8-27-2024

Why is the Mycobacterium tuberculosis Beijing genotype so prevalent in Colón, Panama? Uncovering the risk factors of a dangerous strain

Daniela Candanedo

Why is the *Mycobacterium tuberculosis* Beijing genotype so prevalent in Colón, Panama?

Uncovering the risk factors of a dangerous strain

Daniela L. Candanedo Crespo

Introduction

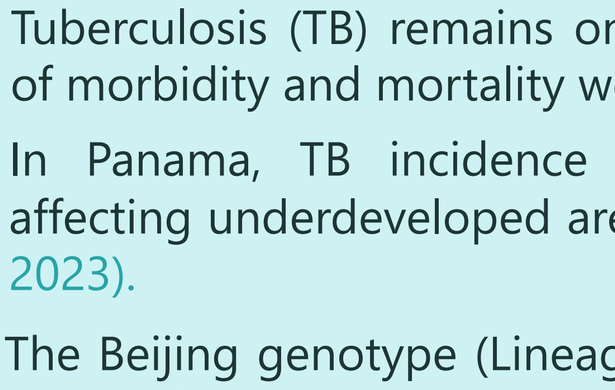
Tuberculosis (TB) remains one of the leading causes of morbidity and mortality worldwide (WHO, 2021).

In Panama, TB incidence is 45.3 per 100,000 population, affecting underdeveloped areas like the Colón province (MINSA, 2023).

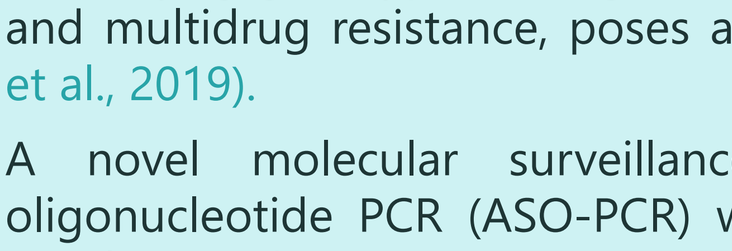
The Beijing genotype (Lineage 2), known for its high transmissibility and multidrug resistance, poses a significant challenge (Pérez-Lago et al., 2019).

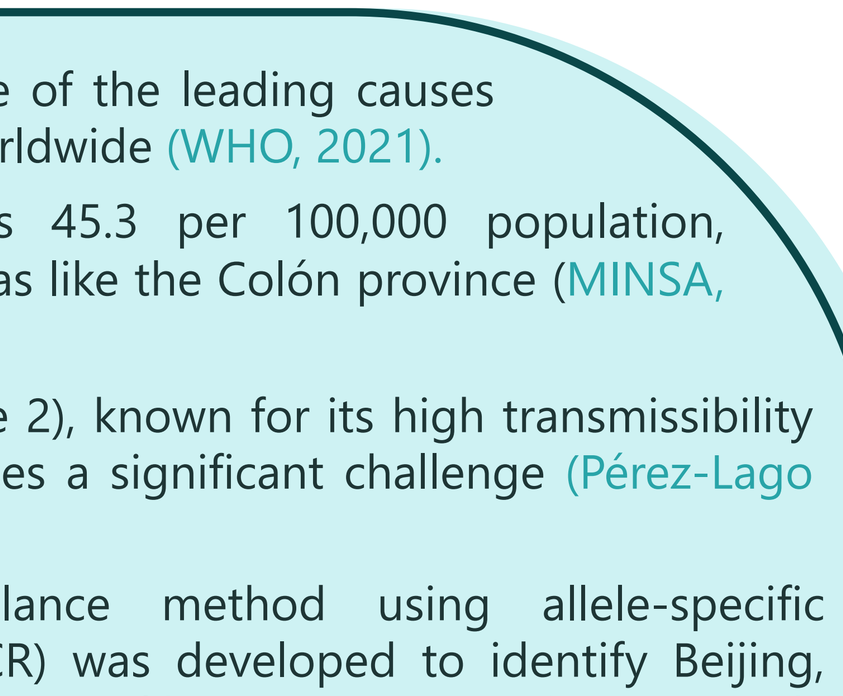
A novel molecular surveillance method using allele-specific oligonucleotide PCR (ASO-PCR) was developed to identify Beijing, Haarlem and LAM genotypes in Colón, Panama (Domínguez et al., 2019). This technique detected 44.1% of Beijing strain and <5% of Haarlem and LAM strains between 2018-2020 (Acosta et al., 2020). This method was also applied between 2021-2022, identifying 29.1% of Beijing strain (Candanedo et al., 2023).

Transmission



Symptoms





Objective

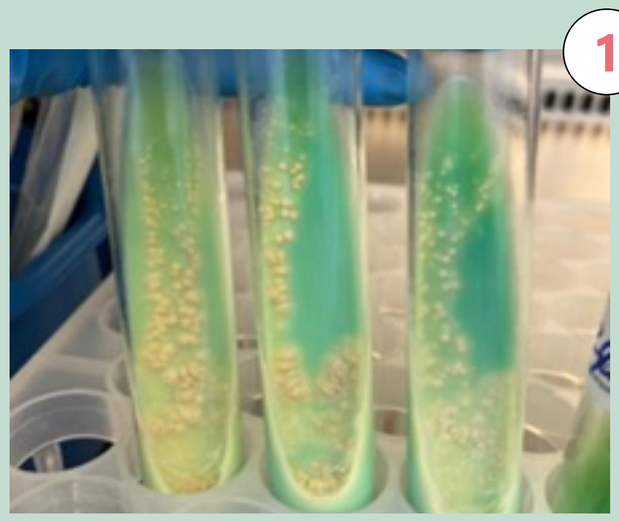
This study aims to identify and analyze the epidemiological risk factors associated with the Beijing strain infection in Colón, Panama between 2025-2026. Demographic, clinical, and geographic variables will be assessed to better understand the infection and transmission dynamics.

Study Importance

The findings will provide critical information to enhance TB control and prevention strategies in Colón, influence health policy formulation, and optimize resource allocation.

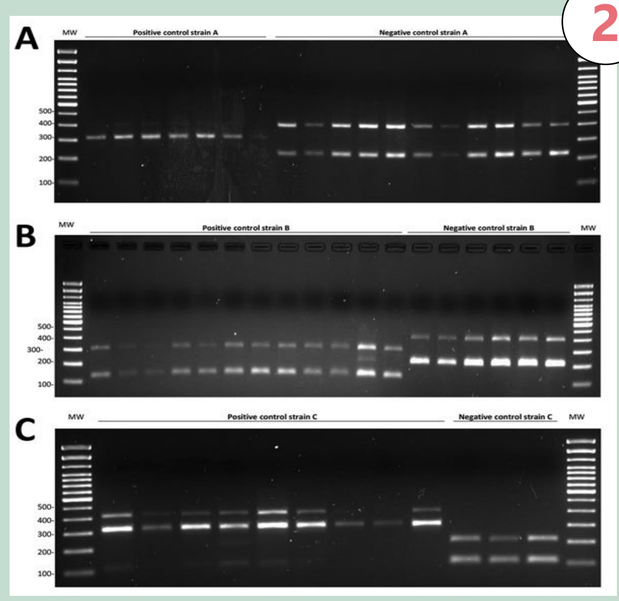
Methods

1



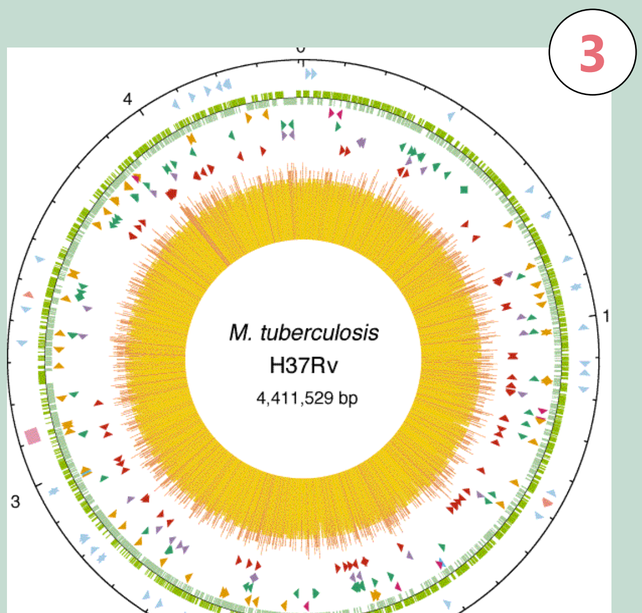
M. tuberculosis isolation and patient's characteristics

2



DNA extraction and ASO-PCR for Beijing strain

3



Whole-Genome Sequencing and Bioinformatics analysis

4

Data Analysis (R-Console)

Timeline

Phase	Activities	Period
Preparation	• Study design, grant approval, ethical approval acquisition.	Month 1-2
Data Collection	• Participant recruitment, structued surveys administration and medical records review; and biological sample collection and molecular testing	Month 3-12
Data Analysis	• Data processing and coding; and results interpretation	Month 3-12
Report Writing	• Discussion and conclusions drafting; and preparation of scientific dissemination materials	Month 13-15
Review and presentation	• Publication in scientifics journals	Month 16-18

References

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