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# Attitudes of Japanese physicians not specializing in care toward people living with HIV and their care

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## Abstract

**Background** Although Japan has successfully mitigated HIV infections, several issues related to the disease remain to be addressed. As the people living with HIV are aging, their medical care needs are expected to become more diversified and regionalized. Those residing beyond the boundaries of specialized hospitals will rely on general physicians for medical services. Hence, general physicians must have a non-discriminatory medical attitude toward people living with HIV and give more ethical consideration than for other diseases, such as privacy protection. Therefore, a nationwide survey was conducted to clarify the attitudes of general physicians, who do not specialize in HIV treatment, toward HIV and people living with HIV.

**Methods** An online questionnaire-based quantitative survey (February 14–16, 2022) yielded 212 valid responses. Questions covered proactivity in HIV care, attitudes toward ethical issues, and awareness of HIV in the context of stigmas. Although the sample size was small due to limited feasibility, similar populations were obtained in terms of distribution of mean age, gender, and type of practice, compared to official physician statistics.

**Results** Approximately 20% of respondents answered that refusing medical care due to HIV infection is acceptable. Younger physicians tended to be more negative toward HIV treatment, and, regardless of age, the negative attitude is correlated with aversion toward HIV infection itself.

**Conclusions** The findings aligned with concerning situations in Japan highlighted by other studies. They also suggested that more careful attitudes may be needed regarding the protection of the privacy of people living with HIV. However, research has also suggested that some physicians could become more positive by providing specialist support for the treatment and prevention of HIV infection. Large-scale and ongoing surveys are imperative to continuously implement effective and reliable interventions that could change the attitudes of general physicians toward people living with HIV.

**Keywords** HIV/AIDS, Physician, Attitude, Stigma, Ethical issue, Japan

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## Background

In Japan, several issues regarding the circumstances surrounding HIV infection remain to be addressed. However, the country has many accomplishments in terms of implementing measures to counter HIV infection. The number of patients with new HIV infections, including those diagnosed with AIDS, peaked in 2013, and registered a downward trend thereafter. Although the 95-95-95 care cascade, which is the goal set by the UNAIDS Global AIDS Strategy 2021–2026 [1], has insufficient data, the rate of access to treatment and virus suppression in the blood of those treated are said to be 95% or higher [2, 3]. Since the end of the 20th century, specialized hospitals nationwide have been providing medical care to people living with HIV, and public financial support to continue medication therapy is also generally in place [3].

Access to treatment for those who test positive in Japan has witnessed a certain level of improvement, but issues that need to be addressed nevertheless exist, including the difficulty in obtaining public coverage and starting medication immediately after diagnosis [3, 4]. Moreover, in general medical care, other than HIV treatment, a certain number of people living with HIV are refused treatment or they fail to disclose their infection to medical personnel for fear of being refused treatment [3, 5, 6]. A lag reportedly exists in the understanding of HIV among the general Japanese population [7, 8]. However, even when limited to medical access, the stigma surrounding HIV continues to be a major concern, and cases of HIV infection-related job refusal still occur in medical institutions [9]. Stigma among healthcare professionals is internationally known to be a barrier in access to medical care for people testing positive for HIV [10–14]. Advances in treatment technology have resulted in the lifespan of people infected with HIV increasing to the same level as non-infected people [15]. The medical needs of people living with HIV are reportedly diversifying owing to aging populations [13, 16, 17]. In Japan, people living with HIV have been progressively aging, and their medical care needs cannot be met solely by providing HIV-related medical care at specialized hospitals. Advances in diversification and regionalization are expected, and access to medical care for community-dwelling people living with HIV needs to be ensured beyond the framework of specialized hospitals [3].

These findings indicate that ensuring access to medical care for people living with HIV who are expected to reach advanced ages in the near future requires intervention by medical professionals at general medical institutions, not just medical institutions specializing in HIV, with a particular focus on physicians who are expected to have an attitude of non-discriminatory treatment toward people living with HIV. Simultaneously, given the stigma attached to HIV in society, ethical issues that require greater consideration also exist, such as protection of privacy, than other diseases. The definitions of stigma and discrimination are based on the UNAIDS Terminology Guidelines. Stigma is "a dynamic process of devaluation that significantly discredits a person in the eyes of other people, such as when certain attributes are seized upon within cultures or settings and defined as discreditable or unworthy. When stigma is acted upon, it may amount to discrimination" [18]. Discrimination is "any distinction, exclusion, restriction, preference, or other differential treatment based directly or indirectly on specific grounds of a person's identity and personal characteristics (e.g. race, age, sexual orientation, migrant background, gender identity), with the intention or effect of nullifying or impairing the recognition, enjoyment, or exercise, on an equal footing, of human rights and fundamental freedoms in the political, economic, social, cultural, or any other field of public life" [18].

First recognizing the current situation and then repeating long-term efforts and evaluations are believed to be important for addressing these issues. A survey of dentists in specific regions was conducted to assess attitudes toward people living with HIV and their treatment [19]. Specific academic societies have conducted surveys on physicians who do not specialize in HIV to examine their attitudes toward patients who are HIV positive and their treatment [20, 21]. However, no nationwide survey has been conducted so far. Therefore, this study conducted a nationwide survey to clarify the attitudes of general physicians, who do not specialize in HIV treatment, toward HIV and people living with HIV. To the best of our knowledge, this is the first nationwide survey in Japan of physicians not specializing in HIV.

## Method

We conducted a quantitative survey involving physicians who do not specialize in HIV. The web-based survey was conducted from February 14–16, 2022, by a survey company.

### Study sample

The participants included physicians with medical experience in Japan who did not meet any of the following two exclusion criteria:

i) Dentists: In dentistry, refusal of treatment to patients who are HIV positive is a particular problem in Japan, as highlighted in several surveys [19]. However, the training course for dentists is different from that of other general physicians, and medical conditions also differ; therefore, a separate survey was judged necessary.

ii) Physicians who specialize in HIV: The participant must not be a physician or specialist certified by the Japanese Society for AIDS Research and must not be a medical specialist who routinely provides HIV treatment at a medical institution specializing in such treatment.

According to the 2018 "Statistics for Physicians, Dentists, and Pharmacists" (Ministry of Health, Labour, and Welfare of Japan), the number of physicians in Japan, excluding dentists, who constitute the population of this survey, totals 327,210 in terms of notifications [22]. Since the number of HIV infection specialists, which is an exclusion criterion, is believed to be insignificant, the expected population is estimated to be approximately 320,000 people. Based on this, the number of valid responses (sample size) obtained from the survey was 212. Thus, the ideal sample size for a survey targeting a population of this size, assuming a 5% margin of error, would be approximately 400; however, during negotiations with the survey company, securing the ideal sample size for an Internet survey targeting an online general panel was difficult, and as a result, smaller in size than the ideal one. However, if the acceptable margin of error is within 10% (sample size: approximately 200), the data can be judged to be adequate. Such a smaller data size may be considered unreliable. However, we consider this research study to be a pilot for the implementation of a full-scale survey in the future. Therefore, the purpose of this survey is not to calculate precise figures but, rather, to present a hypothetical framework for understanding the general trends in responses and attitudes of a target population for which no previous research has been conducted. Whether the hypotheses presented herein can be replicated in a large-scale survey to address the attitudes of general physicians in Japan and the issue of monitoring in the future remains to be determined.

Recruitment of participants and collection of response data were conducted by a contracted research company. The company invited people who had previously registered with its related panels and mainly listed their occupation as "doctor" to participate in the survey. 5,000 people were asked to answer screening questions to determine their eligibility, and those who agreed to participate in the survey proceeded to answer the questionnaire. When the number of respondents exceeded 200, reaching 223, the survey was closed. If the recruitment period had been extended further, it would have been difficult to recruit additional participants from these panels. No allocation was made based on region or gender. Respondents were provided with reward points of the research company, but these were equivalent to a very small amount of cash.

### The questionnaire

One of the primary questions of this survey is "to what extent are the attitudes of general physicians toward HIV treatment positive (or negative, and what variables correlate with this attitude)?" The questions were as follows: (i) Positivity toward HIV treatment (The question is "Should it be permissible to refuse medical treatment on the basis of HIV infection?"; Likert scale ranging from "Agree" to "Disagree"; Details are provided in Table 2 of the results); (ii) Attitude toward ethical issues (The questions concern obtaining informed consent (IC), privacy and confidentiality, guidance on sexual behavior for people living with HIV, and attitudes toward drug users; Likert scale ranging from "Agree" to "Disagree"; Details are provided in Table 2 of the results); (iii) Resistance to treatment depending on infection route (The questions deal with the patient's route of infection, including opposite sex, men who have sex with men [MSM], drug intake, blood transfusion, and about patients who have been examined in the past; Likert scale ranging from "Resistant" to "Not resistant"; Details are provided in Table 3 of the results); (iv) Anxiety surrounding HIV treatment (Select one option from a total of eight choices in the "Avoidance from other staff," "Infection risk to myself," and "Free comments" section; Details are provided in Table 6 of the results); (v) Opinions about HIV (Questions are related to stigma; Likert scale ranging from "Agree" to "Disagree"; Details are provided in Table 4 of the results); vi. Knowledge about HIV (Questions test knowledge such as the current status of medication treatment; Likert scale ranging from "very familiar" to "not familiar at all."); vii) Awareness of undetectable = untransmittable (U = U) (The questions are as follows: After an explanation of U = U, participants are asked to rate their level of trust in the finding on a Likert scale ranging from "trustworthy" to "untrustworthy." They are also asked to indicate whether they agree or disagree that U = U will promote the generalization of HIV treatment on a Likert scale ranging from "agree" to "disagree."); and viii) Participant experience and attributes (The questions deal with medical experience, training history, medical department, nature of affiliated institution, preparation of needlestick accident response, age, sex, etc. Some of the main ones are described in detail in Table 1 of the results). Questions relating to stigma referred to "Measuring HIV stigma and discrimination among health facility staff" [23]. The overall questionnaire structure and content referred to surveys conducted among medical professionals in the United States [12] and a systematic review [14].

Regarding the selection of questions, we selected questions related to the level of enthusiasm of general practitioners toward clinical practice and issues considered to be related to this from the questions used in the above-mentioned previous studies. Ethical issues that are a concern in clinical practice were selected based on discussions in the field of medical ethics [24]. Furthermore, the questions

**Table 1** Participant attributes ($N=212$)

| | |
|---|---|
| Age group | 20s/30s: 27 (12.7%)<br>40s: 38 (17.9%)<br>50s: 77 (36.3%)<br>≥ 60s: 70 (33.0%) |
| Sex | Male: 171 (80.7%) Female: 41 (19.3%) |
| Medical department* | Internal medicine: 85 (40.1%)<br>Surgery: 49 (23.1%)<br>Others: 78 (36.8%) |
| Work type | Full-time physician: 147 (69.3%)<br>Part-time physician: 28 (13.2%)<br>Trainee doctor: 3 (1.4%)<br>Practitioner: 34 (16.0%) |
| No. of beds at the affiliated medical institution | < 20 beds: 69 (32.5%) ≥ 20 beds: 143 (67.5%) |
| HIV treatment experience | Yes: 59 (27.8%) No: 153 (72.2%) |

*Medical department types: internal medicine (including respiratory medicine, neurology, and palliative care), surgery (including plastic surgery), and others (e.g., pediatrics, obstetrics and gynecology, psychiatry, dermatology, urology, ophthalmology, otorhinolaryngology, and anesthesiology)

addressed ethical issues, such as whether confidentiality should be waived, but without prejudging whether such actions are legal or not. The questions were designed to elicit respondents' ethical attitudes. In addition, the co-researchers for this survey include HIV specialists, general practitioners, and individuals involved in activities supporting people living with HIV, among other stakeholders with expertise in HIV. The selection of survey questions was based on the empirical knowledge of the co-researchers.

### Statistical analysis

We focused on descriptive statistics for each variable. The variable corresponding to the main hypothesis, "Should it be permissible to refuse medical treatment on the basis of HIV infection?" was used as the dependent variable. Multiple cross-tabulations and statistical differences were analyzed using other variables as independent variables to clarify trends. Additionally, as previously mentioned, attitudes toward main ethical issues (e.g., obtaining IC, lifting confidentiality obligations) are aspects that require special consideration when treating patients who are HIV positive. Therefore, this was treated as a dependent variable, similar to the positivity toward medical treatment. In addition, we conducted a similar analysis to examine variables that correlated with attitudes toward ethical issues using other variables as independent variables. SPSS v.28 was employed for the analysis.

### Ethical considerations

To protect the participants' privacy, the survey was conducted anonymously, and we did not obtain any personal information. Additionally, the participants were allowed to answer the questionnaire voluntarily after reading a text that explained the purpose of the survey. Both survey participation and withdrawal were voluntary.

The appropriateness of the study, including the above-mentioned ethical considerations, was reviewed by the ethics committee, and the survey was conducted after obtaining approval from the committee and the head of the affiliated institution (the Ethics Committee of Tohoku University Graduate School of Medicine: Approval No. 2021-1-967, Shiga University of Medical Science Research Review Board: Approval No. RRB23-027).

## Results

### Characteristics

Of the 223 respondents, 212 were included in the analysis after excluding 11 who did not meet the eligibility criteria, such as dentists and veterinarians, in response to the question regarding medical departments. Participant attributes and the nature of their affiliated institutions are presented in Table 1.

Regarding age distribution, the mean age was 53.52 (minimum: 25, maximum: 82, standard deviation: 11.230 years). A total of 171 participants were males (80.7%), and 41 were females (19.3%), with none answering "other." Regarding medical departments, 85 (40.1%), 49 (23.1%), and 78 (36.8%) were in internal medicine, surgical departments, and other departments, respectively. Under the Japanese medical institution classification, institutions with ≥ 20 beds are termed as hospitals and those with < 20 beds as clinics. The breakdown of participants' affiliated medical institutions was as follows: hospitals with ≥ 20 beds, 143 individuals (67.5%); clinics with < 20 beds, 69 individuals (32.5%). With regard to HIV treatment experience, 59 (27.8%) responded that they had previous such experience, and 153 (72.2%) had no such experience.

As previously mentioned, the survey included only physicians. According to a 2020 survey by the Ministry of Health, Labour, and Welfare of Japan, the distribution is as follows: mean age: 50.1; sex: 77.2% males and 22.8% females; medical department: 36.2% internal medicine-related fields and 18.5% surgery-related fields; and affiliated medical institution: 66.8% hospitals and 33.1% clinics [22]. A comparison of the characteristics of the population and valid participants revealed that the mean age of this survey sample was moderately older with marginally fewer women, and the internal-to-surgical department ratio was comparatively lower. However, no major deviations from the population were observed, including the distribution of affiliated medical institutions. Therefore, the data sample used in the subsequent analysis was considered generally suitable for capturing the characteristics of the population.

### Attitudes toward HIV treatment

The questions regarding positivity toward HIV treatment and attitudes toward each ethical issue are presented in Table 2.

The question, "I think it should be permissible to refuse medical treatment on the basis of HIV infection," was positioned as a variable that primarily indicates positivity toward HIV treatment ("positivity toward HIV"), and the results were as follows: "agree/somewhat agree that it should be allowed," which was considered negative, accounting for 41 individuals (19.4%); "disagree/somewhat disagree that it should be allowed," which was considered positive, accounting for 123 individuals (58.0%); and "neither agree nor disagree," accounting for 48 individuals (22.6%).

Regarding variables believed to be one of the main ethical issues, 145 individuals (68.4%) said obtaining IC for HIV tests should be clearly differentiated from that for other tests, while 174 individuals (82.1%) believed that the police should be notified of illegal drug use, with each attitude accounting for the majority. Meanwhile, regarding whether physicians should be allowed to inform sexual partners of the risk of infection without the consent of people living with HIV, 76 individuals (35.9%) responded "agree/somewhat agree that it should be allowed," and 73 (34.5%) responded "disagree/somewhat disagree," thus indicating that both attitudes were balanced.

Regarding ethical issues, we also obtained variables that asked about attitudes in specific situations, such as: "do you think that obtaining permission from an affected individual's family for an HIV test should be allowed," and "should disclosing results of a positive test to the family without the individual's consent be allowed." SC1 and SC2 in Table 2 present the results. The specific situations are as follows:

- The man (in his 20s) was accompanied by his parents to a hospital following a high fever of 39 °C.
- An individual was rushed to the hospital with suspected viral meningitis but was diagnosed with a possible acute HIV infection due to symptoms such as fever and diarrhea.
- The patient is conscious but somewhat dazed because of high fever and is able to communicate in a simple manner by nodding in response to questions from medical staff.

Next, attributes of people living with HIV, particularly resistance toward medical treatment by the infection route, are presented in Table 3.

The proportion of participants who responded "resistant" or "somewhat resistant" was highest for sharing needles during illegal drug use (118 individuals, 55.7%) and decreased in the order of MSM activity (74 individuals, 34.9%), sexual activity with the opposite sex (57 individuals, 26.9%), previously treated patient (regardless of infection route) (43 individuals, 20.3%), and blood transfusion or blood products (39 individuals, 18.4%).

**Table 2** Positivity toward treatment of people living with HIV and attitudes toward each ethical issue ($N=212$)

| | Agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Disagree |
|---|---|---|---|---|---|
| 1 I think it should be permissible to refuse medical treatment on the basis of HIV infection. | 15 (7.1%) | 26 (12.3%) | 48 (22.6%) | 57 (26.9%) | 66 (31.1%) |
| 2 HIV testing should be differentiated from other general tests, and IC should be obtained. | 87 (41.0%) | 58 (27.4%) | 34 (16.0%) | 18 (8.5%) | 15 (7.1%) |
| 3 Patients who are infected through sexual activity should be strictly instructed to refrain from sexual activity. | 33 (15.6%) | 49 (23.1%) | 70 (33.0%) | 37 (17.5%) | 23 (10.8%) |
| 4 Physicians should be allowed to communicate the risk of infection to sexual partners of people living with HIV without their consent. | 36 (17.0%) | 40 (18.9%) | 63 (29.7%) | 36 (17.0%) | 37 (17.5%) |
| 5 If it becomes known that a person who is HIV positive is using illegal drugs, they should be reported to the police. | 121 (57.1%) | 53 (25.0%) | 22 (10.4%) | 10 (4.7%) | 6 (2.8%) |
| 6 If it becomes known that a person who is HIV positive is using illegal drugs, refusal of medical treatment should be allowed. | 55 (25.9%) | 41 (19.3%) | 52 (24.5%) | 45 (21.2%) | 19 (9.0%) |
| SC1 I think that an HIV test can be explained to a family member rather than the affected individual for obtaining permission to conduct the test. | 70 (33.0%) | 62 (29.2%) | 37 (17.5%) | 24 (11.3%) | 19 (9.0%) |
| SC2 Test results revealed HIV infection. No significant changes were observed in the patient's state of consciousness. I think that the test results can be conveyed to the family without the affected individual's consent. | 40 (18.9%) | 49 (23.1%) | 46 (21.7%) | 33 (15.6%) | 44 (20.8%) |

**Table 3** Resistance according to people living with HIV attributes (infection route, previous medical experience) (*N* = 212)

| | Resistant | Somewhat resistant | Neither | Somewhat not resistant | Not resistant |
|---|---|---|---|---|---|
| 1 People living with HIV infected through sexual activity with person of opposite sex | 17 (8.0%) | 40 (18.9%) | 55 (25.9%) | 55 (25.9%) | 45 (21.2%) |
| 2 People living with HIV infected through MSM activity | 23 (10.8%) | 51 (24.1%) | 55 (25.9%) | 41 (19.3%) | 42 (19.8%) |
| 3 People living with HIV infected after illegal drug use (sharing needles) | 53 (25.0%) | 65 (30.7%) | 36 (17.0%) | 29 (13.7%) | 29 (13.7%) |
| 4 People living with HIV who were infected through blood transfusion or blood products | 12 (5.7%) | 27 (12.7%) | 54 (25.5%) | 53 (25.0%) | 66 (31.1%) |
| 5 HIV-positive person who was previously examined and subsequently found to be infected with HIV | 12 (5.7%) | 31 (14.6%) | 63 (29.7%) | 53 (25.0%) | 53 (25.0%) |

**Table 4** Opinions toward people living with HIV (*N* = 212)

| | Agree | Somewhat agree | Neither | Somewhat disagree | Disagree |
|---|---|---|---|---|---|
| 1 Resistant to the idea of working with staff who have tested positive at the same medical institution. | 12 (5.7%) | 42 (19.8%) | 56 (26.4%) | 63 (29.7%) | 39 (18.4%) |
| 2 Feel that other staff members will avoid me if I am involved in the medical care of people living with HIV. | 14 (6.6%) | 45 (21.2%) | 56 (26.4%) | 57 (26.9%) | 40 (18.9%) |
| 3 Feel that those who were infected through sexual activity are at fault. | 6 (2.8%) | 35 (16.5%) | 86 (40.6%) | 48 (22.6%) | 37 (17.5%) |
| 4 Feel that people living with HIV have many sexual partners | 12 (5.7%) | 52 (24.5%) | 95 (44.8%) | 34 (16.0%) | 19 (9.0%) |
| 5 Females who are HIV positive should not become pregnant or give birth. | 9 (4.2%) | 31 (14.6%) | 78 (36.8%) | 58 (27.4%) | 36 (17.0%) |
| 6 People living with HIV who engage in sexual activity without telling the other person that they are infected should be punished. | 63 (29.7%) | 73 (34.4%) | 59 (27.8%) | 9 (4.2%) | 8 (3.8%) |
| 7 Feel that I would be ashamed if I were infected with HIV. | 20 (9.4%) | 53 (25.0%) | 83 (39.2%) | 33 (15.6%) | 23 (10.8%) |

Concerning anxieties regarding treating people living with HIV, the highest proportions were made up by "lack of skills to deal with people living with HIV" (75 individuals, 35.4%), followed by "infection risk to myself" (54 individuals, 25.5%), "no anxieties in particular" (36 individuals, 17.0%), "infection risk to other staff" (17 individuals, 8.0%), "avoidance from other staff" and "avoidance from other patients" (12 individuals each, 5.7%), and "moral resistance toward people living with HIV" (6 individuals, 2.8%), which was the lowest. A free-response column was also provided as "Other," but no participant provided a response.

### Opinions toward people living with HIV

The opinions relating to stigma toward people living with HIV are presented in Table 4.

The proportion of those who felt that people living with HIV who engage in sexual activity without telling the other person that they are infected should be punished totaled 136 individuals (64.1%), which was the only variable that exceeded the majority.

### Variables correlated with positivity toward HIV treatment

We analyzed our main hypothesis, that is, positivity toward HIV treatment as the dependent variable and other variables as independent variables. The results revealed different trends depending on independent variables such as demographics, ethical attitudes, medical anxieties, and opinions relating to stigma. The main variables were as follows.

First, cross-tabulation is related to the following variables: age and medical anxiety.

#### *Age*

Regarding age, the results of cross-tabulation in four categories (20s, 30s, 40s, 50s, and ≥ 60s) are reported in Table 5.

The proportion of those with a negative response toward HIV treatment ("agree," "somewhat agree") and with a positive response toward HIV treatment ("somewhat disagree," "disagree") were 33.3% / 37% for those in their 20s/30s, 23.7%/50% for those in their 40s, 19.5%/58.4% for those in their 50s, and 11.4%/70% for

**Table 5** Cross-tabulation between positivity toward HIV treatment and age group ($N=212$)

| | I think it should be permissible to refuse medical treatment on the basis of HIV infection. | | |
|---|---|---|---|
| | Agree/ Somewhat agree | Neither | Somewhat disagree/ Disagree |
| 20s/30s | 9 (33.3%) | 8 (29.6%) | 10 (37.0%) |
| 40s | 9 (23.7%) | 10 (26.3%) | 19 (50.0%) |
| 50s | 15 (19.5%) | 17 (22.1%) | 45 (58.4%) |
| ≥ 60s | 8 (11.4%) | 13 (18.6%) | 49 (70.0%) |

**Table 6** Cross-tabulation between positivity toward HIV treatment and greatest anxiety ($N=212$)

| | I think it should be permissible to refuse medical treatment on the basis of HIV infection. | | |
|---|---|---|---|
| | Agree/Somewhat agree | Neither | Somewhat disagree/Disagree |
| Avoidance from other staff | 4 (33.3%) | 3 (25.0%) | 5 (41.7%) |
| Avoidance from other patients | 4 (33.3%) | 3 (25.0%) | 5 (41.7%) |
| Infection risk to other staff | 1 (5.9%) | 5 (29.4%) | 11 (64.7%) |
| Infection risk to myself | 16 (29.6%) | 10 (18.5%) | 28 (51.9%) |
| Lack of skills to deal with people living with HIV | 12 (16.0%) | 17 (22.7%) | 46 (61.3%) |
| Moral resistance toward people living with HIV | 2 (33.3%) | 3 (50.0%) | 1 (16.7%) |
| No anxieties in particular | 2 (5.6%) | 7 (19.4%) | 27 (75.0%) |
| | 41 (19.3%) | 48 (22.6%) | 123 (58.0%) |

those in their 60s and higher, respectively, with positive attitudes increasing with age. The results of the chi-square test at the 10% significance level ($p=0.091$) and linear-by-linear association test ($p=0.001$) were both significant.

#### *Greatest anxiety while treating people living with HIV*

Cross-tabulation results (Table 6) established that the top three variables where the proportion of those with positive attitudes toward HIV treatment was higher than the proportion of those with negative attitudes were as follows: "no anxieties in particular" (75% of participants displayed a positive attitude, same below), "infection risk to other staff" (64.7%), and "lack of skills to deal with people living with HIV" (61.3%). Only these variables were higher than the overall proportion who had a positive attitude toward HIV treatment (58.0%). The chi-square test ($p=0.071$) was significant at the 10% significance level.

Next, in the correlation analysis, each item was scored on a four- or five-point scale and analyzed using these as an ordinal scale. The ambiguity of the correlation coefficient cannot be ruled out because the response range as a quantitative variable is minor, but the overall trends among variables can be read. The correlation coefficient and p-value are listed in parentheses.

#### *Other ethical attitudes*

An analysis of the correlation between positivity toward HIV treatment and other ethical attitudes revealed significant correlations for the following variables. Positive correlations with a negative attitude toward medical treatment were observed. Essentially, as attitudes toward medical treatment turned negative, a tendency for the following judgments emerged: "Patients who are infected through sexual activity should be strictly instructed to refrain from sexual activity" (0.312, < 0.001); "Physicians should be allowed to communicate the risk of infection to sexual partners of people living with HIV without their consent" (0.235, < 0.001); "If it becomes known that a person who is HIV positive is using illegal drugs, refusal of medical treatment should be allowed" (0.315, < 0.001); and "I think that HIV infection should be disclosed to family members even without the individual's consent" (0.207, < 0.001), which is a response under the SC2 specified situation.

#### *Attributes of people living with HIV*

An analysis of the correlation with each attribute of people living with HIV, such as the infection route, indicated that all variables had a significant correlation. All the variables had positive correlations with negativity and resistance toward medical treatment. With increased negativity, a tendency for greater resistance emerged, even for the following attributes: "infection due to sexual activity with those of the opposite sex" (0.353, < 0.001), "infection due to MSM activity" (0.314, < 0.001), "infection due to illegal drug use (sharing needles)" (0.338, < 0.001), "infection due to blood transfusion and blood products" (0.406, < 0.001), and "previously treated patients" (0.425, < 0.001).

#### *Awareness related to stigma*

An analysis of the correlation with awareness related to stigma revealed that the following variables had significant correlations and a correlation coefficient of ≥ 0.2.

The following had a positive correlation with negativity toward medical treatment. As such negativity increased, participants felt the following: "Resistant to the idea of working with staff who have tested positive at the same medical institution" (0.374, < 0.001), "Feel that other staff will avoid me if I am involved in medical care of people living with HIV" (0.231, < 0.001), "Feel that those who were infected through sexual activity are at fault" (0.232, < 0.001), "Feel that people living with HIV have many sexual partners" (0.271, < 0.001), "Females who are HIV positive should not become pregnant or give birth" (0.300, < 0.001), and "Feel that I would be ashamed if I were infected with HIV" (0.270, < 0.001).

### Variables correlated with privacy, such as obtaining IC and confidentiality

#### *Correlation between obtaining IC for tests from family members and disclosing results and age*

A cross-tabulation of the correlation between the proportion of those who felt that obtaining IC for an HIV test and disclosing positive results to family members without the affected individual's consent under specified circumstances (SC1/2) and age group established the following results. For obtaining IC for tests, 51.9% of those in their 20s and 30s felt that this should be allowed, as opposed to 65.7% of those aged 60 and older. For disclosure of positive results, 33.3% of those in their 20s and 30s felt that this should be allowed, as opposed to 54.3% of those aged 60 and older. These results indicated that those in the older age groups were more accepting of obtaining IC from a family member without the affected individual's consent and disclosing the results. However, the difference was not significant at the 10% significance level.

#### *Correlation between confidentiality and HIV training history and knowledge about needlestick accidents*

We cross-tabulated the attitude of lifting confidentiality obligations, that is, informing the sexual partner of a person who is HIV positive about infection risk without the affected individual's consent should be allowed, with other variables. A comparison between the proportion of those with and without a history of HIV training during their university years and those who were tolerant of lifting confidentiality obligations (45.2% and 33.5%, respectively) revealed that those with a history of training tended to be more tolerant of lifting confidentiality obligations. However, the difference is not significant at the 10% level.

Additionally, a comparison between the proportion of those who responded that a manual for dealing with needlestick accidents is available at their affiliated institutions and were tolerant about lifting confidentiality obligations (42.7%) and the proportion of those who responded that no manual is available or they are not aware of such a manual and were tolerant about lifting confidentiality obligations (30.9%) revealed that the former were more positive toward lifting confidentiality obligations. A comparison between the proportion of those who responded that they knew a medical institution where they could consult after a needlestick accident, and who were tolerant about lifting confidentiality obligations (46.0%) and the proportion of those who responded that they do not have such a medical institution or were not sure and who were tolerant about lifting confidentiality obligations (26.8%) indicated that those who knew a medical institution were more positive toward lifting confidentiality obligations. The results of these tests (former: $p = 0.094$, latter: $p = 0.006$) were significant.

Next, correlation analysis established a positive correlation between those who had knowledge of infection prevention through antiretroviral therapy regarding needlestick accidents (correlation coefficient: 0.167, $p = 0.015$) and a tendency to be more positive about lifting confidentiality obligations.

## Discussion

### Comparison of participant group and population

As described in the methods section, a sample of nearly 400 participants were required to keep the allowable error within 5%. However, owing to feasibility limitations, the margin of error was increased to 10%; therefore, it is difficult to say that a sufficient sample size was achieved. However, we were able to target a population that roughly approximated the mean age, sex, medical department type, and affiliated medical institution type reported in official population statistics. We were able to collect data on a target population that met the purpose of surveying the trends of general physicians in Japan.

### Attitudes toward HIV treatment

Regarding general physicians' attitudes toward HIV treatment, the overall proportion of those who felt that refusing treatment is acceptable amid concerns of HIV infection was approximately 20%. Despite the difficulty concluding the extent without comparing attitudes toward other sexually transmitted diseases, hepatitis, tuberculosis, and other infectious and non-infectious diseases, Japan has universal health insurance, which provides free access to any medical institution, and with the exception of the current COVID-19 pandemic, refusal of medical treatment is generally not a topic of discussion in the mass media. Given the above-mentioned situation in Japan, the fact that one in five physicians believes that refusal should be allowed cannot be considered a small percentage.

However, a specialist system is being developed to ensure the quality of medical care in each field. To promote these efforts, the Japanese Medical Specialty Board was established in 2014 [25], amid a growing trend toward referring an affected individual to a specialist. This trend is believed to be stronger among younger physicians in terms of education and practice. Specifically, younger physicians more likely believe that not making judgments based on feelings of refusal, and connecting people living with HIV to specialists rather than providing medical care themselves, is a desirable patient and medical practice. Therefore, regarding the variables that asked about positivity toward medical treatment, a certain proportion of those who expressed a negative attitude based their response on better provision of medical care rather than refusal.

However, the correlation with other variables reveals that the main reason for negativity toward HIV treatment is an attitude of refusal. Regarding attitudes toward ethical issues, a significantly positive correlation with attitudes toward lifting confidentiality obligations and disclosing results to family members was observed, including the tendency of a positive attitude such as "should be given strict instructions to refrain from sexual activity," and a tendency to prioritize infection control over sexual health and privacy of people living with HIV was also thought to exist. Additionally, the correlation with resistance according to the attribute of people living with HIV, such as according to infection route, revealed that all variables had a significantly positive correlation with the tendency to show more resistance. Furthermore, regarding the correlation between stigma and associated variables, a significantly positive correlation was observed with tendencies such as aversion to working with others as co-workers, the feeling that it is the affected individual's own fault, and the feeling that it was shameful to be infected, thereby demonstrating a correlation with an attitude of refusal toward people living with HIV existed.

Therefore, the overall trend was that younger participants were more negative toward HIV treatment and, regardless of age, the main basis for the negative attitude is the feeling of aversion toward HIV infection itself. Owing to sample size limitations, to conclusively state that younger physicians are more reluctant to provide HIV treatment because they have greater aversion to treating HIV patients is difficult. Therefore, to reliably uncover the trends in more segmented populations, such as age groups, medical departments, and sex, is important by collecting data from more participants so that effective interventions can be implemented among general physicians.

Next, we provide a more detailed discussion of the variables that are significantly correlated with positivity toward HIV treatment.

Regarding age, the above-mentioned interpretation was not only present, but the professionalism of the physician changed with age. Considering that the specialist system is relatively new, a major shift in professionalism may have occurred, as seen in the generation that has cultivated an attitude of providing medical care as long as there is a patient in front of them, regardless of their specialty, and the generation now preferring to leave matters to specialists as much as possible [26]. Previous studies have shown a similar tendency for younger people to be more reluctant to seek medical treatment. A stigma survey conducted among healthcare workers in the Netherlands, using the "Measuring HIV stigma and discrimination among health facility staff" [23] questionnaire, showed that healthcare workers aged 25 and under were more likely to exhibit thoughts and behaviors indicative of stigma, such as fear of infection and excessive and unnecessary use of infection control measures [27]. Such differences in trends by age may be considered more international trends. If future surveys secure a sufficient number of respondents, we believe that comparisons with such international trends will provide further insights into the effectiveness of interventions.

With regard to the greatest anxieties regarding treatment of people living with HIV, the group that answered "no anxieties in particular" accounted for the largest proportion, with groups expressing anxieties about infecting other staff members or their own skills being more positive toward medical treatment. Ignoring the fact that no room exists for doubt for the positivity of those who are not particularly aware of HIV infection, such as those with no anxieties, physician groups that believed that the appropriateness of infection control and provision of medical care in clinical settings are issues in themselves were more positive toward HIV treatment. Having a specialized follow-up system for infection control and medical care provision may be effective when expanding access to general medical care in the community for people living with HIV.

Regarding awareness related to stigma, its correlation with attitudes favoring punishment for engaging in sexual activity without disclosing HIV infection is one aspect that should be considered. Whether to disclose HIV infection during sexual activity is a complex issue from a legal and ethical perspective, and to simply say that any one position is correct is difficult [28, 29]. However, international organizations such as UNAIDS have argued that HIV infection-specific criminalization is discriminatory and a barrier to countermeasures [30]. Furthermore, given the seriousness of HIV infection and trends for reasonably reducing the possibility of infection such as

U = U, worldwide movements have sought to reconsider criminalization [31, 32]. Combined with the significant correlation between a positive attitude toward instructions of refraining from sexual activity and a negative attitude toward HIV treatment, general physicians need to be provided the opportunity to consider the sexual health of people living with HIV.

Another area of concern with regard to awareness related to stigma is the high correlation between unwillingness to work with people living with HIV as co-workers and the attitude of refusal of treatment. First, the results of this survey established that the proportion of people who showed resistance toward working with people living with HIV as co-workers was approximately one in four, which cannot be considered insignificant. Over the past 10 years, a series of court precedent rulings in Japan regarding the refusal of employment for medical workers infected with HIV [9, 33] have taken place and in all these cases, refusal of employment was ruled unfair. However, the mere fact that refusal of employment occurs is itself a threat to the daily lives of people living with HIV, and it is considered even more serious as this is occurring in medical institutions. Unfortunately, the fact that countermeasures for HIV stigma in medical institutions, particularly among physicians, is one of the most important issues in Japan was also confirmed in this survey.

#### Ethical attitudes

No definitive correct answer exists regarding attitudes about IC acquisition or confidentiality obligations. While it is important that only the HIV test be independent and IC be obtained to better respect the autonomy of the examinee, the fact that the test be presented by the provider as part of a routine check-up is also important to eliminate barriers from other tests to expand opportunities for examinees [34, 35]. However, people in Japan cannot be said to have a sufficient understanding of HIV infection, and the Ministry of Health, Labour, and Welfare of Japan encourages individuals to obtain individual IC for HIV tests [36]. Regarding confidentiality obligations, although the protection of third parties who are at risk of infection is important, a strong stigma nevertheless exists, such as the disadvantage faced by people living with HIV if their infection is revealed, and the importance of confidentiality obligations cannot be denied. Furthermore, even though it depends on the condition of people living with HIV themselves, a very careful approach should be adopted when obtaining IC for tests from family or disclosing results to family in cases where the individual has some degree of understanding, as in the present case. Overall, although one approach or the other cannot be said to be correct, a need exists for a careful approach regarding attitudes that obtaining IC for the HIV test does not need to be distinguished from other tests, confidentiality obligations can be lifted, and IC acquisition for tests and disclosure of results can be done with family members.

In particular, the findings documented that older physicians tended to be more accepting of IC acquisition for tests or disclosure of results with family members under specified conditions. This accepting attitude can be considered an expression of various forms of awareness, such as the traditional view of the family as a single unit, and the conceptualization that priority is given to ensuring the diagnosis and intervention of HIV infection. However, in all these cases, such attitudes prioritize these forms of awareness rather than the protection of the privacy of people living with HIV.

In addition, those who had received training on HIV in medical school, had knowledge as to how to respond to a needlestick accident, and confirmed the response given by their affiliated medical institution in the event of such an accident tended to be more accepting of lifting confidentiality obligations. Those who responded "yes" to these variables may be more aware of infection risk management.

Given that none of these were ethically wrong attitudes, future large-scale surveys to examine the nature of attitudes that are more accepting of the sharing of information about infection with family members and the lifting of confidentiality obligations will enable interventions that encourage each physician to make ethically-valid considerations.

#### Limitations

As previously mentioned, the allowable error was set at up to 10%; therefore the sample size cannot be considered necessarily sufficient. Therefore, even if interesting statistically significant results are derived in the analyses where the population is subdivided, these should be carefully interpreted. However, as indicated in the results and interpretations, the fact that the distribution of the main demographics such as age, sex, and medical department are similar to the population can be considered a factor that compensates for an insufficient sample size.

Next, as the survey targets a general panel registered with the company that commissioned the survey, limits on whether the participants truly meet the eligibility criteria exist. To the extent possible, we recruited people who had been respondents as physicians on the same panel in the past, but this was not the case for all participants, and in either case, the limitation itself would not be resolved.

Furthermore, regarding social desirability bias, we took measures such as allowing anonymous responses and reviewing the wording with the co-researcher who is a physician, but the analysis was conducted with the

understanding that some bias still remained. However, even though some bias remains, we believe that the dispersion trends shown are worth referring to.

Therefore, the tendencies of general physicians who do not specialize in HIV treatment in Japan that were derived from this survey need to be carefully interpreted. However, this survey can serve as a major steppingstone for obtaining more reliable analysis results through future large-scale surveys.

## Conclusion

Despite being a pilot study, a nationwide survey of physicians who did not specialize in HIV treatment revealed some areas of concern among the participants, such as the fact that 20% approved of refusal of treatment, which may be based on deep-rooted resistance to HIV infection and people living with HIV. These survey results are consistent with actual lawsuits in Japanese society regarding refusal of employment at medical institutions, testimonies of refusal of medical treatment of people living with HIV, and resistance toward the disclosure of infection status at general medical institutions. The results also suggested that more careful attitudes may be needed regarding the protection of the privacy of people living with HIV.

However, groups that were positive toward treatment to some extent could become more positive by providing specialist support for the treatment and prevention of HIV infection, with the possibility that interventions can change the attitudes of general physicians.

This survey was limited in its ability to reveal the true nature of resistance to HIV infection and people living with HIV. Conducting large-scale and continuous surveys is imperative to continuously implement more effective and reliable interventions that could lead to changes in the attitude of general physicians.

### Abbreviations

| | |
|---|---|
| IC | Informed consent |
| MSM | Men who have sex with men |
| U | U undetectable = untransmittable |

### Authors' contributions

T.O. wrote the main manuscript text and Y.I. mainly conducted statistical analysis. T.O., Y.I. and K.Y. mainly made the questionnaire. All authors have made substantial contributions to the design of the work including the creation of questionnaire, the analysis and interpretation of data and the review of the draft and revisions of the paper. All authors reviewed the manuscript. T.O. and Y.I. are equal contributors as the first author.

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### Data availability

The datasets generated and analysed during the current study are not publicly available due to ongoing analysis but are available from the corresponding author on reasonable request.

## Declarations

### Ethics approval and consent to participate

To protect the participants' privacy, the survey was conducted anonymously, and we did not obtain any personal information. Additionally, the participants were allowed to answer the questionnaire voluntarily after reading a text that explained the purpose of the survey. Both survey participation and withdrawal were voluntary. Informed consent was obtained from all participants for the participation of the study. The appropriateness of the study, including the above-mentioned ethical considerations, was reviewed by the ethics committee, and the survey was conducted after obtaining approval from the committee and the head of the affiliated institution (the Ethics Committee of Tohoku University Graduate School of Medicine: Approval No. 2021-1-967, Shiga University of Medical Science Research Review Board: Approval No. RRB23-027). Furthermore, this survey conforms to the Helsinki Declaration and the corresponding ethical guidelines in Japan, the Ethical Guidelines for Medical and Biological Research Involving Human Subjects.

### Consent for publication

Not applicable.

### Competing interests

The authors declare no competing interests.

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## Publisher's Note