Perceived impact and actionability of barriers to drug repurposing: Insights from a multi-stakeholder policy survey

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INTRODUCTION

- Drug repurposing (DR) - identifying new therapeutic indications for existing approved or investigational drug substances - has emerged as an important strategy to reduce development costs in comparison with de novo drug discovery.[1]
- Policy barriers to successful DR remain pervasive across the drug development ecosystem.[2]
- A systematic literature review undertaken by the REMEDi4ALL Horizon Europe project identified 33 policy-related barriers.[3]

METHODS

- We developed an online policy survey.
- Participants were asked to weigh the impact and actionability of all barriers from their perspectives, using 5-point categorical scales.
- The barriers were grouped by categories, and participants were allowed to skip whole themes (therefore not every participant weighted every barrier).
- The responses of the participants were converted into numerical values.
- The barriers were prioritized by a weighted combination of the scores from the two domains.

RESULTS: SURVEY COMPLETION

- Participants' characteristics are shown in *Table 1.*, completion rates for each theme can be seen on *Figure 1*.

Table 1. Characteristics of the participants

Total participants	60	100%
Participants by stakeholder group		
HTA, healthcare payer, regulator	11	18.3%
Patient representatives	6	10.0%
Funders (Philanthropic or public funder of DR)	12	20.0%
Pharmaceutical industry (pharmaceutical companies, biotech and SME, industry association, consultant, venture capitalist)	17	28.3%
Researchers (researchers, academia and clinicians)	14	23.3%
DR Expertise/perspective of participants by geographical distribution		
EU countries before 2004 (EU15)	31	51.7%
EU countries after 2004 (EU13)	12	20.0%
Other (USA, Switzerland, Ukraine, UK)	17	28.3%

HTA - health technology assessment; SME - small-medium sized enterprises; EU - European Union; USA - United States of America; UK - United Kingdom

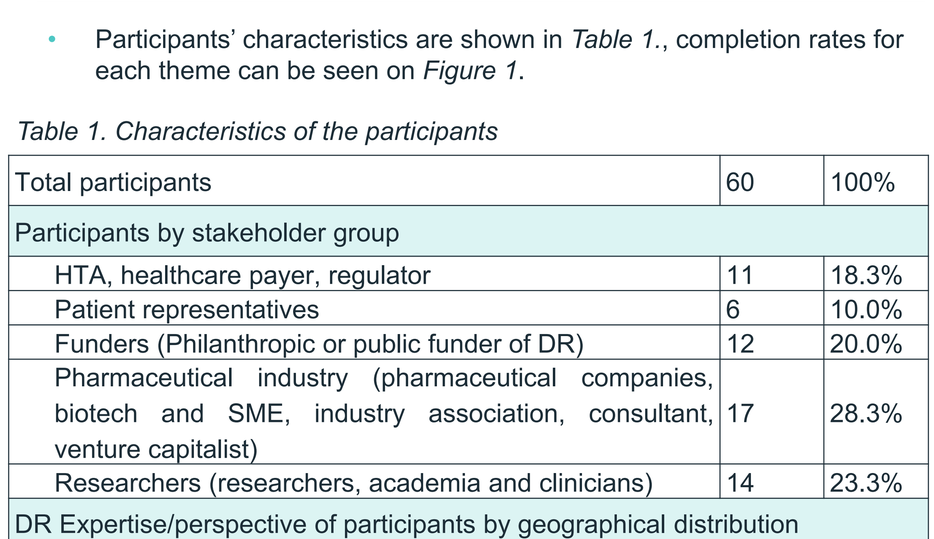

Figure 1. Response rates for each theme, in order of their appearance in the survey (% of all respondents)

OBJECTIVES

- To prioritize the identified barriers with the involvement of multiple stakeholder groups.
- To develop a shortlist of barriers that are considered most important based on the result.
- To examine the differences between stakeholder groups' perceptions on the most important barriers.

RESULTS: BARRIER SHORTLIST

- The final shortlist contained 22 barriers.
- The highest ranked barriers varied across different stakeholder groups, with the patient representatives' preference showing the greatest divergence from other groups' preferences.

Table 2. Shortlist of Barriers and their Heatmap based on Stakeholder Groups' Perceptions of the Barriers

Barrier	HTA, healthcare payer, regulator	Patient representatives	Funders	Pharmaceutical industry	Researchers
Generic pricing mechanisms are often applied to off-patent repurposed medicines.					
Limited market protection and data exclusivity options for repurposed medicines.					
Limited incentives to turn off-label use to on-label to ensure access to a wider patient population.					
Insufficient return on investment is anticipated for repurposing off-patent medicines.					
Competitors can benefit from the DR investment in case of off-patent medicines by cross-label prescribing and dispensing.					
Limited, incomplete and fragmented funding is available for non-profit DR at different stages.					
Indication-based differential pricing for repurposed medicines is problematic.					
Evidence requirement for HTA is not designed for off-patent DR and is of high burden.					
For label-extension, there is a need for marketing authorisation holder's involvement for non-MAH developers.					
There is a lack of clarity/limited awareness on evidence requirements for some off-patent drug repurposing cases.					
Enforcement of market protection for repurposed medicines is difficult because of cross-label prescribing and dispensing.					
Lack of findable, accessible, interoperable, and reusable (FAIR) data (especially proprietary data) for DR.					
No tailored or predictable technology appraisal process exists for off-patent DR.					
Incentives for market authorization of repurposed medicines in paediatric indications are not proportionate to the required efforts for evidence generation.					
Evidence generation is burdensome for the market authorisation of off-patent medicines.					
Enforcement of patent protection for repurposed medicines is difficult and costly.					
DR research of off-patent medicines is perceived as less-innovative, less robust or less attractive compared to de novo drug development.					
Cost of DR development is perceived to be disproportionally high compared to the risks and potential revenues.					
Limited options for patent protection of repurposed medicines.					
Public-private partnerships in funding DR are complex and not always possible.					
The know-how needed for DR may not be available for non-profit entities or SMEs.					
Originator companies often lack incentives to repurpose on-patent compounds due to low expected return on investment and strategic business decisions regarding their disease portfolio.					

Colour code: grey - answered by less than 50% of participants from the stakeholder group; white - ranked 10th or lower within the stakeholder group; yellow - ranked between 7th and 9th within the stakeholder group; orange - ranked between 4th and 6th within the stakeholder group; red - ranked among the top 3 within the stakeholder group

DR - drug repurposing; HTA - health technology assessment; MAH - market authorisation holder, SME - small medium-sized enterprise

POLICY IMPLICATIONS

- Prioritization of barriers can facilitate the development of solutions by focusing on the most critical challenges first.
- Recognition of stakeholder groups' different perceptions on the impact and actionability of barriers is essential in creating a shared multi-stakeholder understanding when developing policy recommendations to address the most pressing obstacles to DR.

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