Bayesian Ranking (1)

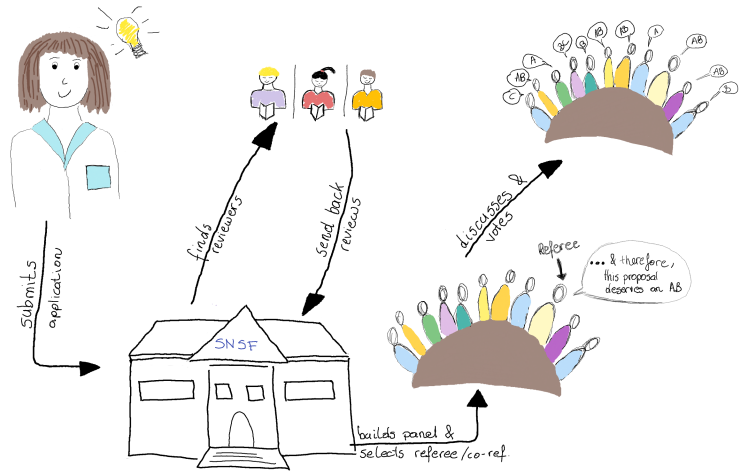

Figure 1: From idea to funding decision at the SNSF (prior to 2022)

Bayesian Ranking (2)

From idea to funding decision at the SNSF (prior to 2022):

ID	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	Av
#1	C	AB	A	BC	B	AB	AB	A	AB	AB	B	4.55
#2	C	AB	A	BC	**COI**	AB	AB	A	AB	AB	B	4.6
#3	A	A	..	..	..	..	..	..	..	C	A	4.73
#4	A	AB	..	..	..	..	..	..	..	**COI**	A	5.63
#5	C	C	..	..	..	..	..	..	..	C	BC	2.33

Bayesian Ranking (2)

From idea to funding decision at the SNSF (prior to 2022):

ID	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	Av
#1	C	AB	A	BC	B	AB	AB	A	AB	AB	B	4.55
#2	C	AB	A	BC	**COI**	AB	AB	A	AB	AB	B	4.6
#3	A	A	..	..	..	..	..	..	..	C	A	4.73
#4	A	AB	..	..	..	..	..	..	..	**COI**	A	5.63
#5	C	C	..	..	..	..	..	..	..	C	BC	2.33

We need a method that:

$\rightarrow$ allows to split scientific evaluation and funding decision.

$\rightarrow$ defines the funding line and a lottery group in a consistent, transparent and reproducible way.

Bayesian Ranking (3)

- Let's assume that y_{ij} is the estimation of the quality of proposal i by voter j, $i \in \{1, \ldots, n\}$ and $j \in \{1, \ldots, m\}$.
- Bayesian Hierarchical Model (given some priors) for the panel votes:

$$\begin{aligned} y_{ij} \mid \theta_i, \lambda_{ij} &\sim N(\bar{y} + \theta_i + \lambda_{ij}, \sigma^2) \\ \theta_i &\sim N(0, \tau_\theta^2) \\ \lambda_{ij} &\sim N(\nu_j, \tau_\lambda^2). \end{aligned}$$

- Model and extract the **distribution of the rank of the** θ_i to achieve the Bayesian Ranking.

Bayesian Ranking (4)

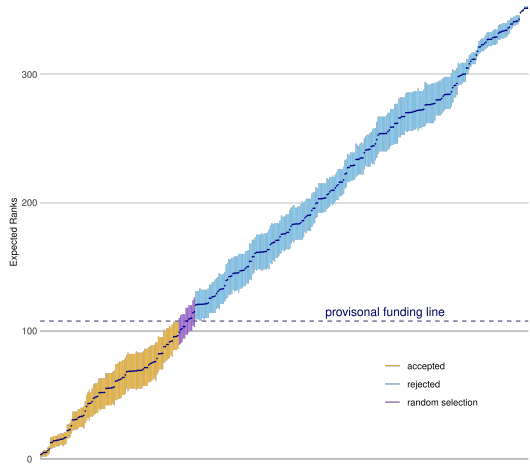

Figure 2: 28% accepted (100), **4% in lottery (12)**, 68% rejected (241)

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F. Freuli, L. Held, R.Heyard, 2022 (osf.io/preprints/metaarxiv/s4b65)

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