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Public awareness, attitudes, and motivation toward biobanks: a survey of China



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Abstract

Background Biobanks are vital for advancing medical research, and public participation is a crucial determinant of their success. This study uses a survey to assess the awareness, attitudes, and motivation of the public in China with regard to participating in biobanks.

Methods We conducted an online survey that yielded 616 responses from participants with diverse demographic backgrounds. The survey included questions on the respondents' awareness of biobanks, their attitudes toward them, their preferences with regard to consent, and their concerns.

Results The results of the survey revealed that 57.95% of the respondents were aware of biobanks. Altruism was the respondents' primary motivation for participation in biobanks. Their preferences for models of consent varied. The respondents raised concerns about the commercialization of biobanks (56.66%) and data privacy (55.84%). Notably, only 37.01% of the respondents were concerned about the risk of discrimination in biobanks, where this was lower compared with the results for populations in Western countries.

Conclusions This study provides valuable insights into the Chinese public's awareness of and attitudes toward biobanks. To foster public trust and enhance participation, biobanks should prioritize transparent and continual communication to ensure that the participants are well informed about the use and protection of the samples that they have donated. Future research should explore the influence of cultural nuances to develop strategies that address specific concerns and ethical challenges in the context of public participation in biobanks.

Keywords Biobanks, Public awareness, Attitudes, Altruism, Consent

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Background

Significant advancements in the collection and storage of human biological samples have enabled the global scientific community to make critical breakthroughs in medical research over the past few decades, particularly in disease treatment and screening, and precision medicine [1]. Many countries have established biobanks as an essential infrastructure to support such research [2–4], and China is no exception to this trend. The country's biobank infrastructure has grown rapidly in recent years. Analyses based on incomplete data suggest that there are now thousands of large biobanks in China's tertiary hospitals, major medical institutions, universities, and



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research institutes, which shows that the construction of biobanks in China has already reached a significantly large scale [5].

Biobanks are essential for correlating diverse data across population-based, disease-oriented, and tissuespecific repositories [6]. However, public participation is crucial in this context, regardless of the type of biobank, as these repositories are built based on biological samples donated by people. Despite their rapid growth in the country, the public awareness of biobanks in China and its participation in them have lagged behind. This discrepancy threatens to limit the effective use of biobanks [7].

Public awareness of biobanks and people's willingness to donate to them vary widely across the world. A study in Italy showed that 65% of the participants were aware of the term "biobank" while 76.3% were willing to donate their specimens to biobanks [8]. By contrast, another study showed that 81% of the respondents in Egypt had never heard of biobanks, yet 85% of them expressed their willingness to donate to them [9]. Nonetheless, research has also shown that less than 10% of participants in the Arab region are willing to donate samples to biobanks [10]. These figures underscore the significant regional differences in public attitudes toward biobanking.

China's population was estimated to be 1.425 billion as of May 2024, representing 17.8% of the global population [11]. It can thus serve as a significant resource for biobanking for national research as well as for global datasharing initiatives. However, few studies have explored the Chinese public's awareness of and attitudes toward biobanks. While some studies have investigated specific areas in this domain, including methods of outreach [7], breast milk donations [12], and samples from children [13], there is lack of comprehensive research on the perspective of the general population across China on biobanking.

The above gap in understanding the public's awareness of and attitudes toward biobanks in China may hinder efforts to engage people in the relevant initiatives. Without a clear picture of the Chinese public's motivations and concerns in this regard, the potential for its participation in biobanks may remain underutilized. In light of this, we aims to fill the gap between the proliferation of biobanks in China, and the lack of knowledge of the Chinese public's awareness of and attitudes toward them by providing a detailed analysis of the latter. Our work here addresses the need for more information on public engagement with biobanks, which is critical for their long-term sustainability and ethical operation. Our findings will inform future strategies for enhancing the public's involvement in biobanks and clearing the potential barriers to its participation.

Methods

Study design and participants

We conducted a cross-sectional survey-based study. All the participants were from China, were at least 18 years old, and voluntarily completed our questionnaire.

The suitable sample size for this cross-sectional study was calculated based on the formula for estimating population proportions. The parameters were set as follows: The margin of error (δ) was 5%, the significance level (α) was 0.05, with a corresponding critical value ($\mu \alpha$) of 1.96, and an estimated rate of awareness (p) of 19% [9]. This yielded a suitable sample size of 236 participants. By assuming that approximately 20% of the questionnaires would be unusable, we required approximately 295 participants for our survey. The formula for this calculation is as follows:

$$\mathbf{n} = \left(\frac{u_{\alpha}}{\delta}\right)^2 p \left(1 - p\right)$$

Study tools and data collection

We designed a questionnaire comprising two parts: (1) the demographic data of the participants, and (2) their knowledge of biobanks, attitudes toward them, preferences related to informed consent, and relevant concerns. A preliminary survey was used to evaluate the validity and reliability of the questionnaire. Three Chinese experts in public health and bioethics were recruited to assess the relevance of the items of the questionnaire, and their ability to accurately measure the public's knowledge of and attitudes toward biobanks. Minimal modifications were made to the questionnaire based on their feedback. We finally obtained a questionnaire with 10 demographic questions and 20 questions related to the respondents' knowledge of biobanks, their attitudes toward them, and related issues.

The participants were recruited through two methods. A portion of them was recruited via online platforms, such as email and social media sites, over which the link to the survey was widely shared. Moreover, we recruited participants offline by randomly approaching them in public places. In both cases, the participants completed the survey electronically by scanning a QR code or accessing a web link (https://w.wjx.com/vm/tU0HyzB.as px#) on their mobile devices to ensure their convenience and the consistency of data collection. The data were collected in May and June of 2024.

Statistical analysis

The data were analyzed by using SPSS version 21.0 (IBM Corporation). The measurement data that conformed to the normal distribution were expressed as mean \pm SD, while those that did not conform to the normal distribution were expressed in terms of the median (M) and

interquartile spacing (Q25, Q75). The count data were statistically described by the frequency, percentage, or constituent ratio. We used Pearson's correlation coefficients to analyze the linear relationships between the variables. The raw data were first cleaned and pre-processed by removing non-numeric columns and missing

Table 1 General characteristics of the participants (N=616)

variable	lotal (N, %)
Gender	
Male	265 (43.02%)
Female	351 (56.98%)
Age (years)	
<18	40 (6.49%)
129	260 (42.21%)
30–44	199 (32.31%)
45–59	93 (15.1%)
≥60	24 (3.9%)
Occupation	
Farmer	22 (43.02%)
Labourer	32 (5.19%)
Private (foreign) company/enterprise employee	163 (26.46%)
Employee of government department/state-owned	81 (13.15%)
enterprise/public institution	
Medical worker	81 (13.15%)
Student	89 (14.45%)
Liberal profession	57 (9.25%)
Self-employed	40 (6.49%)
Retired	20 (3.25%)
Other	31 (5.03%)
Highest educational level	
Junior high school or below	61 (9.9%)
High school	94 (15.26%)
College or undergraduate degree	381 (61.85%)
Postgraduate	71 (11.53%)
Doctoral student	9 (1.46%)
ls it a minority ethnic group	
Yes	53 (8.6%)
No	563 (91.4%)
Believe in religion or not	
Yes	84 (13.64%)
No	532 (86.36%)
Economic income level	
Low income level	135 (21.92%)
Lower-to-middle income level	104 (16.88%)
Middle income level	184 (29.87%)
Middle-to-upper income level	77 (12.5%)
High income level	116 (21.85)
Living location	
City	407 (66.07%)
Countryside	61 (9.9%)
Between them	148 (24.03%)
Whether there are children	,
Yes	323 (52.44%)
No	293 (47.56%)

values from them, and by converting all variables to numeric types. Pearson's correlation coefficients were then calculated to measure the linear relationships between each pair of variables, and their p-values were computed to assess their statistical significance. The significance level was set to $\alpha = 0.05$, which means that correlations with p-values lower than 0.05 were considered to be statistically significant. Finally, the significant correlations (p < 0.05) were highlighted in the correlation matrix, and the results are presented in a table for ease of interpretation of the relationships between the variables.

Results

Characteristics of participants

We obtained 616 valid responses to our survey questionnaire. There were 265 male respondents (43.02%) and 351 female respondents (56.98%). The highest ratio of the participants (42.21%) was aged 18–29 years, while 61.85% of all participants were in college or had completed their undergraduate education. The general information on the participants is detailed in Table 1.

Knowledge of and attitudes toward biobanks

More than half of the participants (57.95%) had heard of the term "biobank." However, the number of respondents who had a comprehensive or sound understanding of the specific functions of biobanks was significantly lower. Some participants perceived biobanks as posing more risks than the benefits that they provided (19.16%). The detailed information is provided in Table 2.

Willingness to donate biological samples to biobanks

Fewer than half of the participants claimed to be "extremely willing" or "very willing" to donate their samples to a biobank. However, far more respondents were willing to donate their urine and saliva, which involve non-invasive collection, than their blood and genetic samples. The detailed data are provided in Table 3. A total of 44.97% of the participants believed that donations should be completely anonymous, 45.45% were indifferent, while 9.58% felt that anonymity was unnecessary. Only 20.13% expressed their willingness to donate to forprofit private companies.

Aspects of biobanks that influence willingness to donate

According to Table 4, the primary factors that influenced people's willingness to donate their biological samples included the purpose of use of the samples (59.58%), privacy protection (52.11%), types of donated samples (45.29%), and the process of informed consent (43.67%). Following these factors, the qualifications of the biobank (36.53%), the location of sample donation (35.39%), the biobank's sources of funding (34.25%), and

Variable	Total (<i>N</i> , %)
Have you ever heard of the term "biobank" before?	
Yes	357 (57.95%)
No	259 (42.05%)
Do you understand the specific role of biobanks in medical research?	
Extremely familiar	70 (11.36%)
Very familiar	121 (19.64%)
Moderately familiar	157 (25.49%)
Slightly familiar	129 (20.94%)
Not at all familiar	159 (25.81%)
What do you think is the ratio of benefits to risks of biobanks?	
The benefits are greater than the risks.	281 (45.62%)
The benefits are equal to the risks.	217 (35.23%)
The risks are greater than the benefits.	118 (19.16%)
What do you think is the importance of biobanks?	
Extremely important	215 (34.9%)
Very important	236 (38.31%)
Moderately important	115 (18.67%)
Slightly important	40 (6.49%)
Not important at all	10 (1.62%)

	Table 3	Participants'	willingnes	s to donat	e biologic	al samples	to biobanks
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Variable	Extremely	Very willing	Moderately	Slightly willing	Not will-
	willing		willing		ing at all
Will you donate your sample to a biobank in the future?	83 (13.47%)	149 (24.19%)	182 (29.55%)	128 (20.78%)	74 (12.01%)
If you are asked to donate saliva or urine for research?	156 (25.32%)	232 (37.66%)	146 (23.7%)	59 (9.58%)	23 (3.73%)
If you are asked to donate a blood sample for research?	125 (20.29%)	217 (35.23%)	171 (27.76%)	77 (12.5%)	26 (4.22%)
If you are asked to participate in genetic research?	100 (16.23%)	146 (23.7%)	167 (27.11%)	128 (20.78%)	75 (12.18%)

Table 4 Aspects of biobanks influencing people's willingness to donate (multiple choice)

Variable	Total (<i>N</i> , %)
Purpose of sample use	367 (59.58%)
Privacy protection	321 (52.11%)
Types of donated samples	279 (45.29%)
Informed consent process	269 (43.67%)
Qualifications of the biobank	225 (36.53%)
Location of sample donation	218 (35.39%)
Funding sources of the biobank	211 (34.25%)
Biobank administrators	208 (33.77%)
Others	8 (1.3%)

its administrators (33.77%) also played a significant role in the participants' willingness to donate to biobanks.

Main motivations for sample donation

The participants' primary motivations for sample donation were found to be altruistic. The most compelling reasons included the desire to support scientific research and contribute to the common good of humanity, as well as to generate new knowledge and develop new therapies to help future patients. These motivations were endorsed by approximately 70% of participants, indicating a strong inclination toward altruism. Moreover, such personal benefits as expecting advantages for their family or community, and obtaining prioritized access to medical services significantly influenced their willingness to donate, with nearly 70% of the participants agreeing strongly with these motivations. While financial compensation was a notable factor, motivating around 60% of the participants, it was less influential than altruistic motivations and the expectation of personal benefits. Overall, the data emphasized the importance of both altruistic and personal incentives in encouraging the donation of biological samples by people. The details are shown in Table 5.

Informed consent

According to the results, the participants had different preferences on the process of informed consent following the donation of samples to a biobank. 41.56% of the participants expressed the preference for being informed and asked for consent each time their sample was needed for research. This was followed by participants who wished to only be informed when their sample was being used, without the need for obtaining their consent each time (21.92%). The participants expressed clear preferences regarding the content that should be included in the informed consent. The highest ratio of

Table 5 Participants' main motivations for sample donation

Variable	Very strongly agree	Strongly agree	Moderately agree	Slightly agree	Not agree at all
Supporting scientific research and contributing to the common good of humanity	220 (35.71%)	214 (34.74%)	123 (19.97%)	39 (6.33%)	20 (3.25%)
Hoping to generate new knowledge and develop new therapies to help future patients	212 (34.42%)	232 (37.66%)	121 (19.64%)	38 (6.17%)	13 (2.11%)
Expecting benefits for family, relatives, or community	213 (34.58%)	221 (35.88%)	118 (19.16%)	47 (7.63%)	17 (2.76%)
Priority access to medical services for self	190 (30.84%)	239 (38.8%)	131 (21.27%)	40 (6.49%)	16 (2.6%)
Receiving financial compensation	153 (24.84%)	214 (34.74%)	174 (28.25%)	56 (9.09%)	19 (3.08%)

Table 6 Participants' opinions on informed consent

Variable	Total (<i>N</i> , %)
Preferences for types of informed consent	
I want to be informed and asked for my consent each time my sample is needed for research.	256 (41.56%)
I want to only be informed each time my sample is needed for research. My consent is not necessary.	135 (21.92%)
I do not want to opt out of the research unless I change my mind and oppose the future use of my sample.	119 (19.32%)
At the beginning, give me some options to specify that my sample cannot be used for certain types of research.	73 (11.85%)
Once I have provided my sample, I have no interest in knowing any further detail.	33 (5.36%)
Content of informed consent form (multiple choice)	
Privacy protection measures	436 (70.78%)
Purpose of sample use	389 (63.15%)
Ownership of sample	386 (62.66%)
Rights and obligations of donor	369 (59.9%)
Duration of sample storage	365 (59.25%)
Others	3 (0.49%)
Is it necessary to obtain your renewed informed consent if there are changes in the use of your sample?	
Extremely necessary	258 (41.88%)
Very necessary	182 (29.55%)
Moderately necessary	115 (18.67%)
Slightly necessary	49 (7.95%)
Not necessary at all	12 (1.95%)

Table 7 Participants' concerns about sample donation

Variable	Total (<i>N</i> , %)
Worried someone might profit from my health information	349 (56.66%)
Worried about personal information being leaked	344 (55.84%)
Worried my sample might be used in research I do not want to participate in	321 (52.11%)
Worried my sample might be sent to other institutions	311 (50.49%)
Worried about my genetic information being shared	286 (46.43%)
Worried about discrimination against myself or my family	228 (37.01%)
Worried about how researchers will use my health information	225 (36.53%)
Others	2 (0.32%)

participants (70.78%) was concerned about measures for privacy protection with regard to the samples, followed by those who were concerned about the purposes of sample use (63.15%) and ownership (62.66%). Over 70% of the respondents believed that it was necessary to obtain renewed informed consent in case of changes in the use of the sample. Of them, 41.88% considered this "extremely necessary" while 29.55% considered it "very necessary." The details are shown in Table 6.

Concerns about sample donation

According to the results, the protection of their personal information, and the use and sharing of their healthrelated information were the primary concerns for most respondents after donating biological samples to biobanks. They were followed closely by concerns about the potential use of their samples for research in which they did not wish to participate, or having their samples sent elsewhere. The details are shown in Table 7.

 Table 8
 Influence of sociodemographic variables on public perceptions of biobanks

	Gender	Age	Occupation	Highest education	Minority	Religious belief	Income level	Residence
Heard about biobanks	0.134	0.124	0.099	0.135	0.331	0.396	0.225	0.856
Specific uses of biobanks	0.436	< 0.001*	0.002*	0.302	0.453	0.331	0.165	0.51
Benefit-to-risk ratio of biobanks	0.556	0.252	0.324	0.056	0.146	0.01*	0.016*	0.019*
Importance of biobanks	0.92	0.002*	0.178	0.108	0.114	0.043*	0.061	0.008*
Overall willingness to donate	0.807	0.003*	0.245	0.014*	0.079	0.131	0.266	0.542
Saliva or urine	0.494	0.662	0.004*	0.124	0.237	0.441	0.387	0.809
Blood	0.522	0.53	0.002*	0.171	0.199	0.28	0.323	0.426
Genetic samples	0.014*	0.155	0.053	0.447	0.242	0.417	0.247	0.377
Motivation	0.268	0.265	0.056	0.345	0.787	0.482	0.612	0.062

*p<0.05

Influence of Sociodemographic Variables on Public Perceptions of Biobanks

We calculated Pearson's correlation coefficients to better understand the relationships between the respondents' demographic characteristics, and their knowledge of biobanks, attitudes toward them, and willingness to donate to them. These coefficients measure the strength and direction of the linear relationships between pairs of variables. The significance of each correlation is represented by p-values, where p < 0.05 represents statistical significance.

Table 8 shows that several demographic factors of the respondents, such as their age and income level, exhibited significant correlations with their knowledge of and attitudes toward biobanks. For example, younger participants and those with higher income levels were more likely to harbor positive attitudes toward participation in biobanks. This suggests that sociodemographic factors may play a critical role in shaping public perspectives on biobanks and the research conducted by them.

Discussion

Participants' knowledge of biobanks and attitudes toward them

Our findings indicate that 57.95% of the Chinese public has heard of the term "biobank," a figure significantly higher than those reported for Jordan (28.5%) [14], Latvia (25.8%) [15], and Morocco (32.4%) [16]. Despite this relatively high level of awareness, only 11.36% of the respondents were extremely familiar with what a biobank does such that they could provide specific examples. This gap between a high awareness and a low understanding of biobanks may hinder the public's trust and active participation in them. In the context of public attitudes toward them, 73.2% of the respondents recognized the crucial role of biobanks in the development of new drugs and precision medicine. This perspective reflects a general alignment with the goals of biobanking and an appreciation for the long-term societal benefits that it promises. Conversely, 19.16% of respondents expressed concerns that the risks associated with biobanks might outweigh their benefits. These concerns primarily stemmed from potential misuse of personal genetic information, apprehensions over the invasion of privacy, and the possibility of unforeseen ethical dilemmas arising from the use of biobank data. This group of respondents called for stringent measures to ensure data protection and transparency in the use of biobank resources, and robust ethical oversight to safeguard individual rights and maintain public trust.

Our study also provides interesting insights into the sociodemographic factors that influence people's awareness of and attitudes toward biobanks. Age emerged as a pivotal determinant, with younger individuals—particularly those under 40—exhibiting more favorable attitudes toward biobanks. This trend likely stems from their increased exposure to digital sources of information and educational content. Conversely, older adults, who may be more skeptical of digital technology or less informed about it [17], require targeted outreach efforts to enhance their understanding and acceptance of biobanks-related initiatives.

Religious beliefs also influenced the respondents' attitudes toward biobanks. People with strong religious affiliations were more likely to express concerns about the ethical implications of biobanks and their handling of biological samples. Interestingly, a study conducted in Egypt found no such association between knowledge of biobanks and religious beliefs [9]. Our results also suggest that there was a significant difference in the perceived benefit–risk ratio of biobanks among people with varying levels of income. People with higher incomes generally have better access to education and resources of information, which can enable them to develop a more nuanced understanding of biobanks and their benefits.

Willingness to donate

The results of this study indicate that there are differences in the willingness of the Chinese public to donate difference kinds of samples to biobanks. The respondents of our survey were most willing to donate urine and saliva samples, followed by blood samples. They were the least willing to donate genetic material or hereditary substances, like DNA samples. These results are comparable to those of a previous study [9], which showed that people were more willing to donate samples that could be obtained through non-invasive means than samples that required even a minimally invasive procedure. If people were asked to participate in genetic research, their willingness to do so would significantly decrease. This notable decline in willingness highlights concerns about privacy and the potential risks of misuse of genetic information. These concerns are likely influenced by broader societal discussions on genetic privacy and data security, as well as fears of discrimination based on genetic information [18].

Past research in the area has shown that commercialization is a key factor influencing the public's willingness to participate in research conducted by biobanks. The involvement of private funders may exacerbate privacyrelated concerns, or at least increase the tensions related to privacy [19]. Therefore, the involvement of commercial entities hinders public participation in biobanks [20]. This is consistent with our findings, which showed that only 20.13% of the participants of our survey were willing to donate to for-profit organizations. Studies conducted in Australia support the claim that people prefer donating to public institutions, which are perceived to be more trustworthy [21]. However, the respondents of a study conducted in Greece explained that they did not trust their country's political system, and therefore feared that the information collected by biobanks might fall into the wrong hands [22]. This contrast highlights the significant role that institutional trust plays in public participation in biobanks. There is a higher willingness among people to donate samples in countries where public institutions are seen as trustworthy and capable of safeguarding sensitive data [21].

Altruistic motivation

We also explored the public's motivations for donating to biobanks, and found that a majority of participants identified altruism as the primary reason for donating samples. This finding aligns with other studies that have similarly highlight altruism as a key motivating factor for participation in biobanks [7, 23, 24]. Altruism is universally recognized as intentional and voluntary behavior aimed at improving the condition of others without expecting personal gain [25]. While Western concepts of altruism often emphasize reciprocity and virtue ethics, altruism is deeply grounded in Confucian ethics in Chinese culture-particularly the concept of Ren, or humaneness. Ren is a central moral, sociopolitical, and spiritual concept in Confucianism that encapsulates the good feeling experienced by a virtuous person when acting altruistically [26]. For Confucius, the practical expression of *Ren* is to love others, and demonstrate benevolence and generosity toward them. As such, the moral principle of *Ren* instills a sense of duty to contribute to the well-being of others, including through acts of donation [27].

Preferences regarding informed consent

Informed consent is one of the most critical and widely discussed elements in considerations about the governance of biobanks. We explored various models of informed consent, and found that the most favored option among the Chinese was to be informed, and be required to provide their consent every time their sample was used for research. Conversely, the least favored option was for them to receive no information about the subsequent use of their samples once they had been donated. This result aligns with the findings of a study conducted in Latvia. Most of its respondents reported preferring that researchers provide specific information about each study for which their donated samples were used [15]. However, the public has expressed a higher preference for broader consent in surveys conducted in Italy [28] and the United States [29].

The debate surrounding models of consent for donors to biobanks continues, and the results of our study provide valuable insights into public preferences that may help inform future discussions on this issue.

Concerns about sample donation

We also identified concerns among the Chinese public regarding the commercialization of their samples, privacy-related issues, misuse of samples, and the sharing of samples and associated data. These concerns have also been reported in previous studies [7, 9, 10, 28]. In addition to these general concerns, previous research has explored specific issues related to the sharing of samples across biobank networks, including across international borders [30]. When samples are shared internationally, participants may have concerns about the legal and ethical frameworks governing their use in other countries, which might have different standards of privacy and data protection. Addressing these concerns requires clear communication about the mechanisms of governance in place, both at the national and international levels, to ensure the ethical use of samples and protect the rights of donors.

Cultural factors and Biobanks

The intersection of cultural factors and biobanking is an important issue that influences public attitudes toward sample donation and participation in biobanks. Previous research has shown that cultural values, religious beliefs, and societal norms play a crucial role in shaping people's perceptions of their participation in biobanks [31, 32].

While some issues identified in this study are consistent with those reported in other countries, unique cultural and social factors shape the perspectives of the Chinese public. The prevailing collectivist mindset in Chinese culture often results in the prioritization of national and societal interests over individual concerns, including those related to privacy [33]. This reflects a societal view that prioritizes collective well-being over individual concerns about privacy, which is a common theme in Chinese ethics. This cultural viewpoint may help clarify why Chinese participants are more inclined to contribute to biobanks, perceiving their involvement as a means of promoting national health security, rather than concentrating on the individual risks related to data privacy.

Limitations

This study has several limitations. First, we relied on a questionnaire, which might have affected the participants' responses-particularly regarding complex topics like models of consent-as some of them had limited prior knowledge of biobanks. To mitigate this, we provided a brief introduction to biobanks and made researchers available to offer clarifications during data collection. However, the participants' unfamiliarity with biobanks might still have influenced their responses. Second, while our sample size of 616 provided preliminary insights, it may not fully represent the diverse perspectives of the entire Chinese population. Finally, self-reported data may contain response biases, with participants possibly providing socially desirable answers rather than expressing their true beliefs. Furthermore, their responses to hypothetical questions may not accurately predict their actual behavior. These factors should be considered when interpreting the findings of this study.

Conclusions

This study provides valuable insights into the Chinese public's awareness of and attitudes toward biobanks. Altruism was identified as the participants' predominant motivation for donating samples to biobanks, with a substantial portion of respondents willing to contribute to scientific research for the benefit of humanity. The preference for dynamic consent among the participants underscores the need for flexible and ongoing communication in biobanking practices, which can allow donors to stay informed and maintain control over their donations. This model of dynamic consent, which was favored by nearly half of the respondents, and reflects a desire among the Chinese people for greater involvement and oversight in how their samples are used. Tailored approaches that consider cultural contexts are essential for fostering a supportive environment for people's participation in biobanks in China. Future research should explore these cultural factors in greater depth to develop more effective strategies for addressing public concerns and promoting ethical biobanking practices. By understanding and responding to the unique motivations and concerns of the Chinese public, biobanks can enhance their ethical frameworks and operational transparency, and can better contribute to the advancement of medical research and public health.

Supplementary Information

The online version contains supplementary material available at https://doi.or g/10.1186/s12910-025-01163-y.

Supplementary Material 1

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Author contributions

MH and LY contributed to the work design, data analysis and data interpretation, drafted the article, revised important intellectual content of the article. KL, XW, JW and XC contributed to data collection and data acquisition, drafted the article. XZ contributed to the work design and data interpretation, revised important intellectual content of the article. All authors read and approved the final manuscript.

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Data availability

Data generated in this study are available from the corresponding author upon request.

Declarations

Ethics approval and consent to participate

The study protocol was reviewed and approved by the Ethics Review Committee of the Chinese Academy of Medical Sciences and Peking Union Medical College, ID: CAMS&PUMC-IEC-2024-045. The ethical approval document, including the official seal, is provided as a supplementary PDF file in the manuscript submission system. The research was conducted in accordance with relevant ethical guidelines and regulations for studies involving human participants and/or human tissue samples. The questionnaire was fully anonymized, and did not reveal any of the participants' personal information or any other detail that could be used to identify them. A form to obtain their informed consent was included in the introductory section of the questionnaire, where the participants were required to confirm that they understood the research-related information, and expressed their willingness to participate in the study by clicking an "Agree" button or checking a consent box.

Consent for publication

Not Applicable.

Competing interests

The authors declare no competing interests.

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