

Analysis of *Legionella* spp. from water samples in Estonia

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INTRODUCTION

Legionella is a genus of bacteria that can cause a pneumonia-like illness called Legionnaires' disease.

It is common in water environments and can propagate in incorrectly maintained water systems, pools or cooling towers.

It can cause infection upon inhalation, which makes pools, showers and cooling towers the main sources of *Legionella* infection.

OBJECTIVES

The aim of this study was to analyse the results of the *Legionella* spp. water sample analyses conducted in 2023. To have a better overview of *Legionella* spp prevalence and distribution in Estonia we had the following objectives:

- Percentage of positive samples regionally
- Levels of *Legionella* spp. in positive samples
- The species distribution of positive *Legionella* spp. samples

METHODS

All water samples were collected in 2023 from Estonia, 90% of them were drinking water, but technical water, pool water and surface water samples were also collected. All water samples were analysed in the Republic of Estonia Health Board Laboratory of Communicable diseases according to the international standard EVS-EN ISO 11731:2017 using the membrane filtration method with washing procedure on BCYE and GVPC media.

RESULTS

The following results are summarised from analyses from all regions and all water sources where samples were collected in 2023.

In 2023 685 water samples were analysed for *Legionella* spp., 372 of them (46%) were positive (Figure 1). Of the 372 positive samples 230 were confirmed as *Legionella pneumophila* and 41 of those were *Legionella pneumophila* sg 1. In 161 of the samples the *Legionella* level was over 1000 CFU/1000 ml.

There was little regional variation in sample positivity (Figure 2). The Western region had the highest rate of positive samples at 61% and the Northern region had the lowest rate with 39% of the samples being positive.

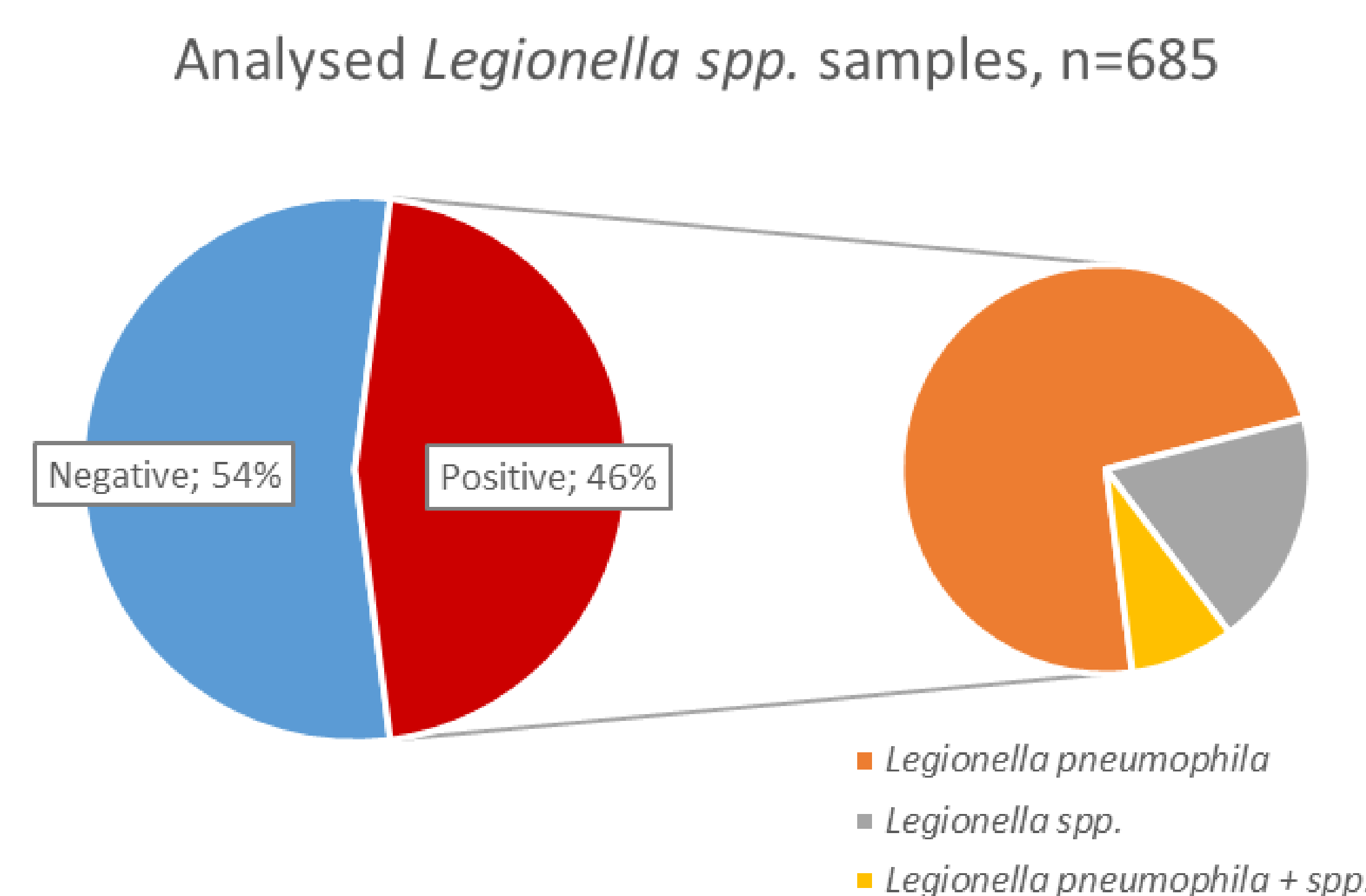


Figure 1. Overview of *Legionella* spp. sample analysis with the distribution of positive samples by species.

In addition to *Legionella pneumophila* several other *Legionella* species were detected:

- *Legionella anisa* (n=35), *Legionella rubrilucens* (n=2), *Legionella bozemanai* (n=2), *Legionella geestiana* (n=1), *Legionella erythra* (n=3) and *Legionella cherrii* (n=6)

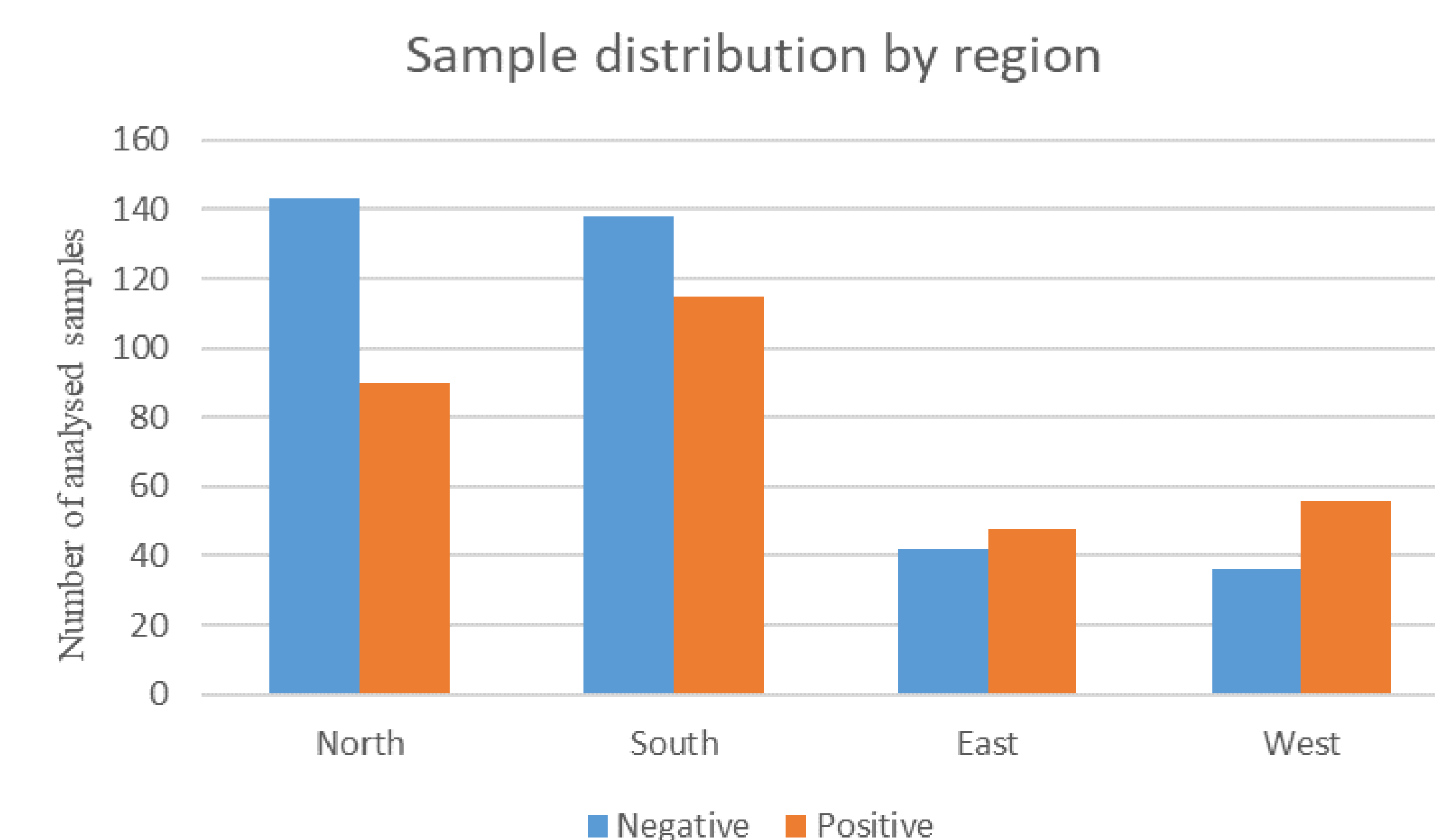


Figure 2. Positive and negative sample distribution by region

CONCLUSIONS

In 2023 in Estonia *Legionella* spp. was detected in almost half of the analysed water samples (45%) with almost a quarter of all samples (23%) having a detected level higher than the limit in the drinking water regulation (1000 CFU/1000 ml). 6% of all samples contained *Legionella pneumophila* serogroup 1 which is the primary cause of Legionnaires' disease.

In 13% of the samples another *Legionella* species other than *Legionella pneumophila* was detected which shows the importance of being able to detect *Legionella* species other than *Legionella pneumophila*.

In the future sequencing of *Legionella* spp. will be important to establish correlations between environmental and clinical samples, therefore the sequencing methodology is being developed in the Republic of Estonia Health Board Laboratory of Communicable diseases and all positive *Legionella* spp. samples are being stored for potential future analyses.

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