INTERNATIONAL CENTRE FOR
ANTIMICROBIAL RESISTANCE
SOLUTIONS

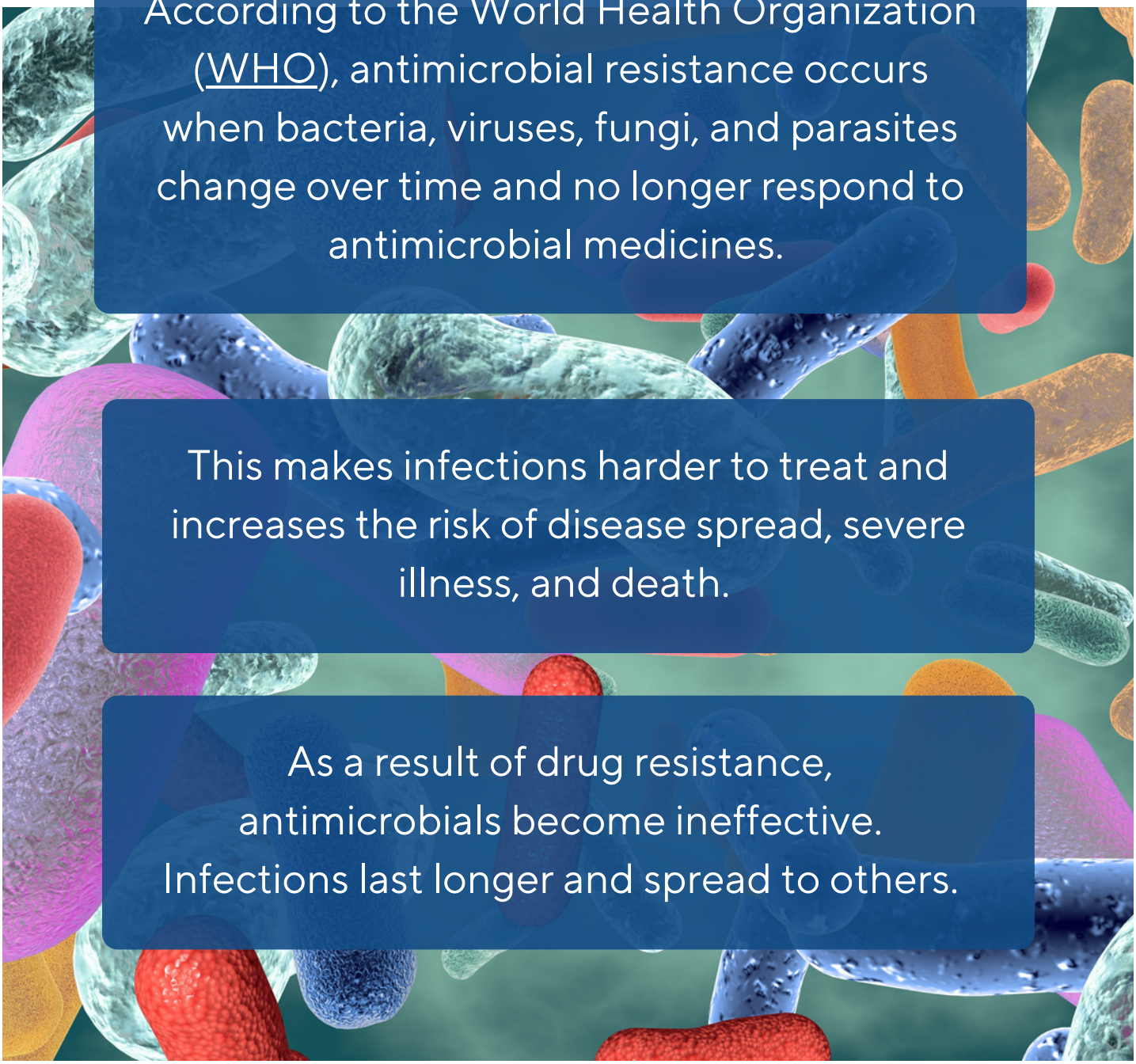
Antimicrobial Resistance in Low- and Middle-Income Countries: ICARS' tailored approach.

Policy Brief

2023

Antimicrobial Resistance (AMR)

According to the World Health Organization (WHO), antimicrobial resistance occurs when bacteria, viruses, fungi, and parasites change over time and no longer respond to antimicrobial medicines.



This makes infections harder to treat and increases the risk of disease spread, severe illness, and death.

As a result of drug resistance, antimicrobials become ineffective. Infections last longer and spread to others.

Key messages

01. **Every year, millions of patient deaths are attributed to or associated with drug-resistant infections** (1), lack of access to effective antimicrobials, inadequate diagnostics capacity, or ineffective treatment.

02. **AMR adversely affects** humans, animals, plants, and the environment.

03. **Low- and Middle-Income Countries (LMICs)** face **greater burdens** due to higher infection rates, inadequate infection prevention and control, poor water and sanitation infrastructure, fragile healthcare systems, and competing health priorities.

04. **AMR is a global challenge that knows no borders**. It is a One Health issue that affects societies, economies, and ecologies worldwide.

05. While much research has generated successful, evidence-based **solutions** to mitigate AMR, a critical gap remains in adapting and adopting this evidence in **LMICs**.

06. Despite the existence of **AMR National Action Plans** (NAPs) in numerous countries, the persistent challenge lies in effectively prioritising and implementing NAPs on AMR in resource-limited settings.

About Us

The International Centre for Antimicrobial Resistance Solutions (**ICARS**) partners with Low- and Middle-Income Countries (**LMICs**) to **co-develop** and test **cost-effective, context-specific solutions** with the potential for **scale-up** and **sustainable impact** across the **One Health** spectrum.

What We do

ICARS works with a **top-down approach** with governments and policymakers and a **bottom-up approach** with practitioners and research institutions to identify and address priority **AMR challenges**.

These partnerships include **capacity building** to deliver **tailored** solutions at the country level and advance **NAP implementation**.

ICARS not only partners with LMIC governments but works together with public and private, national, and regional stakeholders to **synergise** efforts, avoid duplication, and support the **uptake** of the **evidence** generated.

Background and challenges

To encourage action on antimicrobial resistance, the 68th World Health Assembly adopted a **Global Action Plan** (GAP) on AMR in **2015**.

194 WHO member states committed to developing multisectoral NAPs on AMR within two years (by the 70th World Health Assembly in 2017).

These NAPs would incorporate the **One Health** approach, a unifying concept that recognises the interconnectedness and interdependence of humans, animals, plants, and the environment.

Since 2015 , many countries have developed NAPs on AMR. However, in **resource-constrained settings**, the challenge remains of how best to prioritise, adapt, and implement evidence-based solutions to mitigate AMR (1).

Additionally, activities identified in NAPs often **lack sustainable domestic financing for implementation, especially in LMICs**. As a result, AMR mitigation initiatives rely on funds from foreign donors and philanthropies with specific terms and timelines.

Although extensive research has generated successful, evidence-based solutions for mitigating AMR (2) (3) (4), a **critical gap remains** in **adapting** and **adopting** these solutions in **LMICs**. This is partly because this evidence is largely generated in high-resource settings and cannot be directly translated to LMICs or often even between High- Income Countries (HICs).

Key actions and policy recommendation

The following are key considerations for mitigating AMR in LMICs and advancing NAP implementation, based on ICARS' experience to date:

- **Country ownership** is essential, involving all relevant national stakeholders, including communities, to jointly define the AMR challenge and burden, and identify potential solutions to be tested.

- **Financial** and **political commitment** and **support** from ministries, the private sector, and civil society is pivotal.

- Solutions must be **tailored** to **local needs** and leverage existing country **capacity** and **capability** by the involvement of cross-sectoral stakeholders.

- Evidence-based solutions must be **tested** in **real-life settings** to ensure that context-specific knowledge, attitudes, practices, and behaviours are considered.

- Solutions should be **cost-effective** and/or show a tangible return on investment to facilitate further implementation and **sustainable scale-up**.

- Understanding the **enablers** and **barriers** to the **adoption** of evidence-based solutions in the specific context is equally important if solutions are to be sustained and have true impact.

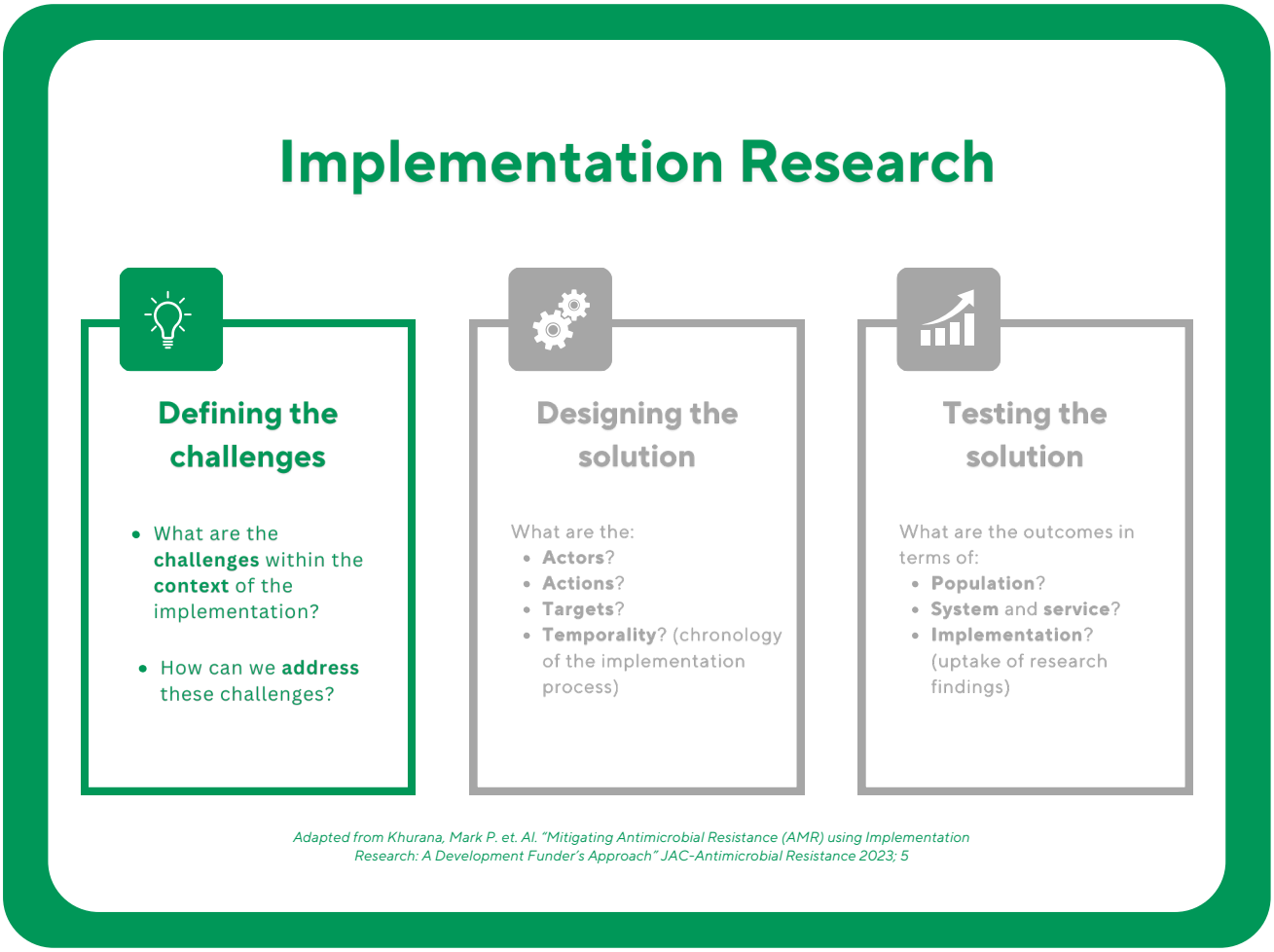
Given the above considerations, implementation research provides a practical framework to implement evidence-based and sustainable AMR mitigation solutions in specific country contexts. It presents an opportunity for successful stakeholder engagement and local ownership.

Developing, testing, and adapting a possible intervention to ensure successful implementation.

Step one is to work together with **relevant stakeholders** such as policymakers, practitioners, researchers, communities, civil society, professional organisations and the private sector to identify **key AMR imperatives** within the specific practice(s) or system(s).

This collaboration helps understand the **context**, **AMR challenges**, and **knowledge gaps** that countries are committed to working on, aligning the solutions with the priorities of country NAPs.

This joint effort also provides valuable **insights** into the hurdles and complexities surrounding the **implementation** of evidence-based solutions.



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EXAMPLE FROM ICARS PROJECTS

Tailored solutions leveraging existing country capacity by the involvement of cross-sectoral stakeholders.

Tanzania

An ICARS project, carried out by AMR researchers in collaboration with the Tanzanian Ministry of Livestock and Fisheries, addresses the **challenges posed by the rapid growth of Tanzania's intensive poultry industry**. With the rising demand for poultry products, the industry has heavily relied on antimicrobials to maintain flock health and productivity. In response, the project concentrates on implementing **disease prevention measures**, specifically through **biosecurity** interventions, including **poultry vaccination**.

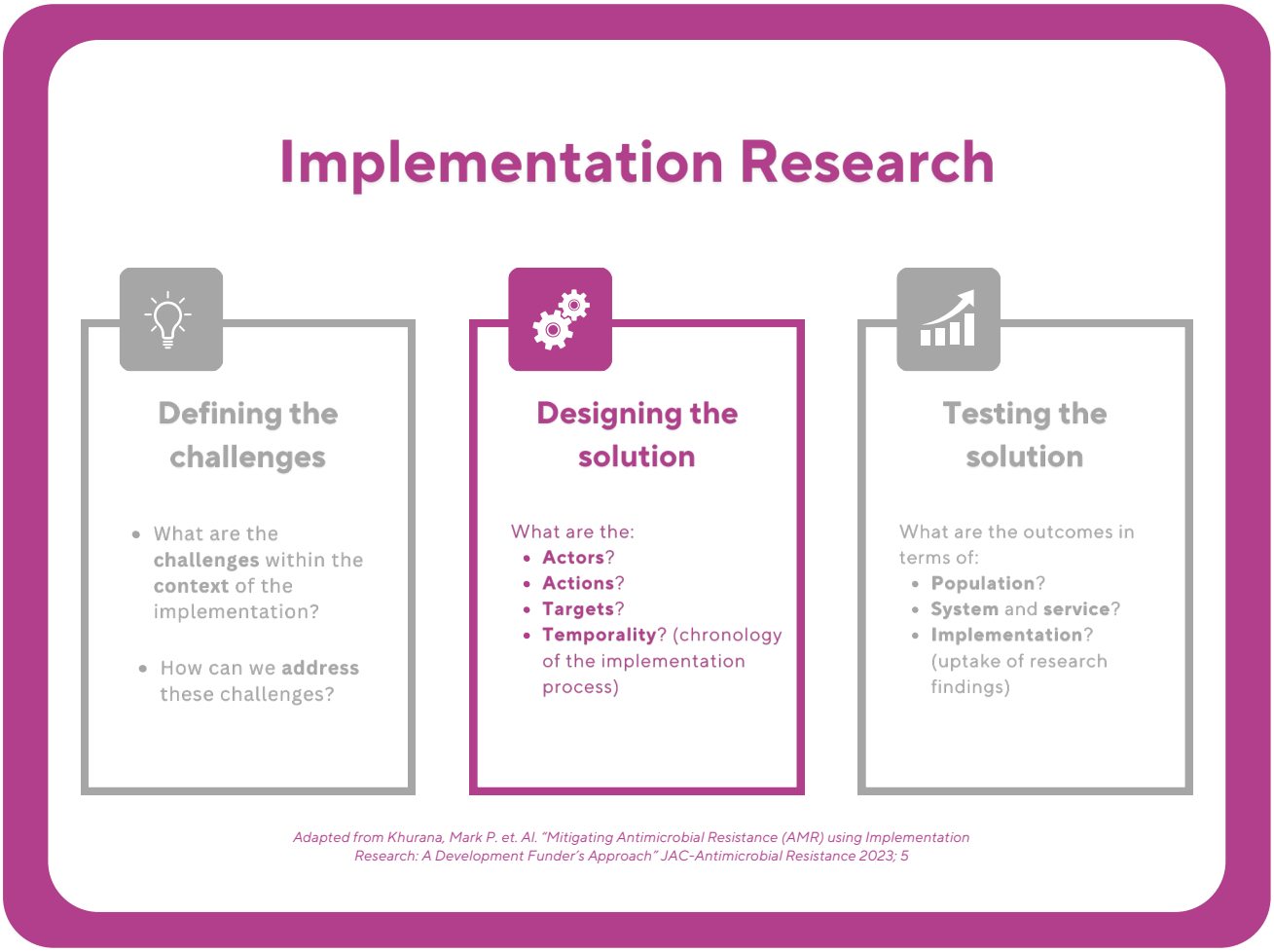
By collaborating closely with both **individual actors** (policymakers, veterinarians, poultry farmers, researchers) and **organisational actors** (Ministry of Livestock and Fisheries, private vaccine provider, university), interventions are **tailored** to address the **specific challenges** and **available resources** in Tanzania. This approach not only ensures the relevance and effectiveness of the interventions, but also fosters a sense of **ownership** and **commitment** among stakeholders.

Developing, testing, and adapting a possible intervention to ensure successful implementation.

Step two is about **designing** the actual **solution**.

The **key stakeholders** involved in the implementation and identified in step one work with researchers to develop the actions or steps needed to make the **intervention** work **sustainably**. The targets or beneficiaries of the intervention and the timeline for the implementation are identified.

This step also considers the factors that can either **help** or **hinder** the **implementation process**.



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EXAMPLE FROM ICARS PROJECTS

Solutions must be tested in real-life settings to ensure that context-specific knowledge, attitudes, and practices are considered.

Kyrgyzstan

An ICARS project in the Kyrgyz Republic places emphasis on the importance of testing solutions **considering contextual elements.**

In Kyrgyzstan, limited access to diagnostic equipment in primary care clinics has led to the overuse of antibiotics in treating acute respiratory infections among children. To address this issue and given the context, an ICARS-supported project is evaluating the effectiveness, feasibility, acceptability, and cost-effectiveness of a point-of-care test for measuring C-reactive protein (CRP) to differentiate between viral and bacterial infection in children with respiratory tract infections.

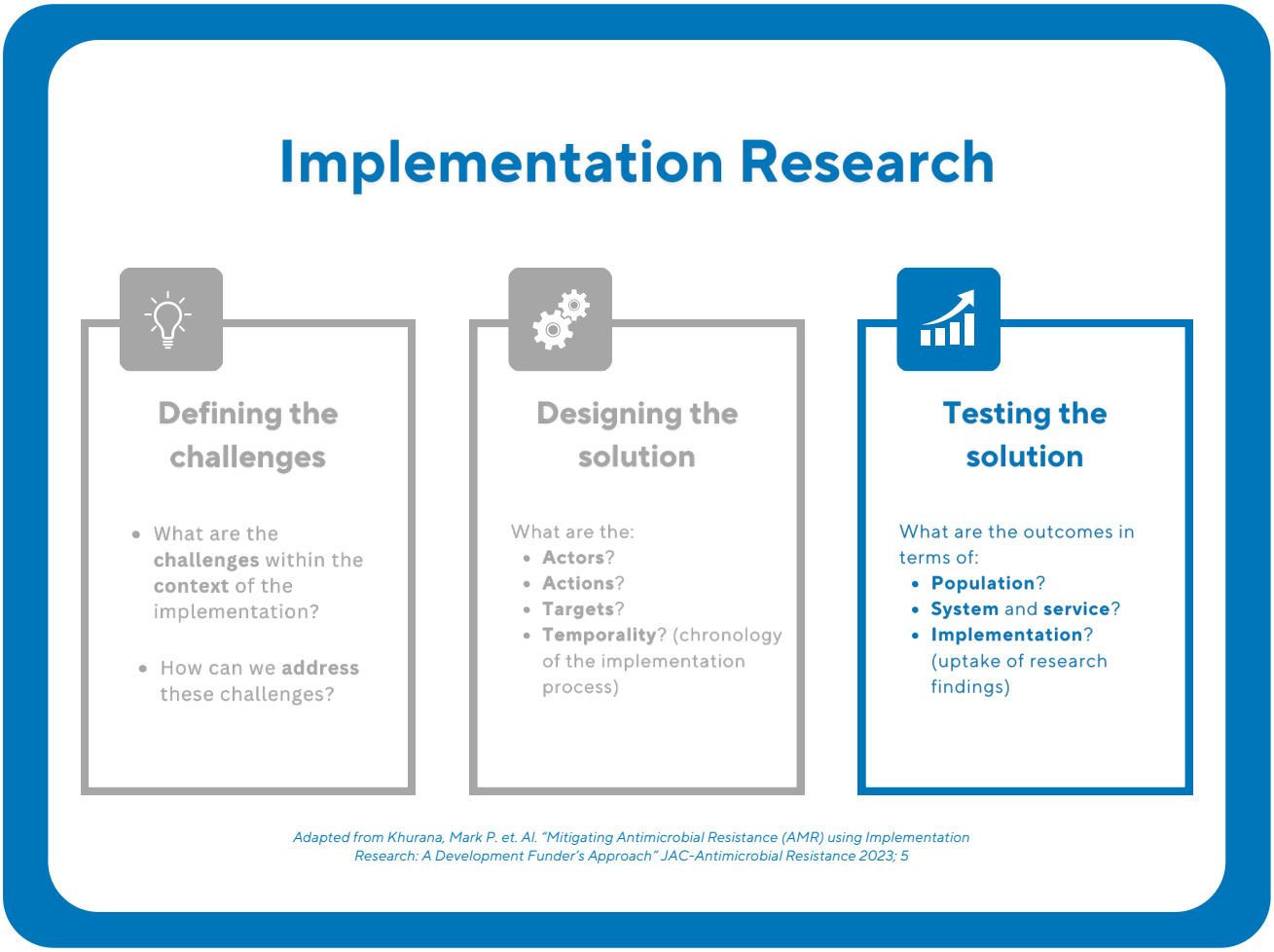
Preliminary results hold great potential, showing a reduction in antibiotic prescriptions, and promising evidence of behavioural change among caregivers and healthcare workers.

Developing, testing, and adapting a possible intervention to ensure successful implementation.

Step three emphasises the integration and **sustained scale-up** of evidence-based solutions, including innovations within systems.

Proposed solutions are evaluated based on acceptability, adaptability, adoption potential, appropriateness, cost-effectiveness, scalability, feasibility, and sustainability.

Particular attention is given to the factors that enable behaviour change within the specific context. True impact and sustainability of solutions rely on **behaviour change** at both individual and systems levels (5).



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EXAMPLE FROM ICARS PROJECTS

Solutions should be cost-effective, but enablers of behaviour change in the specific context are equally important if solutions are to be sustainable and have true impact.

Colombia

In 2022, ICARS concluded a co-funded project with the UK Department of Health and Social Care's Global AMR Innovation Fund (GAMRIF) together with Porkcolombia, an industrial organisation representing the majority of Colombia's pig producers.

The project successfully identified obstacles and solutions for implementing a diagnostic network in Colombian pig farms. A cost-benefit analysis demonstrated that the **strategies including the use of the diagnosis network are more cost beneficial than current practice (i.e., empirical use of antibiotics).**

The project prioritised **engagement**, established dialogue across farm levels, and tailored messaging to empower stakeholders in the livestock industry. It also addressed obstacles such as knowledge access, poor communication infrastructure, and logistical challenges in diagnostics.

Further work is being conducted to show the return on investment of different diagnostic tests with the potential to inform policy and practice in Colombia and beyond.

References and resources

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(2) Rogers Van Katwyk S, Hoffman SJ, Mendelson M, Taljaard M, Grimshaw JM. Strengthening the science of addressing antimicrobial resistance: a framework for planning, conducting, and disseminating antimicrobial resistance intervention research. Heal Res Policy Syst 2020; 18: 60.

(3) Pokharel S, Raut S, Adhikari B. Tackling antimicrobial resistance in low-income and middle-income countries. BMJ Glob Heal 2019; 4: e002104.

(4) The Lancet. The antimicrobial crisis: enough advocacy, more action. Lancet 2020; 395: 247

(5) Khurana, Mark P. et. Al. “Mitigating Antimicrobial Resistance (AMR) using Implementation Research: A Development Funder’s Approach” JAC-Antimicrobial Resistance 2023; 5