**ELIGIBILITY/EXCLUSION + INCLUSION CRITERIA**

Once the initial search has been completed, these papers have to pass through three stages of criteria. The first two stages are the selection and the exclusion criteria. The last stage is to select studies for inclusion into the study.

* The **selection** and **exclusion** criteria are applied to the initial search to identify a preliminary list of papers.
  + This stage is to try and narrow down the papers that focus on using risk assessment/epidemiological modelling approaches to look at the question AMR transmission
  + Dynamic epidemiological models and risk assessments are the only two types of mathematical models that exist that allow us to assess the dynamics of AMR transmission between population – therefore this was specified in the selection criteria
* The final stage (**inclusion criteria**) is to try and narrow down these mathematical modelling studies to focus entirely on zoonotic transmission between livestock and humans.

**Selection criteria** based on abstract and title from the initial large search

* Study includes the use of “dynamic epidemiological models” (not exact wording – the concept of this model must be used) in title/abstract

OR

* Study includes the use of a risk assessment, or at the minimum, at least one of the stages of a risk-assessment (hazard identification, exposure assessment, hazard characterisation or risk characterisation) in title/abstract.
* Both types of model has to reference “antimicrobial resistance” (or another term for AMR – antibiotic resistance or a resistance to a specific antimicrobial) in title/abstract.
* No selection restriction based on publication date of the study
* Will only include English articles.

**Exclusion criteria** (parts of the title or abstract that disqualify the study from the search)

* Exclude meta-analysis or review studies with no novel data.
* Exclude studies which focus solely on within-host bacterial interaction dynamics or models detailing bacterial growth dynamics
* Exclude papers which look at companion animals
* Exclude studies which look at statistical modelling as the primary modelling method
* Exclude mention of non-bacterial resistance models (cancer, tumors, HIV, malaria)
* Exclude pharmaco-dynamic modelling studies.
* Exclude studies which focus on molecular genetic modelling

**Inclusion criteria**

* Study must be a quantitative outlook on the transmission dynamics of AMR transmission or attempt to quantify the risk to human health
  + Exclude qualitative risk assessments

AND

* Study has to model the zoonotic transmission of AMR pathogens between livestock and humans or the effects of agricultural antibiotic usage on human health.
  + The study does not have to explicitly model the animal or livestock compartment, rather the influence of a population can be grounds for inclusion (e.g – Parameter x models the influence of AMR transmission from livestock)
  + Can include the effects of intermediate pathways (as long as they are explicitly mentioned by the study as being related to animal/livestock – e.g: Risk of transmission through contaminated foodstuffs).
  + The study does not have to model the entire farm-to-fork pathway
    - Intermediate steps can be considered (waste water, environment), but these stages must pose some tangible risk to human health and also must be related to AMR in the zoonotic population (e.g - AMR in wastewater – the study must explicitly state that AMR in water is influenced by agricultural runoff from farms).

AND

* Risk assessment studies must meet the three criteria described by Caffrey et al, 2018 for a risk assessment study.
  1. Does the study identify the AMR hazard of concern? Is it at least an AMR hazard?
  2. Does the study have an outcome in the form of the probability or expected number of cases, rate or risk estimate expressed in terms of individual risk, population risk, per-meal risk or annual risk based on consumption or exposure?
  3. Is the study a synthesis of various sources of data on exposure to the hazard which has been identified earlier in the study?