	528	152	103	572
	%	100.0	0.9	1.2	5.9	26.3	25.6	7.4	5.0	27.7

Note: The upper row of the table shows the number of respondents (persons). The lower row represents the ratio (%) to the total (2,062).

In Table 1, the result reveals that 43.3% of the surveyed participants exhibit a naked visual acuity in their left eye below 0.3, marking the highest proportion within the group of uncorrected left eyesight. Similarly, 44.0% of respondents demonstrate a naked visual acuity in their right eye below 0.3, constituting the highest percentage within this category. Furthermore, 27.6% and 27.7% of the participants report that they have not undergone any corrective measures for their left and right eyes, respectively. More than 50% of the respondents exhibit corrected visual acuity ranging from 0.7 to 1.2 in their left eye. Among them, 26.8% report corrected visual acuity between 0.7 and 1.0, while 24.7% demonstrate a corrected left eye vision within the range of 1.0 to 1.2. Similarly, for the right eye, 26.3% of respondents have corrected visual acuity between 0.7 and 1.0, while 25.6% report corrected visual acuity between 1.0 and 1.2.

Q2. Have you had any of the following eye-related subjective symptoms in the past few days? Please select all that apply.

Table 2 Eye-related subjective symptoms (multiple answers)

	N	%
Total	2,062	-
1. Difficulty seeing things (lack of focus)	597	29.0
2. Blurred vision	678	32.9
3. Dazzling	284	13.8
4. Things look distorted	86	4.2
5. Deteriorated eyesight	694	33.7
6. Glowing in the eyes	50	2.4
7. See something like a mosquito	359	17.4
8. Teary eyes	142	6.9
9. Easily get dry eyes	395	19.2
10. Pain in the eyes	71	3.4
11. The dark center of the eyes	10	0.5
12. Eye strain (tired eyes)	705	34.2
13. Limited range of vision	46	2.2
14. Swollen eyes	15	0.7
15. Difficulty seeing things at night or in the dark	338	16.4
16. Difficulty seeing small letters, numbers, charts, etc.	816	39.6
17. Subjective eye-related symptoms other than those listed above	30	1.5
18. Do not have subjective eye-related symptoms	393	19.1

Note: The second column of the table shows the number of respondents (persons), and the third column shows the percentage (%) of the total (2,062).

From Table 2, we find that the most common subjective eye-related symptom is difficulty seeing small letters, numbers, charts, etc., affecting a significant 39.6% of respondents. Following closely, the symptom of eye strain (tired eyes) is reported by 34.2% of participants. Additionally, 33.7% and 32.9% of the surveyed individuals indicate experiencing symptoms of deteriorated eyesight and blurred vision, respectively.

Q3. Do the subjective symptoms described in the previous question affect your daily life in any of the following ways? Please choose one for each of the following.

Table 3 Impact on daily life

		Total	1. Have a great effect	2. Have a slight influence	3.Almost no effect	4.Not at all	5. Do not drive
1. Activities of daily living (getting up, dressing, eating, bathing, etc.)	N	1,669	25	214	679	751	-
	%	100.0	1.5	12.8	40.7	45.0	
2. Going out (limited time and amount of work, etc.)	N	1,669	31	232	725	681	-
	%	100.0	1.9	13.9	43.4	40.8	
3. Work, household chores, school work (limited time, amount of work, etc.)	N	1,669	63	439	673	494	-
	%	100.0	3.8	26.3	40.3	29.6	
4. Driving a car	N	1,669	75	266	479	338	511
	%	100.0	4.5	15.9	28.7	20.3	30.6
5. Watching TV, computers, smartphones, and tablets	N	1,669	122	696	582	269	-
	%	100.0	7.3	41.7	34.9	16.1	

Note: The upper row of the table shows the number of respondents (persons). The lower row represents the ratio (%) to the total (1,669).

Based on the findings presented in Table 3, it can be deduced that the subjective symptoms outlined in the previous question exert a relatively minor impact on daily life activities such as getting up, dressing, eating, and bathing, as well as going out (including restrictions on the amount and duration of work). This conclusion is drawn from the fact that more than 80% of the respondents assert that these symptoms do not significantly disrupt their daily routines and outings. Approximately 70% of the participants indicate that these symptoms have a limited impact on their performance at work, household chores, and studies. 26.3% believe that these symptoms exert a slight influence on their work activities. In the context of driving a car, nearly half of the respondents report that these subjective symptoms have virtually no bearing on their ability to drive safely. However, it is worth noting that 41.7% of those surveyed acknowledge a slight impact on their watching TV, computers, smartphones, and tablets.

Q4. Please select one main reason that you think is the reason for your visual acuity decline.

Table 4 Main reason for visual acuity decline

	N	%
Total	694	-
1. Natural vision loss due to aging	424	61.1
2. Refractive errors such as myopia, hyperopia, and astigmatism	185	26.7
3. Eye diseases (glaucoma, cataracts, etc.)	55	7.9
4. Changes in vision due to disease or drug side effects	7	1.0
5. Loss of vision due to accident or trauma	3	0.4
6.【 】Others (fill in specifics)	20	2.9

Note: The second column of the table shows the number of respondents (persons) and the third column shows the percentage (%) of the total (694).

Analysis of Table 4 reveals that a significant majority, accounting for 61.1% of the respondents, attribute their vision loss primarily to the natural process of aging and its associated decline in vision. Meanwhile, 26.7% of participants ascribe their vision impairment to refractive errors such as myopia, hyperopia, and astigmatism. A notably small fraction, comprising just 0.4%, believe that their vision loss can be attributed to accidents or trauma.

Q5. Please select the reasons why you want to restore or maintain your eye vision. Please select all that apply.

Table 5 Reasons for wanting to restore or maintain vision (multiple responses)

	N	%
Total	2,062	-
1. To improve the quality of daily life	1,161	56.3
2. To reduce the impact on work and studies	545	26.4
3. To avoid the use of vision correction devices (glasses, contact lenses, etc.)	366	17.7
4. To enjoy sports and hobby activities	237	11.5
5. To increase confidence in life by seeing clearly	554	26.9
6.【 】Others (fill in specifics)	20	1.0
7. Nothing in particular	277	13.4
8. Not applicable (do not wish to restore or maintain vision)	222	10.8

Note: The second column of the table shows the number of respondents (persons), and the third column shows the percentage (%) of the total (2,062).

From the data presented in Table 5, it becomes evident that out of 2,062 respondents, a majority of 1,161 individuals, constituting 56.3% of the total, express a desire to either restore or maintain their eyesight to enhance their overall quality of daily life. Furthermore, 26.9% of respondents express the aspiration to boost their confidence in life by achieving clear vision,

while an additional 26.4% express the intention to mitigate the adverse effects of diminished eyesight on their work and studies.

Q6. What are you currently doing to improve your eye health or vision? Please select all that apply.

Table 6 What you are currently working on for eye health (multiple answers)

	N	%
Total	1,563	-
1. Specific dietary or nutritional supplements (e.g. Eye supplements)	197	12.6
2. Eye exercises and training	115	7.4
3. Proper eye care (eye drops, massage, eye masks, etc.)	379	24.2
4. Attend vision restoration programs and training	17	1.1
5. Specialist care and treatment for vision restoration	38	2.4
6. Use glasses (corrects vision for myopic, hyperopia, astigmatism, etc.)	765	48.9
7. Use of contact lenses (vision correction for myopic, hyperopia, astigmatism, etc.)	250	16.0
8. Underwent surgery such as LASIK and ICL (Intraocular Contact Lens)	26	1.7
9. Specific eye exams for vision maintenance	74	4.7
10.【 】Others (fill in specifics)	19	1.2
11. Not working on	505	32.3

Note: The second column of the table shows the number of respondents (persons) and the third column shows the percentage (%) of the total (1,563).

Regarding current efforts aimed at maintaining or enhancing eye health, it is noteworthy that the highest percentage, at 48.9%, is allocated to those who utilize corrective glasses to address conditions such as myopia, hyperopia, and astigmatism. Additionally, 24.2% of individuals engage in proper eye care practices, including the use of eye drops, massages, and eye masks, in pursuit of improved eye health. However, it is of concern that a significant portion, precisely 32.3% of the respondents, report not actively taking any measures to enhance their eye health or vision.

Q7. Overall, how satisfied are you with the results you answered in the previous question?

Table 7 Overall satisfaction level

		Total	1. Fully satisfied	2. Rather satisfied	3. Can't say either	4. Somewhat unsatisfied	5. Unsatisfied
1. Specific dietary or nutritional supplements (e.g. Eye supplements)	N	197	13	56	90	35	3
	%	100.0	6.6	28.4	45.7	17.8	1.5
2. Eye exercises and training	N	115	2	37	50	22	4
	%	100.0	1.7	32.2	43.5	19.1	3.5
3. Proper eye care (eye drops, massage, eye masks, etc.)	N	379	13	140	157	58	11
	%	100.0	3.4	36.9	41.4	15.3	2.9
4. Attend vision restoration programs and training	N	17	2	4	6	3	2
	%	100.0	11.8	23.5	35.3	17.6	11.8
5. Specialist care and treatment for vision restoration	N	38	5	23	10	0	0
	%	100.0	13.2	60.5	26.3	0.0	0.0
6. Use glasses (corrects vision for myopic, hyperopia, astigmatism, etc.)	N	765	63	400	187	105	10
	%	100.0	8.2	52.3	24.4	13.7	1.3
7. Use of contact lenses (vision correction for myopic, hyperopia, astigmatism, etc.)	N	250	43	115	55	33	4
	%	100.0	17.2	46.0	22.0	13.2	1.6
8. Underwent surgery such as LASIK and ICL (Intraocular Contact Lens)	N	26	8	9	7	1	1
	%	100.0	30.8	34.6	26.9	3.8	3.8
9. Specific eye exams for vision maintenance	N	74	12	38	21	3	0
	%	100.0	16.2	51.4	28.4	4.1	0.0
10. Other ([Q7_10FA selection])	N	19	5	5	7	2	0
	%	100.0	26.3	26.3	36.8	10.5	0.0

Note: The upper row of the table shows the number of respondents (persons). The lower row represents the percentage (%) of the total.

In Table 7, it is evident that a significant proportion of respondents are generally content with the measures they have undertaken for eye health. Specifically, 52.3% of those who utilize glasses to address issues like myopia, hyperopia, and astigmatism express a rather satisfaction with this approach. For individuals using contact lenses, 46% report a similar level of satisfaction. 60.5% of those who conduct specialized eye care and treatment express a relatively high level of satisfaction with this approach. Moreover, among the subset of 26 respondents who underwent surgical procedures such as LASIK and ICL, a substantial 17 individuals expressed their satisfaction with the outcomes of these surgeries.

Q8. Please select how you obtain support and information regarding eye vision restoration, maintenance, and regular checkups. Please select all that apply.

Table 8 How to get support and information (multiple responses)

	N	%
Total	1,563	-
1. Advice from a physician or ophthalmologist	616	39.4
2. Internet (medical information websites, specialist blogs, etc.)	604	38.6
3. Information from magazines, books, newspapers, and other print media	149	9.5
4. TV information and health programs	467	29.9
5. Advice from friends and family	248	15.9
6. Information from health insurance or public institutions	82	5.2
7. Vision restoration programs and community involvement	15	1.0
8. Others (fill in specifics)	73	4.7

Note: The second column of the table shows the number of respondents (persons), and the third column shows the percentage (%) of the total (1,563).

According to the results presented in Table 8, a significant portion of the respondents acquired support and information pertaining to eye vision restoration, maintenance, and regular checkups from two primary sources. Specifically, 39.4% of respondents seek advice from a physician or ophthalmologist, while 38.6% turn to the internet, including medical information websites and specialist blogs, for relevant guidance. Furthermore, 29.9% of the participants rely on television-based information and health programs as a source of support and information for their eye health needs.

Q9. Do you have regular eye examinations?

Table 9 Frequency of eye examinations

	N	%
Total	2,062	100.0
3 or more times a year	181	8.8
About twice a year	157	7.6
About once a year	482	23.4
About once every two years	119	5.8
Almost not having a regular eye exam	1123	54.5

Note: The second column of the table shows the number of respondents (persons) and the third column shows the percentage (%) of the total (2,062).

When considering the frequency of eye examinations, it is noteworthy that a substantial majority of respondents, accounting for 54.5%, hardly undergo regular eye exams, making it the

highest proportion. Additionally, approximately 23.4% of participants indicate that they receive regular eye examinations about once a year.

Q10. Please select all that apply to your reason for not having regular eye examinations.

Table 10 Reasons for not undergoing regular eye examinations (multiple answers)

	N	%
Total	1,123	-
1. Do not have time	161	14.3
2. The place is far away	41	3.7
3. It costs money	257	22.9
4. It's a hassle to go all the way to the health checkup location	368	32.8
5. Because of pain during the examination (intraocular pressure test, corneal examination, etc.) or discomfort in the eye	11	1.0
6. Worried about getting a checkup and finding out something bad	48	4.3
7. Was in a medical institution at that time	3	0.3
8. Do not feel the need to take eye exams on a regular basis every year	149	13.3
9. Do not have a problem with eye vision condition and don't feel the need for eye exam	149	13.3
10. Can always visit a nearby ophthalmologist when worried about the eyes	165	14.7
11. Other	20	1.8
12. Nothing in particular	261	23.2

Note: The second column of the table shows the number of respondents (persons) and the third column shows the percentage (%) of the total (1,123).

Regarding the reasons for not undergoing regular eye examinations, the results in Table 10 indicate that 32.8% of respondents consider the inconvenience of going to the health checkup location to be the most prevalent factor. Furthermore, 22.9% cited financial constraints as one of the barriers.

Q11. In terms of the following items, on average, how much time do you spend on a weekday?

Table 11 Hours of use for each activity

		Total	0 minutes (generally or rarely)	Less than 30 minutes	30 minutes or more but less than 1 hour	1 hour or more but less than 2 hours	2 hours or more but less than 3 hours	3 hours or more but less than 4 hours	4 hours or more
1. Television	N	2,062	174	191	274	435	428	235	325
	%	100.0	8.4	9.3	13.3	21.1	20.8	11.4	15.8
2. Newspaper	N	2,062	1,187	700	131	32	10	0	2
	%	100.0	57.6	33.9	6.4	1.6	0.5	0.0	0.1
3. Personal computer	N	2,062	441	157	212	273	256	155	568
	%	100.0	21.4	7.6	10.3	13.2	12.4	7.5	27.5
4. Smartphone	N	2,062	81	351	398	530	317	168	217
	%	100.0	3.9	17.0	19.3	25.7	15.4	8.1	10.5
5. Reading books	N	2,062	1,097	561	252	107	33	7	5
	%	100.0	53.2	27.2	12.2	5.2	1.6	0.3	0.2
6. Driving a car	N	2,062	779	467	475	232	63	19	27
	%	100.0	37.8	22.6	23.0	11.3	3.1	0.9	1.3

Note: The upper row of the table shows the number of respondents (persons). The lower row represents the percentage (%) of the total.

As depicted in Table 11, about television, 21.1% of respondents dedicated 1 hour or more but less than 2 hours to watching television, closely followed by 20.8% who allocated approximately 2-3 hours to this activity. In contrast, a significant 57.6% of participants reported not spending any time reading newspapers, marking the highest proportion in this category. Regarding the use of personal computers, 27.5% of individuals invested 4 hours or more on them. When it comes to smartphone usage on a weekday, 25.7% indicate they spend around 1-2 hours. It's noteworthy that a substantial 53.2% of respondents rarely engage in book reading on a weekday. In terms of weekday driving habits, 37.8% do not drive a car, while 22.6% drive for less than 30 minutes, and 23% drive for 30 minutes or more but less than 1 hour.

Q12. What is your usual driving situation?

Table 12 Usual driving situation

	N	%
Total	2,062	100.0
1. Do not have a driver's license from the beginning	223	10.8
2. Had a driver's license but returned it and decided not to renew it	65	3.2
3. Have a driver's license but rarely drive	440	21.3
4. Drive about one day a week	213	10.3
5. Drive 2-3 days a week	306	14.8
6. Drive about 4-5 days a week (mostly weekdays)	247	12.0
7. Drive about 6 to 7 days a week (including holidays)	568	27.5

Note: The second column of the table shows the number of respondents (persons) and the third column shows the percentage (%) of the total (2,062).

As for the usual driving situation among the respondents, 568 out of 2,062 individuals reported that they drove about 6 to 7 days a week (including holidays), which was the highest proportion at 27.5%. In contrast, 440 out of 2,062 respondents, representing 21.3%, held a driver's license but seldom engaged in driving activities. A mere 3.2% of participants had a driver's license but chose to return it and opted not to renew it.

Q13. Please answer the following questions about driving a car.

Table 13 About driving a car

		Total	Yes	No
1. Have had other vehicles, pedestrians, etc. seem to suddenly jump out in front of you	N	1,334	145	1,189
	%	100.0	10.9	89.1
2. Have had difficulty seeing or understanding traffic lights and signs	N	1,334	358	976
	%	100.0	26.8	73.2
3. Family members or co-workers have pointed out that you are a dangerous driver	N	1,334	156	1,178
	%	100.0	11.7	88.3
4. Sometimes it is difficult to see the road surface, the path, or the border between the road and the gutter	N	1,334	225	1,109
	%	100.0	16.9	83.1
5. Sometimes it's hard to follow the flow of cars because of not having a good sense of distance or speed	N	1,334	72	1,262
	%	100.0	5.4	94.6
6. Sometimes it is difficult to see the gauges, displays, and warning lights in the car	N	1,334	74	1,260
	%	100.0	5.5	94.5
7. The road surface may appear dark at night even with the front light on	N	1,334	401	933
	%	100.0	30.1	69.9
8. Difficult to see in the dark (at night, in the dark, in tunnels, etc.)	N	1,334	634	700
	%	100.0	47.5	52.5

Note: The upper row of the table shows the number of respondents (persons). The lower row represents the percentage (%) of the total.

Based on the findings presented in Table 13, it is evident that most of the respondents encounter few issues while driving. For instance, when asked about the occasional challenge of following the flow of traffic due to difficulties in gauging distance or speed, an overwhelming 94.6% of respondents reported not experiencing such problems. Similarly, 94.5% indicated that they do not encounter difficulties in viewing gauges, displays, and warning lights within the car. However, when it comes to difficulties related to nighttime driving or driving in dark conditions, including tunnels, 47.5% of participants reported experiencing such challenges.

Q14. Please select one item from each of the following that applies to your situation in the past month.

Table 14 Situation in the past month

		Total	1. Very bad	2. Bad	3. Can't say either	4.Good	5. Very good
1. Visual acuity and vision status	N	2,062	43	410	1,124	444	41
	%	100.0	2.1	19.9	54.5	21.5	2.0
2. Physical health	N	2,062	33	257	910	800	62
	%	100.0	1.6	12.5	44.1	38.8	3.0
3. Mental health	N	2,062	66	281	815	799	101
	%	100.0	3.2	13.6	39.5	38.7	4.9
4. Quality of sleep	N	2,062	93	534	864	522	49
	%	100.0	4.5	25.9	41.9	25.3	2.4
5. Overall health status	N	2,062	35	328	896	767	36
	%	100.0	1.7	15.9	43.5	37.2	1.7

Note: The upper row of the table shows the number of respondents (persons). The lower row represents the ratio (%) to the total (2,062).

In Table 14, it is evident that the highest proportion of responses in each health-related category tends to fall into the "cannot say either way" answer. To illustrate, when assessing eyesight status, a significant 54.5% of respondents indicated uncertainty about their eyesight, while only 23.5% reported having good eyesight. In terms of physical health, 38.8% reported having good physical health. Concerning mental health, 38.7% indicated good mental health. Additionally, it is noteworthy that 25.9% of participants reported experiencing bad sleep quality.

Q15.Please indicate the injury or illness situation diagnosed by a professional (doctor, hospital, medical checkup, etc.).

Table 15 Status of chronic diseases

		Total	Yes	No
1. Diabetes	N	2,062	142	1,920
	%	100.0	6.9	93.1
2. Obesity	N	2,062	232	1,830
	%	100.0	11.3	88.7
3. Dyslipidemia	N	2,062	312	1,750
	%	100.0	15.1	84.9
4. Eye disease	N	2,062	262	1,800
	%	100.0	12.7	87.3
5. Hypertension	N	2,062	414	1,648
	%	100.0	20.1	79.9
6. Stroke (cerebral hemorrhage, cerebral infarction, etc.)	N	2,062	30	2,032
	%	100.0	1.5	98.5
7. Angina pectoris/myocardial infarction	N	2,062	40	2,022
	%	100.0	1.9	98.1
8. Sleep disorder	N	2,062	176	1,886
	%	100.0	8.5	91.5

Note: The upper row of the table shows the number of respondents (persons). The lower row represents the ratio (%) to the total (2,062).

From the results in Table 15, it can be concluded that nearly 80% or more of the respondents do not have the above-mentioned chronic diseases. Hypertension is one of the most popular chronic diseases among the respondents with 20.1%.

Q16. Please choose the one that applies to your annual income (including taxes, pensions, dividends, etc.) during the last year (January-December 2022).

Table 16 Annual Income in the Last Year

	N	%
Total	2,062	100.0
990,000 yen or less	436	21.1
1,000,000 - 1,990,000 yen	258	12.5
2,000,000 - 2,990,000 yen	194	9.4
3,000,000 - 3,990,000 yen	180	8.7
4,000,000 - 4,990,000 yen	165	8.0
5,000,000 - 5,990,000 yen	107	5.2
6,000,000 - 6,990,000 yen	87	4.2
7,000,000 - 7,990,000 yen	81	3.9
8,000,000 - 8,990,000 yen	55	2.7
9,000,000 - 9,990,000 yen	43	2.1
10,000,000 - 11,990,000 yen	43	2.1
12,000,000 - 13,990,000 yen	13	0.6
14,000,000 - 15,990,000 yen	9	0.4
16,000,000 yen or more	17	0.8
Do not know	102	4.9
Do not want to answer	272	13.2

Note: The second column of the table shows the number of respondents (persons) and the third column shows the percentage (%) of the total (2,062).

From Table 16, we can see that nearly 60% of the respondents have an annual income of less than 5 million yen. Among them, 21.1% have an income of less than 990,000 yen, 12.5% have an annual income of more than 1 million and less than 1.99 million yen. 9.4% have an annual income of between 2 million and 2.99 million yen. However, a very small percentage had an annual income of 12 million yen or more. For example, only 0.6% of respondents had an income between 12 million and 13.99 million yen. The proportion of respondents with annual income between 14 million and 15.99 million yen is even smaller, at 0.4%, and the fraction of respondents with income of 16 million yen or more is only 0.8%. In addition, 4.9% and 13.2% of the respondents reported “Do not know” and “Do not want to answer”, respectively.

Q17. Please select one that applies to your employment status.

Table 17 Employment status

	N	%
Total	2,062	100.0
1. Regular staff and employees (salaried employees of a company or organization)	715	34.7
2. Temporary staff, contract employees, part-time employees, and part-time workers	520	25.2
3. Directors, etc. of companies and organizations	37	1.8
4. Self-employed, agriculture, forestry, fisheries, and family employees	129	6.3
5. Retired pensioners (65 years old and over)	161	7.8
6. Full-time housewife (husband), housework help, on childcare/nursing care leave	287	13.9
7. Not currently working (under age 64; not seeking work)	91	4.4
8. Not currently working (under age 64; seeking employment)	69	3.3
9. (【　　】) Other	53	2.6

Note: The second column of the table shows the number of respondents (persons) and the third column shows the percentage (%) of the total (2,062).

Table 17 reveals that the largest occupational group among respondents, comprising 34.7% of the sample, consists of regular staff or employees, specifically salaried individuals working for companies or organizations. The second-largest group includes temporary employees, contract employees, and part-time workers, representing 25.2% of the sample. Additionally, 13.9% of respondents identified themselves as a full-time housewife (husband), involved in housework or childcare/nursing care leave. In contrast, directors and other high-ranking positions in companies and organizations constitute only a modest 1.8% of the sample.

Q18. Overall, please indicate your overall life satisfaction.

Table 18 Overall life satisfaction

	N	%
Total	2,062	100.0
Very satisfied	55	2.7
Satisfied	863	41.9
Cannot say either way	647	31.4
Not very satisfied	325	15.8
Not satisfied	172	8.3

Note: The second column of the table shows the number of respondents (persons), and the third column shows the percentage (%) of the total (2,062).

According to the data in Table 18, it can be observed that 44.6% of the respondents expressed

satisfaction with their overall life. A substantial portion, specifically 31.4%, provided a neutral response when asked about their overall life satisfaction. In contrast, 15.8% of the respondents conveyed that they were not very satisfied with their overall life, and an additional 8.3% reported being dissatisfied with their life.

Table 19 Age distribution

	N	%
Total	2,062	100.0
40-44 years old	310	15.0
45-49 years old	380	18.4
50-54 years old	360	17.5
55-59 years old	326	15.8
60 years old or over	686	33.3

Note: The second column of the table shows the number of respondents (persons) and the third column shows the percentage (%) of the total (2,062).

Table 19 illustrates that the largest demographic group among the respondents consists of individuals aged 60 years and above, comprising 33.3% of the sample. Following closely, the second-highest percentage belongs to those in the age bracket of 45-49 years old, accounting for 18.4% of the participants.

Table 20 Distribution of regions

	N	%
Total	2,062	100.0
Hokkaido	127	6.2
Tohoku	109	5.3
Kanto	785	38.1
Chubu	327	15.9
Kinki region	400	19.4
Chugoku	101	4.9
Shikoku	55	2.7
Kyushu	158	7.7

Note: The second column of the table shows the number of respondents (persons) and the third column shows the percentage (%) of the total (2,062).

In Table 20, the largest proportion of the respondents are in the Kanto region, representing 38.1% of the sample. The Kinki region and the Chubu region follow as the next most prevalent regions, making up 19.4% and 15.9% of the respondents, respectively.

3. Conclusion

In this study, we have compiled the descriptive findings from our original survey on awareness of visual protection and enhancement. We intended that these results could offer valuable insights to deepen our comprehension of practices aimed at preserving and enhancing visual health. Going forward, we plan to conduct a more in-depth analysis using individual data gathered from this survey, exploring the connections between eye conditions and life satisfaction, while also underscoring the significance of eye protection.

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