Dynamic Dashboard - List of Infectious Agents with a relevant AMR issue

How to use this list

- Pathogens are categorized primarily at genus or family level, with sector-specific inclusion rules described in each section.
- "Other" categories are used for AMR-relevant pathogens that are not listed individually; "Not specified" is used when relevant pathogen detail is not provided.
- The environment sector includes pathogens listed for the human, animal, and plant sectors, following the corresponding sector-specific approaches.

Section A: Categories applicable to all sectors

Bacteria / Gram staining / Genus or family name
The category includes any bacteria considered to have a drug resistance issue and are listed individually as priority bacteria for humans, animals and plants (see **section B - D**). The environment sector includes all bacteria and other pathogens with relevant drug resistance issue listed in all other sectors (**Tables 1 – 10**) following the approaches described under each section (**B – D**).

Bacteria / Not specified
Includes projects conducting R&D relevant to AMR that do not specify which bacterium or Gram reaction.

Bacteria / Other gram variable
This category includes the bacteria that are considered:

- Gram variable, meaning they may stain either negative or positive
- Atypical, meaning they do not colour with Gram staining but rather remain colourless, or it is difficult to see the Gram reaction
- Acid fast

Bacteria / Other gram negative
The category includes any gram negative bacteria considered to have a drug resistance issue that are listed as other bacteria or not listed individually (see **section B – D**). This includes projects that are specifically conducting R&D on gram negative bacteria without specifying which bacterium.

Bacteria / Other gram positive
The category includes any gram positive bacteria considered to have a drug resistance issue that are not listed individually (see **section B – D**). This also includes projects that are specifically conducting R&D on gram positive bacteria without specifying which bacterium.

Section B: List of Infectious Agents relevant for AMR R&D in Humans

1. Bacterial Pathogens

Categorization and inclusion methodology for human bacterial pathogens

The World Health Organization's (WHO) Global Priority List of Antibiotic-Resistant Bacteria [1], the United States of America's Centers for Disease Control and Prevention (CDC) Antibiotic Resistant Threats in the United States 2019 [2], the bacteria included in the European Centre for Disease Prevention and Control's (ECDC) European Antimicrobial Resistance Surveillance Network (EARS-Net) [3] and the Indian Priority Pathogen List [4] jointly developed by the Department of Biotechnology (DBT), Government of India, and the WHO India Office, were used to develop a combined list of priority bacteria with a drug-resistance issue. It was considered that all research into these bacteria, irrespective of the drug-resistance profile, would be relevant to advance efforts to address antimicrobial resistance.

For the categorization process, only the bacterial genus level (noting the family *Enterobacteriaceae* was also included) was used and is displayed. **Table 1** lists the genus included in categorization and the rules applied for inclusion based on the aforementioned priority lists.

When projects included bacteria other than those listed in **Table 1** an individual assessment was performed by the Secretariat to determine if there is a known drug-resistance issue. This assessment included searching the literature and reaching a consensus within the Secretariat whether the bacteria has a known drug-resistance issue or not. Where consensus was not reached or there was ambiguity in the literature bacteria were parked and further investigation was conducted.

The list of additional bacteria and the outcomes from the assessment are provided in **Table 2** and are categorized as *Other bacteria* as per their Gram staining. Please note that these lists will be continually updated.

Table 1: *Genus of priority bacteria and inclusion criteria for the Dynamic Dashboard*

Priority^	Bacterial genus	Inclusion criteria for the Dynamic Dashboard
Critical	*Acinetobacter*	All *Acinetobacter* included.
	Clostridioides	*Clostridioides* (or *Clostridium*) *difficile* was included. Any other *Clostridioides* and *Clostridium* were individually assessed for inclusion.
	Enterobacter	All *Enterobacter* included.
	Enterobacterales / Enterobacteriaceae	*Enterobacter* spp., *Escherichia coli, Klebsiella pneumonia, Proteus* spp. *Providencia* spp., *Citrobacter spp.* and *Serratia* spp. were included. In addition, projects that just mentioned *Enterobacterales* or *Enterobacteriaceae,* without further specification, were included. Any other bacteria in the order *Enterobacterales* or *Enterobacteriaceae* family were individually assessed for inclusion.
	Escherichia	*Escherichia coli* was included. Any other *Escherichia* were individually assessed for inclusion.
	Klebsiella	*Klebsiella pneumonia* was included. Any other *Klebsiella* were individually assessed for inclusion.
	Morganella	All *Morganella* included.
	Proteus	All *Proteus* included.
	Providencia	All *Providencia* included.
	Pseudomonas	*Pseudomonas aeruginosa* was included. Any other *Pseudomonas* were individually assessed for inclusion.
	Serratia	All *Serratia* included.
	Mycobacterium	*Mycobacterium tuberculosis* was included. Any other *Mycobacterium* were individually assessed for inclusion.
High	*Campylobacter*	All *Campylobacter* included.
	Enterococcus	*Enterococcus faecium* and *Enterococcus faecalis* were included. Any other *Enterococcus* were individually assessed for inclusion.
	Helicobacter	*Helicobacter pylori* was included. Any other *Helicobacter* were individually assessed for inclusion.
	Neisseria	*Neisseria gonorrhoeae and Neisseria meningitis* was included. Any other *Neisseria* were individually assessed for inclusion.
	Salmonella	All *Salmonella* included.
	Staphylococcus	*Staphylococcus aureus* was included. Any other *Staphylococcus* were individually assessed for inclusion.
	Shigella	All *Shigella* included.
Medium	*Streptococcus*	*Streptococcus pneumoniae,* group A *Streptococcus* (*S. pyogenes* and group B *Streptococcus* (*S. agalactiae*) were included. Any other *Streptococcus* were individually assessed for inclusion.
	Haemophilus	*Haemophilus influenzae* was included. Any other *Haemophilus* were individually assessed for inclusion.
Watch	*Bordetella*	*Bordetella pertussis* was included. All other *Bordetella* were checked to see if there was a published resistance issue

^ Priority level used for visualisations on the Dynamic Dashboard

Table 2: *Other bacteria with a drug resistance issue included in the Dynamic Dashboard*

Genus	Species	Gram stain
Actinomycetes	All *Actinomycetes* included	positive
Achromobacter	*A.xylosoxidans*	negative
Burkholderia	*B. cenocepacia*	negative
	B. cepacia	
	B. mallei	
	B. multivorans	
	B. pseudomallei	
	B. vietnamiensis	
Chlamydia	*C. trachomatis*	negative
Clostridium	*C. botulinum*	positive
	C. perfringens	
Coxiella	*C. burnetti*	negative
Chronobacter	*Cronobacter* spp., formerly *Enterobacter sakazakii*	negative
Corynebacterium	*C. diphtheriae*	positive
Cutibacterium	*C. acnes*	positive
Enterococcus	*E. hirae*	positive
Helicobacter	*H. cinaedi*	negative
Listeria	*L. monocytogenes*	positive
Moraxella	*M. catarrhalis*	negative
Mycobacterium	Non tuberculosis mycobacterium (NTM) as a group	variable
	M. abscessus	
	M. africanum	
	M. avium	
	M. kyorinense	
	M. leprae	
	M. ulcerans	
Mycoplasma	*M. genitalium*	variable
	M. pneumoniae	
Nocardia	All *Nocardia* included	positive
Porphyromonas	*P. gingivalis*	negative
Stenotrophomonas	*S. maltophilia*	negative
Staphylococcus	*S. epidermidis*	positive
Streptococcus	*S. mitis, S. mutans*	positive
Treponema	*T. pallidum*	negative
Ureaplasma	All *Ureaplasma* included	variable
Vibrio	*V. alginolyticus, V. cholerae, V. vulnificus*	negative
Yersinia	*Y. pestis*	negative

2. Fungal pathogens

Categorization and inclusion methodology for human fungal pathogens

The human fungal pathogen list (**Table 3**) was developed in consultation with experts who contributed to the development of the World Health Organization's (WHO) Human Fungal Priority Pathogen list before its publication. The WHO report was published in 2022[5], and current fungal pathogen list has been updated accordingly as part of the continual maturation of the Dynamic Dashboard.

For the categorization process, only pathogen genus or family were used and are displayed in the Dynamic Dashboard. All species within the listed genus or family were included and some representative species are listed in **Table 3**. When projects included species that are not listed in the table below and with a relevance for AMR, they were categorized as *Fungus–other*. All projects with relevant fungal pathogens without any specific details were categorized as *Fungus not specified*.

Table 3: *Fungus with a drug resistance issue included in the Dynamic Dashboard*

Fungus Genus	**Species include, but not limited to**
Ascomycota Other	AMR relevant species that belong to the *Ascomycota* phylum/division, not listed below
Aspergillus	*A. nidulans*; *A. fumigatus* complex; *A. niger* complex; *A. flavus* complex; *A. ustus* complex; *A. terreus* complex
Basidiomycota Other	AMR relevant species that belong to the *Basidiomycota* phylum/division, not listed above
Blastomyces	AMR relevant species
Candida	*C. auris*; *C. albicans*; *C. glabrata*; *C. tropicalis*; *C. krusei; C. parapsilosis*
Candidozyma	*C. auris (previously Candida auris)*
Cladophialophora	AMR relevant species that belong to the *Cladophialophora* genus
Coccidioides	All *Coccidioides* included
Cryptococcus	*C. gattii*; *C. neoformans* (serotypes A, D & AD)
Epidermophyton	AMR relevant species that belongs to the *Epidermophyton* genus.
Eumycetoma	*E.* causative agents (*Madurella* spp., *Falciformispora senegalensis*, *Curvularia lunata*, *Scedosporium* spp., *Zopfia rosatii*, *Acremonium* spp.)
Fonsecaea	*F. pedrosoi*
Fusarium	All *Fusarium* included
Histoplasma	*All Histoplasma included*
Lichtheimia	AMR relevant species that belong to the *Lictheimia* genus
Lomentospora	*L. profilicans*
Microsporum	AMR relevant species that belong to the *Microsporum* genus
Mucor	*M. circinelloides*; *M. irregularis; Mucor spp.*
Mucorales Other	AMR relevant species that belong to the *Mucorales* order, not listed above
Nakaseomyces	*N. glabrata* (previously *Candida glabrata*)
Paracoccidioides	AMR relevant species that belong to *Paracoccidioides spp.*
Phialophora	*P. verrucosa*
Pichia	*P. kudriavzeveii (previously Candida krusei)*
Pneumocystis	*P. jirovecii* (previously known as *P. carinii*)
Rhizopus	AMR relevant species that belong to the *Rhizopus* genus
Scedosporium	AMR relevant species that belong to the *Scedosporium spp.*
Sporothrix	*S. schenckii*; *S. brasiliensis*
Talaromyces	*T. marneffei*
Trichophyton	*T. asahii*; *T. rubrum*; *T. mentagrophytes; T. indotineae*
Not-specified	**AMR relevant fungal pathogen, with no specific details given**
Other	**AMR-relevant fungal pathogen not covered by any of the categories listed above**

Section C: List of Infectious Agents relevant for AMR R&D in Animals

Categorization and inclusion methodology for animal pathogens relevant to AMR

A pathogen list relevant to AMR R&D for animals was created based on WOAH's guidance documents resulting from consultation of two ad hoc Groups on 'Prioritization of Disease for which Vaccines could reduce Antimicrobial Use in Animals'.

- Pigs, poultry and fish (April 2015) AHG_AMUR_Vaccines_2015 [6] and
- Cattle, sheep and goats (May 2018) AHG_AMUR_Vaccines_Ruminants_2018 [7]
- Poultry, Pigs, Fish (February 2026) Report of the Meeting of the PROEVA ad hoc group [8]

In addition, relevant animal pathogens with an unmet need for AMR were included per input from the experts consulted by the Secretariat for the development of the animal-specific categorization fields of the Dynamic Dashboard.

For the categorization process, only pathogen genus or family level were used and are displayed in the Dynamic Dashboard. All species within the listed genus or family were included and some representative species are listed in the tables. When projects included species that are not listed in the tables below and with a relevance for AMR, they were categorized as *Virus–other*, *Fungus–other* and *Parasite–other*, respectively. In the case of bacterial infections, they were categorized as other and according to gram staining (*Other gram positive*, *Other gram negative* and *Other gram variable*).

Table 4: *Animal Bacterial Pathogens*

Bacterial Genus	Species include, but not limited to
Actinobacillus	*A. pleuropneumoniae*
Aeromonas	*A. hydrophila; A. salmonicida; Aeromonas spp.*
Anaplasma	*A. marginale*
Bacillus	*B. anthracis*
Bibersteinia	*B. trehalosi*
Bordetella	*B. bronchiseptica*
Brachyspira	All *Brachyspira* included
Brucella	*B. suis; B. abortus; B. ovis; B. melitensis*
Campylobacter*	All *Campylobacter* included
Chlamydiaceae	All *Chlamydia* included
Clostridium	*C. perfringens*
Corynebacterium	All *Corynebacterium* included
Dermatophilus	*D. congolensis*
Dichelobacter	*D. nodosus*
Edwardsiella	*E. ictaluri; E. tarda*
Ehrlichia	*E. ruminantium*
Escherichia*	All *Escherichia* included
Flavobacterium	*F. columnare; F. psychrophilum*
Francisella	*Francisella spp.*
Fusobacterium	*F. necrophorum*
Haemophilus	*H. parasuis (renamed Glaesserella parasuis)*
Histophilus	*H. somni*
Lactococcus	*L. garvieae*
Lawsonia	*L. intracellularis*
Leptospira	All *Leptospira* included
Mannheimia	*M. capricolum; M. haemolytica*
Mycobacterium	*M. bovis; M. avium* (paratuberculosis)

Mycoplasma	*M. agalactiae, M. hyopneumoniae; M. hyosynoviae; M. hyorhinis*
Pasteurella	*P. multocida*
Photobacterium	All *Photobacterium* included
Piscirickettsia	*P. salmonis*
Pseudomonas*	All *Pseudomonas* included
Salmonella*	All *Salmonella* included
Staphylococcus*	*S. aureus; S. hyicus; S. pseudintermedius*
Streptococcus	*Streptococuss* spp.
Trueperella	*T. pyogenes*
Vibrio	All *Vibrio* included
Yersinia	*Y. ruckerii*

*Any bacteria with relevance for AMR but not included in bacteria genus names highlighted in bold indicate a human priority pathogen as described above.

Table 5: *Animal Viral Pathogens*

Virus Family	
Alloherpesviridae	Cyprinid Herpesvirus 3
Arteriviridae	Porcine Reproductive and Respiratory Syndrome virus (PRRSV)
Birnaviridae	Infectious Bursal Disease virus (IBDV)
Coronaviridae	Bovine coronavirus (BCoV), Avian coronavirus/Infectious bronchitis virus (IBV), Porcine Epidemic Diarrhea Virus, Porcine Delta Coronavirus
Orthomyxoviridae	All influenza viruses included, Swine Influenza Virus
Paramyxoviridae	Peste des petits ruminants virus (PPRV), Bovine Respiratory Syncytial Virus (BRSV)
Pestivirus	Bovine Virus Diarrhoea Virus (BVDV)
Poxviridae	Goatpox Virus, Sheeppox Virus
Reoviridae	Bluetongue virus, Rotavirus
Amnoonviridae	*Tilapia tilapinevirus* (Tilapia Lake Virus)

Table 6: *Animal Fungal Pathogens*

Fungus Genus	
Aspergillus	All *Aspergillus* included
Candida	All *Candida* included
Cryptococcus	All *Cryptococcus* included
Mucorales	All *Mucorales* included

Table 7: *Animal Parasitic Pathogens*

For the categorization process, parasites were grouped into protozoa, helminths and ectoparasites.

Parasites	
Protozoa-*Babesia*	All *Babesia* included
Protozoa-*Cryptosporidium*	*Cryptosporidium parvum*
Protozoa-*Eimeria*	All *Eimeria* included
Protozoa-*Theileria*	*Theileria annulata, Theileria parva*
Protozoa-*Trypanosoma*	All *Trypanosoma* included
Helminths-*Nematodes*	Mostly families: *Trichostrongylidae*, *Molineidae*, *Ancylostomatidae, Chabertiidae*
Helminths-Other	For example, Trematoda such as *Fasciola hepatica*
Ectoparasites	All ectoparasites are included
Other Oomycota	*All Aphanomyces* included

Section D: List of Infectious Agents relevant for AMR R&D in Plants

Categorization and inclusion methodology for plant pathogens relevant to AMR

A pathogen list relevant to AMR R&D for plants was created based on input from the experts consulted by the Secretariat for the development of the plant-specific categorization fields of the Dynamic Dashboard. Only bacterial and fungi-relevant plant pathogens were included. For fungal pathogens the Fungicide Resistance Action Committee (FRAC) pathogen list was considered [9] . Fungal pathogens listed by FRAC as having a high risk of development of resistance to fungicides were categorized by genus level (**Table 9** below), while fungal pathogens listed by FRAC as having a medium risk of development of resistance to fungicides were categorized as one group termed *Fungus–Medium Priority* not by individual genus level (**Table 10** below).

For the categorization process, only pathogen genus were used and are displayed in the Dynamic Dashboard. All species within the listed genus were included and some representative species are listed in the tables. When projects included species that are not listed in the tables below they were deemed not relevant for AMR. Plant projects addressing pathogens listed in the human and animal health sectors were included and categorized as described above.

Table 8: *Plant Bacterial Pathogens*

Bacterial Genus	**Species include, but not limited to**
Acidovorax	*A. avenae*
Burkholderia	*B. glumae*
Erwinia	*E. amylovora*
Pseudomonas	*P. syringae*
Ralstonia	*R. solanacearum*
Xanthomonas	All *Xanthomonas* included
Xylella	*X. fastidiosa*

Table 9: *Plant Fungal Pathogens – High risk categorized by genus level*

Fungus Genus	**Species include, but not limited to**
Alternaria	*A. alternata*
Botrytis	*B. cinerea*
Blumeria	*B. graminis*
Cercospora	*C. beticola*; *C. kikuchii; C. sojina*
Corynespora	*C. cassiicola*
Dydimella	*D. bryoniae*
Magnaporthe	*M. oryzae*
Mycosphaerella	*M. fijiensis: M. brassicicola; M. musicola; M. nawae; M. pinodes*
Phakopsora	*P. pachyrhizi*
Plasmopara	*P. viticola*
Pseudoperonospora	*P. cubensis*
Pseudocercospora	*Pseudocercospora (Mycosphaerella) fijiensis*
Pyricularia	*P. oryzae*
Ramularia	*R. collo-cygni*
Sphaerotheca	*S. fuliginea; Podosphaera xanthii*
Venturia	All *Venturia* included
Zymoseptoria	*Z. tritici*; synonymous with *Septoria*

Table 10: *Plant Fungal Pathogens – Medium risk categorized as one group and includes following genus level*

Fungus Genus	**Species include, but not limited to**
Albugo	*A. candida*
Alternaria	*A. brassicicola; A. brassicae; A. solani*
Ascochyta	*A. pisi*
Bipolaris	*B. maydis*
Blumeriella	*B. jaapii*
Bremia	*Bremia lactucae*
Colletotrichum	*C. acutatum; C. gloeosporoides*
Drepanopeziza	*D. ribis*
Elsinoe	*All Elsinoe* included
Erysiphe	*E. cruciferarum; E. heracleid; E. necator*
Gibberella	*G. fujikuori*
Glomerella	*G. cingulata* (anamorph: *Gloeosporium fructigenum*)
Neofabraea (anamorph Gloeosprorium)	*N. malicorticis; N. perennans: N. vagabunda*
Leveillula	*L. taurica*
Monographella	*M. nivale*
Monilinia	All *Monilinia* included
Mycovellosiella	*M. nattrassii*
Oculimacula	*All Oculimacula* included
Oidium	*O. neolycopersici*
Penicillium	*P. digitatum; P. expansum; P. italicum*
Peronospora	*Peronospora* spp.
Pestalotiopsis	*P. longiseta*
Phyllosticta	*P. citricarpa*
Phytophthora	*P. capsica; P. infestans; P. porri*
Pseudoperonospora	*P. humuli*
Pyrenopeziza	*P. brassicae; P. teres; P. tritici-repentis*
Ramularia	*R. areola*
Sclerotinia	*S. homoeocarpa*
Septoria	*S. glycines; S. lycopersici*
Setosphaeria	*S. turcica*
Sphaerotheca	*S. macularis, S. mors-uvae*
Spilocea	*S. oleagina*
Stemphylium	*S. vesicarium*
Wilsonomyces	*W. carpophilus* (*Ascospora beijerinckii*)

Section E: List of Infectious Agents relevant for AMR R&D in the Environment

Categorization and inclusion methodology for environment pathogens relevant to AMR

All pathogens listed in the **Tables 1-10** above were included. For the categorization process, only pathogen genus or family level were used and are displayed in the Dynamic Dashboard following the approaches described under the sectors human, animal and plant.

References

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