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Public needs for information disclosure on healthcare performance
Different determinants between Japan and the Netherlands

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Abstract

The accumulated healthcare performance data related to unwarranted practice variations are not necessarily disseminated to patients and citizens. To clarify the needs for public disclosure, we explored Japanese and Dutch citizens' preferences and values towards information disclosure and healthcare disparity.

Online opt-in survey was conducted and we asked citizens their preference to know about the healthcare performance indicators of regions and hospitals, and their attitudes towards healthcare equity. After a descriptive statistical analysis, Chi-squared automatic interaction detection tree analysis was performed to explore the socio-demographic determinants which were associated with positive value for information disclosure and healthcare equity. Then, we compared the combination of attributes of the highest and the lowest subgroups of each country and compared within and between countries. Last, logistic regression analysis was performed to further evaluate the impact of each determinant.

Significant differences were observed between the 2 countries (Japan [JPN] 1038; Netherlands [NL] 1040). The crucial attributes identified were age, sex, educational background, and living area (JPN), along with age and sex (NL). Japanese comprised multiple subgroups with heterogeneous values, showed relatively low interest in knowing the information, and seemed to accept healthcare inequality, especially among urban males aged 20 to 59 years. Contrarily, Dutch people mostly showed high interest in both items. Female and older respondents valued information disclosure highly across countries.

To share healthcare performance knowledge and empowering the public, historical, cultural, and socio-demographic context including health literacy of citizens' subgroups should be considered in making comprehensive public reports.

Abbreviations: CHAID = Chi-squared automatic interaction detection, JPN = Japan, NL = Netherlands.

Keywords: public disclosure, healthcare performance, health literacy, Japan, the Netherlands

1. Introduction

Healthcare disparity among regions and hospitals has been revealed widely, even in developed countries. It becomes more and more clear that there is considerable practice variation in health care utilization, quality and costs, which is partly unwarranted.[1–4] There is also a growing awareness that the public disclosure on practice variation is crucial for sparking change and improvement.[3,4] However, the accumulated crucial data and outcomes related to unwarranted practice variations are not necessarily disseminated to the stakeholders such as healthcare providers, policymakers, payers, and also, consumers including patients, families, and citizens. Westert et al have recently reported the structural difficulties in sharing the healthcare performance knowledge among stakeholders and suggested implementing "the Value Improvement Cycle," which may close the gap between unwarranted healthcare variation and improving care.[3]

To overcome the huge information asymmetry in health care, there have been a number of researches and movements to actively share healthcare information with patients and families in the context of patient-centered care and shared decision making.[5–7,14] Health performance data have been reported to be especially difficult to use because of the complexity of data, the poor construction of data, and the lack of skill to understand and use them.[8] On the other hand, there is an evidence that – if information such as healthcare outcomes would be provided in a tailor-made way, fitting with people's personal profiles, they would be willing to use such data.[9] Thus, when sharing the health performance information with the public, we need to consider their health literacy, their needs for information, and their values for health equity. According to the previous reports in Europe, low health literacy is common even in economically

advanced countries.[5,10] Specific vulnerable groups – which include those with low income, low education, worse health status, and relatively old age – have much higher proportions of limited health literacy than the general population.[11,12] In that case, the existing available data could be "too extensive, too complex, and too confusing" to understand and thus useless to people making their hospital or regional healthcare choice.[13]

This study aimed to clarify the current needs of health performance information of the general citizens as well as the citizens' attitudes towards variation in healthcare quality, utilization, and costs in the Netherlands and Japan. In addition, we explored the different determinants of the positive attitudes (ie, willingness to know performance data; attitudes towards healthcare equity) between countries and sought for the citizens' socio-demographic key factors that have to be recognized to effectively disclose the health performance information to the public.

2. Methods

2.1. Data sources

We conducted a survey between March and April 2016, using a nationwide social research panel of approximately 1.2 million registrants in Japan and 220,000 registrants in the Netherlands, which is owned by an online research company (Macromill, Inc, Tokyo, Japan) and its partner company. Respondents were recruited by randomly sending emails to the panel's registrants who have nationalities and live in the 2 countries (Japan 10,000; Netherlands 50,000), and participated in the survey using an "opt-in" approach. Recruitment emails were sent step-by-step until the intended number of participants in each following stratum had been fulfilled.

By using quota sampling method by age, sex, and residential area, a total of 1040 citizens for each country responded to the survey (260 urban male, 260 urban female, 260 rural male, and 260 rural female). Each stratum consisted of the same age category volume (ie, 52 male and 52 female in 20–39, 40–49, 50–59, 60–69, and ≥70 years age groups) to make valid comparison. "Urban" and "rural" was defined based on regional population in advance, so that respondents would not be skewed to urban residents who tend to use much more Internet. The final sample sizes were 1040 in the Netherlands and 1038 in Japan after excluding 2 respondents whose answers were unreliable.

Among the survey questions, as part of the larger questionnaires including possible dementia care and end-of-life care in the future, we focused on items of public needs for information disclosure on healthcare performance and attitudes towards regional and income variations related to healthcare quality. Subjective residential area was also asked as urban, suburban, and rural according to the impression of the respondents. The questionnaire was developed based on literature reviews and discussions with experts in both countries.

(Supplemental Digital Content [Appendix Table 1, http://links.lww.com/MD/D310]).

2.2. Needs for public disclosure and citizens' attitudes towards healthcare variations

The questionnaire was designed to clarify the following elements:

(1) willingness to know the regional healthcare performance,
(2) willingness to know the hospital performance in which they may receive treatment,
(3) preferences towards the type of public disclosure,
(4) attitudes towards regional variation in general, and
(5) attitudes towards income-related variation in healthcare access and quality.

2.3. Statistical analysis

After calculating descriptive statistics, we summarized the responses to the aforementioned 5 questions. Next, we performed a Chi-squared automatic interaction detection (CHAID) tree analysis to identify the individual characteristics which were associated with the citizens' preference and attitudes. The dependent variables were set to be the positive value for each question (dichotomous variables). For example, considering "attitude towards regional equity," responses of who chose "necessary" and "preferable" were regarded as "positive." The independent variables included nationality, sex, age group, area of residence, final academic background, annual income, marital status, and occupation. CHAID is the oldest tree classification model that repeatedly uses Chi-square tests to split independent variables into child nodes and automatically identifies the sets of independent variables for the dependent variables.[15–17] This algorithm is used in the field of complicated huge data sets such as marketing and health care.[16,17] Exhaustive CHAID algorithm, a modified version that performs a more thorough merging and testing, was used in this study.[18] Then, we compared the identified attributes of the highest and the lowest subgroups to know the extent of differences between the subgroups within the country as well as to explore the cause of differences between the countries.

Last, to further evaluate the impact of identified attributes on each dependent variable, multiple logistic regression analysis was performed. Since logistic modeling is widely used and easy to interpret, we employed this method to better understand the CHAID results, as is discussed in previous studies.[16–19] Interaction terms derived from the CHAID results were also examined to explore the effects among determinants.

All statistical analyses were conducted using SPSS software version 20.0J and Decision Tree (SPSS Inc, Chicago, IL). P-values (2-tailed) <.05 were considered statistically significant.

2.4. Ethics approval and consent to participate

This study was approved by the Ethics Committee of Kyoto University Graduate School and Faculty of Medicine, Japan (R0478). Informed consent was received from all participants before the survey.

3. Results

3.1. Descriptive statistics

Respondent baseline characteristics are shown in Table 1. Respondents who lived in the suburban area resulted to be doubled in Japan compared to the Netherlands. The proportion of freelance workers, housewives (/house-husbands), unemployed, those with low academic background, and those with low annual income were higher in Japan, while the proportion of pensioners was higher in the Netherlands.

Table 2 shows the description of the survey response. Dutch respondents showed much higher interest to know the regional healthcare performance compared with Japanese respondents.

Table 1

Baseline characteristics of the respondents.

(%)	Japan n = 1038		Netherlands n = 1040	
Female	519	(50.0)	520	(50.0)
Age				
20–39 yr	207	(19.9)	208	(20.0)
40–49 yr	208	(20.0)	208	(20.0)
50–59 yr	207	(19.9)	208	(20.0)
60–69 yr	208	(20.0)	208	(20.0)
≥70 yr	208	(20.0)	208	(20.0)
Area of residence				
Urban	342	(32.9)	444	(42.7)
Suburban	584	(56.3)	293	(28.2)
Rural	112	(10.8)	303	(29.1)
Marital status				
Married	678	(65.3)	570	(54.8)
Unmarried	327	(31.5)	342	(32.9)
Officially registered living together	19	(1.8)	37	(3.6)
Living together without official registration	14	(1.4)	91	(8.8)
Family composition and living arrangements				
Single living alone	174	(16.7)	252	(24.2)
Occupation				
Company employee	284	(27.3)	314	(30.2)
Medical/nursing professional	21	(2.0)	20	(1.9)
Civil servant	24	(2.3)	37	(3.6)
Self-employed (own firm with personnel)	56	(5.4)	17	(1.6)
Self-employed (own firm without personnel)	17	(1.6)	41	(3.9)
Freelance worker	163	(15.7)	7	(0.7)
Teacher	9	(0.9)	25	(2.4)
Research and development	2	(0.2)	11	(1.1)
Housewife/house-husband	230	(22.2)	85	(8.2)
Pensioner	66	(6.4)	310	(29.8)
Student	10	(1.0)	27	(2.6)
Unemployed	142	(13.7)	71	(6.8)
Other	14	(1.3)	75	(7.2)
Final academic background				
High	429	(41.3)	459	(44.1)
Moderate	253	(24.4)	374	(36.0)
Low	350	(33.7)	201	(19.3)
None of the above	6	(0.6)	6	(0.6)
Annual income				
Under €7,000	97	(9.3)	32	(3.1)
€7000–€21,000	221	(21.3)	141	(13.6)
€21,000–€35,000	261	(25.1)	211	(20.3)
€35,000–€75,000	237	(22.8)	347	(33.4)
€75,000 and over	69	(6.6)	63	(6.1)
Do not know	153	(14.7)	246	(23.7)

With regard to knowing the hospital performance, similar tendency was observed between the 2 countries. A majority of respondents preferred "complete" disclosure in both countries. However, a third of Japanese respondents "did not know" which type of public disclosure would be desirable.

3.2. Citizens' preferences towards public disclosure of medical practice variation

We successfully identified the elements which may associate with the citizens' positive interest and attitude towards healthcare performance information. Figure 1 shows the example of the CHAID tree results regarding citizens' willingness to know about regional healthcare performance. First, 3 major determinants of the positive response – that is, nationality, academic background,

and age – were identified. Next, we found that the lowest subgroup (36.0%, node 4) who were willing to know the information comprised Japanese with lower academic background, whereas the highest subgroup (81.2%, node 6) comprised Dutch people aged 50 years and over. When we focus on the highest subgroup in Japanese (63.8%, node 8) which comprised 60 to 69 years with higher academic background, the proportion was almost equivalent to the lowest subgroup in the Netherlands (64.3%, node 10) (Fig. 2A).

Similarly, we identified the crucial elements of the highest and the lowest subgroup in each country for the subsequent questions. With regard to knowing the hospital performance, the major attributes were "nationality" and then "age" in the Netherlands, and "academic background," "area of residence," and "sex" in Japan. The lowest subgroup in Japan comprised

(%)	Japan n = 1038		Netherlands n = 1040	
Willingness to know the *regional* healthcare performance indicators				
Yes	467	(45.0)	805	(77.4)
No	220	(21.2)	92	(8.8)
Do not know	351	(33.8)	143	(13.8)
Willingness to know the *hospital* performance indicators				
Yes	552	(53.2)	925	(88.9)
No	202	(19.5)	47	(4.5)
Do not know	284	(27.4)	68	(6.5)
Preferences towards the type of public disclosure of the healthcare performance indicators				
Complete disclosure	609	(58.7)	718	(69.0)
Partial disclosure	159	(15.3)	162	(15.6)
No disclosure	29	(2.8)	58	(5.6)
Do not know	241	(23.2)	102	(9.8)
Attitude towards regional variations in the quality of healthcare				
Equivalent levels of care necessary throughout the country	184	(17.7)	383	(36.8)
Equivalent levels of care preferable throughout the country	410	(39.5)	318	(30.6)
Regional variation with levels of care unavoidable	272	(26.2)	166	(16.0)
Do not mind; seek better hospital located farther away	74	(7.1)	111	(10.7)
Do not know	95	(9.2)	53	(5.1)
Other	3	(0.3)	9	(0.9)
Attitude towards income variations in the quality of healthcare				
All healthcare services should be provided to everyone regardless of income	495	(47.7)	792	(76.2)
Only basic healthcare services to everyone, and highly advanced medical treatments to who can afford them	315	(30.3)	95	(9.1)
All healthcare services should be provided based on each individual's income and insurance premiums	118	(11.4)	93	(8.9)
Do not know	110	(10.6)	60	(5.8)

men with lower academic background. The highest subgroup comprised people who had high academic background living in suburban areas. Within Dutch respondents, the elements associated with citizens' attitudes were only "age," and even the lowest subgroup ("20–49 years") showed relatively high proportion, which indicates high interest, when compared with Japanese respondents (Fig. 2B).

The impact of identified attributes on positive responses to each of the core 4 questions are shown in Table 3. In Japan, female, older age (≥60 years), and higher academic background showed strong association with willingness to know about both *regional* performances (odds ratio [OR] 1.33; 1.78; and 2.02, respectively) and *hospital* performance (OR 1.42; 1.75; and 1.92, respectively). Notably, higher-educated people were more likely to show high demand for information. In the Dutch population, "older age" was the only attribute associated with both *regional* and *hospital* performance (OR 1.49; 2.19, respectively).

3.3. Citizens' attitudes towards healthcare equity: regional variation and income-related variation

Concerning the citizens' attitudes to agree with equivalent levels of care across countries, "age," "sex," "academic background," and "area of residence" showed strong correlation in Japan, and only "sex" in the Netherlands. The highest subgroup in Japan comprised older females, and the lowest subgroup comprised urban males aged 20 to 59 years. In the Netherlands, the highest comprised female and the lowest comprised male (Fig. 2C).

With regard to the acceptance of receiving all healthcare services including highly advanced medical treatment for everyone, the major attributes were "nationality" and then "academic background" in Japan and "age" in the Netherlands.

In Japan, the highest and the lowest subgroup comprised citizens with lower academic background and higher academic background, respectively. Among Dutch respondents, the highest and the lowest subgroup comprised "≥50 years" and "20 to 49 years," respectively; these proportions were both relatively high when compared with Japanese (Fig. 2D).

The results from the multiple logistic regression considering the interaction effects are shown in Table 3. Older people, female, and residents in nonurban areas showed higher value towards regional equity in Japan (OR 2.21; 1.66; 1.56, respectively), whereas older people and female had higher odds in the Netherlands (OR 1.52; 1.66). However, in both countries, people with higher educational background are less inclined to agree with "all healthcare services to everyone" (OR both 0.70). Interestingly, we found that "urban males aged 20 to 59 years" attached the lowest value to this statement in Japan (OR 0.55), while the same subgroup of Dutch people valued health equity regardless of income much higher (OR 2.01). No other statistically significant effect was observed for other interaction terms. The regression results without considering interaction terms are shown in Supplemental Digital Content (Appendix Table 2, http://links.lww.com/MD/D310) for reference.

4. Discussion

We observed sharp contrasts between Japan and the Netherlands, in the citizens' preference and value towards public disclosure and healthcare equity. This may indicate the necessity of careful consideration of how to prioritize and disclose public reporting in the future across countries. To note, Japanese people tended to show relatively lower interest in knowing the healthcare performance information, and seemed to accept healthcare
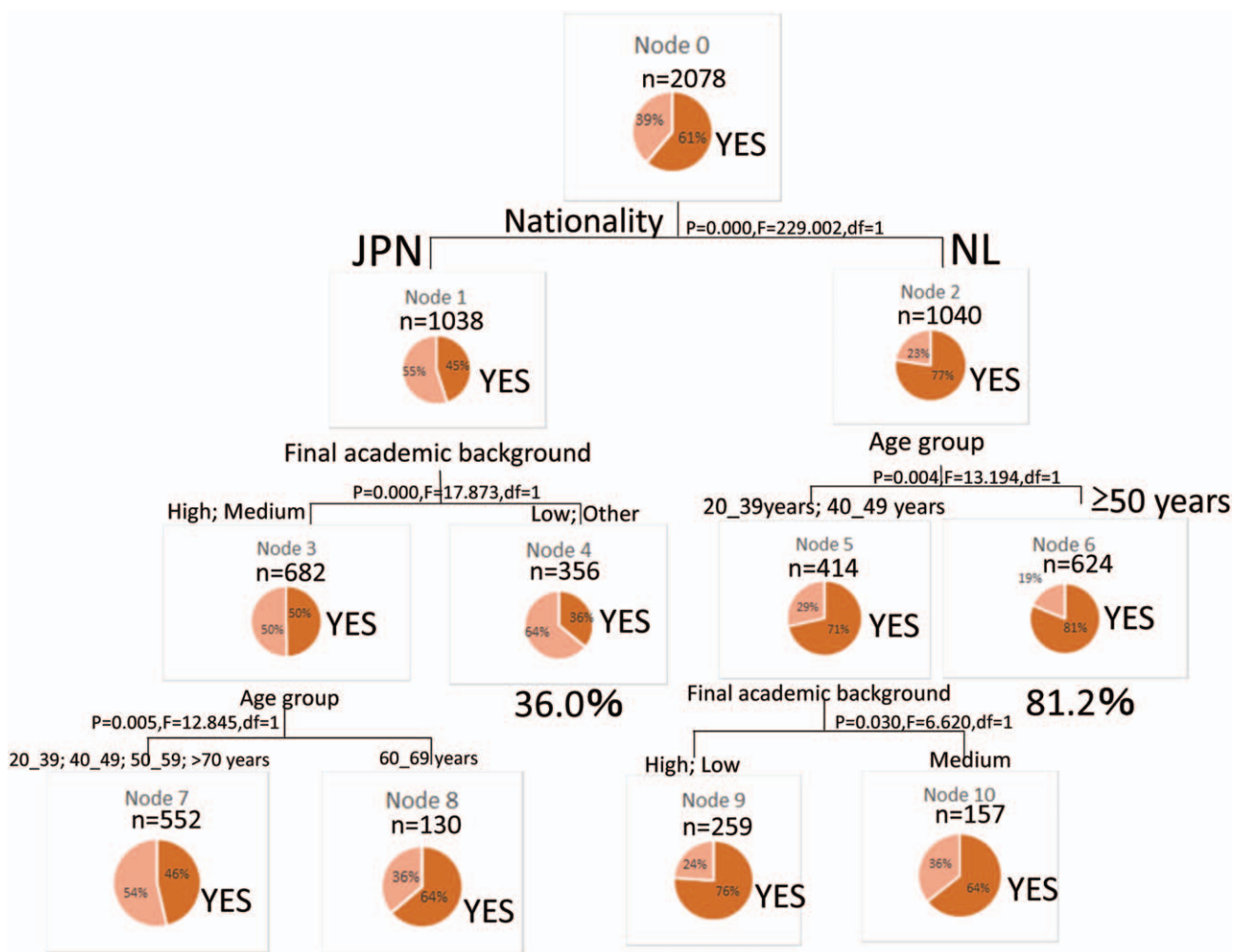
Figure 1. An example of a CHAID decision tree showing willingness to know about the regional healthcare performance. The proportion of "YES" responses indicates who agreed with the following question: "Would you like to know about the healthcare performance (such as disease-specific mortality rates and rate of a certain procedure performed) of the province and municipality where you live?." CHAID = Chi-squared automatic interaction detection.

inequality especially among urban males aged 20 to 59 years, while Dutch people mostly showed high interest in public disclosure and tend to highly value healthcare equity.

4.1. Citizens' desire to know more about regional/institutional differences in health care quality
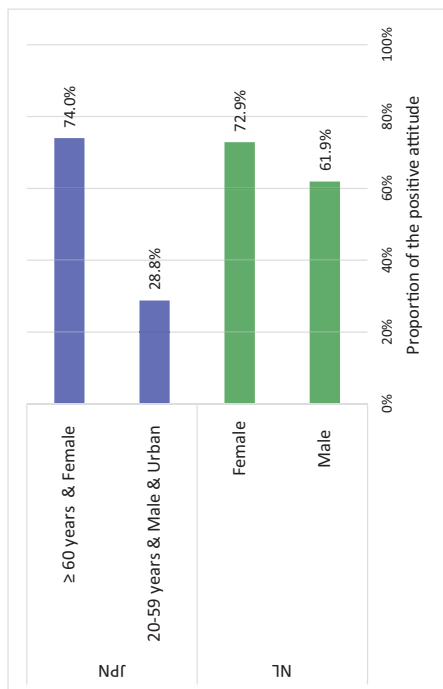
Regarding the desire to know regional and hospital healthcare performance, the difference between the highest and the lowest subgroups within Japan was large according to the educational background compared with Dutch subgroups (Fig. 2A and B). The results possibly reflect the citizens' health literacy, which is in line with several recent international documents. They reported that national activities to empower patients are scarce and patient involvement has been limited in Japan,[5] while in the Netherlands, national networks aiming to improve health literacy of the population have been empowering citizens including vulnerable people such as lower social status groups, immigrants, and elderlies.[6,7] Taking these reports into account, push efforts by healthcare stakeholders to improve health literacy of the population subgroups may lead to the practical use of health performance data.[6,10,20]

With regard to Dutch people, the determinants which affected the desire to know the performance data were only sex and generation, and the impact of these attributes was relatively small between subgroups within the country (Fig. 2A and B). The Dutch have a "decades-long tradition of special health communication for migrants and minority groups, often in foreign languages," involving many stakeholders.[6] In the context of Dutch health care reform, this movement was initiated during the late '80s and effectuated with the new Health Care Insurance Act of 2006. Giving patients a role as critical consumers, and encouraging them to search actively for the best care possible has been a key in the new system.[21] National activities for tackling health literacy such as the National Alliance of Health Literacy – which comprises more than 60 member organizations including patients, providers, industries, and so on – have been reported to help empower individuals and communities.[6]

In addition, female and older respondents separately tended to show high interest in obtaining performance information across both countries, and those with a higher-educated background additionally showed similar tendency in Japan (Table 3). Several studies support our results that females are more eager to seek
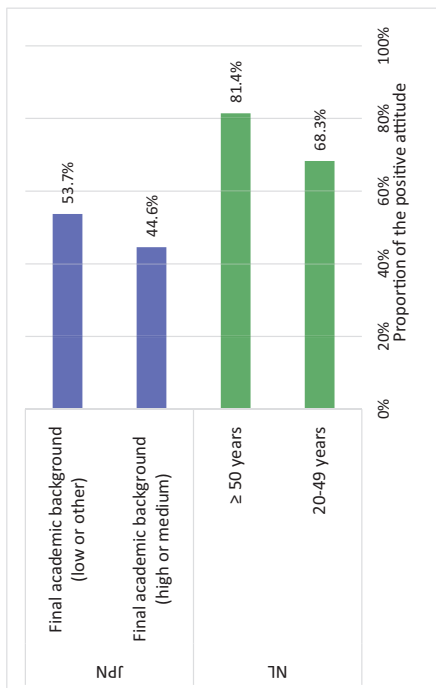
Figure 2. Identified attributes of the highest and the lowest subgroups in each country using CHAID analysis about the following topics: (A) Willingness to know *about the regional* healthcare performances (B) Willingness to know about the *hospital* performances (C) Preference for equivalent levels of care to be provided throughout the country *irrespective of location* (D) Preference for all healthcare provision for everyone *regardless of income.* CHAID=Chi-squared automatic interaction detection, JPN=Japan, NL=Netherlands.

Table 3

The impact of attributes on positive value for each question using multiple logistic regression analysis considering interaction effects.

Attributes	Willingness to know regional healthcare performance		Willingness to know hospital performance		Positive attitude towards regional equity		All healthcare services to everyone regardless of income	
	Odds ratio (95% CI)							
Japan								
Female	1.331	(1.014–1.749)	1.420	(1.081–1.864)	1.662	(1.256–2.198)	0.798	(0.611–1.042)
Age ≥60 yr	1.781	(1.353–2.345)	1.746	(1.326–2.299)	2.207	(1.660–2.933)	0.966	(0.739–1.262)
Final academic background (high or medium)	2.019	(1.535–2.656)	1.917	(1.465–2.507)	0.969	(0.736–1.276)	0.691	(0.532–0.899)
Area of residence (suburban or rural)	1.054	(0.775–1.435)	1.214	(0.891–1.653)	1.556	(1.135–2.134)	0.806	(0.594–1.093)
Male aged 20–59 yr living in urban area	1.058	(0.614–1.822)	1.244	(0.729–2.122)	0.683	(0.388–1.202)	0.545	(0.320–0.929)
C statistics	0.604	(0.569–0.638)	0.601	(0.567–0.635)	0.655	(0.621–0.688)	0.569	(0.534–0.603)
Netherlands								
Female	0.884	(0.627–1.245)	1.164	(0.731–1.853)	1.663	(1.224–2.260)	1.143	(0.815–1.603)
Age ≥60 yr	1.485	(1.064–2.072)	2.193	(1.366–3.521)	1.518	(1.122–2.055)	1.969	(1.409–2.752)
Final academic background (high or medium)	1.102	(0.762–2.032)	1.244	(0.762–2.032)	0.884	(0.626–1.248)	0.628	(0.418–0.944)
Area of residence (suburban or rural)	1.056	(0.745–1.498)	1.089	(0.671–1.767)	1.090	(0.791–1.502)	1.316	(0.931–1.860)
Male aged 20–59 yr living in urban area	1.040	(0.585–1.849)	1.251	(0.586–2.668)	1.043	(0.626–1.736)	2.013	(1.130–3.585)
C statistics	0.559	(0.517–0.601)	0.589	(0.537–0.640)	0.591	(0.554–0.627)	0.603	(0.564–0.600)

CI = confidence interval.

health information than males[22–24] and these sex gaps persist over time.[22] Moreover, despite the less digital searching skills of older people using the Internet,[25] desire for the health performance information would be more urgent to whom tend to possess more diseases than younger people.

Regarding higher demand for health information of higher-educated people in Japan, health literacy is known to be heavily dependent on educational background along with competency to understand and use complex information effectively.[26,27] From the perspective of patient participation, the latest the Organization for Economic Cooperation and Development report of health care quality among 15 countries also described the limited patient involvement at both the services and the decision-making levels in Japan,[5] which implies the current situation that healthcare performance data are not easily available for patients and citizens. Based on our results, different instructive approaches might be usable to multilayered subgroups to facilitate and promote citizens' understandings of health performance information.

4.2. Citizens' values towards healthcare equity: regional variation and income-related variation

The key attributes related with regional equity and income-related equity were quite different. Regarding regional equity, female and older people showed high value for equity in both countries, and residents in nonurban area demonstrated higher value in Japan (Table 3). The high OR of female and older people are in common with the interest in obtaining performance information, whereas the low OR of residents in nonurban area possibly reflects the current difficulties in access to health care services.

With regard to income-related health care equity, higher educated people showed lower value in both countries (Table 3). The result possibly reflects the practical and critical recognition of gaps between ideal status and the reality they hold. However, recent studies have revealed the misperception of income equity within and across countries,[28,29] and further researches are needed to clarify the perception issues in this area.

Intriguingly, urban males aged 20 to 59 years in Japan accepted regional inequality of healthcare provision the most (Fig. 2C), and also demonstrated the lowest value on health equity regardless of income, while the same subgroup of Dutch people showed much higher value on the index health equity (Table 3). Concerning Japan, income inequalities have grown significantly during the past 25 years due to the prolonged economic contraction, and the increased citizens with low socioeconomic status may have resulted in a cycle of poverty which diminishes individual health literacy levels and increase ill health.[11,30–33] Within this context, citizens' values appeared to have changed drastically to accept social inequality, in spite of the longstanding historical trend towards a classless society in Japan.[30] Moreover, political apathy which has grown to an unprecedented level among Japanese youth compared to other developed countries[31] may have fostered a self-centered culture, and their values had little chance to be corrected by political or cultural encouragement.

On the other hand, there is a tradition of "solidarity" in the context of Dutch health and social care insurance. A literature describes "solidarity" – the concept that the better off (for income, health, and health risks) share the burden of the less well off – as a typical Dutch phenomenon divided into 3 types: first, "risk solidarity" is expressed in arrangements that insure everyone under the same conditions, independent of their actual individual risks. Second, "income solidarity" is expressed in arrangements where those with higher incomes pay more and thereby subsidize the care for those with lower incomes. Third, "lifestyle solidarity" is used to signify arrangements that offer insurance under the same conditions to those who engage in high-risk lifestyles as to those with low-risk lifestyles.[34] Moreover, the principle of solidarity was effectuated in the aforementioned Health Care Insurance Act, for example, by the mandatory rich basic benefit basket and the obligation for insurers to accept all applicants. We believe the strong tradition of solidarity is the main explanation that the Dutch respondents valued "equal access regardless of income" this high.

4.3. Study implications

In this study, we identified the key attributes which are associated with positive value for health performance information and

health equity. To enhance the utilization of healthcare performance data both in hospitals and in regions, we need to rethink the disseminating process of the information to the public, taking different needs of the population subgroups into account. Based on our results, it would be crucial to consider relevant methods to provoke more interest to others targeting young to middle-aged male living in urban area in Japan, whereas small variation of the disseminating methods would be enough for Dutch people.

The optimal methods of public reporting targeting patients and citizens for informed decision making is still underway along with a number of systematic challenges provided across countries. A document from 7 countries including Denmark, England, Germany, Italy, the Netherlands, Sweden, and the United States have revealed that the available information does not sufficiently meet patients' needs, and that the systematic involvement of patients and citizens is lacking when developing quality information systems (with a notable exception of the National Health Service Choice in England).[12] Moreover, Canaway et al reported the multiple barriers of public reporting such as conceptual; systems-level; technical and resource-related; and socio-cultural factors, in implementing these systems anywhere.[35]

Considering the fact that government and key authorities tend to develop the system of quality information, and that patients mostly use information from the internet compared with leaflets or other means,[14] our findings may help reconstruct the effective dissemination process (ie, use of different media and contents, different opportunities to learn, etc), and add stakeholders new knowledge to practically make novel approach to certain population subgroups. This implication would be in line with the framework of "proportionate universalism" towards health equity to effectively benefit multiple layers of people when implementing policies and projects.[36,37] We may recognize that the same "goal of providing appropriate supports for different social groups would be best supported by a focus on need."[36]

Moreover, the sharp contrast recognized between the 2 countries here would suggest that not only the key factors of social determinants but also the combination of them would define the motives of individuals according to cultural and socioeconomic background of each county. Further studies considering psychological aspects are also required to clarify this issue.

In summary, our findings suggest that health service stakeholders who intend to proliferate performance information to the public widely should bear in mind the difference of citizens' willingness and competency to use complex information among subgroups, to effectively convey key results and empower the public.

4.4. Limitations

This study has several limitations. First, the disadvantage of comparing 2 countries with a very different cultural background is that the response to surveys includes differences beyond the specific topic studied. Second, since the respondents were recruited through the Internet with a small reward, the selection bias may limit the generalizability to the whole population. Third, respondents may have failed to imagine the expected public reports which may have led to increased "do not know" answers. Finally, we could not identify the effect of healthcare system-level differences between countries. Further studies are needed to

achieve integrated platform to share the healthcare performance information with many layers of citizens.

5. Conclusions

Public needs for information disclosure on healthcare performance differed significantly between the 2 countries. Japanese showed relatively lower interest in knowing the information and seemed to accept inequality, while the Dutch mostly showed high interest in general. Further, female and older respondents separately tended to show high interest in obtaining information across countries. To share healthcare performance knowledge and to empower the public, stakeholders including policymakers, healthcare authorities, and health service researchers may better consider sex, generation, and health literacy of citizens in making understandable public reports.

Author contributions

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References

[1] Wennberg JE. Tracking Medicine: A Researcher's Quest to Understand Health Care. Oxford: Oxford University Press; 2010.
[2] The Dartmouth Atlas of Health Care. Available at: http://www.dartmouthatlas.org/data/topic/topic.aspx?cat=18. [Accessed on June 27, 2018], In press
[3] Westert GP, Groenewoud S, Wennberg JE, et al. Medical practice variation: public reporting a first necessary step to spark change. Int J Qual Health Care 2018;30:731–5.
[4] Corallo AN, Croxford R, Goodman DC, et al. A systematic review of medical practice variation in OECD countries. Health Policy 2014;114:5–14.
[5] OECD. Caring for Quality in Health: Lessons Learnt from 15 Reviews of Health Care Quality; 2017. Available at: https://www.oecd.org/els/health-systems/Caring-for-Quality-in-Health-Final-report.pdf. [Accessed on June 27, 2018]
[6] World Health Organization (WHO). Health Literacy. The Solid Facts; 2013. Available at: http://www.thehealthwell.info/node/534072. [Accessed on May 7, 2018]
[7] Public Health England. Improving Health Literacy to Reduce Health Inequalities; 2015. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/460710/4b_Health_Literacy-Briefing.pdf. [Accessed on June 27, 2018]
[8] Ketelaar NABM, Faber MJ, Flottorp S, et al. Public release of performance data in changing the behaviour of healthcare consumers, professionals or organisations. Cochrane Database Syst Rev 2011;9: CD004538.

[9] Groenewoud S, Van Exel NJ, Bobinac A, et al. What influences patients' decisions when choosing a health care provider? Measuring preferences of patients with knee arthrosis, chronic depression, or Alzheimer's disease, using discrete choice experiments. Health Serv Res 2015; 50:1941–72.

[10] World Health Organization (WHO) . Knowledge Translation Framework for Ageing and Health. WHO, 2012. Available at: https://www.who.int/ageing/publications/knowledge_translation.pdf.

[11] OECD. OECD Data: Income Inequality; 2012. Available at: https://data.oecd.org/inequality/income-inequality.htm. [Accessed on June 27, 2018]

[12] OECD. In it Together: Why Less Inequality Benefits All. Paris: OECD Publishing; 2015. Available at: http://dx.doi.org/10.1787/9789264235120-en. [Accessed on June 27, 2018]

[13] Gabel JR, Hunt KA, Hurst K, et al. When Employers Choose Health Plans: Do NCQA Accreditation and HEDIS Data Count? New York: Commonwealth Fund; 1998.

[14] Cacace M, Ettelt S, Brereton L, et al. How Health Systems Make Available Information on Service Providers. Experience in Seven Countries, 94; 2011. Available at: http://www.rand.org/content/dam/rand/pubs/technical_reports/2011/RAND_TR887.pdf. [Accessed on September 18, 2019]

[15] Kass GV. An exploratory technique for investigating large quantities of categorical data. J Appl Stat 1980;29:119–27.

[16] Antipov E, Pokryshevskaya E. Applying CHAID for logistic regression diagnostics and classification accuracy improvement. J Target Meas Anal Mark 2010;18:109–17.

[17] Chae YM, Ho SH, Cho KW, et al. Data mining approach to policy analysis in a health insurance domain. Int J Med Inform 2001;62:103–11.

[18] Nisbet R, Elder J, Miner G. Handbook of Statistical Analysis and Data Mining Applications. California, USA: Academic Press; 2009.

[19] Magidson J. Some common pitfalls in causal analysis of categorical data. J Market Res 1982;19:461–71.

[20] Lavis JN, Lomas J, Hamid M, et al. Assessing country-level efforts to link research to action. Bull World Health Organ 2006;84:620–8.

[21] Schut FT, van de Ven WP. Rationing and competition in the Dutch health-care system. Health Econ 2005;14:S59–74.

[22] Manierre MJ. Gaps in knowledge: tracking and explaining gender differences in health information seeking. Soc Sci Med 2015;128:151–8.

[23] Ek S. Gender differences in health information behaviour: a Finnish population-based survey. Health Promot Int 2015;30:736–45.

[24] Hiebert B, Leipert B, Regan S, et al. Rural men's health, health information seeking, and gender identities: a conceptual theoretical review of the literature. Am J Mens Health 2018;12:863–76.

[25] Lustria ML, Smith SA, Hinnant CC. Exploring digital divides: an examination of eHealth technology use in health information seeking, communication and personal health information management in the USA. Health Informatics J 2011;17:224–43.

[26] Rowlands G, Protheroe J, Winkley J, et al. A mismatch between population health literacy and the complexity of health information: an observational study. Br J Gen Pract 2015;65:e379–86.

[27] Hibbard JH. Patient activation and the use of information to support informed health decisions. Patient Educ Couns 2017;100:5–7.

[28] Niehues J. Subjective Perceptions of Inequality and Redistributive Preferences: An International Comparison. Cologne Institute for Economic Research. IW-TRENDS Discussion Paper. 2014;2:1–23

[29] Hauser OP, Norton MI. (Mis) perceptions of inequality. Curr Opin Psychol 2017;18:21–5.

[30] Hirahase S. Japan as a stratified society: with a focus on class identification. Social Sci Jpn J Am J Mens Health 2010;12:863–76.

[31] Tsukada J. Examining Japanese youth's perception of political citizenship. Electron j Contemp Jpn Stud 2015;15: Available at: http://japanesestudies.org.uk/ejcjs/vol15/iss3/tsukada.html. [Accessed on July 28, 2018]

[32] Stiglitz J. Inequality and Economic Growth. The Political Quarterly; 2015. Available at: https://www8.gsb.columbia.edu/faculty/jstiglitz/sites/jstiglitz/files/Inequality%20and%20Economic%20Growth.pdf. [Accessed on June 27, 2018]

[33] Pillay-van Wyk V, Bradshaw D. Mortality and socioeconomic status: the vicious cycle between poverty and ill health. Lancet Glob Health 2017;9:e851–2.

[34] Prainsack B, Buyx A. Solidarity in contemporary bioethics. Towards a new approach. Bioethics 2012;26:343–50.

[35] Canaway R, Bismark M, Dunt D, et al. Perceived barriers to effective implementation of public reporting of hospital performance data in Australia: a qualitative study. BMC Health Serv Res 2017;17:391.

[36] Carey G, Crammond B, De Leeuw E. Towards health equity: a framework for the application of proportionate universalism. Int J Equity Health 2015;14:81.

[37] Marmot M. Fair Society, Healthy Lives: The Marmot Review. London: Strategic Review of Health Inequalities in England Post-2010; 2010. Available at: https://www.parliament.uk/documents/fair-society-healthy-lives-full-report.pdf.