

CDMA Disease Prioritization Criteria

This document summarizes the 11 criteria used to evaluate pig diseases for research prioritization. Each criterion has multiple levels ordered from **least concern** (Level 1) to **greatest concern** (highest level). The criteria framework supports the PAPRIKA multi-criteria decision analysis methodology, where stakeholders make pairwise trade-offs to determine criterion weights.

Criteria Descriptions

C1: Foodborne zoonosis

Risk of human infection through consumption of pork products. This criterion evaluates whether the pathogen can transmit from pigs to humans via the food chain. Relevant control points may include ante- and postmortem slaughter inspection, cross-contamination during processing, and post-processing food handling.

C2: Non-foodborne zoonosis

Risk of human infection through routes other than food consumption, including occupational exposure, direct contact with infected pigs, environmental contamination, or aerosol transmission. Occupational exposure includes producers, veterinarians, slaughterhouse workers, and others with direct pig contact.

C3: Biosecurity effectiveness

Extent to which routine on-farm biosecurity can prevent farm-to-farm transmission. The inherent assumption is that, with rare exceptions, direct pig-to-pig transmission can occur with virtually all diseases. Transportation risk and hygiene are considered part of on-farm biosecurity because producers have substantial control over them. Diseases with wildlife reservoirs or vectors are examples where on-farm biosecurity may not adequately limit farm-to-farm spread.

C4: Detection difficulty

Challenge of recognizing and confirming the disease, combining clinical recognition and diagnostic capability. This criterion reflects how quickly and reliably the disease can be identified in the field or with laboratory support. The working assumption is that NVSL and FADDL can essentially test for anything, either with standardized tests or NGS/sequencing; therefore this criterion focuses mainly on what is available at local or regional laboratory level and what can be recognized in routine practice.

C5: Production cost

Direct financial losses from the disease itself, including mortality, morbidity, reduced growth rates, treatment costs, and lost productivity. This criterion does not include market or trade impacts, which are covered separately.

C6: Market impact

Impact on market access, prices, consumer confidence, and trade relationships resulting from disease detection. This includes export restrictions, domestic movement controls, market closures, price impacts, and regulatory trade responses when disease occurs on one or more farms.

C7: AMR risk (pathogen)

Pathogen-level AMR hazard. This criterion asks whether the agent itself is inherently likely to develop clinically important resistance to antibacterial or antiviral treatments, and whether it can efficiently spread that resistance. It concerns organism biology, not how much treatment is used in the field. Viruses generally receive the lowest score because they are not a major AMR concern, whereas some bacterial groups are inherently efficient at generating or transmitting resistance.

C8: AMR use pressure

AMR hazard introduced by how producers are likely to manage the disease. This criterion captures the amount and pattern of antibacterial or antiviral use associated with disease control, not pathogen biology. It reflects the likelihood of antimicrobial exposure through individual treatment, group treatment, or prophylaxis.

C9: Treatment availability

Existence and effectiveness of therapeutic interventions that can alter disease outcomes in infected animals. Considers both availability in the United States and actual efficacy in field conditions.

C10: Vaccine availability

Existence and effectiveness of preventive vaccination options. Considers vaccine efficacy, practical availability in the United States, breadth of protection, and whether vaccines are part of standard disease control programs, including national response stockpiles where relevant.

C11: Eradication feasibility

Biological and practical feasibility of completely eliminating the disease from domestic US pig populations using available tools and foreseeable resources. Considers both technical feasibility and realistic implementation, including logistics, regulation, infrastructure, and producer behaviour.

For detailed information on the project, criteria, diseases, and PAPRIKA methodology, visit: <https://matrix.epi-insight.com>

See reverse for complete level definitions →

Criteria Levels Reference

Levels ordered from least concern (Level 1) to greatest concern (highest level)

Criterion	Level 1	Level 2	Level 3	Level 4	Level 5
C1: Foodborne zoonosis	Highly unlikely: No controls necessary	Rarely occurs: Requires significant failure at one or more control points for transmission to humans	Sometimes occurs: Even minor control point failures likely to result in transmission to humans	Likely to occur: Effective control measures not fully understood	
C2: Non-foodborne zoonosis	Highly unlikely: No evidence of non-foodborne zoonotic transmission	Occupational exposure risk: Non-foodborne transmission pathway(s) that are strongly associated with occupational exposure and can lead to human infection	Public exposure risk: Non-foodborne transmission pathways, beyond occupational exposure, that can lead to human infection		
C3: Biosecurity effectiveness	Not applicable: Agent is ubiquitous on all or most US farms	Highly effective: Routine on-farm biosecurity measures are effective in preventing farm-to-farm transmission	Moderately effective: Requires high level of compliance with extraordinary on-farm biosecurity measures to prevent farm-to-farm transmission	Unlikely to be effective: One or more pathways of farm-to-farm transmission exist that cannot be controlled by on-farm biosecurity	
C4: Detection difficulty	Easy: Distinct clinical signs and/or existing test(s) available at local/regional laboratory(s)	Moderate: Clinical signs not unique but existing tests available at local/regional laboratory(s)	Difficult: Clinical signs not unique and test(s) not available at local/regional laboratory	Very difficult: Clinical signs not unique and reliable test(s) to identify antigen or antibody are not available (rely on NGS or nonspecific tests)	
C5: Production cost	Negligible: No measurable losses	Minor: Low prevalence, typically non-lethal infection with recovery very likely	Moderate: Manageable losses related to endemic (population) or chronic (individual) occurrence	Substantial: Unsustainable acute or chronic losses related to severe clinical signs in a high prevalence of animals	
C6: Market impact	Negligible: Little or no market disruption when disease occurs on one or more farms	Temporary disruption: Measureable negative effect on demand for less than a month when disease occurs on one or more farms	Significant disruption: Measureable negative effect on demand for 1 to 6 months when disease occurs on one or more farms	Prolonged disruption: Measureable negative effect on demand for more than 6 months when disease occurs on one or more farms	
C7: AMR risk (pathogen)	Minimal risk: Agent inherently unlikely to develop clinically important resistance to antibacterial or antiviral treatments	Moderate risk: Evidence of development of clinically important resistance to antibacterial or antiviral treatments, or that development of such resistance is likely to occur over time	High risk: Resistance to antibacterial or antiviral treatments is, or can be expected to be a common problem		
C8: AMR use pressure	Minimal risk: Antibacterial or antiviral treatments rarely occur, or are typically limited to short-course individual animal therapy	Moderate risk: Antibacterial or antiviral treatments are commonly used for treating affected individuals	High risk: Antibacterial or antiviral treatments commonly used on affected groups, or for prophylaxis		
C9: Treatment availability	Widely available: Multiple effective treatments widely available in the US	Available but with uncertain efficacy: Limited treatments available in US or are only effective in some situations	No availability: Effective treatments not currently available in the US (or have not been developed)		
C10: Vaccine availability	Widely available: Effective commercial vaccines widely available in the US (or held in national response stockpile)	Available but uncertain efficacy: Commercial or autogenous vaccines exist in the US but protection may be inconsistent	No availability: Effective vaccines not currently available in the US (or have not been developed)		
C11: Eradication feasibility	Highly likely: Can be eradicated using existing tools and knowledge	Possible: Eradication possible but likely to require major changes into logistic systems, regulatory environment, infrastructure, and producer behaviors	Difficult and uncertain: Extremely difficult and with uncertain success rate, few global examples of success even at farm level	Not feasible: Eradication extremely unlikely	Unknown: Feasibility of eradication not known

For detailed information: <https://matrix.epi-insight.com> | Generated from criteria_levels.yml