



ESCOLA SUPERIOR DE
TECNOLOGIA DA SAÚDE
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Prevalence of airborne pathogenic bacteria in Portuguese Healthcare Facilities

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Health care facilities create an optimal environment for the growth and spread of potentially pathogenic microorganisms particularly associated with nosocomial infections.



Introduction

Several outbreaks of *Legionella pneumophila* recorded in healthcare facilities and associated diseases have been considered a severe public health issue.

Severe pneumonia and Pontiac fever



Potable water → major environmental source

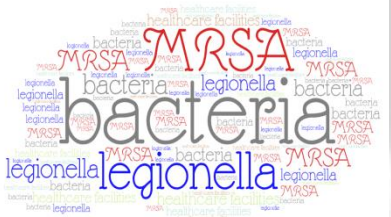
microaspiration → major mode of transmission

Healthcare associated Legionnaire Disease → patients and workers



Introduction

The World Health Organization describes antimicrobial resistance to human pathogens such as methicillin-resistant *Staphylococcus aureus* (MRSA) as a global health challenge.



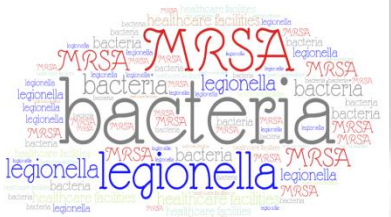
cause of numerous hospitalizations and deaths associated with extremely high mortality rates for invasive infections.

Objective

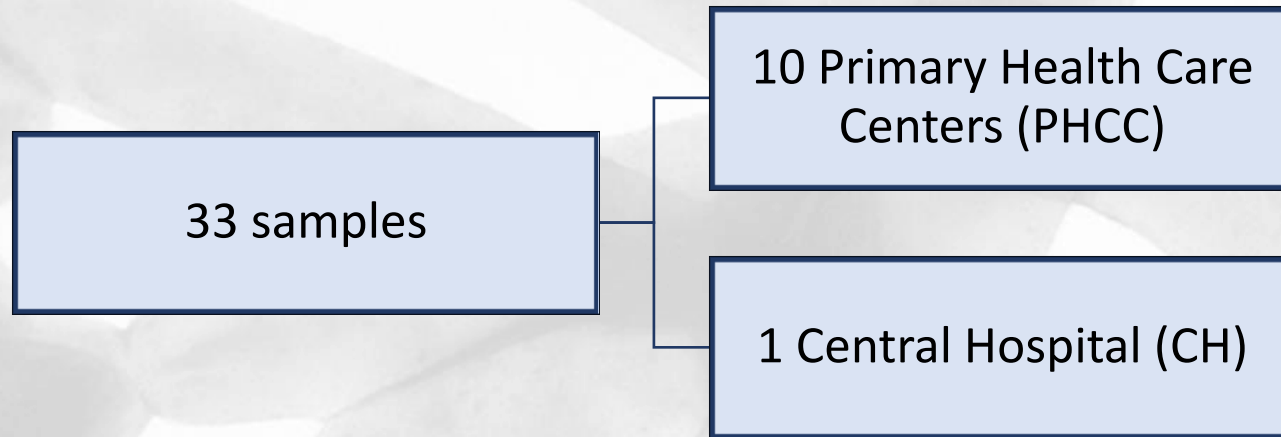
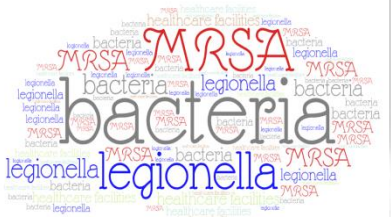
The objective of this study was to estimate the prevalence of airborne pathogenic bacteria, in healthcare units with different typologies.

**Methicillin-
Resistant
*Staphylococcus
aureus* (MRSA)**

***Legionella
sp.***



Materials and Methods - *Legionella*



Sampling
December
2018

Water sampling location: workers toilets showers (1L water and 1 swab for place) and condensate trays of HVAC system (1 swab for place)

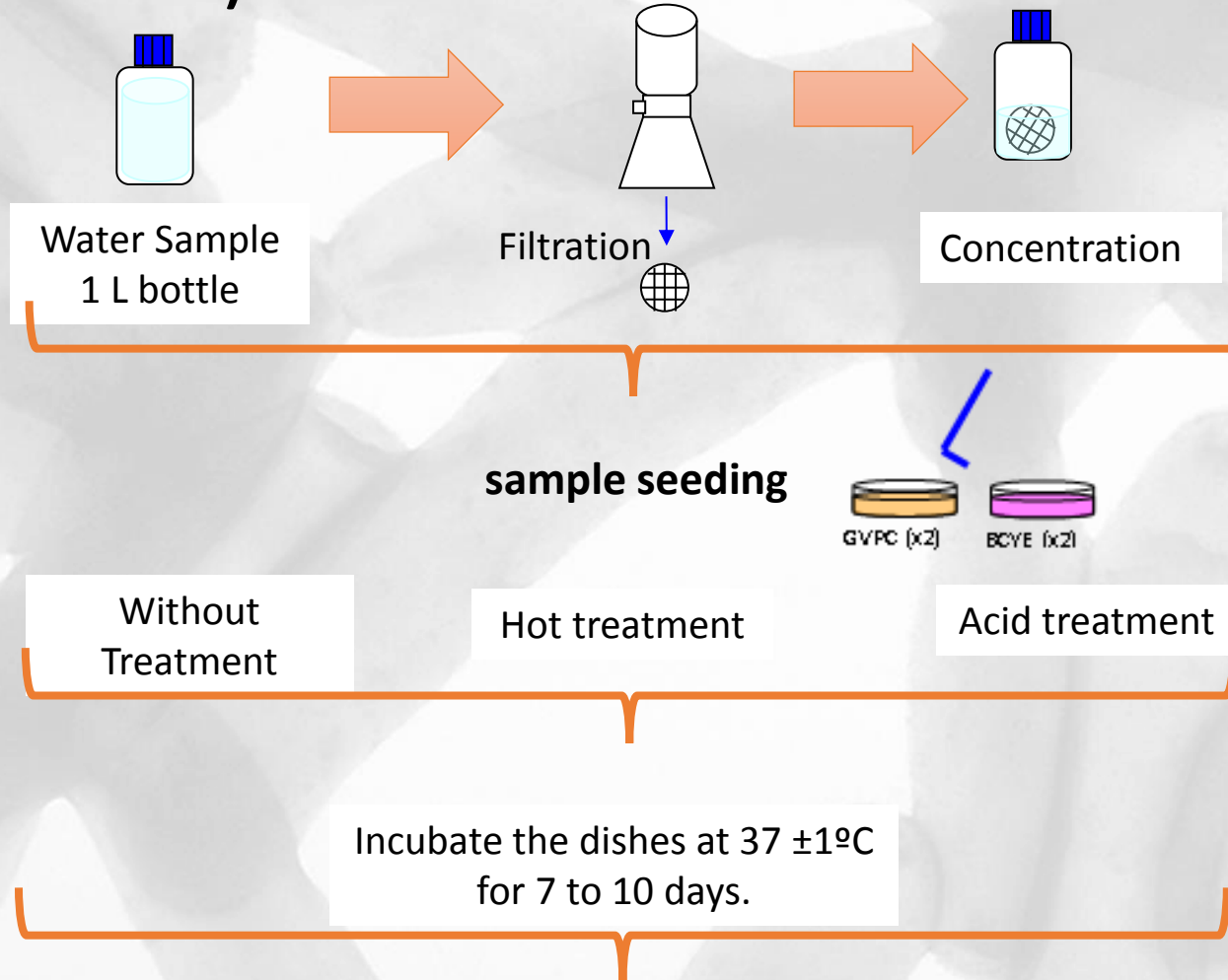
Samples were collected according to the orientations from



and the culture method described in **ISO 11731:2017** was applied for the isolation of *Legionella* and estimation of their quantity in water samples.

Materials and Methods - Legionella

Legionella detection by conventional culture method (ISO 11731)



Reading and confirming suspicious colonies



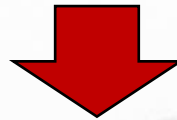
Materials and Methods - MRSA

MRSA

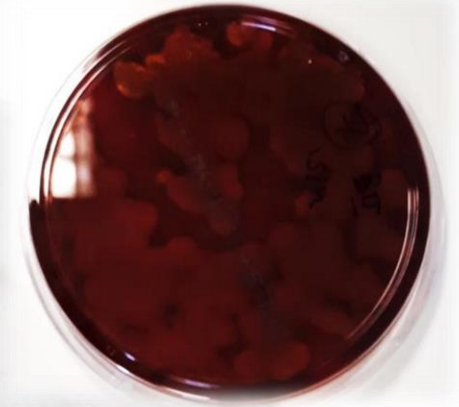
Inoculation in Tryptic Soy Broth enrichment media, incubation at 37°C for 24h

Inoculation in non-selective (Columbia Blood Agar)

Inoculation in selective culture media plates (Chromogen MRSA Selective Agar)



MRSA isolates were confirmed by immunologic assays



Results

Culturable species of *Legionella* were not found in the Primary Health Care Center's and Hospital sampling.

The testing for these bacteria shouldn't stop, because even though the test results were negative there is a possibility that small traces of the bacteria is in the system leading to a false sense of safety.

MRSA was isolated in one surface swab which corresponds to a prevalence of 0.5% in all samples (1/187) and 1.2% in surface samples (1/82).

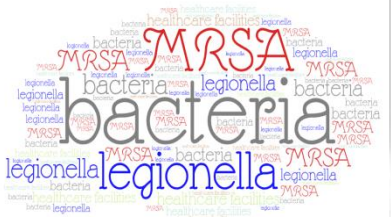


Conclusions

Although negative results were obtained in the *Legionella*, an effective monitoring must be done periodically, during all the year, namely in cold and hot season to prevent the infection of patients and workers.

Even in low prevalence levels, the presence of MRSA in health care facilities is significant considering the immunocompromised state of patients that may be exposed.





Conclusions

Health care facilities can provide optimal conditions for the development of *Legionella* and *Staphylococcus* genus.



Bacterial infections predominantly occur in immunocompromised patients and many are acquired in hospitals.



Bacterial burden assessment should be always performed!



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Thank you for your attention!!

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