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INTERCEPT: Interrupting proliferation of carbapenem resistance in Indonesia

Submission date
21/05/2026

Recruitment status
Recruiting

Registration date
28/05/2026

Overall study status
Ongoing

Last Edited
27/05/2026

Condition category
Infections and Infestations

[_] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[X] Record updated in last year

Plain English summary of protocol

Background and study aims
Bacteria that are resistant to last-line antibiotics of the carbapenem class are a global public health threat, and classified as critical priority pathogens by the World Health Organisation. In Indonesia, they are a serious problem with common disease-causing bacteria which are frequently resistant to carbapenems. The routes by which people acquire these bacteria are unknown, but scarce data from Indonesia and experience in other settings suggests that transmission in hospitals is likely to be common, therefore strategies to block transmission are needed.
Infection prevention and control (IPC) and antimicrobial stewardship provide tools to do just that; yet despite sporadic attempts to deploy them in Indonesia, carbapenem resistance has emerged and proliferated. This mirrors the earlier rapid spread of extended-spectrum beta-lactamase (ESBL) producing bacteria: these bacteria – problematic to treat in their own right - confer resistance to older antibiotics of the beta-lactam class. Carbapenems are commonly used to treat infections with ESBL producing bacteria, which in turn has driven carbapenem resistance. To break this vicious cycle, new interventions to block transmission of resistant bacteria that are adapted to and sustainable in the local context are required.
But understanding transmission is complex. Bacteria can resist antibiotics by acquiring genes that confer resistance, but these acquired genes can be transported by many vehicles, often nested, like a Matryoshka Russian doll: “jumping genes” (transposons) can jump to and from bacterial chromosomes and replicating genetic fragments (mobile genetic elements like plasmids), which can themselves move between bacteria, even between different bacterial species. Bacteria can move between animals, the environment, and humans, living harmlessly in the human gut , a phenomenon called colonisation) prior to causing invasive disease when they escape into (for example) the bloodstream. At the health system level, humans carry resistance genes with them as they move between health facilities and the community; travel disseminates them globally.
INTERCEPT brings together UK and Indonesian researchers to tackle this problem, using cutting edge techniques to identify key transmission routes across a complex healthcare system, then co-designing and piloting interventions to block them.

Who can participate?
Patients colonised with carbapenem resistant bacteria (INTERCEPT-transmission) and patients with Gram-negative bacteraemia(INTERCEPT-bacteraemia)

What does the study involve?
At different levels of the Indonesian health care system, this study will test hospital inpatients and the hospital environment for colonisation with carbapenem-resistant bacteria, as well as community members and hospital wastewater, defining flow of resistance genes into and out of health facilities. The study will test humans by collecting stool or rectal swab samples and testing these samples for resistant bacteria. It will recruit a cohort of patients with bloodstream infection (a serious type of infection where bacteria have spread into the blood) to properly define current treatments and outcomes of people with carbapenem-resistant infection, and identify and interview government and healthcare staff to understand what they perceive as barriers to the implementation of effective antimicrobial stewardship and IPC interventions. Whole-genome sequencing - a technique to record ("sequence") the full genetic code ("genome") of an organism will fully describe bacteria, resistance genes and mobile genetic elements, tracking them through this system; mathematical models will identify key transmission routes. Isolated bacteria into the laboratory where molecular biology techniques developed at the Liverpool School of Tropical Medicine will allow us to understand mechanisms of resistance and the capability of carbapenemase genes to transfer within and between bacteria.
Ultimately, insights from these analyses will inform design of locally-adapted interventions. Workshops will be convened with key health care and government stakeholders to co-design interventions, and pilot them whilst ongoing sampling assesses the impact on transmission. INTERCEPT will provide practical data to guide interventions aligned with national and international AMR-control priorities, suitable for scale-up and larger scale assessment, but also insights into transmission of carbapenem resistance that will benefit hospitalised patients in Indonesia.

What are the possible benefits and risks of participating?
Benefits and risks not provided at time of registration

Where is the study run from?
Liverpool School of Tropical Medicine, UK.

When is the study starting and how long is it expected to run for?
December 2025 to April 2027.

Who is funding the study?
1. UK Research and Innovation (UKRI)
2. Directorate of Research, Technology, and Community Service (Direktorat Riset, Teknologi, dan Pengabdian kepada Masyarakat [DRTPM]), Indonesia.

Who is the main contact?
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Contact information

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Study information

Scientific Title
INTerrupting prolifERation of Carbapenem resistance in Indonesia: clinical and genomic Evaluation of Pathways of Transmission (INTERCEPT)

Acronym
INTERCEPT

Study objectives
AIM 1: Define routes of transmission of carbapenem resistance
AIM 2: Describe current antimicrobial stewardship /IPC practices and barriers to intervention
AIM 3: Co-develop and pilot locally adapted interventions to interrupt transmission of resistant bacteria
AIM 4: Describe the impact of carbapenem-resistant bloodstream infection
AIM 5: Strengthen research capacity in Indonesia and UK, and UK-Indonesia collaborative research network

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 26/11/2025, Liverpool School of Tropical Medicine research ethics committee (LSTM Pembroke Place, Liverpool, L3 5QA, United Kingdom; +44 0151 705 3100; lstmrec@lstmed.ac.uk), ref: 25-041

Primary study design
Observational

Secondary study design
Three linked sub-studies comprising two observational cohort studies (INTERCEPT-transmission, INTERCEPT-bacteraemia) and a qualitative study (INTERCEPT- intervention).

Study type(s)

Health condition(s) or problem(s) studied
Observational cohort study of patients colonised with carbapenem resistant bacteria (INTERCEPT-transmission) and patients with Gram-negative bacteraemia(INTERCEPT-bacteraemia).

Interventions
INTERCEPT -transmission (hospital): Participants will be asked to provide up to seven stool or rectal swab samples during the six week sampling time-frame provided they remain an inpatient on the ward being studied. There is no follow-up.

INTERCEPT-transmission(staff): Staff will be asked to provide up to two nasopharyngeal swabs during the six week sampling period. There is no follow-up.

INTERCEPT -transmission (community): a random cross-sectional sample of community members will be recruited and asked to provide a single stool sample. There is no follow-up.

INTERCEPT-intervention (qualitative): Purposively selected participants will be invited to take part in a semi-structured interview or focus group led by a researcher. There is no follow-up.

Intervention Type
Other

Primary outcome(s)
1. Routes of transmission of carbapenem resistance measured using whole-genome sequencing to fully describe bacteria, resistance genes and mobile genetic elements, tracking them through this system; mathematical models will identify key transmission routes at completion of the initial data collection and analysis

2. A robust description of current antimicrobial stewardship and infection prevention and control (IPC) practices plus barriers to intervention in the three hospitals being studied measured using qualitative analysis of perception of and barriers to IPC/stewardship interventions at completion and analysis of the qualitative investigations

3. Development and piloting of locally adapted interventions to interrupt the transmission of resistant bacteria measured using data collected from stakeholder workshops at completion of the study

Key secondary outcome(s)
1. Robust description of the impact of carbapenem resistant bloodstream infections measured using data collected on the microbiologic and clinical features and outcomes of Gram-negative bacteraemia at completion of the study

2. Strengthened research capacity in Indonesia and the UK with development of an Indonesia-UK collaborative research network measured using data collected throughout the study to establish a clinical research network at completion of study activities

Completion date
30/04/2027

Eligibility

Key inclusion criteria
INTERCEPT-transmission (hospital)
1. Hospitalised adults aged 18+
2. Admitted to the general ward or ICU where recruitment is taking place
3. Able to consent or be consented by a legal representative
4. Able to understand indonesian or english
5. Willing to provide rectal swab at intervals whilst an inpatient
5. Not receiving end of life care or expected to die within 24 hours

INTERCEPT-transmission(staff)
1. Hospital staff aged 18+
2. Able to consent
3. Willing to provide a nasopharyngeal swab sample

INTERCEPT -transmission (community)
1. Adults aged 18+
2. Living in the community surrounding the hospital
3. Not hospitalised in the previous year
4. Able to consent
5. Willing to provide a single stool sample

INTERCEPT-bacteraemia
1. All patients with gram-negative bloodstream infection during 6-week recruitment period
NB. anonymised isolates collected from microbiology laboratory only

INTERCEPT-intervention
1. Key stakeholders across hospital sites (including but not limited to: managers, policymakers, infection prevention and control staff, nurses, clinicians, pharmacists)
2. Willing to consent to be interviewed or join a focus group discussion

Healthy volunteers allowed
Yes

Age group
Mixed

Lower age limit

18 Years

Upper age limit
100 Years

Sex
All

Total final enrolment
0

Key exclusion criteria
INTERCEPT-transmission(hospital)
1.unable to understand indonesian or english
2. unable to consent themselves or via a legal representative
3. receiving end of life care or anticipated to die within 24 hours of recruitment

INTERCEPT -transmission (community)
1. unable to understand indonesian or english
2. hospital admission during previous 12 months

Date of first enrolment
15/12/2025

Date of final enrolment
30/04/2027

Locations

Countries of recruitment
Indonesia

Sponsor information

Organisation
Liverpool School of Tropical Medicine

ROR
https://ror.org/03svjbs84

Funder(s)

Funder type

Funder Name

UK Research and Innovation

Alternative Name(s)
UKRI

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Funder Name
Direktorat Riset, Teknologi, dan Pengabdian kepada Masyarakat

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	version 1.2	17/09/2025	22/05/2026	No	Yes
Participant information sheet	version 1.2	17/09/2025	22/05/2026	No	Yes
Participant information sheet	version 1.0	04/12/2025	22/05/2026	No	Yes
Participant information sheet	version 1.3	04/12/2025	22/05/2026	No	Yes
Participant information sheet	version 1.3	04/12/2025	22/05/2026	No	Yes
Protocol file	version 1.3	04/12/2025	27/05/2026	No	No