

What do biomedical researchers want from biobanks?

Rush A^{1,2}, Catchpoole DR², Ling R³, Searles A³, Watson PH^{4,5} and Byrne JA^{1,2}

¹The University of Sydney Children's Hospital Westmead Clinical School, ²Kids Research, The Children's Hospital at Westmead, ³Hunter Medical Research Institute, ⁴BC Cancer, Canada, ⁵University of British Columbia, Canada

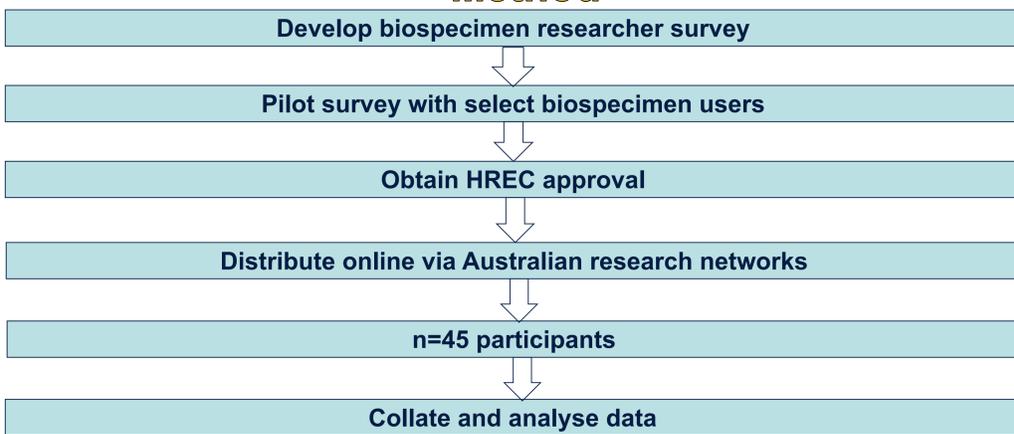
Background

Biobanks collect, process, store and distribute biospecimens and related data for use in basic and translational biomedical research. Despite their accepted importance, biobanks consistently report sustainability challenges. As the ultimate purpose of a human tissue biobank is to support health and medical research, biospecimen researcher opinions on current and future tissue/data needs provide essential information to open-access biobanks to create/modify business modelling and ultimately improve sustainability.

Aim

To determine and evaluate the needs and experiences of researchers who obtain biospecimens from biobanks

Method



Survey questions were drawn from existing US¹ and UK² surveys and from the authors' own experience. There were 23 multiple choice/check box questions, four questions with a 5-point Likert scale, and one free text question. The questions requested information and opinions on:

- Researcher demographics
- Localities of biobanks accessed
- Method/s of sourcing biospecimens
- Researcher satisfaction (application process, biospecimens, data, fit for purpose)
- Influences to use particular biobanks
- Suggested improvements
- Whether researchers had limited their research due to biobank-related challenges

Results

Demographics

Biospecimen researchers predominantly worked at universities (n=23/45, 51.1%) and/or medical research institutes (n=20/45, 44.4%) (Figure 1A), with equal numbers of researchers performing basic (n=17/45, 37.8%) or translational (n=17/45, 37.8%) research (Figure 1B).

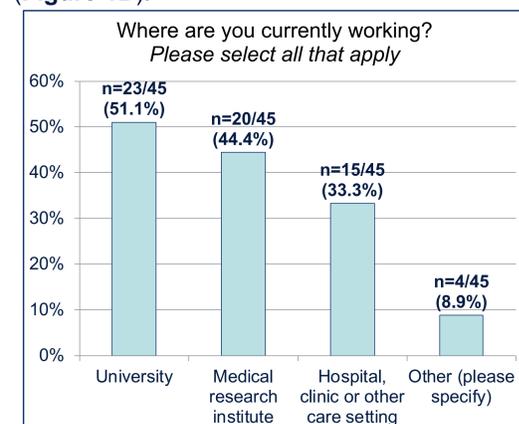


Figure 1A: workplaces of survey respondents

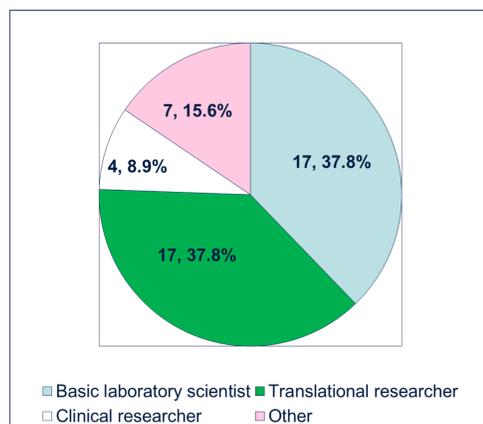


Figure 1B: types of research performed by survey respondents

Table 1: Opinions of biospecimen researcher survey respondents on biobank operations

| | |
|---|---------------|
| The top three influencers to use a particular biobank were proximity (n=15/28; 54%), cost (n=13/28; 46%), and recommendation/reputation (n=13/28, 46%) | |
| Over half of researchers sourced biospecimens from more than one biobank "The number of specimens available is a major limitation." | n=13/25 (52%) |
| Half of researchers created their own collection , rather than applying to an existing biobank "We created our own biobanks as samples were limited in numbers." | n=14/28 (50%) |
| The majority of researchers thought that biobank networks assisted researchers | n=27/33 (82%) |

Table 2: Survey respondents' satisfaction with biobank application processes and whether biospecimens/data were fit for purpose

| | | | |
|--|----------------|-------------------|------------------|
| Biobank application satisfaction (n=27) | Low (n=3, 11%) | Medium (n=4, 15%) | High (n=20, 74%) |
| Fit for purpose of biospecimens/data (n=26) | Low (n=4, 15%) | Medium (n=6, 23%) | High (n=16, 62%) |

Table 3: Survey respondents' satisfaction with formats, types and numbers of biospecimens available..

| | | | |
|---|----------------|-------------------|------------------|
| Biospecimen satisfaction (n=27) | Low (n=5, 19%) | Medium (n=7, 26%) | High (n=15, 55%) |
| Most researchers have not questioned their research results due to biospecimen quality | | | n=21/28, 75% |
| Most researchers have limited the scope of their research because of difficulty obtaining biospecimens | | | n=19/28, 68% |

Table 4: Survey respondents' satisfaction with format and amount of biospecimen-associated data available.

| | | | |
|---|-----------------|-------------------|-----------------|
| Data satisfaction (n=27) | Low (n=10, 35%) | Medium (n=9, 32%) | High (n=9, 33%) |
| Most researchers have not questioned their research outcomes due to data quality | | | n=19/28, 68% |
| Most researchers have limited the scope of their research because of difficulty obtaining data | | | n=21/28, 75% |
| The top three improvements to biobank operations were reported as quality of associated data (n=15/27, 56%), availability of format and amount of associated data (14/27, 52%), and time from application submission to obtaining biospecimens/data (n=11/27, 41%) | | | |
| Researchers reported needing more clinical data (n=21/29, 75%), and more long term follow up data (17/28, 61%) "Need good quality patient data... there needs to be better linkage with patient data" | | | |

Summary and Conclusions

- Most researchers sourced biospecimens from >1 biobank (Table 1), indicating the need for harmonised access and/or larger facilities, to achieve sufficient cohort size.
- Half of researchers opted to create their own collection (Table 1), suggesting that required biospecimens are not readily available/accessible. Furthermore, the majority of researchers reported limiting the scope of their research due to difficulty obtaining biospecimens (Table 3).
- Researchers viewed biospecimen quality favourably (Table 3), however they reported a need for improving biospecimen annotation. They also limited the scope of their research in response to difficulty obtaining data (Table 4). This suggests a need for greater data accessibility and interoperability.
- Researchers requested improvements in application approval times (Table 4), suggesting the need for a review of biobank access procedures.
- Outcomes from this survey can be used to assist open-access biobanks with:
 - Business planning, particularly informed re-direction of resourcing
 - Biospecimen culling strategies
 - Targeted improvements to biospecimen/data quantity and quality
 - Benchmark setting
 - Marketing plans and client engagement
 - Developing/updating cost-recovery plans

Acknowledgements

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References
¹Masset et al, Natl Cancer Inst Monogr, 2011
²UKCRC Tissue Directory and Coordination Centre <https://biobankinguk.org/finding-out-what-makes-researchers-tick/> Accessed 8th April 2020