LB-9398 A Systematic Review of Mosquitoes at International Ports and Points of Entry

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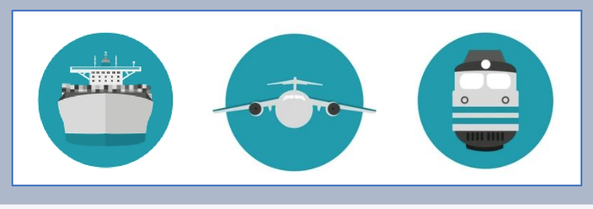
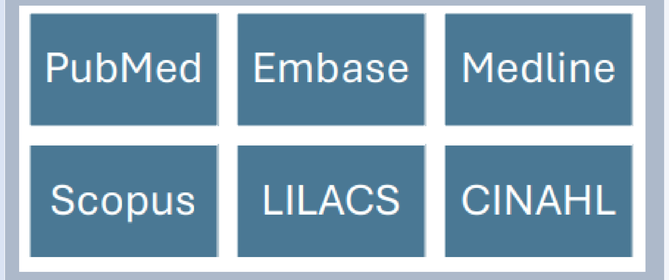
INTRODUCTION

- Transportation systems including aircraft, marine vessels, and trains can spread arthropod vectors of infectious diseases globally
- Insect vectors, including mosquitoes, can transmit pathogens to individuals at transit hubs like airports ("airport malaria"), ports, and railway stations
- Recent data on the threat posed by mosquitoes near aircraft, marine vessels, and railcars at these entry points are limited. ***To address this knowledge gap, we conducted a systematic review of studies documenting mosquito presence at international ports and points of entry***



METHODS

- A systematic review of literature reporting studies of mosquitoes identified at international ports for all modes of transportation was conducted according to PRISMA guidelines
- Outcomes extracted and synthesized include absolute and relative burden of mosquitoes detected at international ports



Databases were searched from inception to May 31, 2024, without language restriction

RESULTS

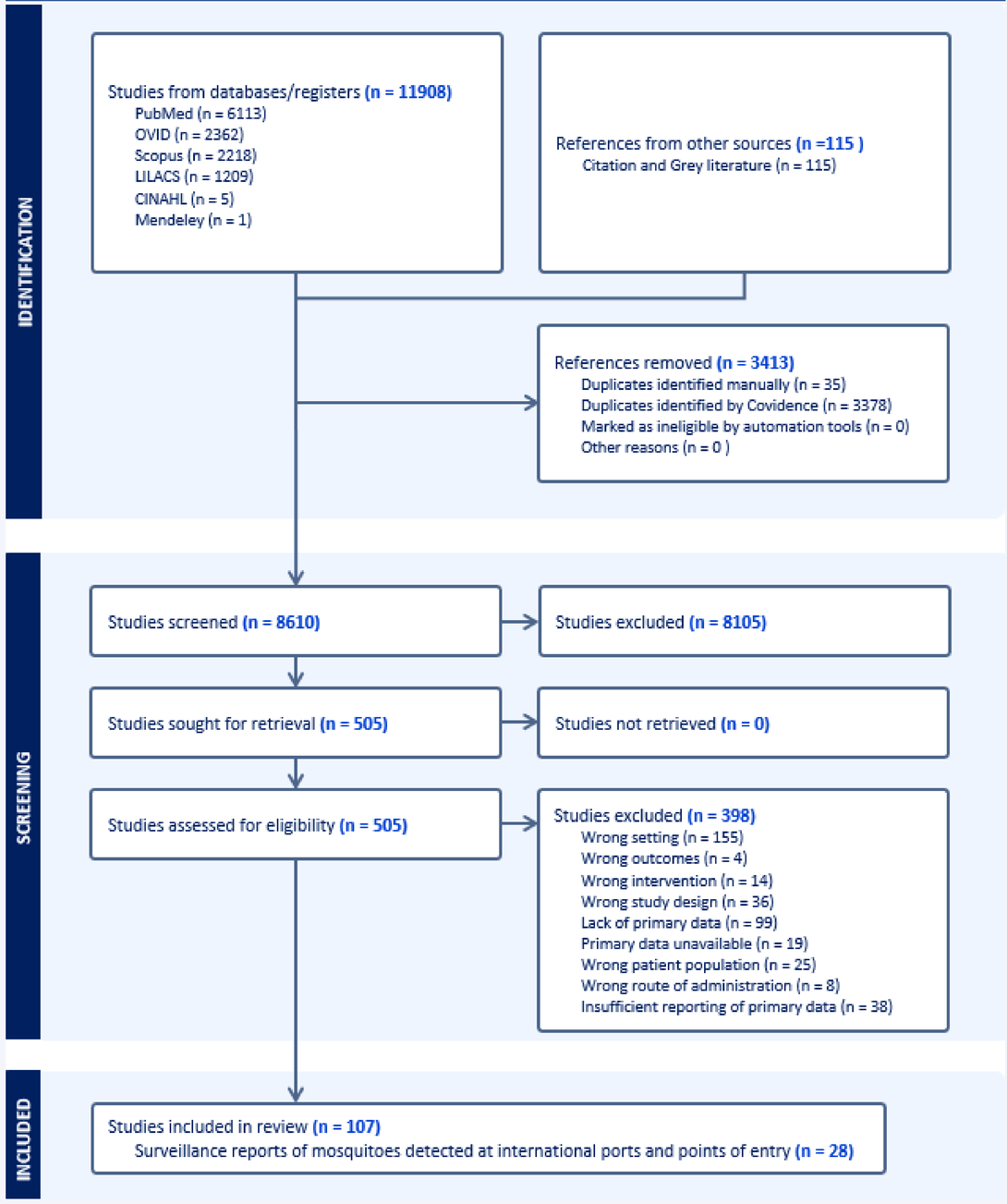


Figure 1: PRISMA Flowchart

Inclusion Criteria	Exclusion Criteria
• All studies reporting on the identification of mosquitoes identified at international ports and points of entry regardless of the application of a disinsection process	• Studies conducted in putative models of ports that did not fully replicate the conveyance environment • Epidemiological studies of airport malaria where the mechanism of transmission was not unequivocally airport related • Epidemiological studies reporting only on larval surveillance activities as a proxy for vector-competent adult mosquitoes

Table 1: Inclusion and exclusion criteria

DISCUSSION

- Notable detection of ***Aedes albopictus*** at points of entry in **Belgium** and **Germany** where this species is non-endemic underscores the potential for vector conveyance globally
- Included cases of airport malaria were convincingly linked to mosquito exposures in **baggage handling areas** and **via airmail**
- Report of a mosquito surviving outside the **International Space Station** highlights the insect's ability to survive extreme conditions and physiological stressors
- The role that **passenger luggage** plays in conveyance of vectors internationally warrants investigation
- **High priority research agenda:** Determining the extent to which mosquitoes are present in passenger bridges and walkways, vehicles that transport passengers to the aircraft door, and vehicles transporting luggage to the cargo hold

CONCLUSIONS

- Given today's climate of the globalization of infection diseases, this evidence synthesis affirms the need for:
  - Comprehensive surveillance to unravel the **causal** relationship between local and introduced populations of vectors at ports, and global emerging infectious diseases
  - **Inclusion** of systematic and largescale pathogen detection initiatives within port-related surveillance programs

REFERENCES