REVERSE
p**REV**ention and management tools for r**E**ducing antibiotic **R**esistance in high prevalence **SE**ttings

WP 6: Cost-effectiveness

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Background

- Recent reviews have identified several health-economic evaluations of various IPC, ASP and MDS programmes. However, the quality of identified studies was low.
  - Inadequate quantification of cost of intervention and implementation
  - Impact of interventions on quality of life unclear
  - Affordability not evaluated, which is problematic in many high prevalence settings
  - Relative importance/value of prevention of different infections, often focusing on a single pathogen
  - Focus only on high income countries

- Estimation of the cost-effectiveness of interventions is crucial for rational decision making in the context of limited healthcare budgets.

- Eliciting preferences for programmes/interventions in low- and middle-income countries is a key step for extrapolating findings from the study undertaken in Europe

Setting

- An intervention that is cost-effective in one setting is not necessarily cost-effective in another
- Dependent on e.g. the incidence of infections, prevalence of antibiotic resistances, levels of antibiotic use in community and hospital, IPC landscape and healthcare systems.

Bug-drug combinations

- While some interventions may particularly impact some organisms (and thus infection types), others may have an impact across multiple bug-drug combinations.
- Reductions in particular bug-drug combinations may be viewed by stakeholders as more important than equivalent reductions in other combinations.

Perspective

- Cost-effectiveness of interventions is also dependent on perspective: whether estimating change in direct costs and health benefits (through infections prevented, and impact on mortality and morbidity or quality of life); cost-effectiveness of intervention adoption at the healthcare provider or system level; or societal impact including implications on costs and health due to reductions in drug resistance in the population.

Affordability

- Interventions that are cost-effective in a particular setting are not necessarily affordable in that same setting.
- Budget impact analyses are needed to assess affordability, i.e. considering the hospital budget and also potential generalizability to low- and middle income countries

Objectives

1. To estimate costs and health benefits associated with the interventions, including estimation of quality of life impact of infections;

2. To perform cost-effectiveness evaluations accounting for heterogeneity based on clinical trials results;

3. To perform cost-effectiveness evaluations beyond the trial duration incorporating impact on resistance and its health and cost consequences in the long-term;

4. To conduct budget-impact analyses to provide estimates of affordability of tested interventions in different resource settings;

5. To identify potential barriers and facilitators of implementation in two selected LMICs.

Task 6.1 Updating systematic reviews on cost-effectiveness of ABS, IPC, and MDS programmes

- Month 25-34, Lead partner: PHE; Other partners involved: UOXF

- This task focuses on updating existing systematic reviews on cost-effectiveness of ABS, IPC, and MDS programmes.
- Will provide an up-to-date overview of cost-effectiveness estimates and will be used to inform specific parameters and modelling approaches for the cost-effectiveness analyses (Tasks 6.3 and 6.4).

Deliverable No and title	Due date	Status
D6.1 Final report and publication for T6.1	Month 37	Not yet begun

Task 6.2 Estimation of intervention costs, clinical and economic outcome data collection, and creation of weighted composite outcome measure of healthcare associated infections

- Month 22-45. Lead partner: UOXF; Other partners involved: PHE, UNIGE
- WP1 and WP5 will work closely together to ensure relevant data collection

- **Micro-costing of interventions**: Costs on intervention components and pathways of implementation across settings will be collected using standardized reporting (2 hospitals from each country).
- **Clinical and cost outcomes**: Clinical outcome data (e.g. incidence of indicator pathogens) and relevant resource use (length of hospital stay, re-admissions, antibiotic usage) will be collected during the trials in collaboration with WP1.
- **Composite outcome:** Detriment to quality of life among patients acquiring key pathogens of interest will be collected (nested study matching infected 1:2 to patients uninfected at time of recruitment) and a composite outcome measure (a weighted cumulative incidence of all included key pathogens) will be developed.

Deliverable No and title	Due date	Status
D6.2 Final report for T6.2	Month 47	Discussions on data collection initiated across WP

Task 6.2 Specifics and input needed

- **Micro-costing**: Standardized reporting form to collect costs on all intervention components as well as pathways of intervention implementation; does it include all relevant items, is it understandable and feasible to complete for the different intervention (bundles), what is likely trial specific?

- **Clinical and cost outcomes**: Ensure all relevant items are collected in terms of resource use.

- **QALY estimation:** Nested study requires ethical approval; collect answers to standardized questionnaires (EQ-5D & SF-12, available in local language) from all consenting patients (or guardian/welfare attorneys/family member) with infection and matched control patient (1:2) during hospitalization (study nurse using REDCap) and at 1, 3, 6 and 12 months post-discharge (pre-paid envelopes or link to REDCap survey).

- **Composite outcome:** Assess relative importance of different infections using swing weighting. Involve multiple experts from high-endemic settings and relevant stakeholders networks such as EU-JAMRAI, WHO, ECDC, those already in advisory board. Suggestions welcome.

Task 6.3 Hospital perspective cost-effectiveness

- Month 35 – 46. Lead partner: PHE; Other partners involved: UOXF, ISGlobal

- The cost-effectiveness of the different intervention bundles will be assessed from the hospital perspective based using a health economic model informed by trial data synthesised with data from the literature and other studies.
- Change in costs associated with interventions, along with the expected pay-offs will be assessed using alternative measures of benefit.
- Uncertainty in cost-effectiveness outputs will be assessed, as well as the relative influence/importance of model inputs.
- Changes to the decision of whether or not an intervention is deemed 'cost-effective' according to prevalence and setting, as well as willingness to pay for health benefits will be explored.

Deliverable No and title	Due date	Status
D6.3 Final report and publication for T6.3	Month 48	Not yet begun

Task 6.4 Societal perspective and incorporating long-term effects

- Month 47 – 60. Lead partner: PHE; Other partners involved: UOXF, ISGlobal

- Extend the model developed under task 6.3 by incorporating costs at the societal level and considering the potential longer-term impact of interventions on antibiotic resistance in the population.
- This model will capture the value, both in terms of economic costs and health, of reduced resistance, and will build on current work of PHE and UOXF.

Deliverable No and title	Due date	Status
D6.4 Final report and publication for T6.4	Month 60	Not yet begun

Task 6.5 Budget impact analysis

- Months 46-57, Lead partner: UOXF; Other partners involved: PHE, ISGlobal

- Assess affordability in different settings and demonstration of the financial implications of implementation.
- An app will be developed to allow decision makers in various settings, including in LMICs where available budgets are often limited, to assess affordability of the interventions at varying levels of uptake and local costs in their own setting.

Deliverable No and title	Due date	Status
D6.5 Final report and publication for T6.5	Month 60	Not yet begun

Task 6.6 Focus on extrapolation to LMIC

- Month 43-60. Lead partner: ISGlobal; Other partners involved: UOXF, PHE

- A cross-sectional discrete choice experiment (DCE) will be performed to explore the relative importance of barriers and facilitators of intervention uptake in health facilities based in Guyana (upper/middle-income country in South America) and Mozambique (low-income country in Sub-Saharan Africa).
- Attributes of the survey will be based on a literature review and qualitative interviews with key AMR experts.
- This DCE will be used to extrapolate findings and recommendations to other high prevalence settings from Europe and LMIC and will work to complement the findings of WP5.

Deliverable No and title	Due date	Status
D6.6 Final report and publication for T6.6	Month 60	Not yet begun

“REVERSE” antimicrobial resistance

(p**REV**ention and management tools for r**E**ducing antibiotic **R**esistance in high prevalence **SE**ttings)

Thank you for your attention

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