

Estimating the Clinical and Economic Value of Aztreonam-Avibactam for the Treatment of Metallo-Beta-Lactamase Producing Carbapenem Resistant Enterobacteriales Infections in China: Adopting the STEDI Value Framework



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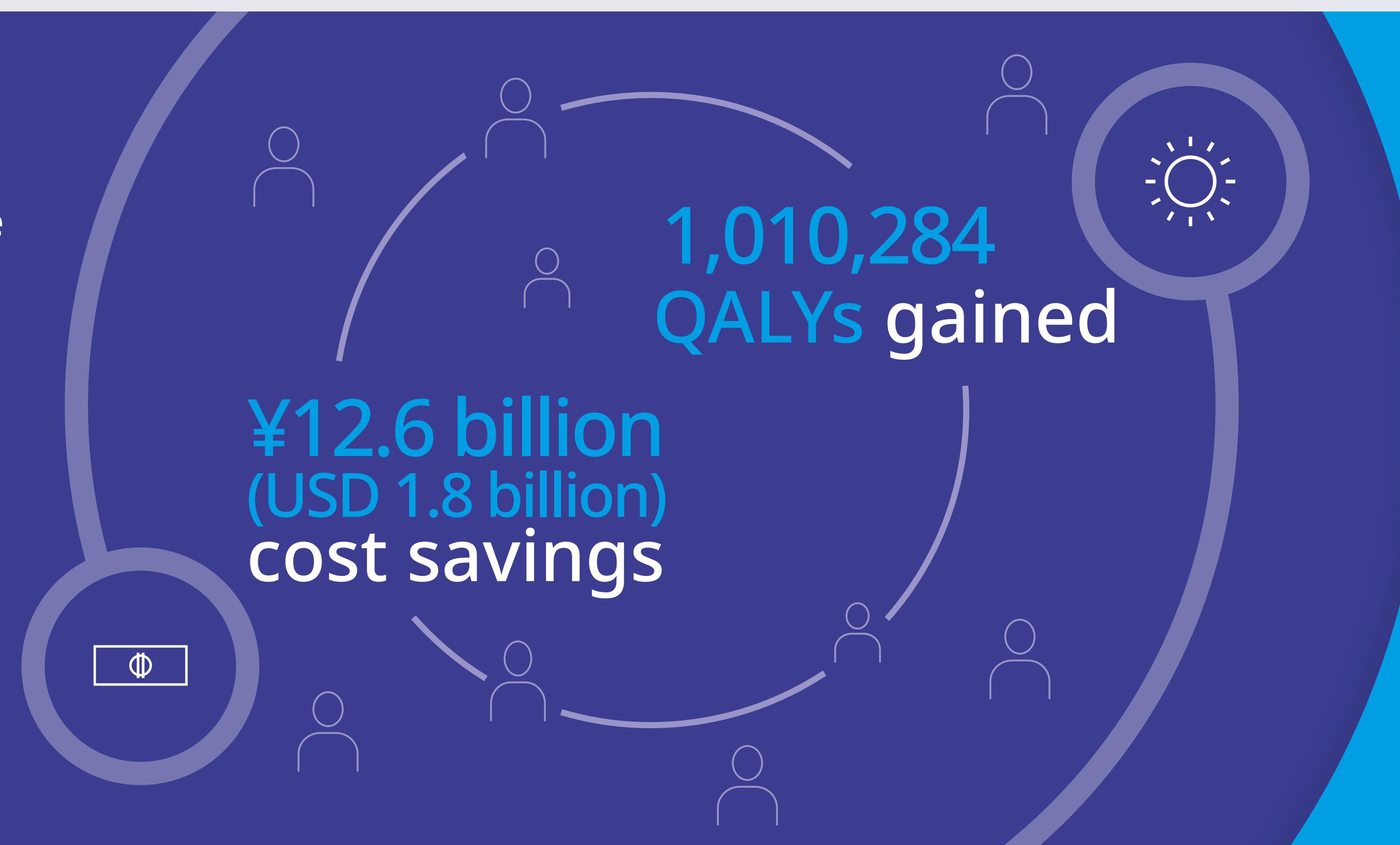
Key takeaways

The evaluation of ATM-AVI using the STEDI[†] framework over a 10-year period estimates:



¥302 billion (USD 43 billion) in value to the Chinese healthcare system

STEDI: Spectrum, transmission, enablement, diversity and insurance



Conclusions

The introduction of ATM-AVI for MBL-CRE HAP/VAP and cIAI, in China, brings substantial health improvements and cost savings

The valuation of novel antimicrobials should be considered in the context of AMR

Capturing antimicrobial population-level benefits in health technology assessment may help to stimulate future investment

Introduction

- China has a high incidence of antimicrobial resistance, with an estimated 52 million (95% CI 10–95 million) hospital-associated antibiotic-resistant infections per year between 2010–2019¹
- In 2025, aztreonam avibactam (ATM-AVI) was approved for use in China for the treatment of both complicated intra-abdominal infections (cIAI) and hospital-acquired pneumonia (HAP), including ventilator-associated pneumonia (VAP)
- Estimating the full value antimicrobials using components of the STEDI framework (spectrum, transmission, enablement, diversity and insurance) is essential to stimulate research and investment in the antimicrobial pipeline

Objective

To estimate the value of ATM-AVI for treating hospital-acquired infections caused by MBL-CRE in China, considering the transmission, enablement and diversity (TED) components described in the STEDI framework

Methods

- A population-level dynamic transmission model encompassing the TED elements of STEDI was adapted to the Chinese setting. The model considered the clinical and economic impact of introducing ATM-AVI over a 10-year infection transmission period, considering lifetime outcomes (Figure 1)
- The incidence of hospital-acquired cIAI and HAP/VAP infections caused by MBL-CRE in the Chinese setting was estimated (infectious environment n = 8,078,156 beds)²
- ATM-AVI was evaluated as a first line treatment added to the existing two-line standard of care (colistin + meropenem followed by colistin + aminoglycoside)

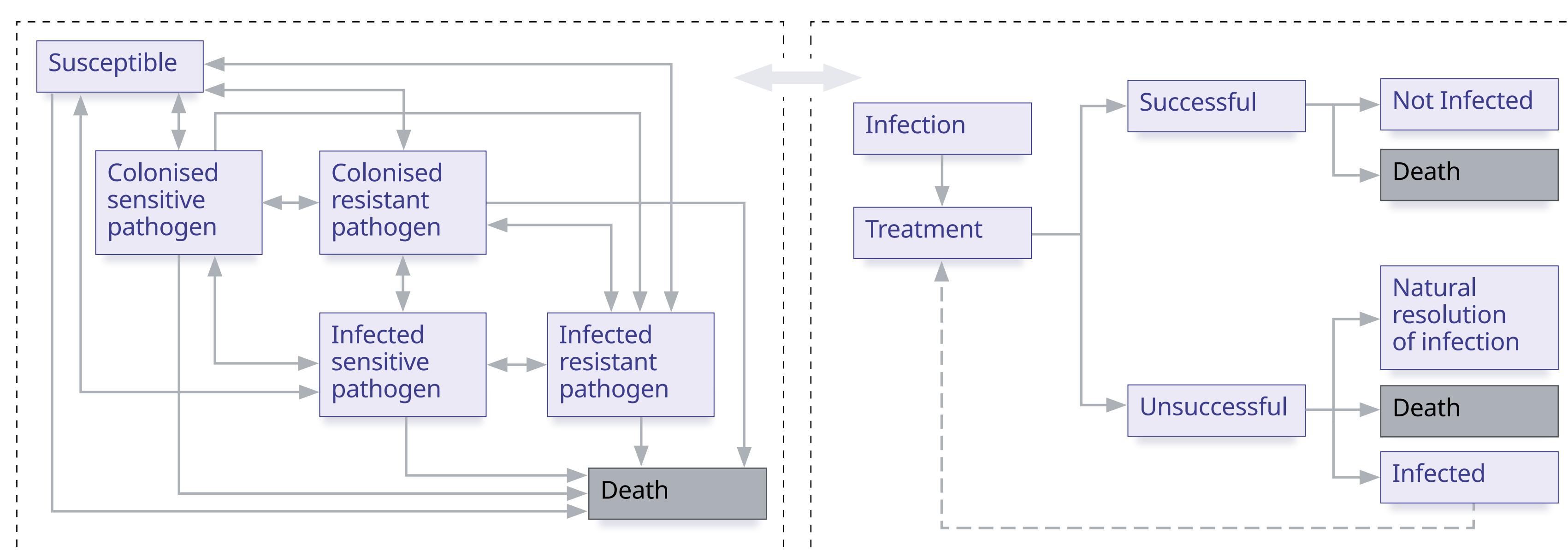
Intervention	ATM/AVI	Colistin + meropenem	Colistin + aminoglycoside
Comparator	Colistin + meropenem	Colistin + aminoglycoside	

Inputs:

- The model was populated using clinical data from sources including the phase 3 clinical REVISIT³ trial. Baseline levels of cIAI and HAP/VAP caused by MBL-CRE were sourced from Chinese surveillance data⁴
- The model included nephrotoxicity as a treatment-related adverse event associated with the antimicrobials used
- Daily treatment costs were calculated from unit prices from the Yaozhi database. General ward and intensive care unit hospitalisation costs were informed by expert local opinion. Costs for adverse events were included
- Length of stay (LOS) was assumed to be 8.5 days for cIAI and 10.3 days for HAP/VAP.³ The duration of unsuccessful treatment was assumed to be 3 days before switching to a different treatment; the LOS was extended by an additional 7 days for those who died

Model design

Figure 1. Model schematic of dynamic transmission model and treatment decision tree



Results

In China over 10 years, the introduction of ATM-AVI for cIAI and HAP/VAP caused by MBL-CRE had a **dominant** incremental cost-effectiveness ratio, leading to **2.22 QALYs gained** compared with the current standard of care

Compared with current treatment strategies, the addition of ATM-AVI was estimated to result in the following clinical benefits:

1.3%
reduction in
resistance gain

401,484
infections
avoided
(0.87 per person)

91,575
lives saved
(0.20 per person
1 per 5 people)

1,085,730
life years
gained
(2.39 per person)

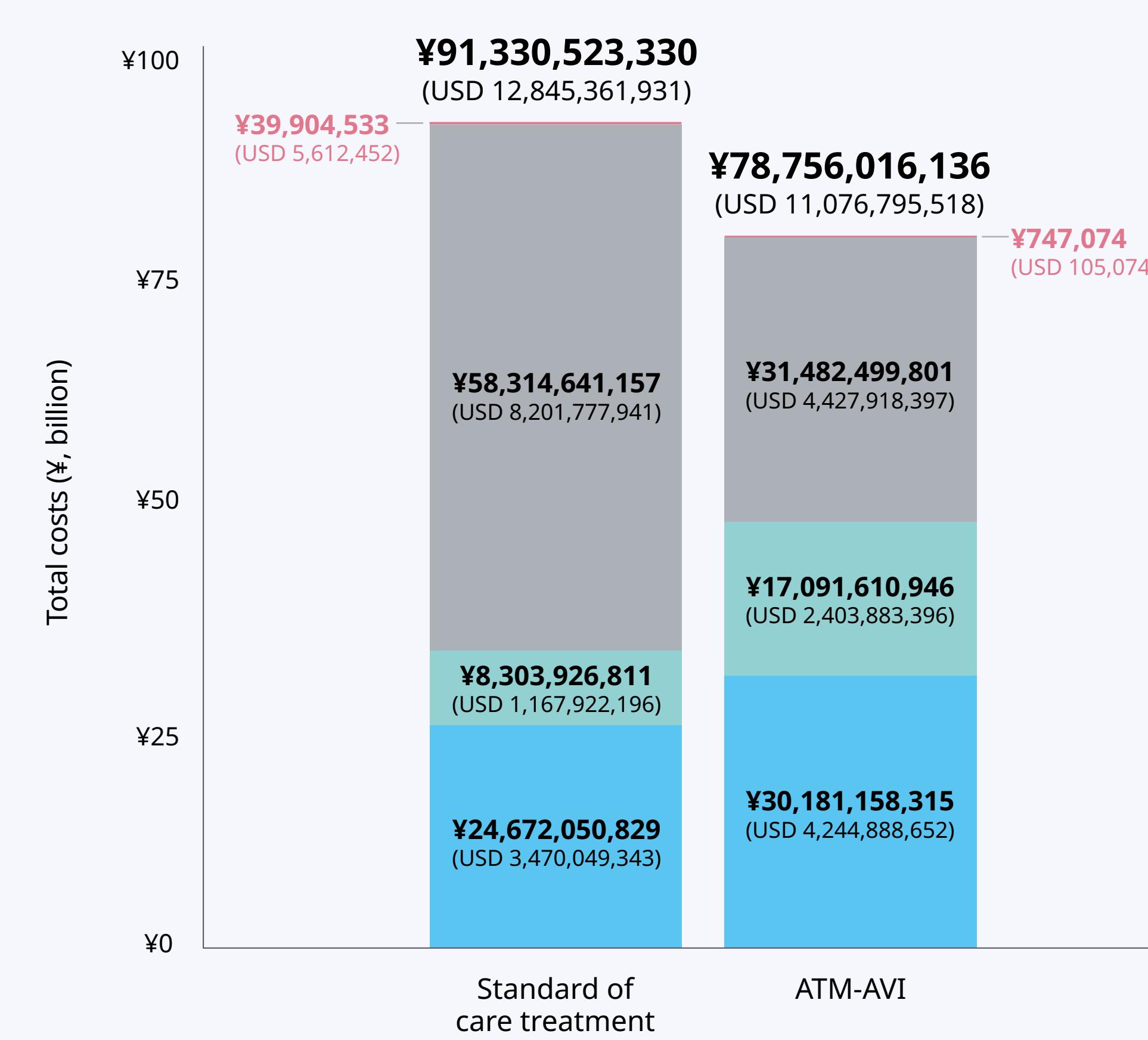
1,010,284
QALYs
gained
(2.22 per person)

The introduction of ATM-AVI is estimated to result in overall cost savings of **¥12.6 billion (USD 1.8 billion)** (figure 2), savings of **¥26,483 (USD 3,725)** per person treated

Increases in hospitalisation and treatment costs associated with a longer treatment line, were offset by savings from costs associated with death and adverse events

At a willingness-to-pay threshold[†] of **¥287,247 (USD 40,400)**, the introduction of ATM-AVI was associated with a net monetary benefit of **¥302 billion (USD 43 billion)** (¥666,651 [USD 93,763] per person) across 10 years

Figure 2. Total costs for standard of care and intervention, over 10 years



[†]Three times the per capita GDP of China in 2024

Adverse event cost Death cost Treatment cost Hospitalisation cost

Abbreviations

ATM-AVI, aztreonam-avibactam;
cIAI, complicated intra-abdominal infection;
GDP, gross domestic product;
HAP/VAP, hospital-acquired/ventilator-associated pneumonia;
LOS, length of stay;

LY, life years;
MBL-CRE, metallo-β-lactamase carbapenem resistant Enterobacteriales;
STEDI, spectrum, transmission, enablement, diversity, and insurance;
QALY, quality-adjusted life year

References

- 1.Balasubramanian R, et al. PLoS Med. 2023;20(6):e1004178
- 2.National Health Commission. 2023 Available from: https://www.gov.cn/jianbo/bumen/202408/content_6971248.htm
- 3.Carmeli et al. The Lancet Infectious Diseases, Volume 25, Issue 2, 218 – 230
- 4.CHINET surveillance www.chinets.com/ -Content/File/

Disclosures

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