

Human health biobanking during the COVID-19 pandemic: challenges and opportunities

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Health
Statewide Biobank

Supporting world-class health and medical research

NSW Health Statewide Biobank

- State-of-the-art facility for NSW health and medical research, opened in November 2017
- Purpose-built facility
- Largely prospective collection model
- Cost-recovery to enable flexible service delivery
- Supported by Office of Health and Medical Research, operated by NSW Health Pathology



<https://biobank.health.nsw.gov.au/contact-us/>

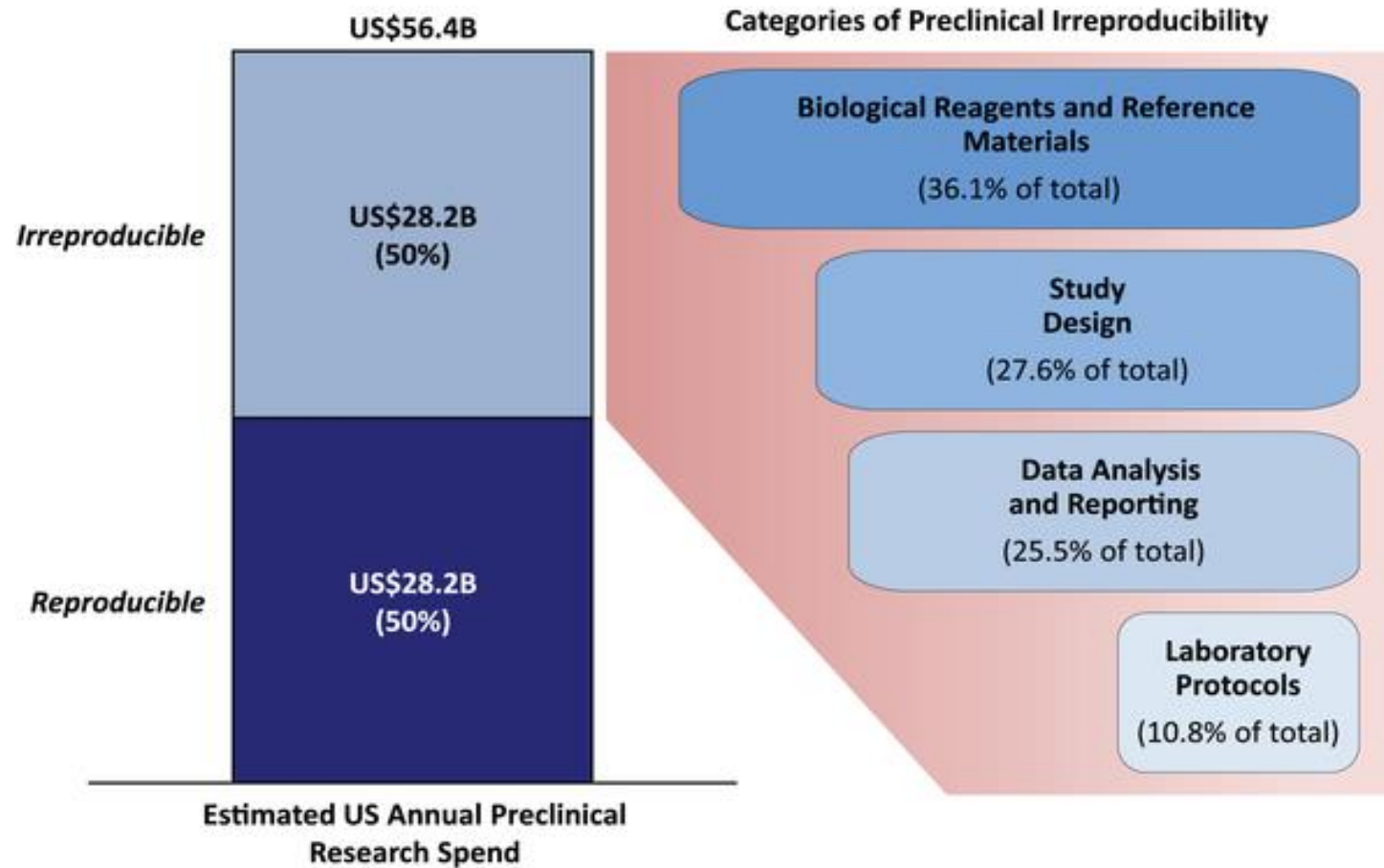
Seminar outline

- Health biobanking and its contributions to research
- Current challenges in health biobanking
- Impacts of COVID-19 on research and health biobanking
- Current opportunities for health biobanking

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Preclinical research irreproducibility and waste

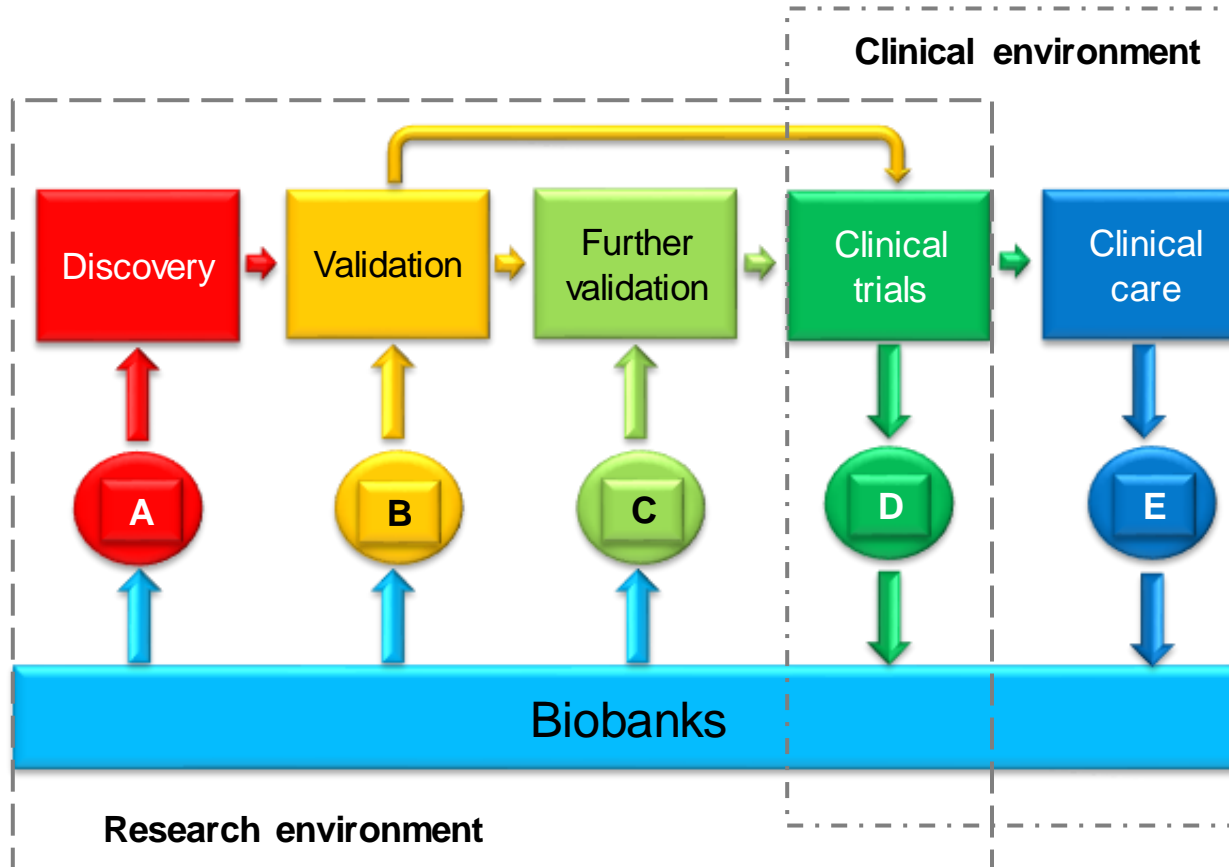


Freedman et al. (2015) PLoS Biol

Biobanking and biomedical research

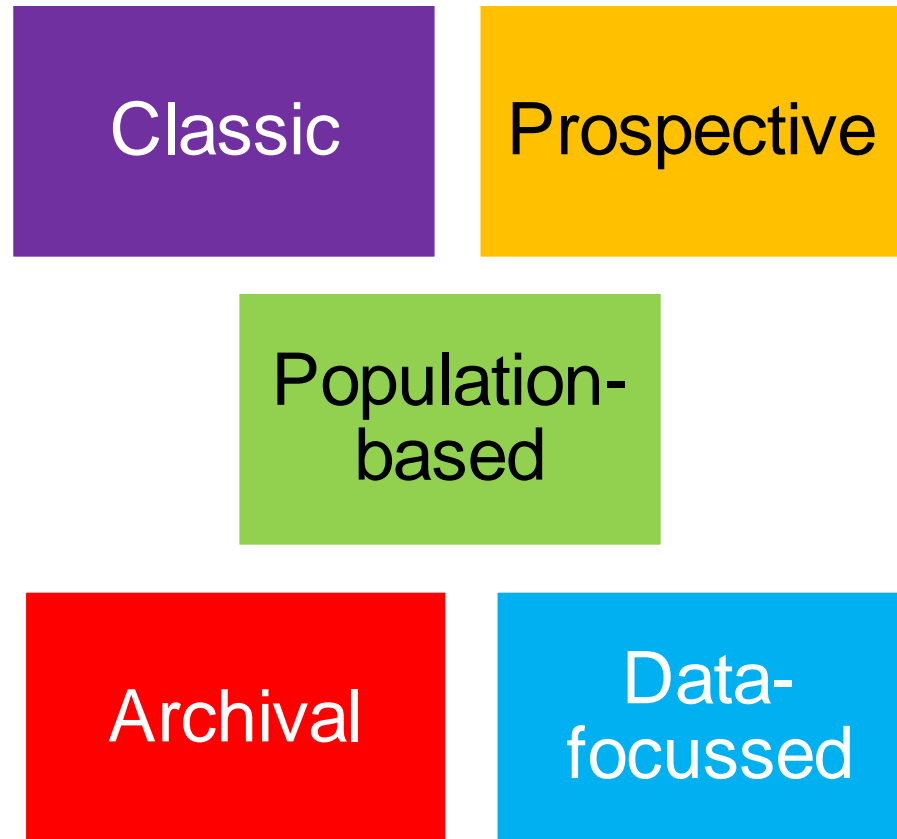
- Biobanking supplies human biospecimens for research
- Enables relevant research
- Enables derivation of other models (cell lines, organoids, patient-derived xenografts)
- Biospecimen availability and quality determine the research that can be undertaken

How human biobanks support research



Rush et al. (2015) Biophys Rev

Different biobanking models (Grizzle et al., 2019)



Grizzle biobanking models

Classic

Prospective

Population-based

Archival

Data-focussed

Grizzle biobanking models

Classic

- Collections built around research aim/ available biospecimens
- May not meet all research needs

Prospective

- Biospecimens collected for specific research projects
- More research use, less waste

Population-based

- Healthy or at-risk populations
- Expensive to establish and maintain

Archival

- Biospecimens collected for clinical care
- Not always suitable for research

Data-focussed

- Focus on data generation from biospecimens
- Less expensive, reliance on IT

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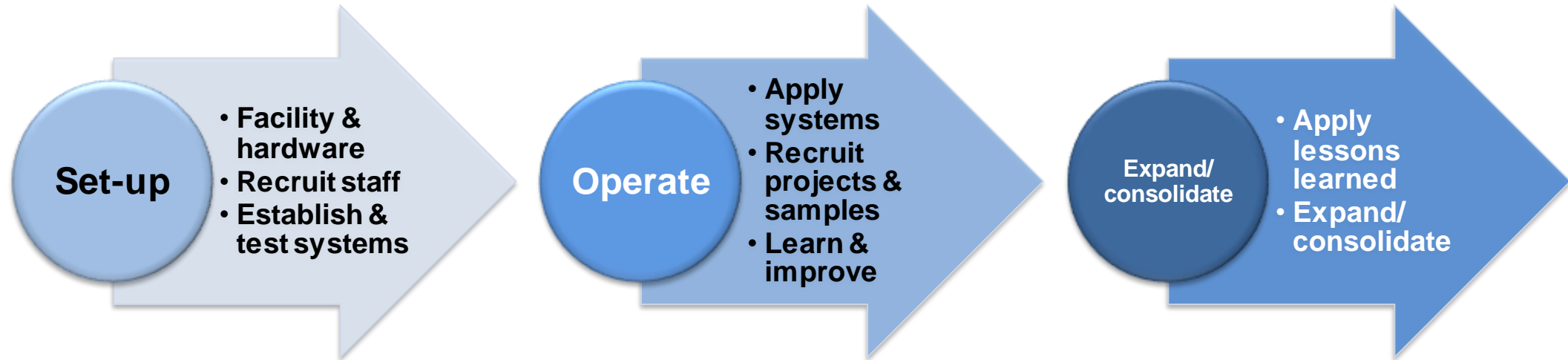
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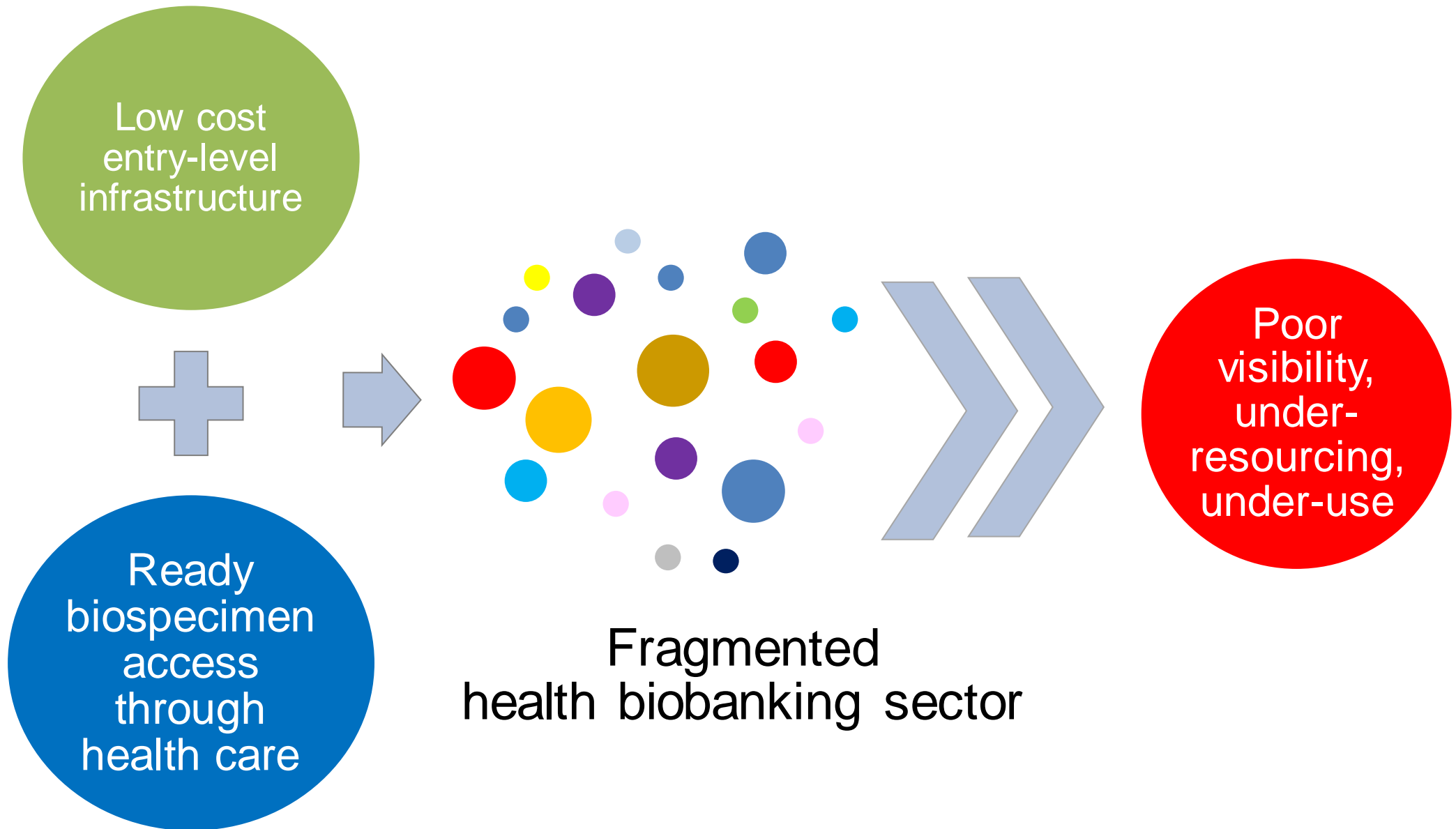
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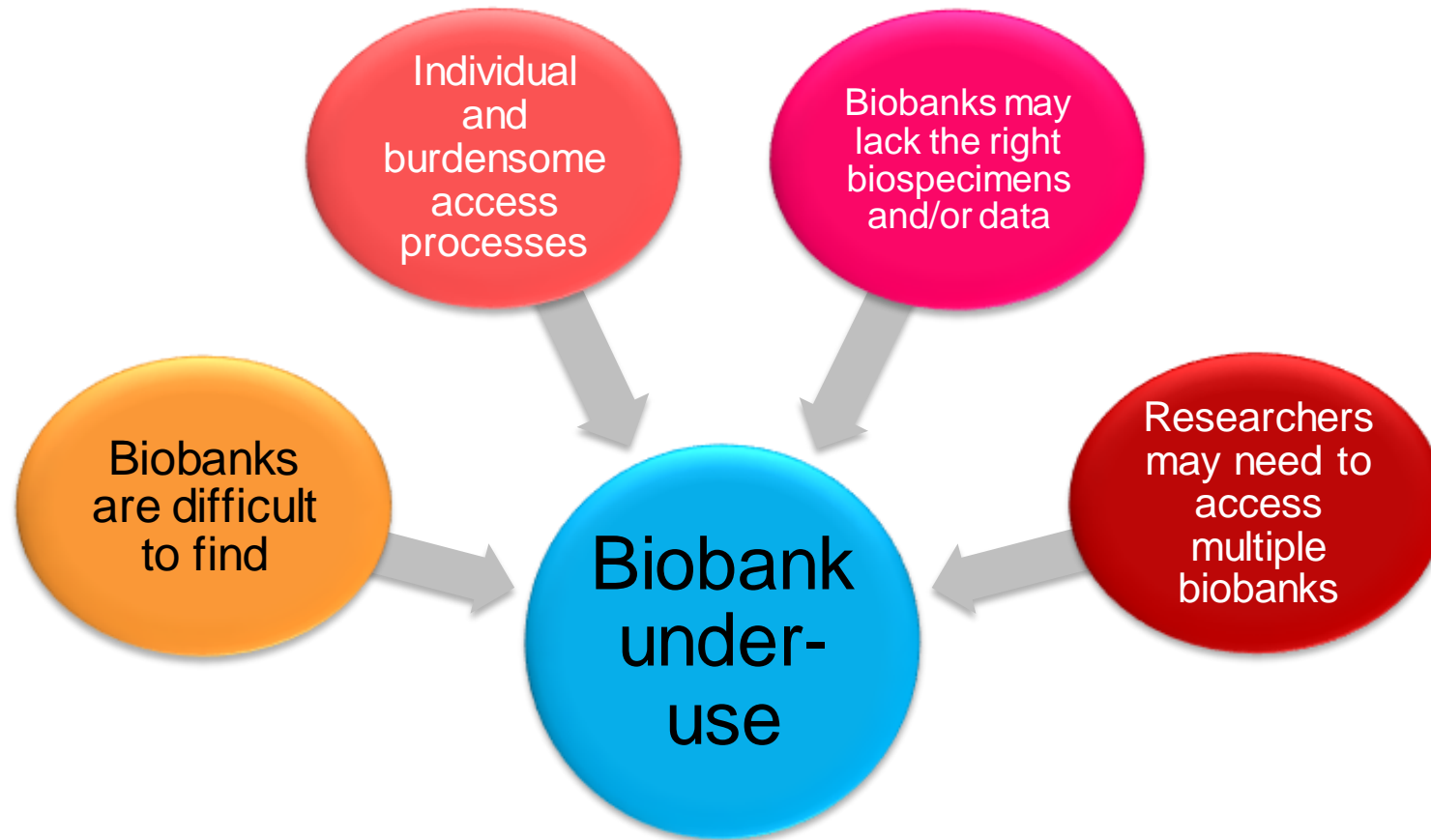
Life-stages of planning and running a biobank



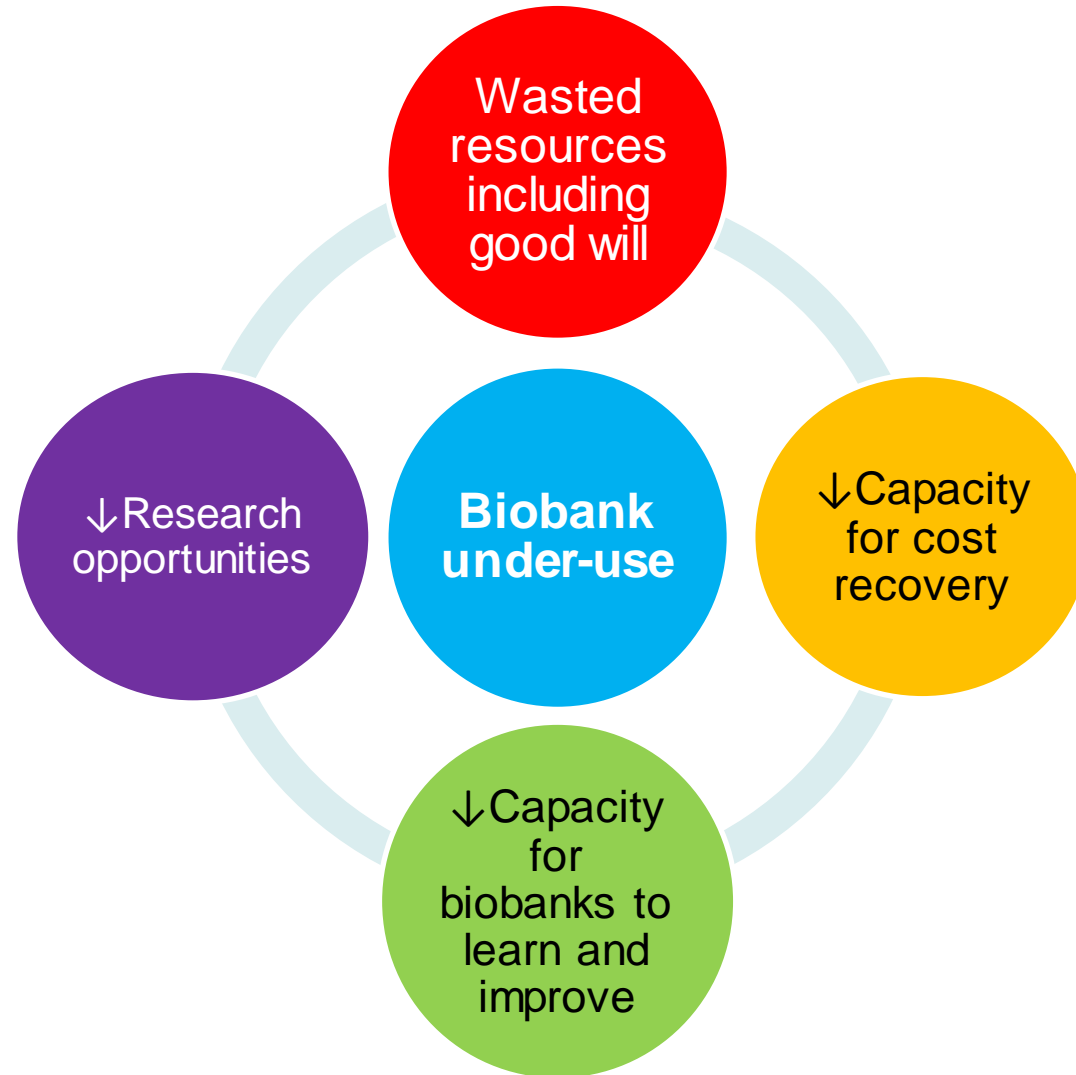
Entropy within health biobanking



Many factors contribute to biobank under-use




Consequences of biobank under-use



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Building Research Support Capacity across Human Health Biobanks during the COVID-19 Pandemic

Jennifer A Byrne^{1,2} , Jane E Carpenter^{3,4} , Candace Carter¹, Kathleen Phillips¹ , Stephen Braye³, Peter H Watson^{5,6} and Amanda Rush^{1,2,7}

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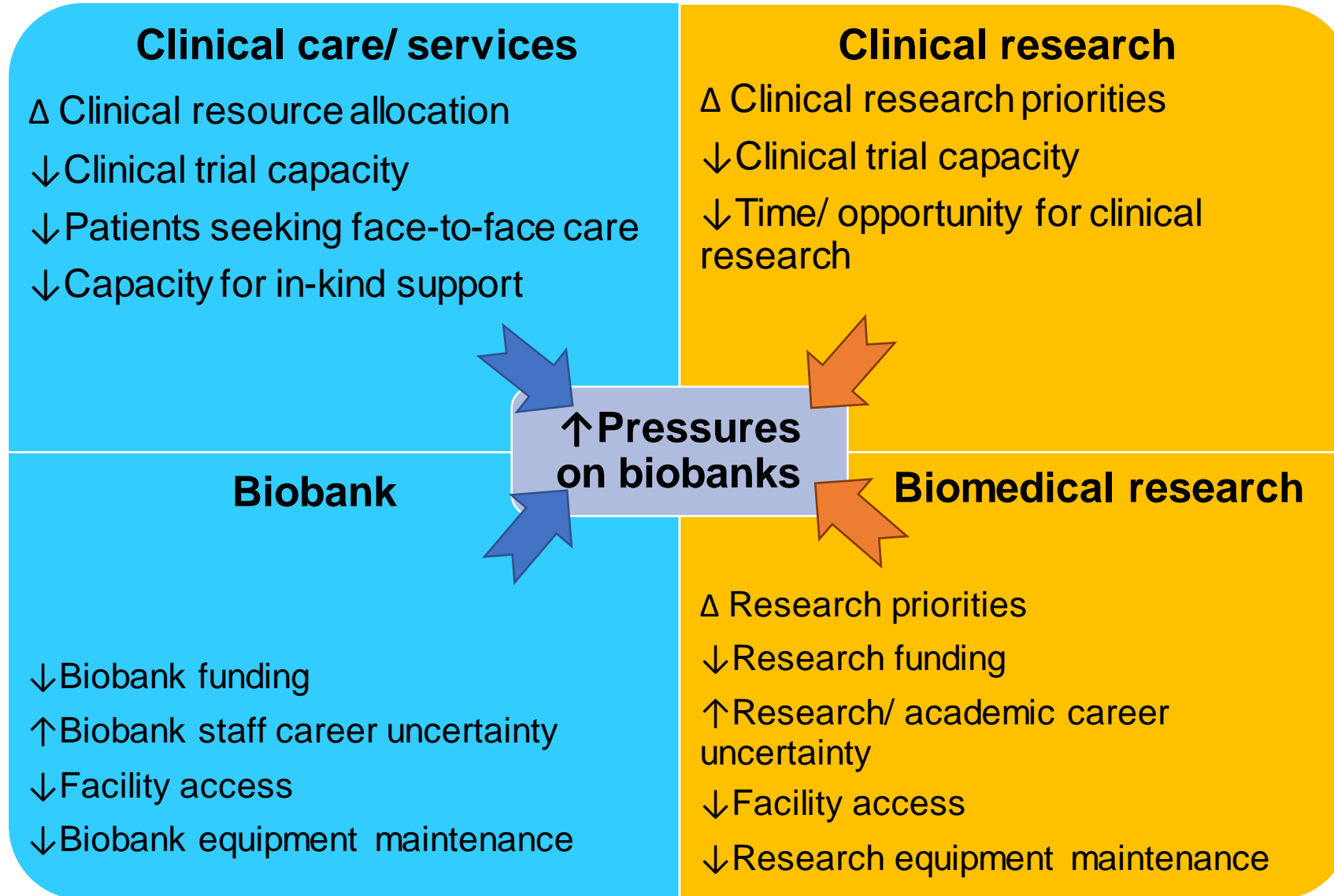
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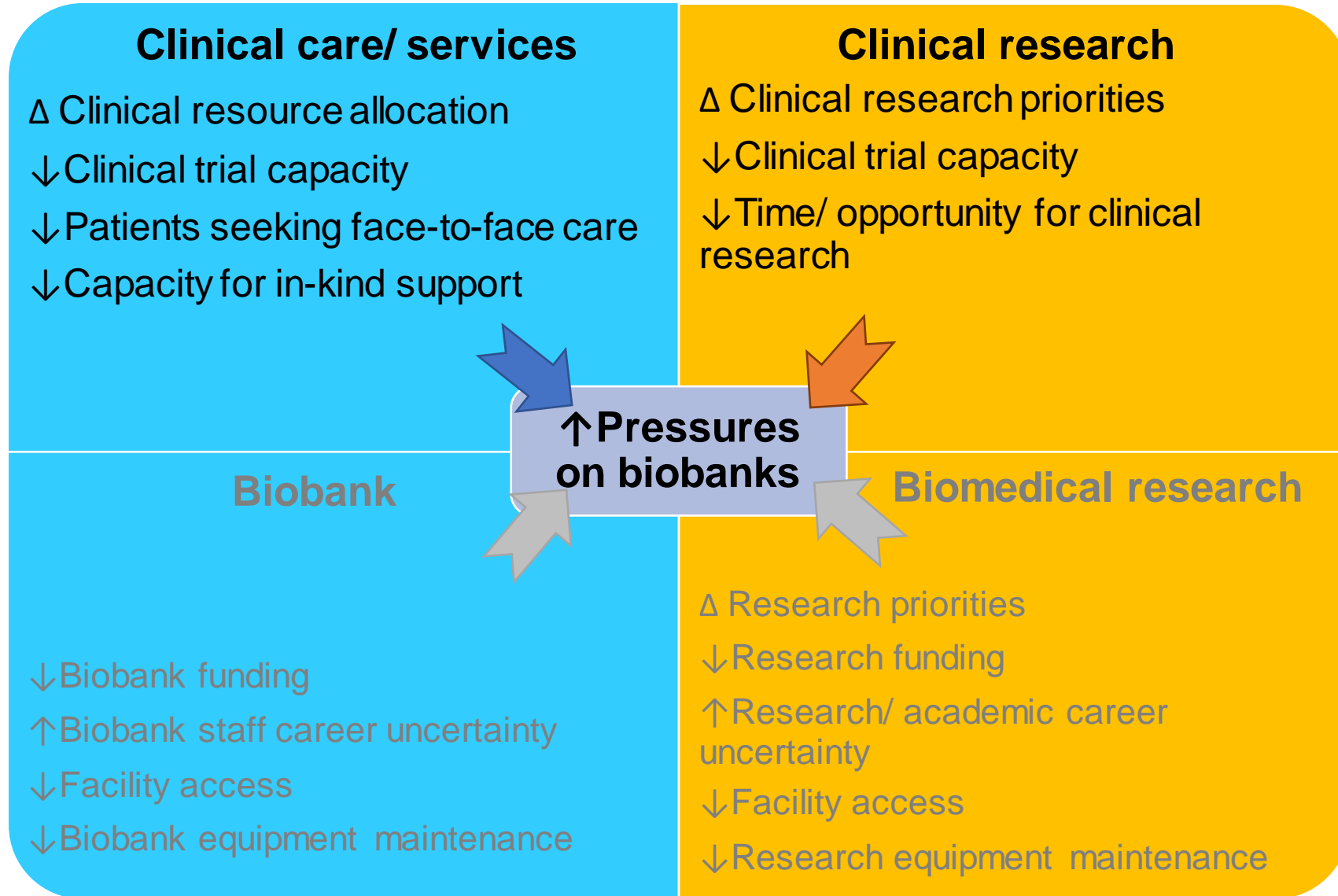
↓ **Supply** of biobank resources

↓ **Demand** for biobank services



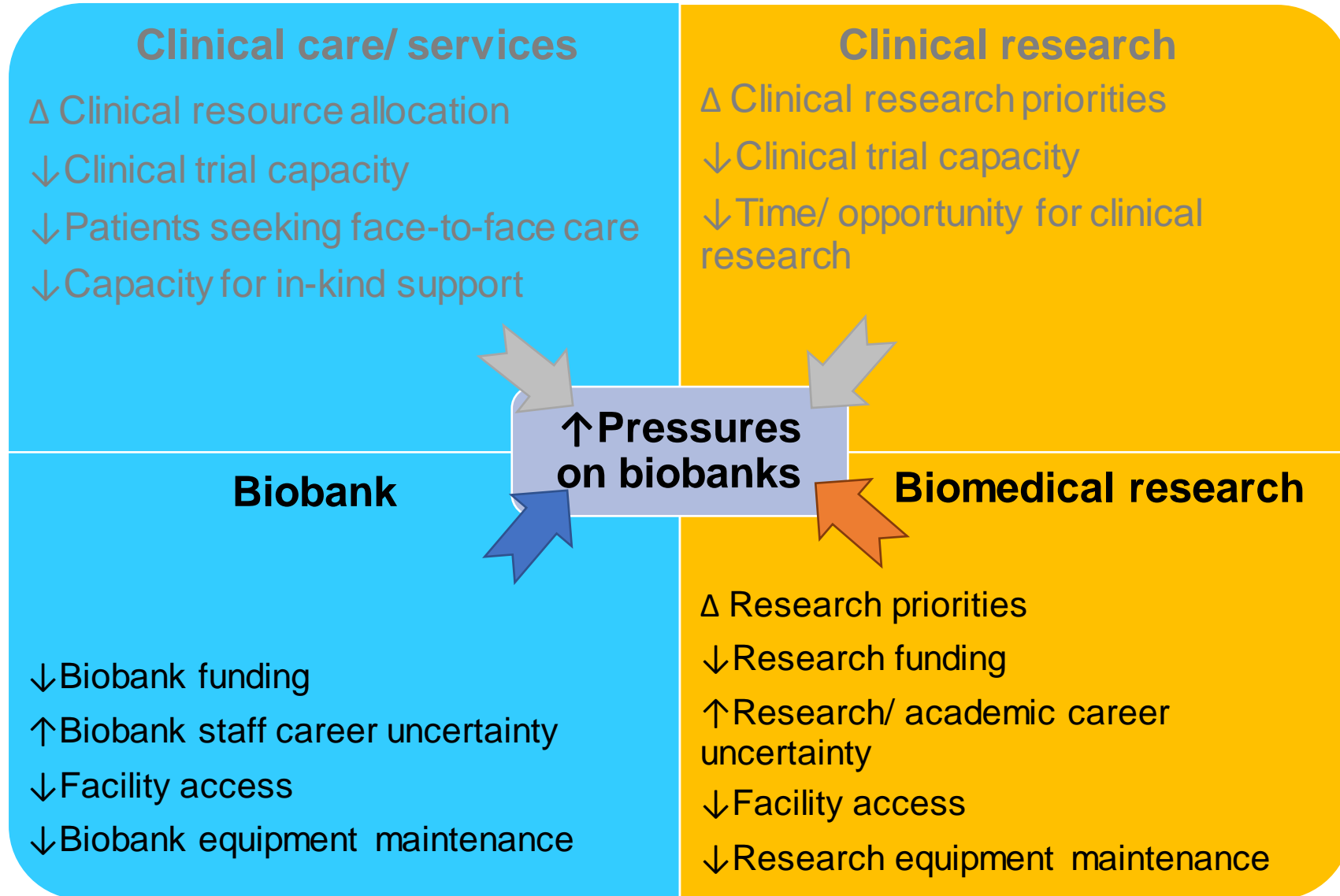
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↓ **Supply** of biobank resources

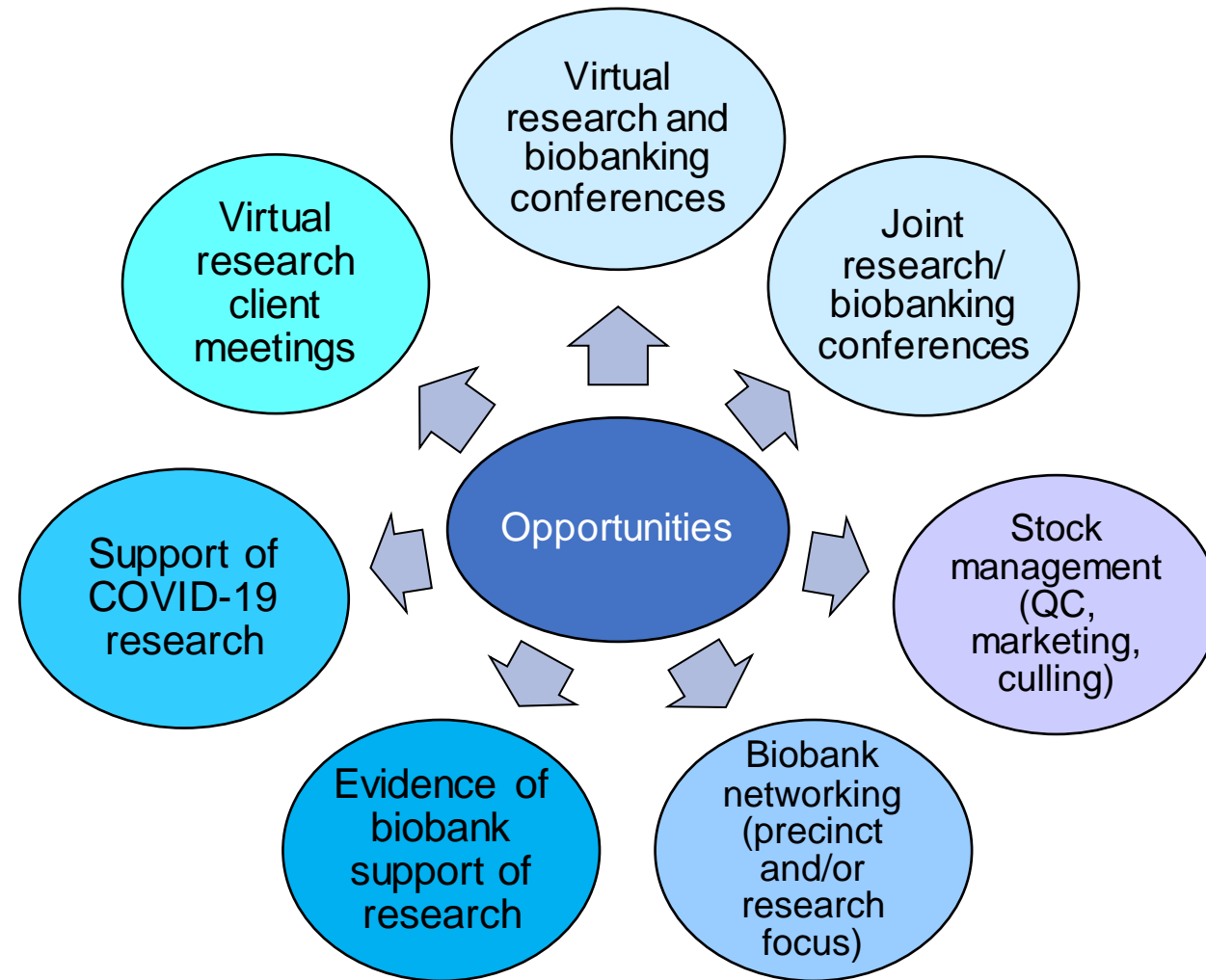
↓ **Demand** for biobank services



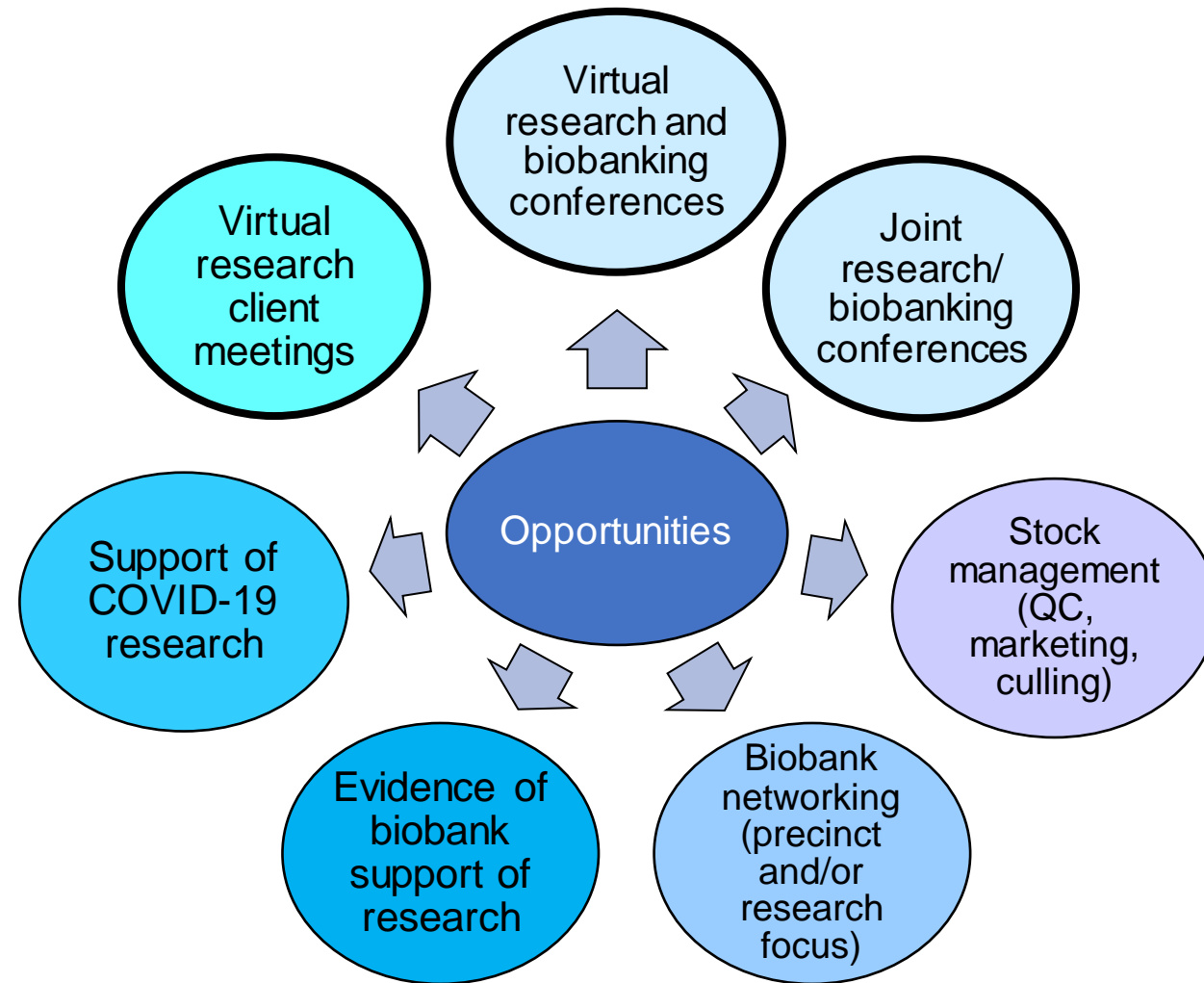
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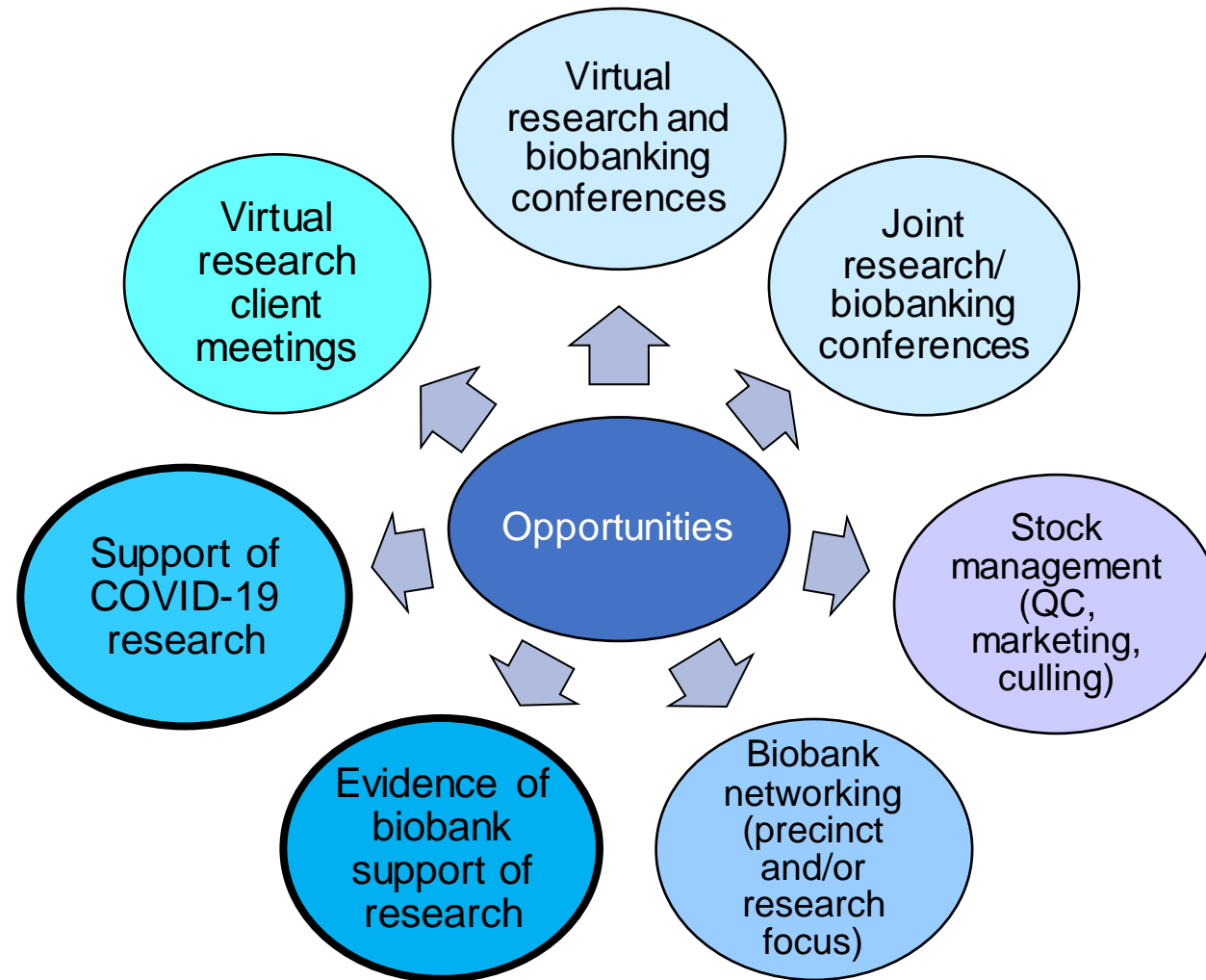
COVID-19 opportunities for biobanks



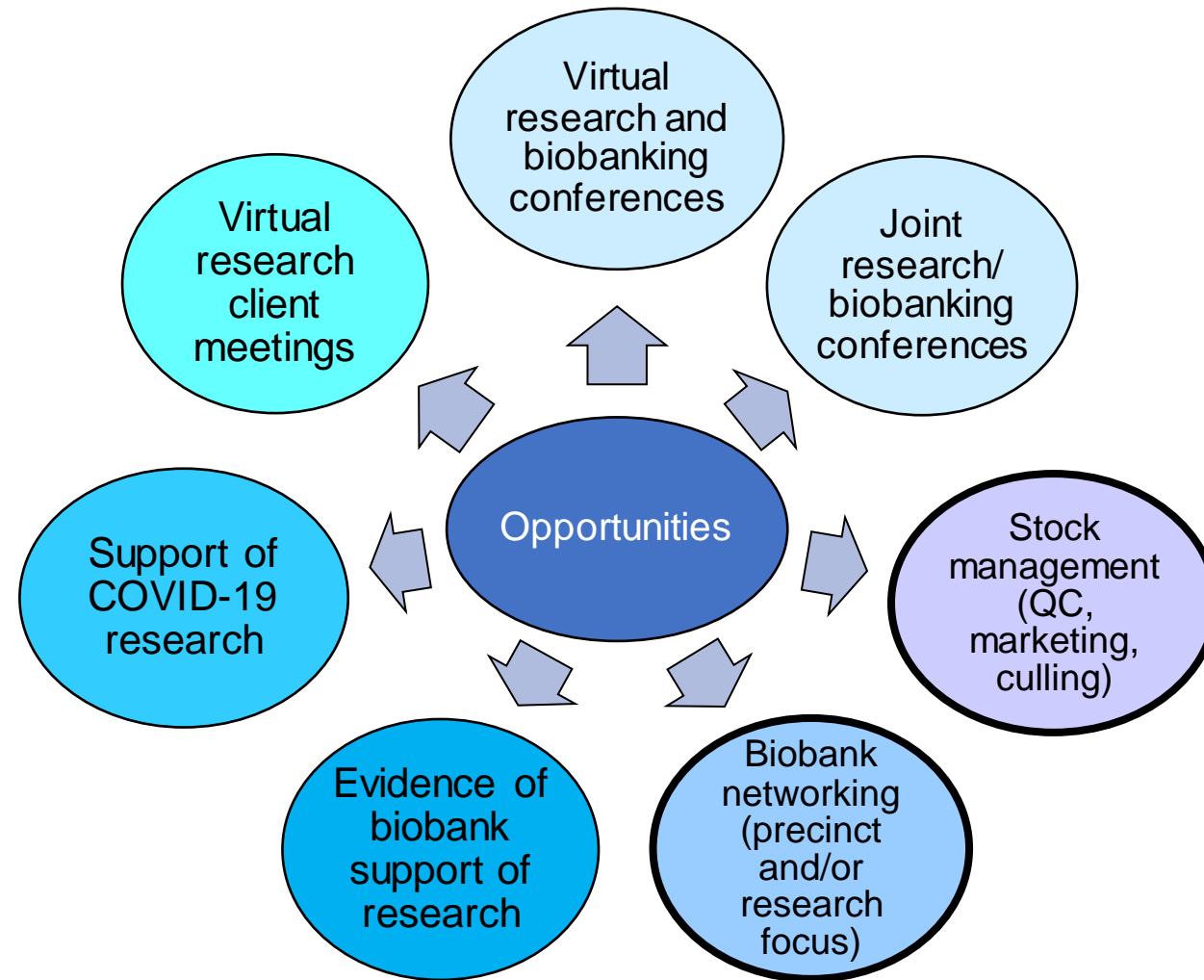
COVID-19 opportunities for biobanks



COVID-19 opportunities for biobanks



COVID-19 opportunities for biobanks



Recognised gaps in biobanking knowledge

	Knowns	Unknowns
Known	Knowledge	<ul style="list-style-type: none">• Organisational dynamics of biobanking (how biospecimens and data are employed in research, and by whom?)• Which biobanking models work (in different research fields/ resource settings)?• Impact of COVID-19 on biobanking success/ research demands
Unknown	Tacit knowledge	Unknown gaps



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Policy Perspective

Improving Academic Biobank Value and Sustainability Through an Outputs Focus



Amanda Rush, MPH,* Daniel R. Catchpoole, PhD, Rod Ling, PhD, Andrew Searles, PhD, Peter H. Watson, PhD, Jennifer A. Byrne, PhD*

ABSTRACT

Although it is generally accepted that human tissue biobanks are important to facilitate progress in health and medical research, many academic biobanks face sustainability challenges. We propose that biobank sustainability is challenged by a lack of available data describing the outputs and benefits that are produced by biobanks, as reflected by a dearth of publications that enumerate biobank outputs. We further propose that boosting the available information on biobank outputs and using a broader range of output metrics will permit economic analyses such as cost-consequence analyses of biobank activity. Output metrics and cost-consequence analyses can allow biobanks to achieve efficiencies, and improve the quality and/or quantity of their outputs. In turn, biobank output measures provide all stakeholders with explicit and accountable data on biobank value, which could contribute to the evolution of biobank operations to best match research needs, and mitigate some threats to biobank sustainability.

Keywords: biobank, research, value, outputs, sustainability.

VALUE HEALTH. 2020; 23(8):1072–1078

Summary

- Small health biobanks are easier to establish than to sustain
- Many individual health biobanks are likely to lead to biobank under-use, and reduced sustainability
- The COVID-19 pandemic has reduced both supply of health biobanking resources and demand for services
- Virtual conferences and COVID-19 research represent opportunities for biobanks
- Research is needed to describe how health biobanking supports research

Thank-you....

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