

**KNOCKING
OUT AMR**

**Harnessing the Irish microbiology
community to **tackle AMR****



**MICROBIOLOGY
SOCIETY**

Harnessing the Irish microbiology community to tackle antimicrobial resistance (AMR)

1. Introduction

As Ireland's Second One Health Nation Action Plan (iNAP2) on AMR concludes, the Microbiology Society engaged with its community of Irish microbiologists to assess the current AMR research and development (R&D) landscape in Ireland and to inform the development of the next action plan.

We thank our community for their invaluable insights. We have engaged directly with key animal health policymakers and will continue to engage with them and support development and implementation of the next national action plan, particularly in relation to strategic objectives promoting the important role of research and innovation in addressing the AMR challenge.

2. Headlines

2.1 Overview

- Input was gathered through a survey (n=51) and two in-person workshops held in Ireland (n=151). The questions are provided in Appendix A.
- The majority of both survey and workshop respondents (65%) rated the current R&D AMR landscape in Ireland as 'fair'.

2.2 Surveillance and One Health approach

- Ireland boasts robust human AMR surveillance systems and adopts a One Health approach that addresses human, animal, and environmental health.
- However, some respondents suggested that the scope of One Health could be further expanded to strengthen its impact.

2.3 Strengths of the AMR R&D landscape

- Ireland's AMR R&D landscape is bolstered by a diverse AMR research base, supported by a highly talented pool of microbiologists, capable of delivering innovative solutions to tackle AMR.
- This strength is further amplified by effective multidisciplinary and cross-sector collaboration, which fosters a cohesive and dynamic AMR research community.
- Key enablers include funding opportunities and strong microbiology education at the undergraduate and postgraduate levels.
- Active researcher engagement, along with proactive government public health efforts and alignment with EU initiatives, further support AMR R&D in Ireland.

2.4 Areas for improvement

- The landscape faces weaknesses such as talent retention issues, lack of coordination among research projects, insufficient funding for therapeutics, diagnostics, fungal research and mechanistic studies, as well as an overemphasis on surveillance.
- Progress is further hindered by barriers such as a perceived funding bias, lack of collaborative structures, difficult data-sharing agreements, insufficient public

awareness and engagement and communication gaps between researchers and policymakers.

2.5 Challenges with the current iNAP2 framework

- Despite the strengths of Ireland's AMR research landscape, the current iNAP2 framework does not fully leverage this research potential.
- Currently, researcher representation on iNAP committees is poor. The iNAP2 framework would benefit from structured mechanisms for regular consultation and meaningful engagement with researchers, facilitating the integration of cutting-edge research into national policy and practice effectively.

3. Recommendations for the next iNAP

The next iteration of Ireland's National Action Plan on Antimicrobial Resistance (iNAP3) offers a pivotal opportunity to address AMR challenges more effectively. Based on the insights gathered, the Microbiology Society calls on policymakers to:

- **Amplify the voice of Irish researchers** by actively involving a diverse range of researchers in decision-making processes. This includes establishing formal mechanisms for researcher representation on iNAP committees to ensure that evidence-based insights shape national strategies. By providing an overview of research progress from annual meetings, the research community can inform iNAP and its committees of innovations and progress on the island, while also acting as a source of disciplinary knowledge when specific expertise is required.
- **Broaden the One Health approach** by equally prioritising human, animal, and environmental health. To achieve this, iNAP3 should focus on developing sector specific strategies and cross-sectoral communication mechanisms to ensure the objectives are achieved collaboratively. Ensuring the iNAP-government-funding policies are targeted in the right manner will deliver impact and innovation.
- **Promote a whole government approach.** iNAP3 should foster coordinated, cross-sectoral collaboration by engaging all relevant government departments, including education, agriculture, and environment. This should be underpinned by a long-term vision and clearly defined, measurable outcomes to drive sustainable progress.
- **Strengthen sustained investment** in AMR solutions. This should include diversifying research support by allocating targeted funding for underrepresented research areas, including fungal research, diagnostics, therapeutics and vaccines. A balanced approach is essential, ensuring both enhanced surveillance systems and the development of innovative solutions to tackle AMR challenges effectively.
- **Enhance outreach efforts** by including a comprehensive outreach and communication plan to unify AMR messaging, engage stakeholders, and promote education and patient advocacy.

4. In-depth findings

4.1 Overall assessment of AMR R&D Landscape in Ireland

The majority of both survey and workshop respondents (65%) rated the current R&D AMR landscape in Ireland as 'fair'. Additionally, 24% rated it as 'good', 7% as 'poor', 1% as 'very poor', and 1% as 'excellent'.

4.2 Strengths and enablers

4.2.1 Strengths

When asked what the current strengths of the AMR R&D landscape are, several key themes emerged:

- **A diverse and cutting-edge AMR research base, encompassing both academic and clinical settings.** Ireland has a strong research base focused on AMR, including research into the mechanisms of AMR, phenotyping of AMR pathogens, genomic surveillance, environmental AMR and alternative therapeutics (including phage therapy, bacteriocin screening and microbiome research).
- **A highly talented pool of microbiology experts.** This wealth of expertise provides a solid foundation for AMR research that could be essential to drive innovative solutions to tackle AMR.
- **Effective multidisciplinary and cross-sector collaboration between AMR researchers.** Respondents felt there were effective collaborative opportunities for AMR researchers across the island. For example initiatives such as the All-island Vaccine Research and Training Alliance (AIVRT) hub, which brings together researchers from University College Dublin, Queen's University Belfast, University College Cork and Trinity College Dublin to develop vaccines against highly resistant bacteria.
- **Strong surveillance systems in humans.** Ireland has established robust surveillance systems for monitoring of AMR in humans, including strong Health Service Executive (HSE) reference laboratory services.
- **One Health approach.** There is a recognised and implemented One Health approach. However, some respondents expressed that the current scope of this approach needs to be further broadened.
- **Policy momentum.** Respondents highlighted that policymakers in Ireland are taking the issue of AMR seriously, demonstrating strong policy momentum.

4.2.2 Enablers

When asked what the current enablers of the AMR R&D landscape are, several key themes emerged:

- **Conferences.** Regular conferences in Ireland play a crucial role in facilitating knowledge sharing and fostering collaboration among researchers.
- **Funding.** Dedicated funding calls and opportunities from organisations such as the Environmental Protection Agency (EPA), the Department of Agriculture and the Marine (DAFM), Health Research Board, Research Ireland and Teagasc are essential enablers for AMR research. Maintaining a strategic funding remit that captures the broad elements of AMR research was highlighted as key to ensuring a coherent and effective AMR research community on the island.
- **Strength of undergraduate and postgraduate programmes.** University of Galway, University College Cork, University College Dublin and Trinity College Dublin all offer popular BSc degrees in Microbiology. Microbiology is also an important component of broader Biology, Biotechnology, Biomedical Science, Medicine and Veterinary Medicine programmes in Ireland. Collectively these teaching programmes underpin significant AMR research in all Irish universities.
- **Policy advocacy.** Researchers play a significant role in informing policy by advocating for evidence-based decisions and pushing for necessary changes.

- **Public health initiatives.** Several comments highlighted the proactive stance of the Irish government in addressing AMR through robust public health initiatives to reduce unnecessary antibiotic usage. This includes strong data collection efforts and responsiveness to EU policy changes around antimicrobial usage, which collectively enhance Ireland's ability to manage and mitigate AMR risks.

4.2.3 Weaknesses

When asked what the current weaknesses of the AMR R&D landscape are, several key themes emerged:

- **Talent retention.** There are significant issues related to brain drain and retention of talent. Skilled researchers are often lost to other countries or sectors due to the lack of job security, weakening the domestic research capacity.
- **Lack of coordination.** The AMR research landscape is characterised by a fragmented approach on the island. This lack of coordination within AMR research results in the lack of a unified vision and leads to missed opportunities for synergistic research efforts.
- **Funding focus.** There is a notable lack of funding for certain critical areas, including therapeutics, diagnostics, vaccines and fungi-focused studies. Additionally, there is a shortage of mechanistic studies aimed at identifying AMR targets. The funding landscape needs a more cohesive strategy, ensuring we maximise the impact and outputs from the collective expertise in AMR research on the island.
- **Overemphasis on surveillance.** While surveillance is essential, it is important to ensure there is not an overemphasis on it at the expense of other crucial research areas. Respondents highlighted that research should now focus on preventative or solution-based research.
- **Environmental AMR underrepresented.** The environmental sector needs more attention, as it is a very important source of both resistant pathogens and potentially novel antimicrobial strategies.
- **Translation of research into policy:** Translating research findings into actionable policy remains a challenge. Although respondents indicated that some funded research is designed to inform policymakers, there is a noticeable gap between research outcomes and policy implementation, especially regarding surveillance data.
- **Public awareness and engagement.** Public awareness and engagement regarding AMR are currently inadequate. Greater efforts are needed to educate and involve the public in AMR prevention and control measures.

4.2.4 Barriers

When asked what the current barriers to achieving progress are, several key themes emerged:

- **Communication gaps between researchers and policymakers.** There are significant communication gaps between researchers and policymakers. These gaps impede the translation of research findings into policy. Additionally, researcher representation on iNAP committees is poor. It is important that the composition of these committees reflects the diverse range of AMR research nationally and internationally.
- **Funding.** The understandable focus on AMR in human health should not be at the expense of research in other One Health areas.
- **Siloes.** The absence of an organised structure for collaboration leads to siloed efforts in AMR research. This fragmentation prevents the development of cohesive research strategies and is something the research community needs to take responsibility for.

- **Access to data.** Researchers face challenges in establishing agreements for data sharing, particularly to access clinical data, which hinders collaborative research efforts between basic scientists, clinicians and hospital-based microbiologists. Furthermore, the lack of accessible databases containing already collected data further impedes research progress and the ability to conduct comprehensive studies.
- **Lack of microbiology education for school students.** Respondents pointed out that iNAP2 does not include education initiatives at the primary or secondary levels, unlike other major societal challenges such as climate change.
- **Lack of clear AMR brand.** The absence of a clear AMR brand on the island hampers the visibility and coherence of AMR initiatives, making it difficult to unify efforts under a common identity.

4.3 Ranking strategic objectives

When respondents were asked to rank the strategic objectives, the percentages reflecting their top choices i.e., the objective ranked as number one, were as follows:

- Top Priority: 'Promote research and sustainable investment in new medicines, diagnostic tools, vaccines and other interventions' (37.50%).
- Secondary Priorities: 'Reduce the spread of infection and disease' (29.17%); 'Improve awareness and knowledge' (29.17%).
- Lower Priorities: 'Optimise the use of antimicrobials in human and animal health' (4.17%); 'Enhance surveillance of antibiotic resistance and antibiotic use' (0%).

5. Conclusion

The Microbiology Society appreciates the engagement and insights provided by its members. These findings highlight the critical strengths and areas for improvement within Ireland's AMR R&D landscape. As we move forward, it is essential that the next iNAP harnesses the breadth and depth of expertise within the Irish microbiology community to effectively tackle AMR challenges.

6. Appendix A: list of questions posed

1. How would you rate the current AMR research and development landscape in Ireland?
 - ☐ Excellent
 - ☐ Good
 - ☐ Fair
 - ☐ Poor
 - ☐ Very Poor
2. What do you see as the main strengths of the current AMR research and development landscape in Ireland?
3. What enablers have facilitated progress in these areas?
4. What do you see as the main weaknesses of the current research and development landscape in Ireland?
5. What are the main barriers to making progress in these areas?
6. Please rank the strategic objectives in order of importance (1 = most important, 5 = least important)
 - Improve awareness and knowledge
 - Enhance surveillance of antibiotic resistance and antibiotic use
 - Reduce the spread of infection and disease
 - Optimize the use of antimicrobials in human and animal health
 - Promote research and sustainable investment in new medicines, diagnostic tools, vaccines, and other interventions
7. Why did you rank your top choice as the most important?
8. Do you have any other comments about Ireland's current National Action Plan on AMR?



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