

Energy in Buildings EMEA 2024



Reducing Hospital-Acquired Infections with Artificial Intelligence

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Understanding Healthcare Associated Infections (HAIs)

Questions to Answer

- What is healthcare associated infection (HAI)
- What are we currently monitoring?
- What resources and commitment are required?
- How do we feed back results?
- How effective have our interventions been?



Healthcare Associated Infections (HAI)



Understanding Healthcare Associated Infections (HAIs)



Healthcare Associated Infections

Definition

Healthcare-Associated Infections (HAIs) are infections acquired by patients during healthcare delivery.

Global Impact

Affect approximately 9% of inpatients worldwide, leading to increased costs and mortality.

Challenge

Despite prevention efforts, these infections persist worldwide, necessitating innovative solutions.

Current Challenges in Infection Control

How can we as Infection Control Teams and hospital staff work together to make an effective and sustained impact on hospital-acquired infection?

Current Challenges in Infection Control

Resource Constraints



Overcrowded hospitals, high bed occupancy, and inconsistent infection practices

Behavioral Barriers



Poor hand hygiene compliance and antibiotic misuse

Monitoring Gaps



Limited quality indicators for tracking and improving infection control

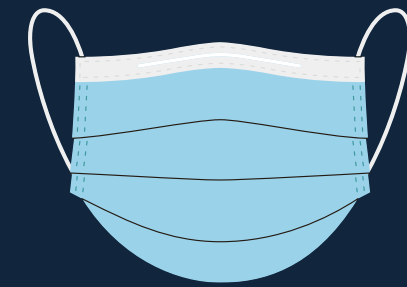
Impact of COVID-19 on Hospital-Acquired Infections (HAIs) & Antimicrobial Resistance (AMR)

Antimicrobial Resistance (AMR)

- 32% rise in hospital-acquired resistant infections during the pandemic
 - 6.3% overall increase in AMR infections per 10,000 hospitalizations (from 181.9 to 193.3)
- Post-pandemic, AMR infections remain 13% higher than pre-pandemic levels

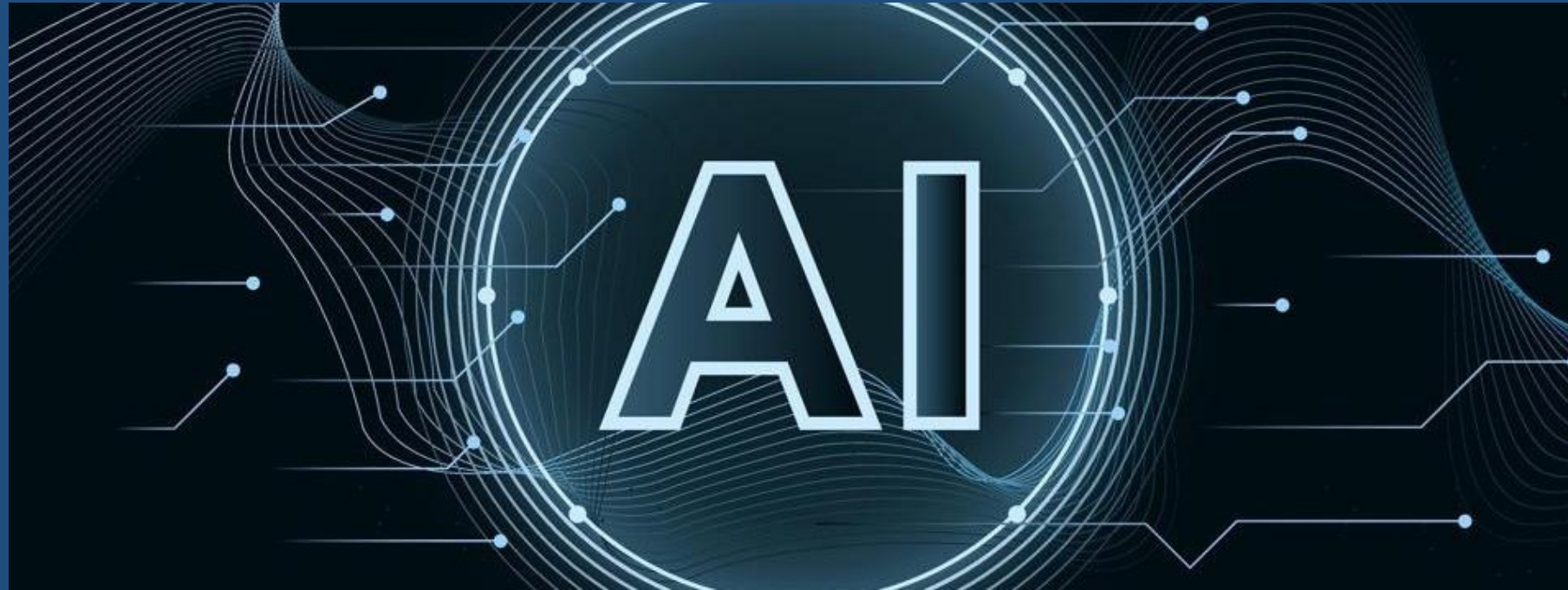
Community vs. Hospital-Acquired Infections

- Hospital-acquired infections rose steeply by 32%
- Community-acquired infections showed a 1.4% increase during the same period



“HAIs cost \$9.8 billion annually, with surgical site infections as the leading cause”

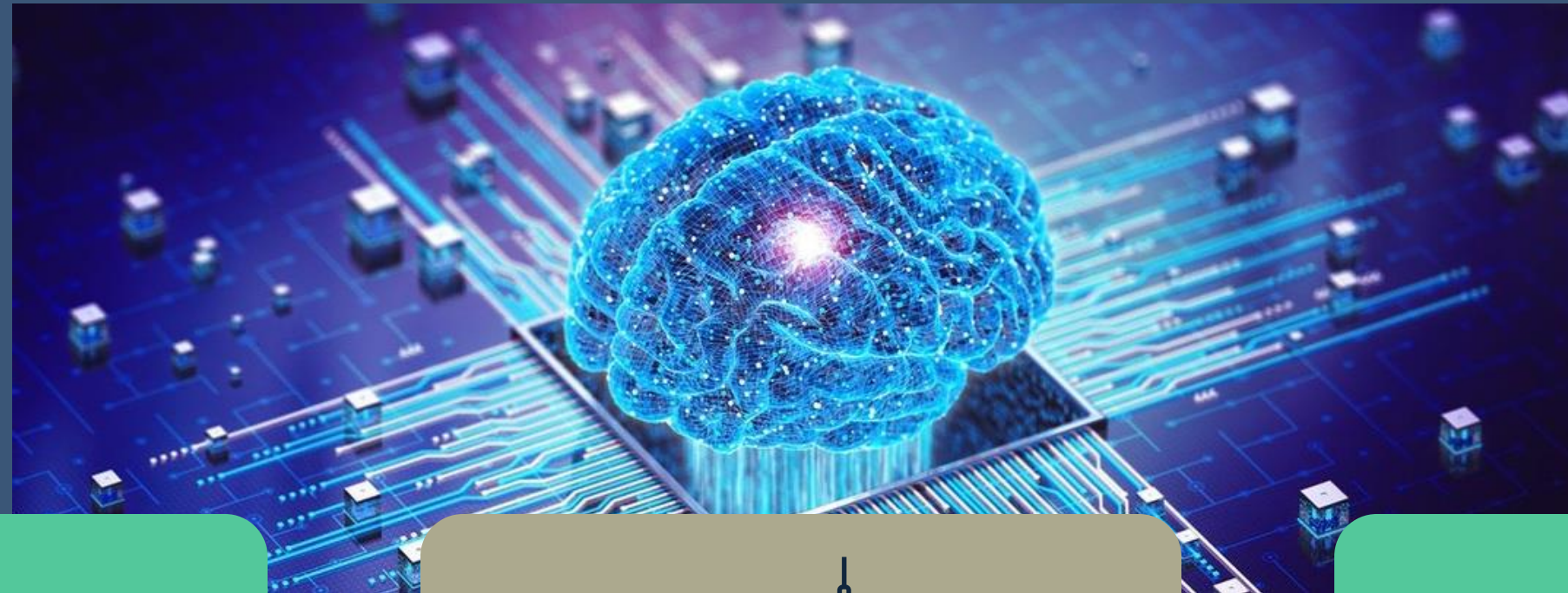
Revolutionizing Infection Prevention with AI



AI drives improvements in real-time surveillance, risk-based infection control, and adherence to preventive protocols.

AI models simulate infection scenarios, advocating proactive measures and curbing the overuse of antibiotics, which helps reduce antimicrobial resistance.

AI in Action: Real-World Applications



AI reduces infection rates by up to 30% in hospitals



Dashboards provide real-time compliance tracking and actionable insights



AI supports hospitals in making data-driven decisions

How AI Transforms Infection Control



Risk Detection

Real-time monitoring and predictive analytics for early intervention



Automation

Robotics for disinfection in high-risk areas, improving hygiene compliance



Enhanced Decision-Making

AI-driven support for antibiotic management and infection prevention



Benefits of Early Detection with Artificial Intelligence

AI enables rapid identification of outbreak risks by analyzing location-specific factors like patient conditions and care team dynamics. Early detection translates to cost savings, reduced hospital stays, and enhanced patient outcomes. It also safeguards hospitals' reputations.



Proven Strategies to Reduce Healthcare Associated Infections (HAIs)



- ✓ Implementing hand hygiene programs with >95% compliance
- ✓ Mandatory reporting and root cause analysis for infections
- ✓ Audit and feedback across all levels of the organisation
- ✓ Competency assurance programs for staff training

Energy Efficiency in AI Systems

AI optimizes energy use in cleaning and disinfection processes

Sustainable practices reduce resource waste and carbon footprint

Aligns infection control efforts with global sustainability goals

Holistic Impact

Combines improved patient safety with environmental responsibility for long-term benefits



Challenges and Ethical Considerations

Challenges

Data privacy, high implementation costs,
and training needs.

Ethical concerns

Transparency of AI algorithms and
patient-centered care



What makes the difference?

- Improving clinical care: invasive devices, assurance package
- Good antibiotic management and practices
- Efficient commissioning & monitoring of services delivered
- Infection control teams that “enable”
- Partnership working





FUTURE

Future of Infection Control with AI



Advanced AI tools to personalize infection prevention



Smarter, more efficient hospital environments



A vision of safer, sustainable healthcare systems

The Role of Personalized Healthcare and AI in Fighting Infections

Personalized Healthcare Overview

- Tailored treatments based on individual patient profiles
- Applications: Oncology, CNS, immunology, respiratory diseases, and chronic illnesses
- Growth drivers: Aging population, chronic illnesses (e.g., diabetes, cancer), advancements in pharmacogenomics

AI's Role in Personalized Healthcare for Infection Control

- Precision targeting of infection-causing pathogens through molecular profiling.
- Predictive analytics to identify high-risk patients for tailored preventive measures.
- Real-time monitoring to personalize treatment regimens based on patient response.

"AI-powered personalized healthcare ensures precise treatments, targets pathogens accurately, reduces infections, and enhances patient health outcomes."



Conclusion



Healthcare Associated Infections (HAIs) pose a significant global challenge

AI provides predictive, preventive, and sustainable solutions

Combining technology with robust infection control practices ensures safer healthcare

Personalized healthcare and AI create a path toward safer, more efficient healthcare systems

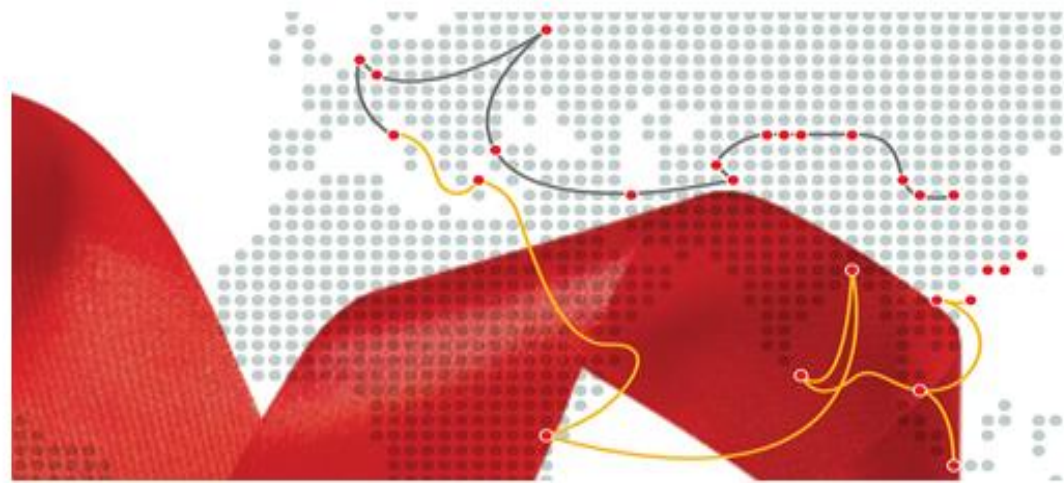


“Globally, healthcare-associated infections (HAIs) represent a significant burden on the healthcare system, costing hospitals millions annually. In high-income countries, the cost of Healthcare Associated Infections (HAIs) can exceed \$40 Billion per year”

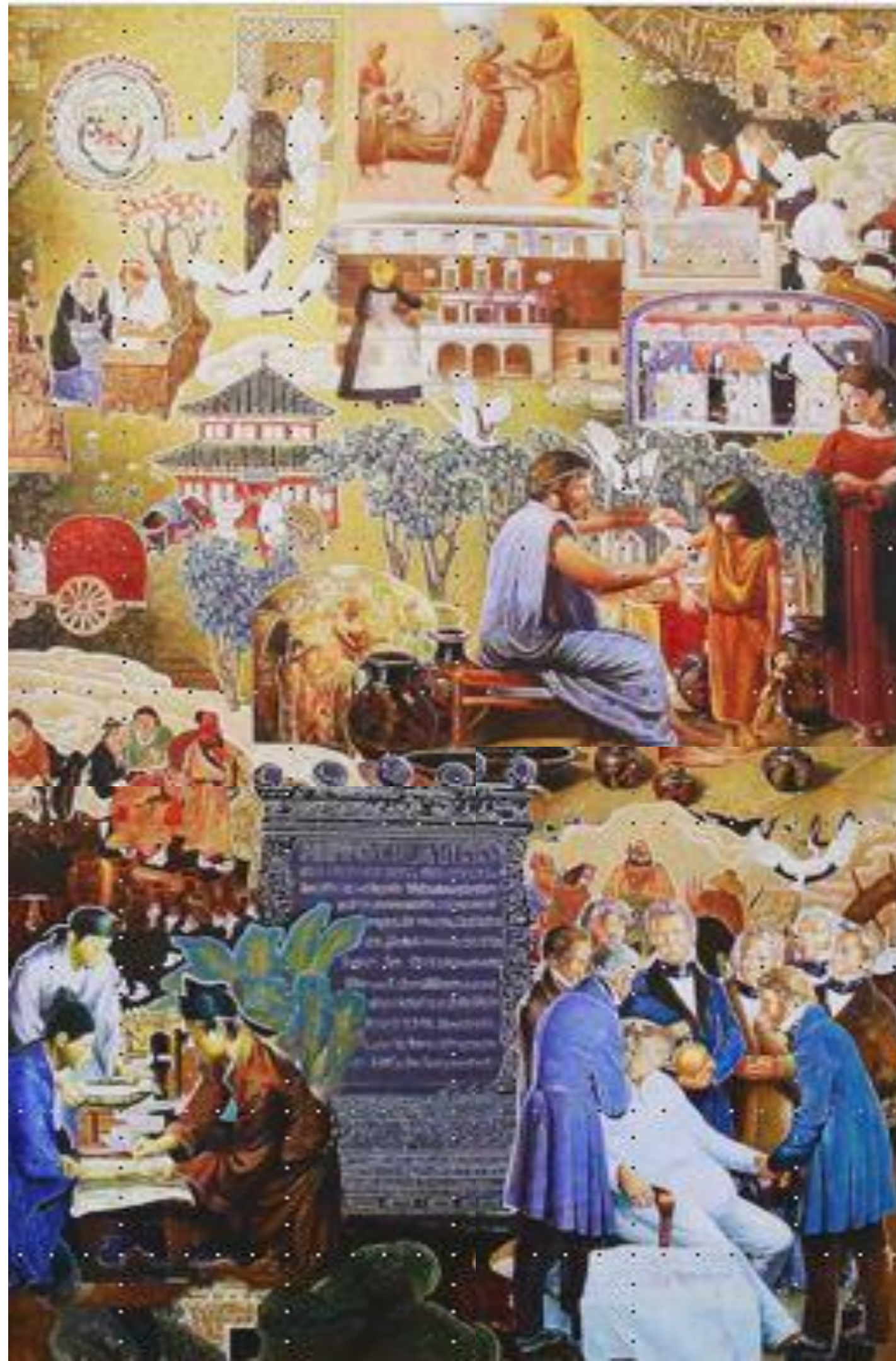
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One Belt One Road



“Belt” refers to the proposed overland routes for road and rail transportation through landlocked Central Asia along the famed historical trade routes of the Western Regions; “road” is short for the 21st Century Maritime Silk Road



One Health One Road ‘s novel approach promoting a universal model of healthcare delivery through innovative means of training, experience sharing and technology transfer aiming to unite the practices of Traditional Chinese Medicine, Ancient Greek Medical Practices and contemporary Western Medicine



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