

Is an expiration date useful for biobanks?

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Introduction

The use of biospecimens and respective data from biobanks enables cost-effective and fast retrospective studies. At the same time, it enables prospective studies with high quality samples following standardized processes and work flows for handling and storage. However, access to long-term funding for biobanks is rare and strategies to recover costs of data and sample processing and retrieval are emerging.

Methods and Results

The diversity of biobanks is enormous. Many biobanks pursue prospective collections based on multiple projects. A considerable number of biobanks collects samples population-based, storing samples almost without any limitation in terms of time for retrospective and epidemiological studies. Accordingly, it is unknown if and when a biobank will spend all the biospecimens for biomedical research. So far, an expiration date for a biobank has not been discussed. However, what are the costs for closure of a biobank?

The following questions were addressed: (1) What kind of existent funding can support the sustainability of a biobank? (2) Is long-term funding possible? (3) Has a biobank to be able to recover all costs itself? (4) Does an expiration date according to the period of funding make sense? (5) How much would it cost to terminate a biobank?

As an example, Biobank Graz was investigated. Analysis of national and international funding acquisition for Biobank Graz was performed by the publicly available Boston-Consulting-Group Analysis and a Strengths-Weakness-Opportunities and Threats Analysis. Costs for processing and storage of biospecimens were calculated by a transparent cost calculation for academic and non-academic researchers. Costs for termination and sample destruction of a biobank were calculated as well.

	Amount of samples at BB	Weight per unit [slide/block/tube] (g)	Total weight (g)	Max. weight (g)	Amount containers	Price/ container [€]	Tonnage price [€](159€ per ton)	Price in total [€]
Paraffin slides (yellow/orange container)	19,000,000 slides	6	114,000,000	20,000 per 25 L container	5,700	3.95	18 126	40,641
Paraffin blocks (black container)	6,000,000 blocks	5	30,000,000	8000 per 30 L container	3,750	18.50	—	69,375
Cryo samples (black container)	30,000 cryotubes	5	150,000	8000 per 30 L container	19	18.50	—	3,451.50
Blood samples (green container)	1,500,000 liquid sample tubes	3.0	4,500,000	20,000 per 25 L container	225	6.50	—	1,462.50

	Hourly rate [€]	Duration of disposal [n]	Amount of personnel	Personnel costs [€]				
Average BMA (biomedical analyst)	28.00	1,780	4	199,360				
Average MTF (medical technical specialist)	25.00		4	178,000				
Average archive	21.00		4	149,520				
				526,880				
Total Costs [€]								641,810

Tab 1: Cost Calculation Disposal of all Biobank Graz Samples . Source: Sargsyan K, et al. Biopreserv Biobank. 2015

Conclusion

As Biobank Graz includes a disease-specific and a population-based collection it is not possible to plan an expiration date without losing a large number of epidemiological data. However, there are no long-term funding options and the total recovery of costs seems difficult in light of the aim to provide researchers high-quality samples/data for their projects independent of acquisition of third-party funds. Costs for a shutdown of Biobank Graz were estimated to be about € 700,000 including consumables such as hand gloves, additional lab coat cleaning but without reconstructing of infrastructure and premises for use by another institution. For clinical biobanks a long-term funding and cost recovery strategy seems to be necessary for sustainable operation.