

Challenges and Opportunities for Brucellosis Diagnosis, Surveillance and Control in Pakistan

Dr. M. Shafiq Haider

Senior Scientific Officer / Program Leader
Animal Reproduction and Genetics Program,
Pakistan Agricultural Research Council

 26 - 29 May 2026

 Beijing, P.R. China

 2nd WOA Regional Training Workshop
Workshop

Current Disease Situation in Pakistan

Prevalence & Distribution

Brucellosis is endemic nationwide with a pooled prevalence of **8.7%** in livestock. Khyber Pakhtunkhwa reports the highest human burden (57.9% of cases).

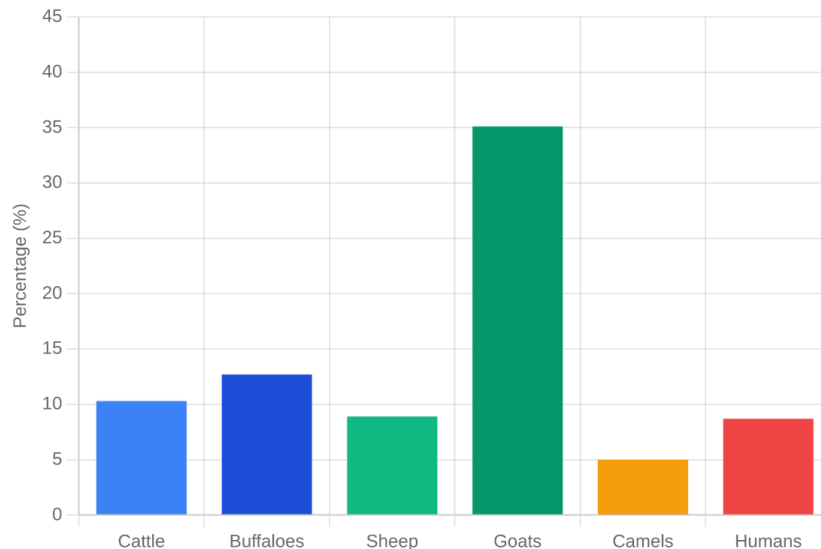
Affected Species

High seropositivity in **Buffaloes (12.7%)** and **Cattle (10.3%)**. Small ruminants (Sheep/Goats) and Camels are also significant reservoirs.

Bacterial Species

B. abortus dominates in large ruminants; *B. melitensis* is prevalent in small ruminants and is the primary zoonotic agent for humans.

Estimated Prevalence by Species



Source: Meta-analysis data
(2021-2025)

Disease Diagnostics Capacity

Laboratory Infrastructure

Pakistan has a tiered laboratory network. The **National Veterinary Laboratory (NVL)** in Islamabad serves as the apex reference center, supported by provincial diagnostic laboratories (PDLs) across all

Test Type	Application	Status
RBPT / MRT	Field Screening	Widely Used
ELISA / SAT	Confirmatory	Routine in Labs
PCR / Culture	Species ID	Advanced Labs

Diagnostic Workflow Workflow

Brucellosis Diagnostic Workflow in Pakistan



The workflow follows a progressive path from rapid field screening to high-precision molecular identification in specialized facilities.

Disease Surveillance Activities

Key Activities

Active Surveillance

Regular screening at organized dairy farms, government government livestock stations, and high-risk peri-urban areas.

Passive Surveillance

Monitoring of abortion cases and clinical reports through the national disease reporting network.

Risk-Based Monitoring

Targeted sampling in areas with high animal density and frequent cross-border movement.

Challenges & Solutions

Underreporting

Lack of awareness and fear of economic loss among smallholder smallholder farmers.

Solution: Community awareness & incentive programs

Logistical Gaps

Challenges in cold chain maintenance and sample from remote regions.

Solution: Digital reporting & localized lab capacity

Data Integration

Fragmented data sharing between provincial and national levels. national levels.

Solution: Unified National Animal Health Information System

Prevention and Control Strategy

Biosecurity Measures

Implementation of strict farm-level protocols: quarantine of new livestock, hygienic disposal of aborted materials, and regular materials, and regular disinfection of premises to break the transmission cycle.

Vaccination Policies

Strategic use of **B. abortus S19/RB51** for cattle and **B. melitensis Rev.1** for small ruminants. Focus remains on high-high-value animals and organized dairy sectors.

Risk Communication

Public awareness campaigns targeting high-risk groups (farmers, abattoir workers) regarding the dangers of raw milk consumption and safe animal handling practices.

One Health Coordination

Multisectoral collaboration between veterinary, medical, and environmental sectors under the National Brucellosis Brucellosis Control Program to manage zoonotic risks effectively.

Prevention and Control Strategy

ONE HEALTH

The One Health approach recognizes that the health of humans, animals, and our environment are closely connected and interdependent.

By working together across disciplines, we can achieve better health outcomes for all.



TOGETHER, WE CAN:



Prevent and control diseases and health threats



Improve animal health and welfare



Protect ecosystems and biodiversity



Support sustainable food systems



Build resilient communities and a healthier planet

The One Health Framework for Zoonotic Disease Management
Management

Key Constraints and Challenges



Resource & Funding Gaps

Insufficient budget for nationwide mass vaccination and lack and lack of compensation for test-and-slaughter policies.



policies.

Socio-economic Factors

Deep-rooted tradition of raw milk consumption and limited limited awareness among smallholder farmers.



Diagnostic Limitations

Lack of standardized protocols across provincial labs and limited access to molecular tools in rural areas.



Unregulated Movement

Unrestricted livestock trade across provincial and international borders complicates disease tracking.

The Coordination Gap

"Fragmented coordination between human and animal health sectors at the grassroots level remains a primary barrier to effective One Health implementation in Pakistan."



Way Forward and Future Strategies

Enhanced Surveillance

Expand active surveillance networks for real-time tracking.

Comprehensive Vaccination

Phased mass vaccination targeting young animals in hotspots.

One Health Institutionalization

Ensure seamless data-sharing and joint outbreak investigations.

Progressive Control Pathway

Stepwise control from organized sectors toward regional zoning.

THE ROAD TO DISEASE ELIMINATION

A coordinated, science-based
pathway to a healthier future



Prevent
together



Protect
communities



Partner
across sectors



Progress
with impact

1

CURRENT CONTROL

Strengthen existing
programs and
build strong
foundations

2

ENHANCED SURVEILLANCE



Early detection,
real-time data,
and rapid
response

3

MASS VACCINATION



Increase coverage,
ensure equity,
and build
community
protection

4

ONE HEALTH INTEGRATION



Collaborate across
human, animal,
and environmental
health sectors

5

REGIONAL ERADICATION



Sustain efforts,
eliminate
transmission,
and protect
regions

DISEASE ELIMINATION

A healthier future
for all



Strategic Roadmap for Brucellosis Elimination in Pakistan

References

Jamil, T., et al. (2021).
Animal and Human Brucellosis in Pakistan. *Frontiers in Public Health*, 9, 660508.

Iqbal, M., et al. (2020).
Brucellosis in Pakistan: A neglected zoonotic disease. *Journal of the Pakistan Medical Association*.

Government of Pakistan.
National Brucellosis Control Strategic Plan (2018-2023) and
Livestock Disease Surveillance Plans (2025-26).

Khan, M. D., et al. (2025).
Epidemiology of Brucellosis in Humans and Livestock: A
Systematic Review and Meta-Analysis (2000–2025) from
Pakistan. *OAPR Journal*.

Khaliq, M. S., et al. (2025).
Brucellosis seropositivity and risk factors in small ruminants.
ruminants. *Preventive Veterinary Medicine*.

Thank You!

Dr. M. Shafiq Haider

Senior Scientific Officer / Program Leader
Animal Reproduction and Genetics Program
Pakistan Agricultural Research Council (PARC)

 drshafiq840@gmail.com