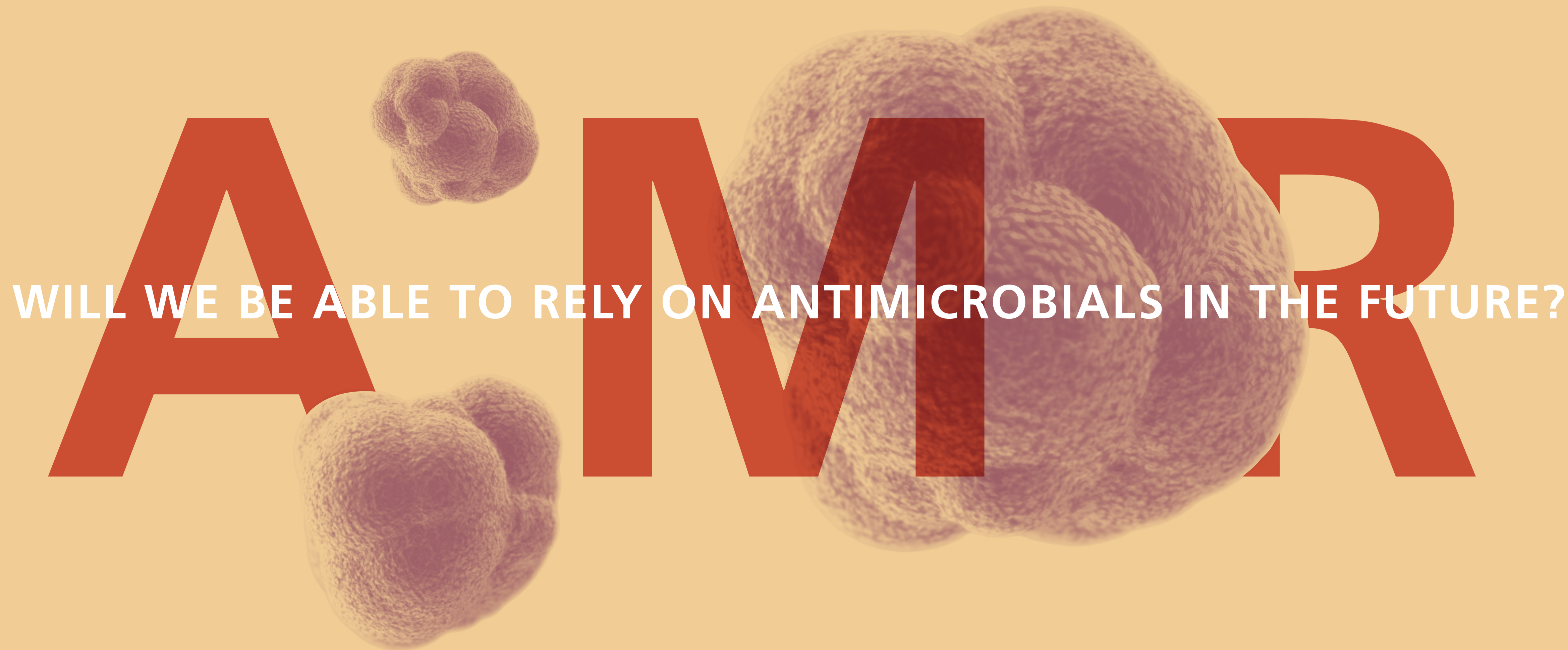




THE SHIONOGI CONTENT SERIES





A microscopic background image showing various bacteria. Most are blue and rod-shaped, some with flagella. Two prominent bacteria are orange and rod-shaped. The text "WHAT IS ANSWER?" is overlaid in white, bold, sans-serif font. The word "ANSWER?" is on the second line, with the "A" being significantly larger than the other letters. The background has a dark blue, almost black, color scheme with some light blue and orange highlights from the bacteria.

WHAT IS  
ANSWER?

01



# WHAT IS ANTIMICROBIAL RESISTANCE?

Most of us will need to be treated with an antimicrobial medicine at some point during our lives to help kill harmful germs that cause infection.

But what happens if the drugs stop being effective? Antimicrobial resistance (AMR) is a natural process that happens when bacteria, viruses, fungi and other parasites cause diseases to evolve over time in ways that enable them to outsmart the medical treatments designed to defeat them. This can lead to 'drug-resistant' infections and standard treatments we rely on start to fail.

Many medical procedures we now take for granted, from caesarian sections to hip replacements and routine dental treatment, simply would not be possible without the existence of effective antibiotics and other anti-infective medicines.

A microscopic image of bacteria, showing several rod-shaped cells with prominent, textured, and somewhat bulbous protrusions (pili or flagella) extending from their surfaces. The background is a soft, out-of-focus purple. Overlaid on the right side of the image is the large, bold, red text 'AMR', which is partially cut off on the right edge.

# AMR



# A GROWING THREAT WE CANNOT IGNORE

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## NEARLY 100 PEOPLE

As rates of AMR have been rising, nearly 100 people die of resistant infections each day across Europe.<sup>2</sup>

## NEARLY 2 MILLION DEATHS EACH YEAR BY 2050

It is estimated that drug-resistant infection could result in nearly 2 million deaths each year by 2050 if effective action isn't taken to tackle this urgent global health issue.<sup>1</sup>

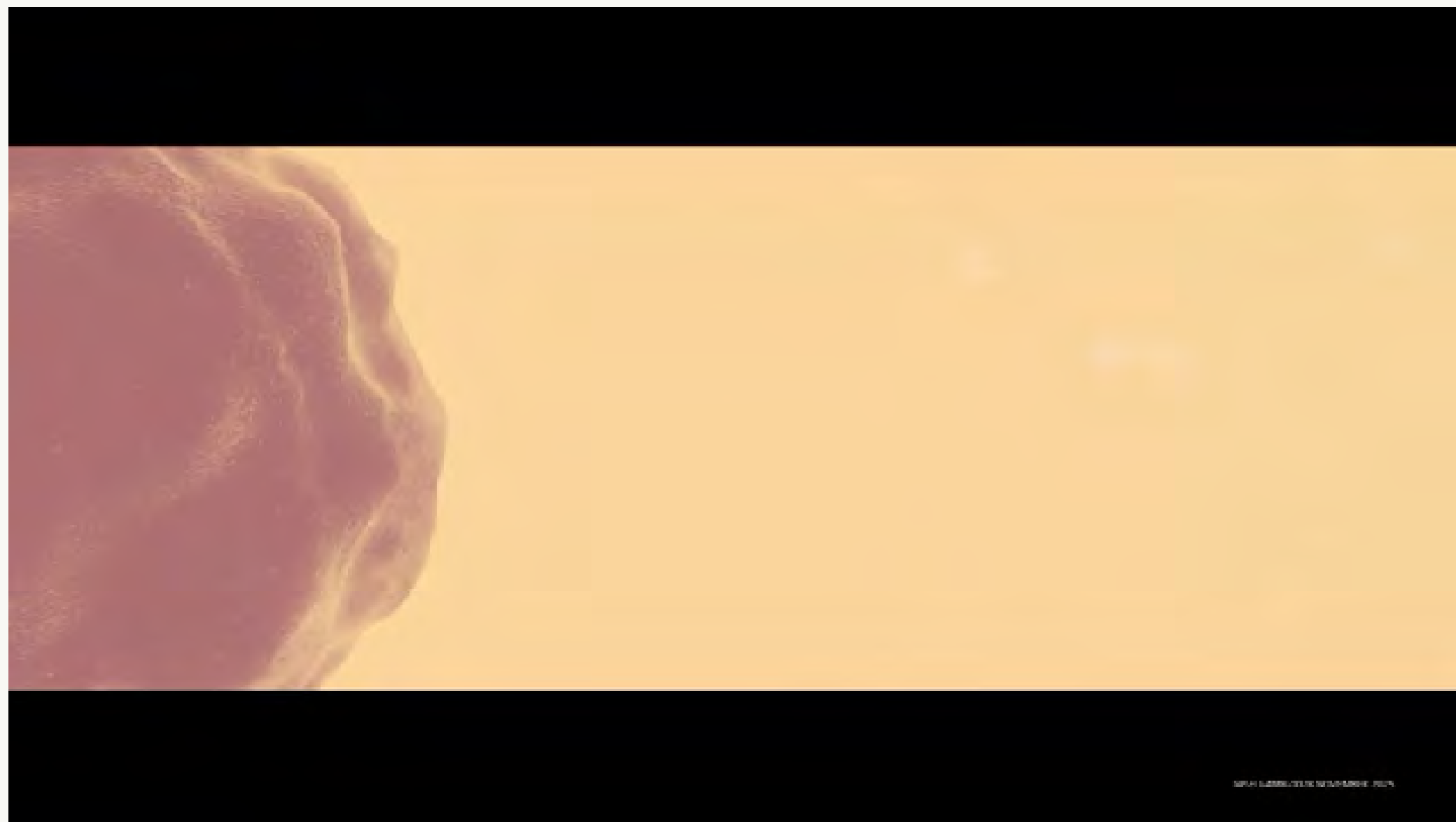
## US \$1 TRILLION ADDITIONAL HEALTHCARE COSTS

There are economic costs linked to resistant infections too – the World Bank estimates that AMR could cause US\$1 trillion in additional healthcare costs globally by 2050.<sup>3</sup>





# MODERN MEDICINE DEPENDS ON ANTIBIOTICS



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“In the century since Alexander Fleming stumbled across penicillin in a laboratory in London, antibiotics have become a mainstay of medicine, transforming once-deadly infections into treatable and curable conditions. Antimicrobial resistance threatens to unwind that progress, making it without question one of the most pressing health challenges of our time.”

Dr Tedros Adhanom Ghebreyesus,  
WHO Director-General, on the approval of the  
Political Declaration at the UN General Assembly  
High Level Meeting on AMR in September 2024



# MODERN MEDICINE DEPENDS ON ANTIBIOTICS

## 4 MILLION

Over 4 million Europeans are diagnosed with cancer each year<sup>4</sup>. Many require chemotherapy, which lowers ability to fight infection, meaning patients rely on antibiotics.



## 3.4 MILLION

Each year in Europe, more than 3.4 million individuals develop sepsis.<sup>5</sup> Antibiotics are crucial for treating sepsis.



## 1 IN 10

1 in 10 adults have kidney disease<sup>6</sup> – dialysis and transplants require antibiotics.



## 1.10 MILLION

Around 1.4 million births in Europe are by caesarian section each year.<sup>7</sup> Surgical site infections require antibiotics.



**“Over the next 25 years, someone will die every three minutes from common, preventable and formerly treatable health conditions, simply because the antibiotics we use to treat them will have stopped being effective. Unless, that is, the world steps up to respond to the growing threat AMR.”**

**Dame Sally Davies,  
The Guardian, September 2024**



The background features a stylized globe with a textured, bumpy surface, rendered in a light purple or pinkish hue. A semi-transparent red overlay covers the entire image. In the top-left and bottom-left corners, the large red numbers '02' are partially visible. Centered on the left side is the main text in a bold, red, sans-serif font.

**WHAT IS CAUSING  
THIS URGENT,  
GLOBAL HEALTH  
CRISIS?**





# WHAT IS CAUSING THIS URGENT, GLOBAL HEALTH CRISIS?

AMR is caused by a range of issues, including over-prescribing and misuse of antibiotics, overuse of antibiotics and anti-fungals in agriculture, poor infection control or lack of hygiene.

While behaviour change, responsible prescribing practices and infection control are all vital, the discovery and development of new antimicrobials remain fundamental in the global response to AMR, and is one that urgently requires innovative, sustainable clinical and economic solutions. As a leading company with a strong heritage in infectious disease research and development, we are particularly focused on the challenge of shoring up the dwindling antimicrobial pipeline.

## **We are running out of effective antimicrobials faster than we are developing new ones**

Right now, there are only 15 antibacterial drugs in development that the World Health Organization considers genuinely innovative<sup>8</sup>. Of those, just five are considered to be effective against at least one of the “critical” bacteria - the most dangerous and drug-resistant strains.

Despite years of global attention, the pipeline is simply too lean to keep pace with the rise of resistant infections. Between 2018 and 2023, resistance increased in 43.8% of monitored pathogen–antibiotic combinations, with the remainder remaining stable<sup>9</sup>.

While there are scientific and regulatory challenges to the development of antimicrobials, the current economic model for developing new antibiotics is simply not working. Companies invest heavily in bringing new drugs to market but struggle to recover their costs or make a profit. R&D for antimicrobials takes 10-15 years, costs hundreds of millions of dollars and is a complex process with new antibiotics facing a staggering 95% development failure rate<sup>10</sup>.

And because antimicrobials are used mostly for acute treatment, and to limit the development of resistance, new antibiotics considered a ‘last resort’ against dangerous bacteria, need to be used sparingly and not sold in large volumes. And compared to more expensive treatments, like cancer therapies, antibiotics tend to be quite low in price.





## 15 ANTIBACTERIALS

Only 15 antibacterials in the clinical pipeline meet the WHO's criteria for being 'innovative'.<sup>8</sup>

## ONLY 5 ARE EFFECTIVE

Of these, only 5 are effective against at least one of the WHO-designated "critical" bacteria.<sup>8</sup>

## EVER-GROWING THREAT

The number of antibiotics in clinical development is still insufficient to tackle the ever-growing threat of the emergence and spread of drug-resistant infections.<sup>8</sup>

## 95% DEVELOPMENT FAILURE

R&D for antimicrobials is a costly and complex process. New antibiotics face a staggering 95% development failure rate and cost hundreds of millions of dollars.<sup>10</sup>

## STEWARDSHIP

Good antimicrobial stewardship is essential and demands usage constraints.<sup>11</sup>

## ANTIMICROBIAL PRICING

Antimicrobials are typically priced lower than other medicines.<sup>11</sup>

## LACK OF INVESTMENT

Research experts are also choosing to work in other areas. In 2024, the UN noted "with concern that the lack of investment, poor professional incentives and declining employment opportunities, amongst other factors, are leading to an increasing number of researchers leaving the field of antimicrobial resistance research."<sup>12</sup>

# INNOVATIVE FINANCE MODELS ARE ESSENTIAL

CLICK TO PLAY VIDEO ↗



The background of the slide features a close-up, slightly blurred image of a metallic drill bit. The drill bit is oriented diagonally, with its sharp tip pointing towards the bottom right. A semi-transparent red overlay covers the entire image, creating a monochromatic effect with varying shades of red and orange. The text is overlaid on this background.

# 03

A CHALLENGING  
ISSUE REQUIRES  
INNOVATIVE  
SOLUTIONS

# 03





# A CHALLENGING ISSUE REQUIRES INNOVATIVE SOLUTIONS

While many big pharmaceutical companies have left the field of antimicrobial research and development, Shionogi has not. We are determined to continue investing, but it's clear that a collaborative, sustainable approach is needed to address both the clinical and economic challenges presented by AMR.





WHAT WE'RE DOING



# GLOBAL COLLABORATION IS CRUCIAL

“If you look at countries who've really had problems with AMR, the work that some of these NGOs are doing around collecting the data on resistance and working with us on how to manufacture the antibiotics, is the way forward.”

Dr Andreas Karas,  
Head of Scientific Affairs, Shionogi Europe

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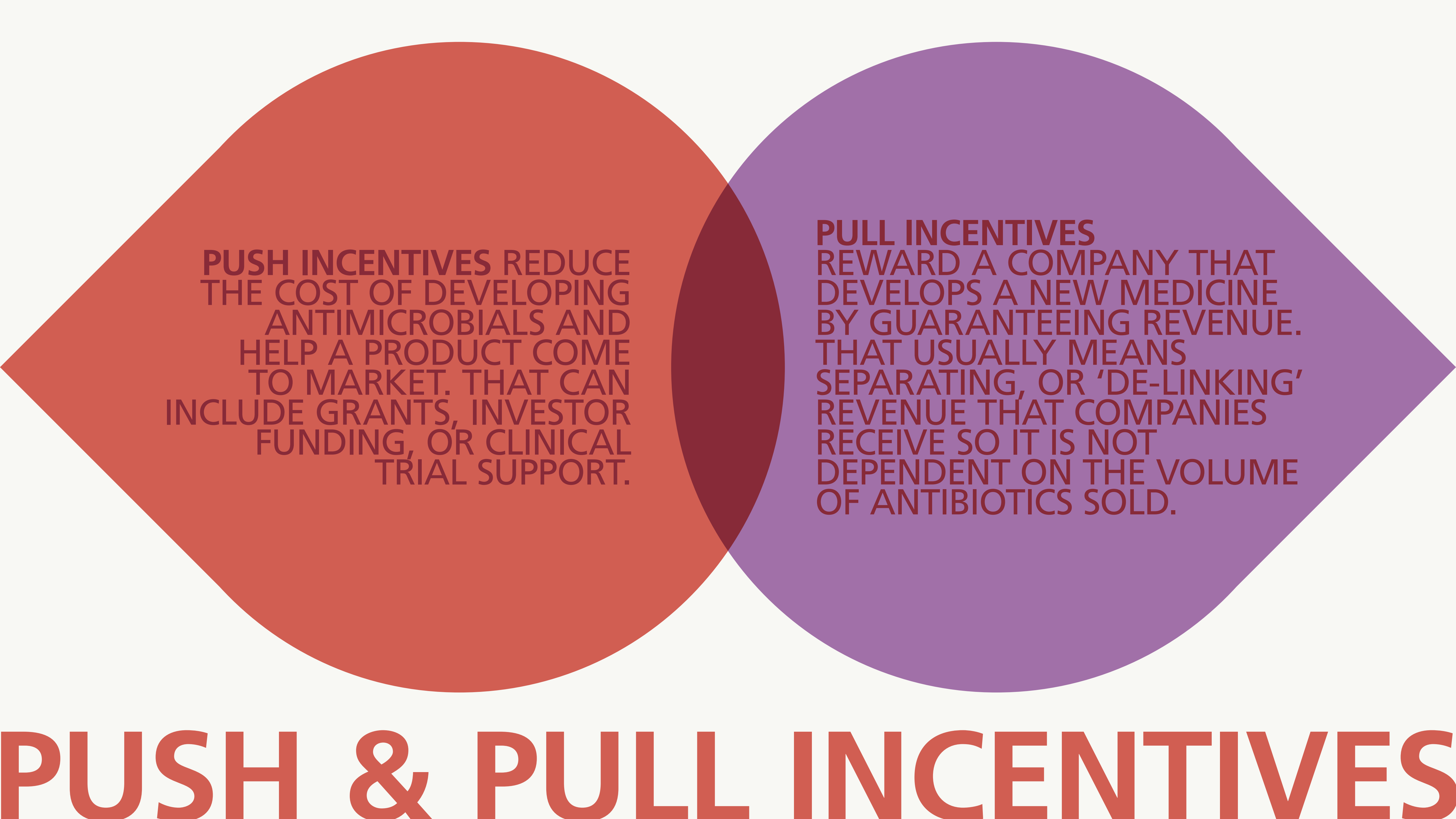
# INVESTMENT AND COLLECTIVE ACTION TO ADDRESS THE ECONOMIC CHALLENGE

We believe AMR must be tackled on multiple fronts – from ensuring appropriate use of antimicrobials to the introduction of policies and incentives to encourage and support research and development of new antibiotics.

This needs greater collaboration between industry, policymakers, healthcare professionals and the public. We need to think differently about how investment in the development of new antibiotics and other essential antimicrobials can continue and be prepared to try new ways of working.







**PUSH INCENTIVES** REDUCE  
THE COST OF DEVELOPING  
ANTIMICROBIALS AND  
HELP A PRODUCT COME  
TO MARKET. THAT CAN  
INCLUDE GRANTS, INVESTOR  
FUNDING, OR CLINICAL  
TRIAL SUPPORT.

**PULL INCENTIVES**  
REWARD A COMPANY THAT  
DEVELOPS A NEW MEDICINE  
BY GUARANTEEING REVENUE.  
THAT USUALLY MEANS  
SEPARATING, OR 'DE-LINKING'  
REVENUE THAT COMPANIES  
RECEIVE SO IT IS NOT  
DEPENDENT ON THE VOLUME  
OF ANTIBIOTICS SOLD.

# PUSH & PULL INCENTIVES

04



WORKING TOGETHER,  
WE MUST PROTECT  
ANTIBIOTICS FOR THE  
NEXT GENERATION



04



# WORKING TOGETHER, WE MUST PROTECT ANTIBIOTICS FOR THE NEXT GENERATION

At Shionogi, we are committed to playing our part to help support sustainable healthcare systems for the future.

This means we use our scientific heritage and expertise to help drive clinical innovation. And we advocate for new funding models so policymakers and clinicians can build a robust defence against a world facing a potential future threat of untreatable infection. AMR is a global challenge that cannot be tackled in isolation and needs all of us to join forces and collaborate to find solutions that will ensure we have effective antimicrobials for the next generation.

## THE NEXT GENERATION'S TAKE ON AMR

[CLICK TO PLAY VIDEO ↗](#)



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