

# What is the preferred future of reproducibility: Results from four future studies workshops

Barbara Leitner<sup>\*1</sup>, Tony Ross-Hellauer<sup>2</sup>, Nicki Lisa Cole<sup>2</sup>, Simone Kopeinik<sup>2</sup>, Serge Horbach<sup>3</sup>, Joeri Tjink<sup>1</sup>

\*b.leitner@amsterdamumc.nl

<sup>1</sup> Vrije Universiteit Medical Center, Amsterdam, Netherlands

<sup>2</sup> Know-Center, Graz, Austria

<sup>3</sup> Radboud University, Nijmegen, Netherlands

## INTRODUCTION

Reproducibility is a corner stone for scientific enquiry. It refers to obtaining consistent results when repeating experiments and analyses. Discourses on reproducibility in the research community tend to promote blanket policies and procedures across areas of research neglecting crucial variation in knowledge production models. To arrive at a research climate that is conducive to reproducibility in various domains, changes to infrastructure, research culture, incentives, and policies have been suggested as preliminary steps. With the current study we sought to further this work by exploring the futures of reproducibility for stakeholders from diverse epistemic contexts. Ultimately, this intends to support the drive towards preferred futures of reproducibility.

## OBJECTIVES

- Explore the ideal future of reproducibility for different stakeholders and epistemic contexts in online workshops
- Explore the roadmap towards these futures including limitations, barriers, and enablers

## METHODS

We conducted four online workshops with four different stakeholder groups in the research community: funders, publishers, machine learning researchers, and qualitative social scientists (N=19). We employed futures studies [1], to examine the realistic, dystopian, outlier, and to explore how preferred futures could be achieved by working backwards from those futures to the present.

## RESULTS

What actors are most influential in shaping the future of reproducibility?

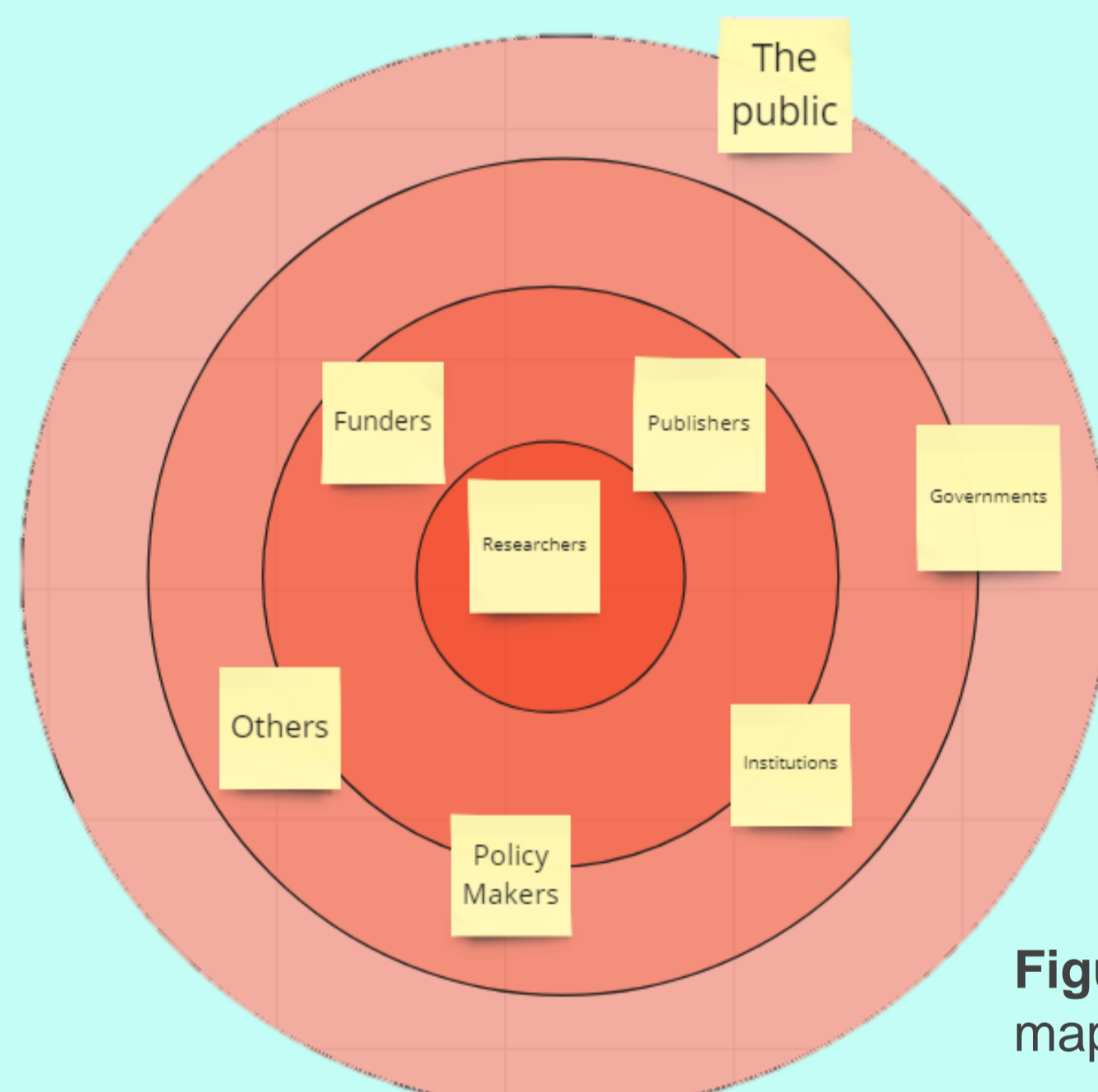


Figure 4: Results for stakeholder mapping

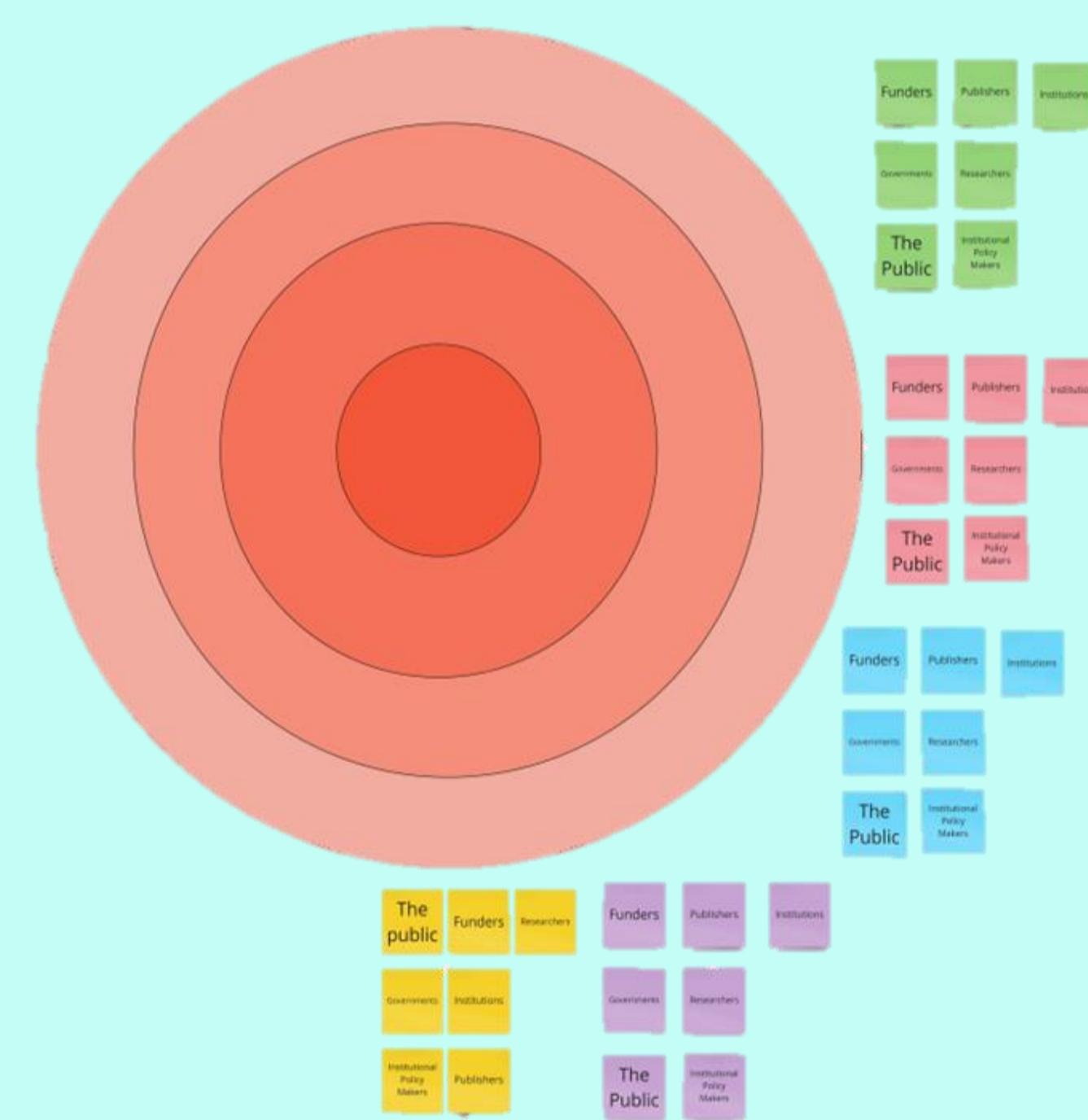


Figure 1: Stakeholder mapping

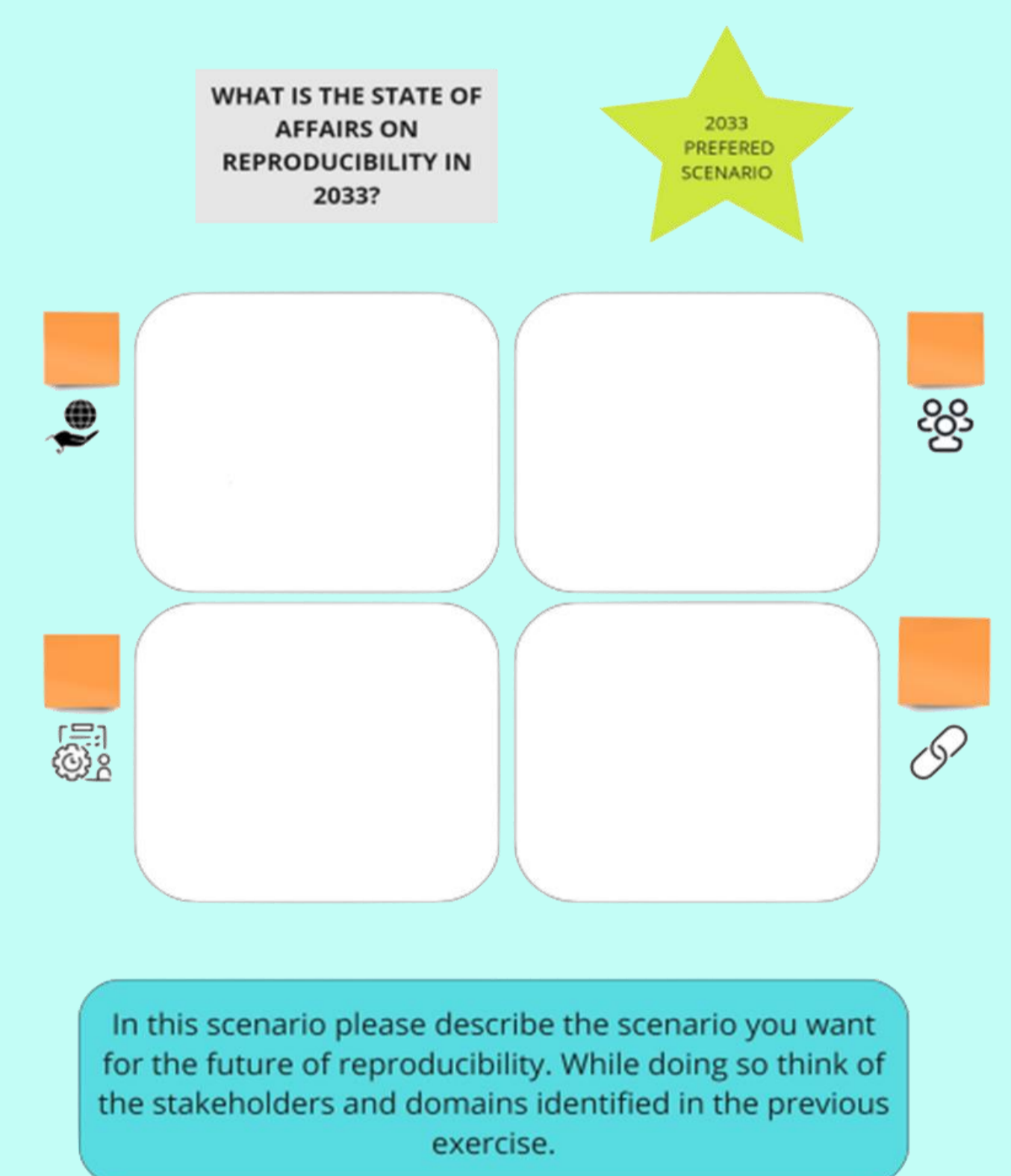


Figure 2: Scenario planning

### Main attributes of a preferred future of reproducibility

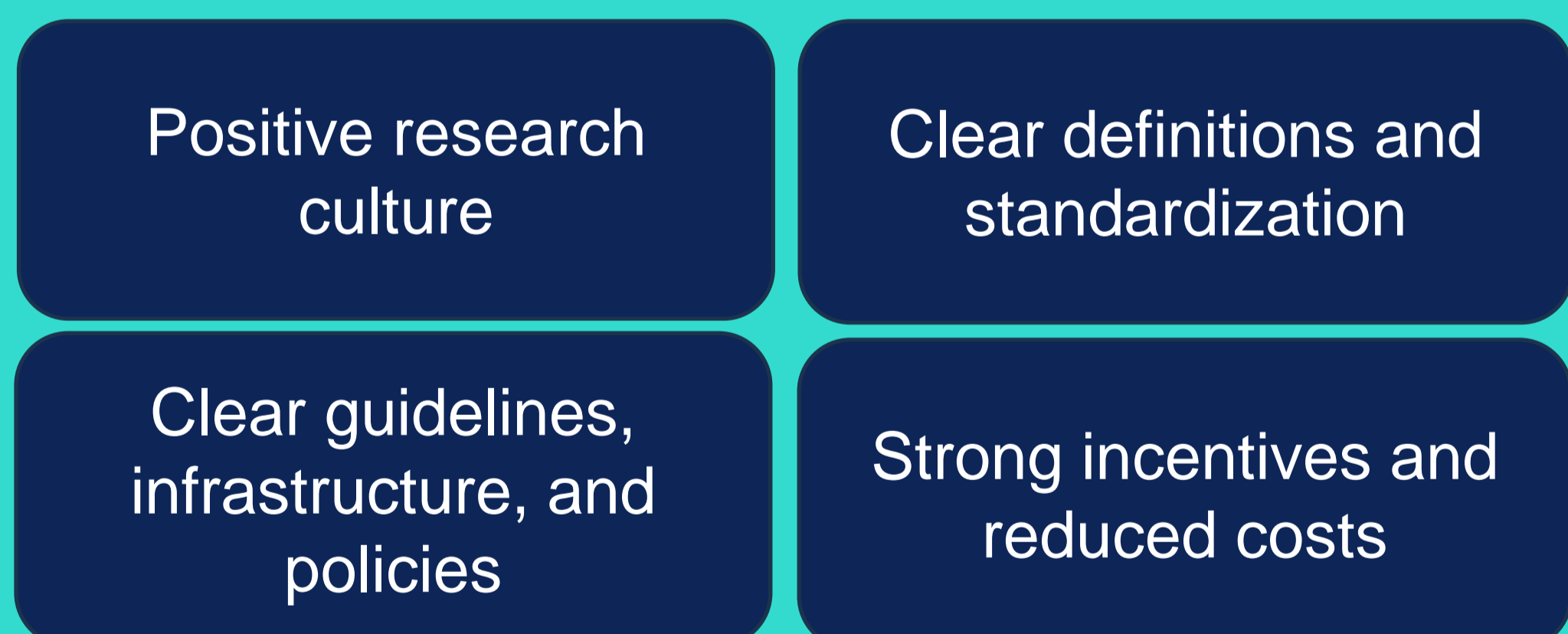
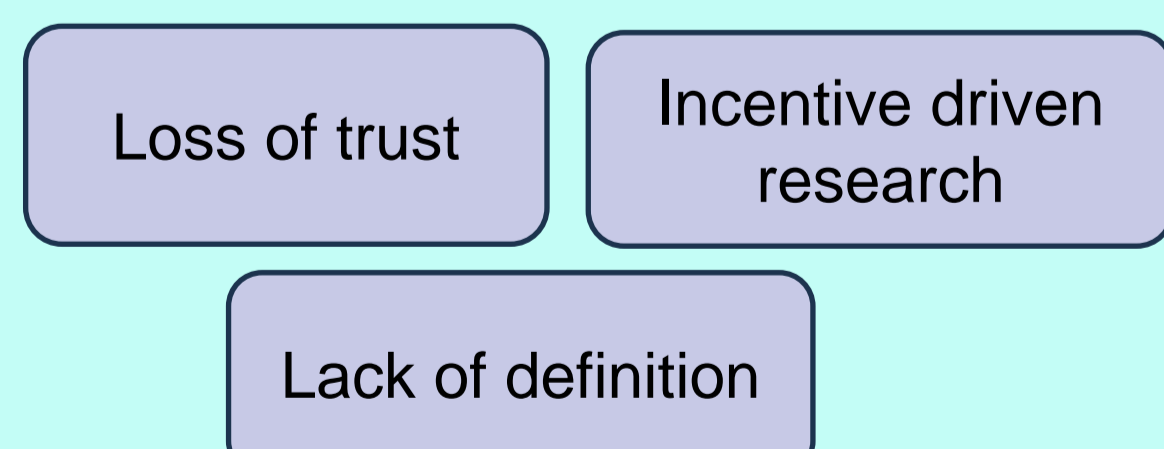


Figure 5: The core themes which encapsulate elements of the preferred futures of the four stakeholder groups

### Dystopian Futures



### Outlier Futures



### Drivers for the preferred futures

Positive research culture, advance in technology and infrastructure, incorporation of training and education, clear policy, and increased funding

### Barriers for the preferred futures

Cultural and social issues, systems and institutions, absence of tools and infrastructures, financial and economic costs, unclear policies, a lack of training and education

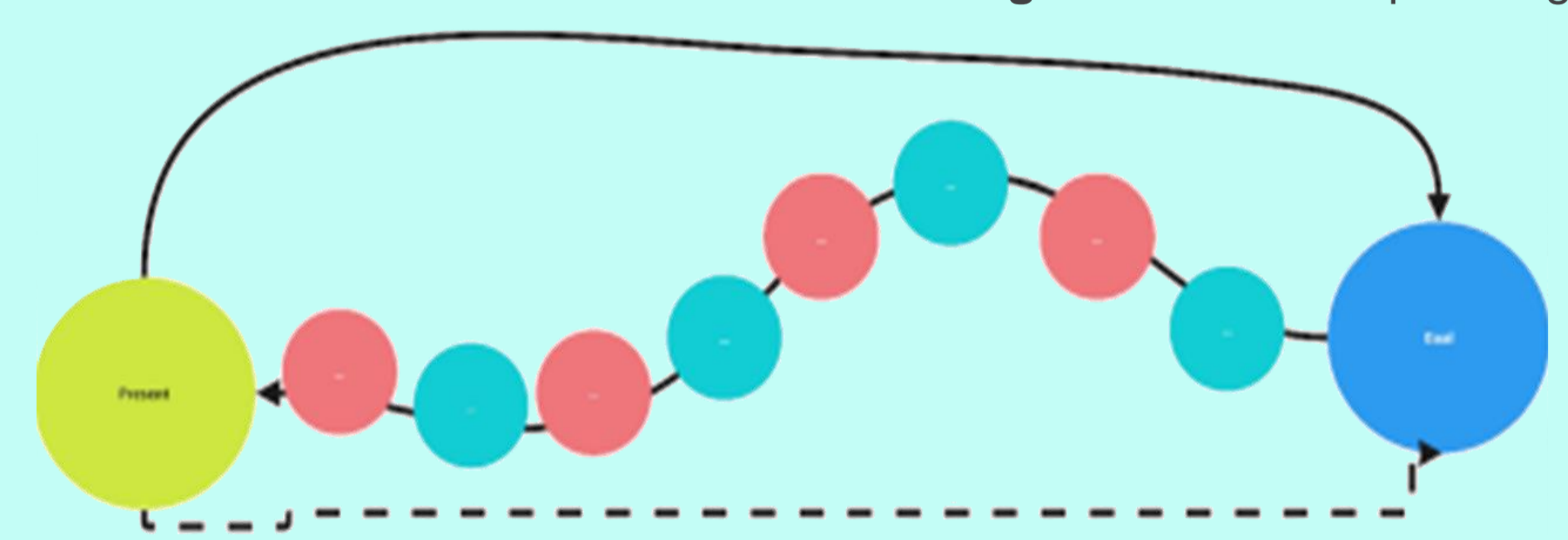


Figure 3: Backcasting

## CONCLUSIONS

- Change in research culture is the most important enabler of the preferred futures of reproducibility.
- Differences between stakeholders' visions for preferred and undesired futures should be used as a starting point to initiate conversations and collaboratively work towards improving research cultures.

## REFERENCES

- [1] Inayatullah, S. (2013). Futures studies: theories and methods. *There's a future: Visions for a better world*, 36-66.
- [2] Nosek, B. (2019, June 11). Strategy for culture change. OSF. <https://cos.io/blog/strategy-for-culture-change>.