



World Organisation  
for Animal Health  
Founded in 1924

中华人民共和国农业农村部

Ministry of Agriculture and Rural Affairs of the People's Republic of China

# Best practices on diagnostics, surveillance and control/elimination efforts for Bovine TB/zoonotic TB

**Indonesia**

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- Tuberculosis (TB) is one of the highest causes of death in humans in the world in the last 200 years.
- The target is to eliminate TB in Indonesia in 2030 by reducing the incidence rate to 65 cases per 100,000 population.
- Based on the 2023 Global TB Report, Indonesia is in second place with the highest number of TB cases in the world after India, followed by China.
- Human tuberculosis is generally caused by *Mycobacterium tuberculosis*, but can also be caused by *Mycobacterium bovis* and *Mycobacterium caprae*.
- Symptoms of Bovine Tuberculosis/Zoonotic Tuberculosis (zTB) infection in humans are similar to tuberculosis (TB) caused by *Mycobacterium tuberculosis* (fever, fatigue, weight loss, cough > 2 weeks, coughing up blood, sweating at night), but the symptoms are often more varied because *M. bovis* more often attacks organs other than the lungs (extra pulmonary)
- zTB infection usually occurs after contact with infected animals or consuming contaminated animal products, such as unpasteurized milk and raw or undercooked meat.



## Situation of Tuberculosis Program in Indonesia, 2021-2023



### Source:

\*Data 2021 : final data GTR 2022

\*Data 2022 : update 13 March 2023; \*cohort 2021

\*Data 2023 : SITB processed data as of February 1, 2024 and SITB processed data as of March 1, 2024; \*\*cohort 2022



Estimated TB Cases 2023

1.060.000



### Case detection of Tuberculosis

2021	2022	2023 <sup>2</sup>
443.235	724.309	820.789



### Detection of TB cases in children

2021	2022	2023 <sup>1</sup>
42.187	110.881	134,528



### Coverage of TB case detection

2021	2022	2023 <sup>2</sup>
46%	68%	77%



### TB cases with positive HIV

2021	2022	2023 <sup>1</sup>
8.344	15.375	17,123



### Detection of RO TB cases

2021	2022	2023 <sup>2</sup>
8.268	12.531	12.487



### Treatment success rate for TB

2021	2022	2023 <sup>1**</sup>
86%	86%	86%



### Initiation of RO TB treatment

2021	2022	2023 <sup>2</sup>
5.082	8.089	9.141.



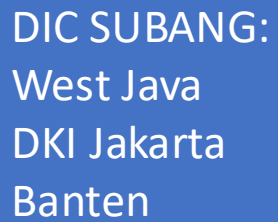
### Coverage of TB preventive therapy

2021	2022	2023 <sup>1</sup>
0,3%	1,3%	2,6%

Eliminate TB in Indonesia by 2030 by reducing the incidence rate to 65 cases per 100,000 population.

Based on the 2023 Global TB Report, Indonesia (10%) is in second place with the highest number of TB cases in the world after India (27%), followed by China (7.1%). With an estimated number of TB cases at 1,060,000 TB cases and 134,000 deaths due to TB per year in Indonesia (17 people die from TB every hour).



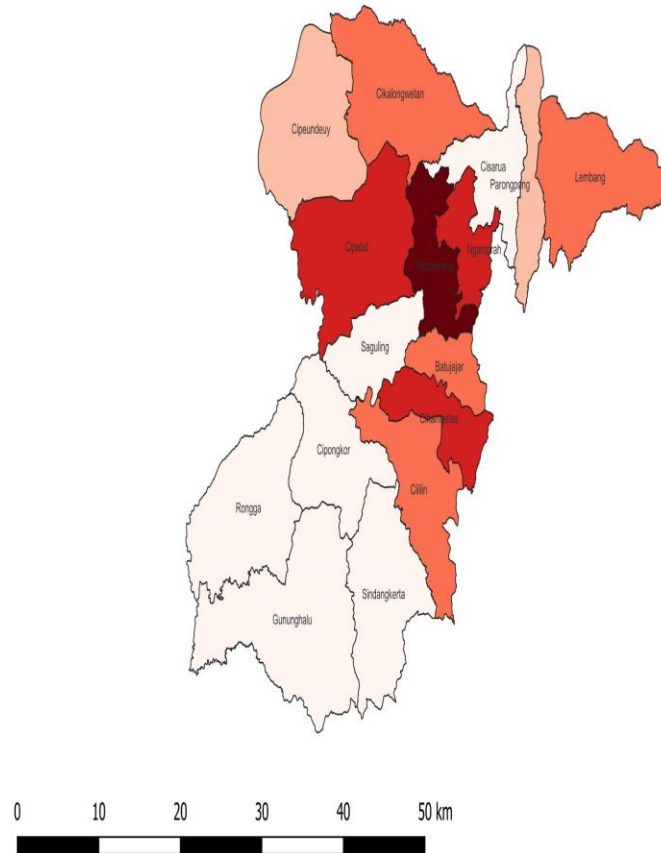




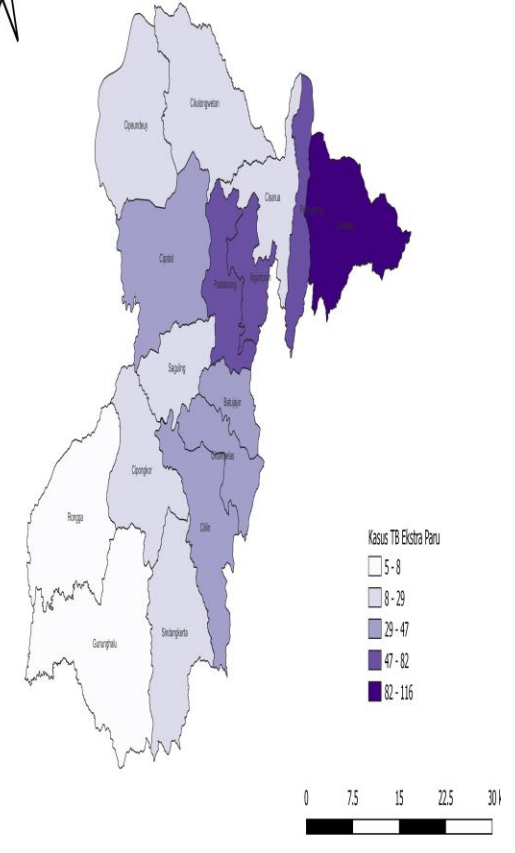
## Human sector

- TB cases in humans in Bandung Barat District in 2023, reach 5.427 cases, with an incidence rate of around 300 cases per 100.000 population, this is still much higher than the TB elimination target in Indonesia.
- Until June 2024, 2.962 cases were reported. The most cases were reported in Padalarang, Cipatat and Ngamprah sub-districts.

Distribution Cases of TB Human at Bandung Barat District



Distribution Cases of Extra Pulmonary TB Human at Bandung Barat District



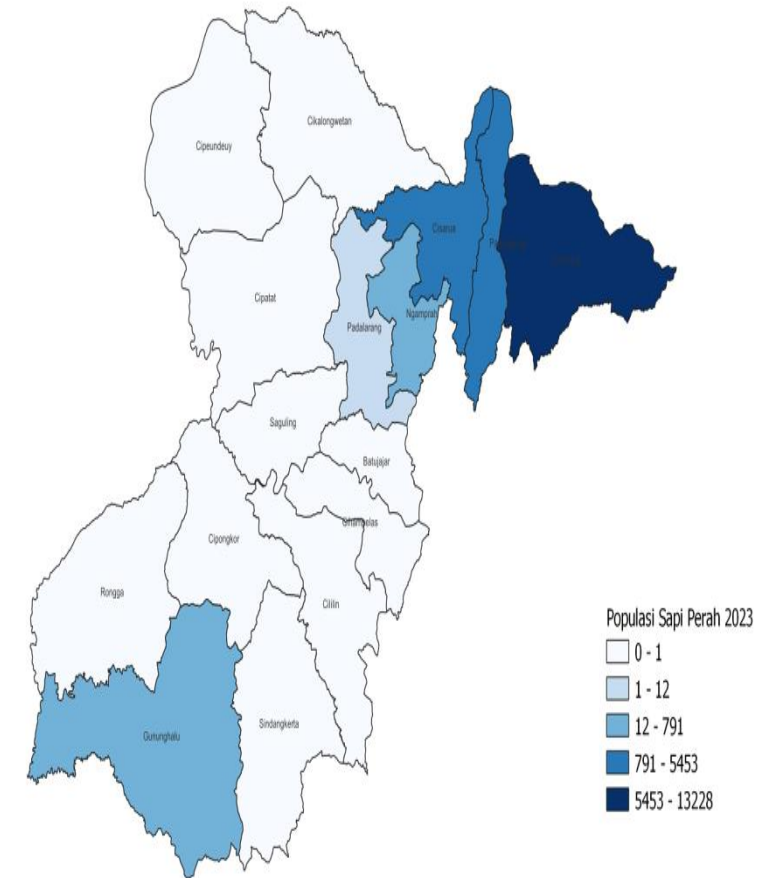


## Animal sector

- The population of dairy cattle in Bandung Barat District in 2023 approximately 28.231 heads, with the largest number in Lembang, Cisarua, Parongpong and Ngamprah sub-districts.
- No reported cases of zTB in animals or humans in Bandung Barat District but with the high population of dairy cattles, milk production and livestock movement, there is a risk of Zoonotic Tuberculosis, especially from dairy cattle to humans.
- In animals zTB has an impact on the economy, including resulting in decreased production, levels of morbidity and death, and it is zoonotic.



Distribution of Dairy Cattle  
Population at Bandung Barat District



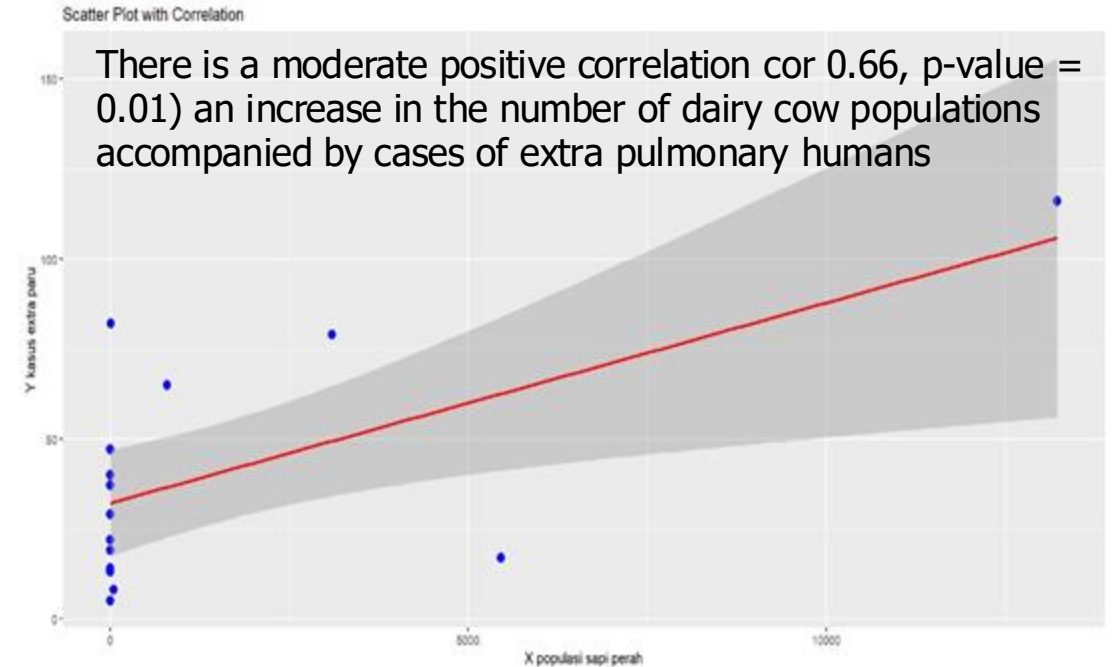
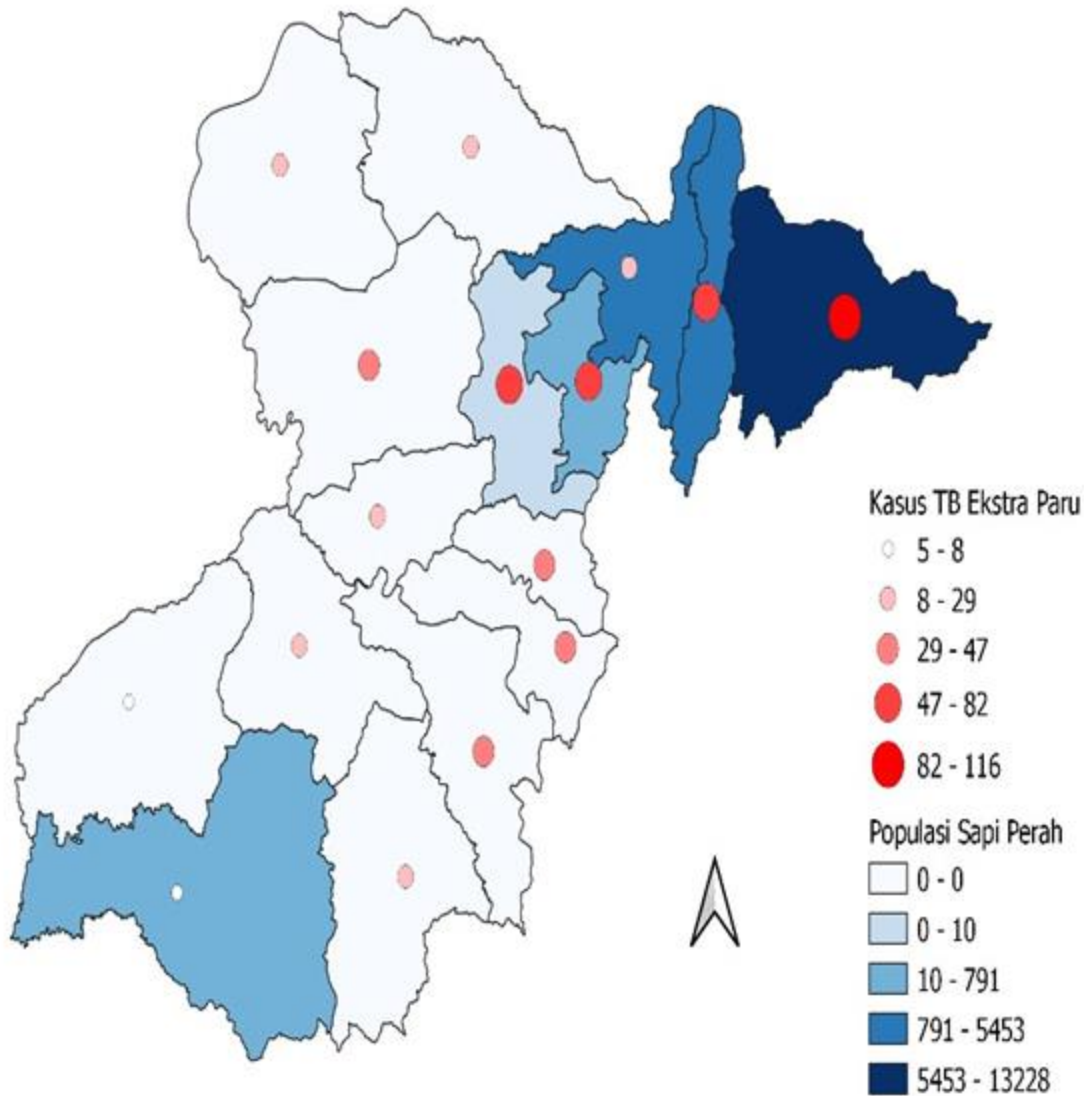
0 7.5 15 22.5 30 37.5 km



# Current TB situation in Bandung Barat District, Indonesia

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- JRA Bandung Barat District



In Lembang District, high risk villages were found (high human TB cases, the number of livestock and breeders was also high): Cikahuripan (cattle: 2,396 heads, breeders: 505, positive TB in humans: 12 people); Sukajaya (Livestock: 1,649 head, breeders: 241, positive: 16 people); Cibogo (1462 heads, breeders: 372, TB positive: 15 people).





Method	Purpose					
	Population freedom from infection	Individual animal freedom from infection prior to movement	Contribute to eradication policies	Confirmation of clinical cases	Prevalence of infection – surveillance	Immune status in individual animals or populations post-vaccination
Detection of the agent						
Acid-fast staining and microscopy	–	–	–	+	–	–
Bacterial isolation	++	–	++	+++	++	–
Histopathology and antigen detection	+	–	+	+	–	–
Real-time PCR (direct from specimens)	++	–	++	+++	++	–
Detection of immune response						
Delayed hypersensitivity skin test	+++ (+++ / +)	+++ (++ / +)	+++ (++ / +)	++	+++ (++ / +)	–
IGRA	++ (++ / +)	++ (+ / +)	+++ (++ / +)	+ (- / -)	+++ (++ / +)	–
ELISA antibody test	+ (- / ++)	+ (+ / ++)	+ (- / ++)	–	+ (- / ++)	–
Lateral flow antibody test	+	+	+	–	+	–

Targeted in Disease Investigation Center (DIC)  
Wates Regional Lab and DIC Subang Regional Lab  
(most populated island: human & cattle)

- Acid-fast staining and microscopy
- Bacterial isolation
- Real-time PCR to detect *Mycobacterium tuberculosis* complex
- Multiplex-PCR for differentiation of *M. bovis* from *Mycobacterium tuberculosis* complex
- ELISA Antibody test

Human sector:

- Tuberculin test
- PCR TB Kompleks





## Data of Positive TB in DIC SUBANG 2021-2024

Year	Province	District	Animal	Sample	Test	Positive
2021	West Java	Bandung	Cattle	Swab	PCR Konvensional TB	3
		Bandung	Cattle	Organ	PCR Konvensional TB	1
		Kota Bogor	Cattle	Swab	PCR Konvensional TB	3
2022	West Java	Bogor	Cattle	Organ	PCR Konvensional TB	1
		Bogor	Cattle	Swab	PCR Konvensional TB	2
		Kuningan	Buffalo	Swab	PCR Konvensional TB	1
		Bogor	Dairy Cattle	Swab	PCR Konvensional TB	23
2023	Banten	Serang	Sheep	Blood	PCR Konvensional TB	8
		Serang	Sheep	Swab	PCR Konvensional TB	8
	DKI Jakarta	Jakarta Timur	Cattle	Serum	PCR Konvensional TB	1
2024	Banten	Kota Serang	Dairy Cattle	Organ	Multiplex PCR	1
TOTAL						52



There is no routine surveillance for TB in animal.

The surveillance TB Project only at DIC Subang and DIC Wates.



## Mapping Harmonisation of Bovine tuberculosis

### Dairy cattle farm

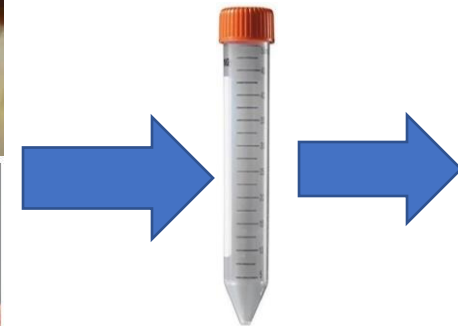
### Detection Bovine tuberculosis at district level

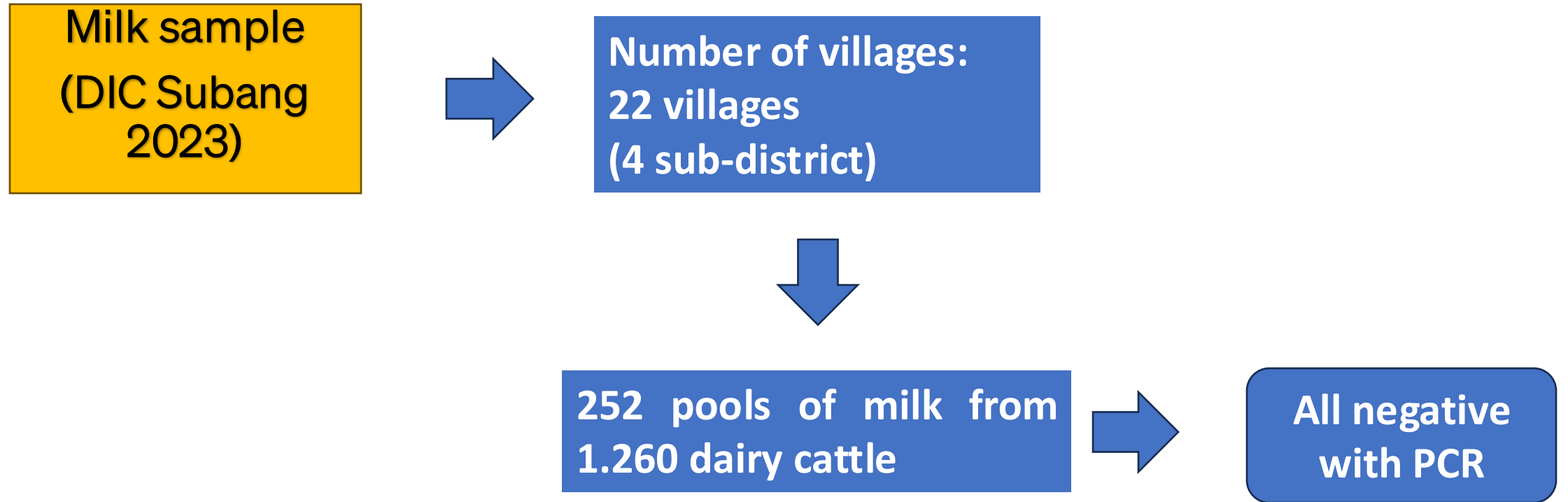
- Target Population: Dairy cattle
- Epidemiology Unit: village or farm
- Sample : milk

Unit-level design prevalence 5%

Cluster-level design prevalence 10%

Maximum sample size per cluster 70







## Animal Sector:

**21 Strategic Infectious Animal Diseases  
(Kepmentan 121/Kpts/PK.320/2023)**

**15 Zoonosis Priority  
(Permentan 237/Kpts/PK.400/M/3/2019)**



1. JRA
2. PCR test for M.bovis
3. Surveillance at slaughterhouses
4. Campaign of drink pasteurization milk
5. KIE of Tuberculosis at farm and slaughterhouse

Indonesia exist:

1. Penyakit Mulut dan Kuku.
2. Lumpy Skin Disease.
3. Porcine Reproductive and Respiratory Syndrome (PRRS).
5. Haemorrhagic Septicaemia (SE)
6. Infectious Bovine Rhinotracheitis (IBR).
7. Bovine Viral Diarrhea.
7. Jembrana Disease.
8. Surra/Trypanomiasis (Penyakit mubeng).
9. Classical Swine fever (Kolera babi).
10. African Swine Fever (AFS).
11. Zoonotic Corona Virus.

Exotic Disease

12. Bovine Spongiform Encephalopathy (BSE) dan
13. Rift Valley Fever (RFV)
14. Peste Des Petits Ruminants (PPRS)

1. Rabies.
2. Avian Influenza.
3. Brucellosis.
4. Anthrax.
5. Leptospirosis.
6. Bovine Tuberculosis.
7. Salmonellosis

1. Japanese B. Encephalitis
2. Schistosomiasis
3. Q Fever
4. Campylobacteriosis
5. Trichinellosis
6. Paratuberculosis
7. Toxoplasmosis
8. Cysticercosis/  
Trichinellosis





## Human Sector:

Perpres No. 67 Tahun 2021  
regarding Tuberculosis  
Countermeasure

Decree of Governor No. 443.05/Kep.862-  
Kesra/2023 regarding the West Java Province  
Regional Tuberculosis Control Acceleration Team  
for 2023 – 2030

## Prevention:

1. Improve Nutrition
2. Complete Immunization Status
3. TB Prevention Therapy
4. Optimizing Clean and Healthy Living Culture and Environment
5. Early Detection (TB Screening)

## Plan

1. Adding health service facilities capable of identifying TB.
2. Strengthen and expand laboratory-based surveillance.
3. Forming a TB Army.
4. Developing a TB vaccine.

Human

1. There is a need for alternative PCR testing such as ELISA or Tuberculin test for screening tests
2. Strengthening AMPM examination to detect bovine tuberculosis
3. NKV certification of dairy farming business units in Bandung Barat district

Animal



## Undiagnosed zoonotic TB (undiagnosed/misdiagnosed)

- *M. tuberculosis* mainly attacks the lungs, even in some cases possibly extrapulmonary.
- zTB can also attack the lungs, but is mainly extrapulmonary, including lymph nodes and other organs,
- In general, TB diagnostic procedures in humans cannot differentiate *M. tuberculosis* from *M. bovis*.

## The incidence of Zoonotic TB is not accurate

- No or insufficient routine supervision of humans and animals

## *M. bovis* is naturally resistant to Pyrazinamide

- Pyrazinamide is one of the four first lines of TB treatment
- Other drug resistance was also detected in some *M. bovis* isolates, including rifampicin and isoniazid, which poses a threat to public health.

## Regulation

- Regulations regarding milk online selling

Data on estimates of zTB are **less precise** since routine zoonotic TB surveillance in animal and human populations is still limited.



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# Thank you!

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