Appendix A. Delphi Round 4 Survey Methods & Results

Appendix B. Follow-Up Interview Methods

Exploring understanding of "understanding": The paradigm case of biobank consent comprehension

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Appendix A. Delphi Round 4 Survey Methods & Results

METHODS

The Duke University Health System and Vanderbilt University Medical Center Institutional Review Boards deemed this research exempt (45 CFR 46.101(b)(2)).

Participants

The process for identifying and recruiting nationally-recognized experts for our Delphi panel and the procedures used for the first three rounds have been described in detail elsewhere (Beskow et al. 2015). All 47 panelists who completed the first three rounds of the Delphi process were invited by email to participate in this fourth round; among these, 44 (94%) completed Round 4. Thus, characteristics of Round 4 respondents closely mirrored those of our original panel (Table A1).

Instrument Development

We constructed a survey instrument consisting of several parts:

- Reminders and updates: We reminded panelists of earlier phases of the Delphi process and our focus on adequate comprehension (i.e., what must participants understand, as distinct from what information should be disclosed); explained our development of comprehension questions based on Delphi consensus results; and described our national survey in which the comprehension questions were implemented (Beskow et al. 2017).

- Biobank consent form and comprehension assessment: We asked panelists to read the consent form and take the quiz to gain first-hand knowledge of the experience.

- National survey results. For each quiz item, we presented panelists with (1) the relevant consent form section (where information pertinent to that item was disclosed); (2) the Delphi consensus statement of what participants must understand about that section; (3) the wording of the quiz item(s) developed to reflect the consensus statement; and (4) a graphical depiction of the proportion of survey respondents who answered that quiz item correctly on the first and second tries (Box A1).

- Survey question: For each quiz item, after displaying the above material, we asked:

  > Assume the wording of the quiz item is acceptable, *i.e.,* that any suggested changes you might have to improve the clarity are incorporated. With this assumption, what should happen if a person is still not able to answer correctly on the second attempt (*i.e.,* after review and re-test)?
  >
  > ___ The person should **still be allowed to enroll** in the biobank
  >
  > ___ The person should **not be allowed to enroll** in the biobank
  >
  > ___ **Additional review and re-testing**; if yes, how many additional attempts after the first two? _____
  >
  > ___ **Other**; please specify _____

Data Collection & Analysis

The survey was fielded online in mid-2015 using Qualtrics software (Provo, UT). Panelists were offered $200 for their participation. We downloaded responses from Qualtrics into Microsoft Excel (Redmond, WA) for basic descriptive analysis.

RESULTS

In our original Delphi process, consensus was defined as agreement by ≥70% of panelists that an element of information was essential for prospective biobank participants to understand. Round 4 responses confirmed the importance of many of these elements (Figure A1). In particular, the basic purpose of the biobank, the collection of information from participants' medical records, a blood draw for research purposes, and widespread data sharing were among the most strongly endorsed (*i.e.,* had the smallest proportions of panelists departing from earlier consensus and indicating that individuals should still be allowed to enroll even if unable to answer corresponding quiz items correctly). For nine elements, however, Round 4 results suggested that consensus had been lost: although ≥70% of panelists previously agreed that these elements were essential for adequate understanding, >30% of Round 4 respondents said that individuals should still be allowed to enroll even if unable to answer corresponding quiz items correctly. Study contact information, the right to withdraw, the possibility that participants might be re-contacted for additional research, and confidentiality protections were among the least strongly endorsed. In addition, although the panel had previously been equivocal as to whether understanding the Genetic Information Nondiscrimination Act (GINA) was essential, 80% of Round 4 respondents indicated that individuals should still be allowed to enroll even if unable to answer the GINA quiz item correctly.

Table A1. Characteristics of Delphi panelists

	Rounds 1 – 3 n = 47		Round 4 Survey n = 44	
	n	*(%)*	*n*	*(%)*
Years in current position:				
Mean	11		10	
Range	2 - 39		2 - 27	
Familiarity with informed consent for biobanking ±				
Somewhat familiar	3	(6)	3	(7)
Familiar	10	(21)	9	(20)
Very familiar	34	(72)	32	(73)
Major Areas of Expertise §				
Bioethics	22	(47)	21	(48)
Genetics	20	(43)	18	(41)
Patient, research participant, community perspectives	16	(34)	16	(36)
Medicine or Nursing	10	(21)	9	(20)
Epidemiology / Public health	10	(21)	9	(20)
Social Sciences	9	(19)	8	(18)
Law	5	(11)	5	(11)
Other	12	(26)	11	(25)
Academic Degrees Obtained §				
BA/BS	22	(47)	19	(43)
MA/MS	19	(40)	17	(39)
MPH/MSPH	8	(17)	7	(16)
JD	5	(11)	5	(11)
PhD	26	(55)	24	(55)
MD	8	(17)	7	(16)
Other	2	(4)	1	(2)
Age				
30-39	5	(11)	5	(11)
40-49	14	(30)	14	(32)
50-59	17	(36)	17	(39)
60-69	10	(21)	8	(18)
70+	1	(2)		
Sex				
Female	32	(68)	30	(68)
Male	15	(32)	14	(32)

	Rounds 1 – 3 n = 47		Round 4 Survey n = 44	
	n	*(%)*	*n*	*(%)*
Race §				
White	41	(87)	38	(86)
Asian	3	(6)	3	(7)
Black	2	(4)	2	(5)
American Indian/Alaska Native	1	(2)	1	(2)
Round 4 Survey Responses (average across 21 quiz items)				
Still allow to enroll	-----		33%	
Do not allow to enroll	-----		12%	
Additional review	-----		42%	
Other	-----		13%	

± Respondents who rated themselves as 'not too familiar' or 'not at all familiar' were deemed ineligible

§ Respondents were allowed to choose more than one

Box A1. Sample of itemized comprehension quiz data presented in Delphi Round 4

QUIZ ITEM 1: Biobank Purpose

Consent Form Section (traditional form):

> **WHY IS THIS PROJECT BEING DONE?**
>
> The purpose of the Biobank is to collect and store human tissue samples (such as blood) and health information. The stored materials will then be used by researchers in future studies.
>
> The goal is to have at least 20,000 people enroll in the Biobank.

Delphi Statement of the minimally correct explanation of this consent form section: *Note that Quiz Item 1 and Quiz Item 2 together cover the key elements of information in this statement[1]*

- "The purpose of this project is to collect and store samples and health information for use in future research."

Quiz Item 1: Collect and store samples and health info
- Version A: The purpose of the Biobank is to collect and store samples and health information. [TRUE]
- Version B: The Biobank will not store any samples or health information. [FALSE][2]

National Survey Results for Quiz Item 1 (Test → Re-test)

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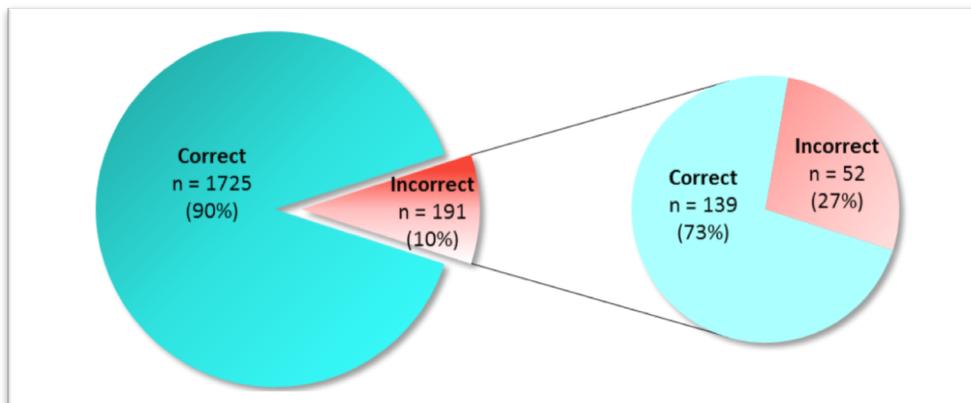
[1] Several of the Delphi statements were compound and thus required >1 quiz items to address the different components
[2] For each item, we created an "A" and a "B" version to avoid presenting exactly the same question during retesting. For the national survey, all participants initially received the A version, with the B versions used only for retesting when needed.

Figure A1. Round 4 survey responses by quiz item

% of Panelists Who Gave Each Response

Legend: ■ Still Allowed to Enroll ■ Not Allowed to Enroll ■ Additional Review ■ Other ■ Missing

Questions (top to bottom):
- Q15. Genetic Information Non-Discrimination Act
- Q14. Confidentiality protections
- Q10. Recontact for additional research
- Q19. Right to withdraw
- Q21. Study contact information
- Q12. Large-scale sharing: tracing information
- Q09. Access to specimens/data: no identifiers given
- Q17. No share of profits
- Q13. Privacy risks
- Q16. Potential benefits
- Q07. Duration of storage
- Q05. Collection of information: updates
- Q20. Withdrawing biospecimens, data in use
- Q04. Collection of information: basic information
- Q08. Access to specimens/data: researcher studies
- Q18. Return of results
- Q11. Large-scale sharing: information in database
- Q02. Biobank purpose: future research use
- Q01. Biobank purpose: collection & storage
- Q03. Blood draw
- Q06. Collection of information: medical records

REFERENCES

Beskow, L. M., C. B. Dombeck, C. P. Thompson, J. K. Watson-Ormond, and K. P. Weinfurt. 2015. "Informed consent for biobanking: consensus-based guidelines for adequate comprehension." *Genet Med* 17 (3):226-33.

Beskow, L. M., L. Lin, C. B. Dombeck, E. Gao, and K. P. Weinfurt. 2017. "Improving biobank consent comprehension: a national randomized survey to assess the effect of a simplified form and review/retest intervention." *Genet Med* 19 (5):505-512.

Campbell, John L., Charles Quincy, Jordan Osserman, and Ove K. Pedersen. 2013. "Coding in-depth semistructured interviews: problems of unitization and intercoder reliability and agreement." *Sociol Methods Research* 42 (3):294-320.

Ezzy, Douglas. 2002. *Qualitative Analysis: Practice and Innovation*. Sydney, Australia: Allen & Unwin.

Saldana, J. 2009. *The Coding Manual for Qualitative Researchers*. Thousand Oaks, CA: Sage Publications.

Saldaña, Johnny. 2014. "Coding and Analysis Strategies." In *The Oxford Handbook of Qualitative Research*, edited by Patricia Leavy. Oxford University Press.

Strauss, Anselm L. 1987. *Qualitative Analysis for Social Scientists*. Cambridge: Cambridge University Press.

Appendix B. Follow-Up Interview Methods

The Duke University Health System and Vanderbilt University Medical Center Institutional Review Boards deemed this research exempt (45 CFR 46.101(b)(2)).

Participants

We purposively selected among Round 4 survey respondents to attain equal numbers of interviewees in the broad categories of expertise (biobanking research, ethics/human subjects protections, and participant perspectives) represented on the original panel (Beskow et al. 2015). Interviewees' Round 4 responses were similar to those of all Round 4 respondents (Table B1).

Instrument Development

We developed a semi-structured interview guide (available upon request) asking for:

- Your reflection on the outcomes of this **Delphi process**
- In thinking about informed consent for biobanking:
  - Should there be a defined **threshold** for what constitutes 'adequate' understanding?
  - Should there be a **consequence** for not achieving this threshold?
- How would the level of risk involved in the study (for example, a Phase III **clinical trial** of a new oncology agent) affect any threshold for 'adequate' understanding?
- In what ways has participation in this process challenged your thinking on **informed consent**?

Data Collection & Analysis

We emailed interviewees a personalized packet in advance, including a study information sheet, a summary of their Round 4 responses, and a graph of the panel's aggregate Round 4 responses (see Appendix A, Figure A1).

Interviews were conducted by telephone in early 2016 by one research team member (KPW), who worked to understand and articulate the justifications being offered during the interview itself.

To code and analyze the professionally transcribed interviews, we used a 2-stage process adapted from Campbell et al. (Campbell et al. 2013)—an approach particularly useful for establishing reliability in situations where data are highly nuanced and complex.

Stage 1: Five research team members were involved in applying a broad structural coding scheme reflecting our basic questions: Should there be (1) a threshold defining 'adequate' understanding, and (2) a consequence for not meeting that threshold? Each transcript was read by a varying combination of 2-3 of the five team members. Each team member independently wrote a short summary of the transcript using a common template to capture major themes, and categorized the interviewee's ultimate disposition (yes or no) regarding concepts of threshold and consequence. All team members read and compared the summaries of each transcript. We met to adjudicate disagreements, achieving 100% inter-coder agreement on the two basic questions (this is the source of specific proportions mentioned in the Results section), and compiled key themes for additional coding.

Stage 2: One team member (LMB) used the key themes to further code and analyze the transcripts. Use of a single knowledgeable coder with substantial content area expertise is

justified and important when the subject matter requires the ability to identify subtle meaning

(Campbell et al. 2013). As noted, when interviewees responded to questions, they often

referred to previous points, rethought prior positions and statements, and reflexively explored

self-identified tensions in their viewpoints. Given these contingent, contradictory, and

contextual characteristics, an interpretive approach was required to make sense of the data in a

manner that preserved richness and complexity. To detect potential patterns and

interrelationships, LMB used a process of generating analytic memos articulating her deductive

and inductive thinking (Ezzy 2002, Saldana 2009); outlining to assemble themes, assertions, and

concepts into a coherent display (Saldaña 2014); and discussing coding dilemmas and

interpretations with the larger team (Strauss 1987).

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	Rounds 1 – 3 n = 47		Round 4 Survey * n = 44		Round 4 Interviews (n = 21)	
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Law	5	(11)	5	(11)	3	(14)
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JD	5	(11)	5	(11)	3	(14)
PhD	26	(55)	24	(55)	13	(62)
MD	8	(17)	7	(16)	3	(14)
Other	2	(4)	1	(2)	1	(5)
Age						
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* See Appendix A

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