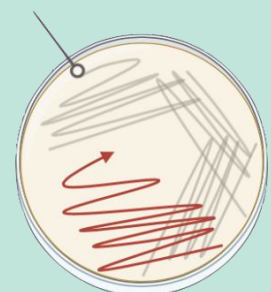


## Abstract

The purpose of this study is to assess the carriage rate of *Staphylococcus aureus* within the CSP community and gain scientific knowledge on how prevalent this common bacterium is. With the data collected, many forms of *S. aureus* proved to be prevalent, for example *Staphylococcal enterotoxin B*, also known as SEB. This form of *S. aureus* is a well known contributor to food poisoning. It was identified in the data collected that this toxin was more pervasive in healthcare workers than non-healthcare workers.

## Background Information

- *Staphylococcus aureus* is a known gram-positive bacteria typically found on the skin and nasal passages of humans and animals.
- It's a common cause of skin and soft-tissue infections as well as other severe infections such as endocarditis, sepsis, and pneumonia.
- *S. aureus* can be easily transmitted through direct contact with an infected person or through a contaminated object.
- It's important to note that *S. aureus* is very adaptable and some forms are difficult to treat because they are resistant to antibiotics (MRSA).



### Current Study Results

1605 Swabs Collected

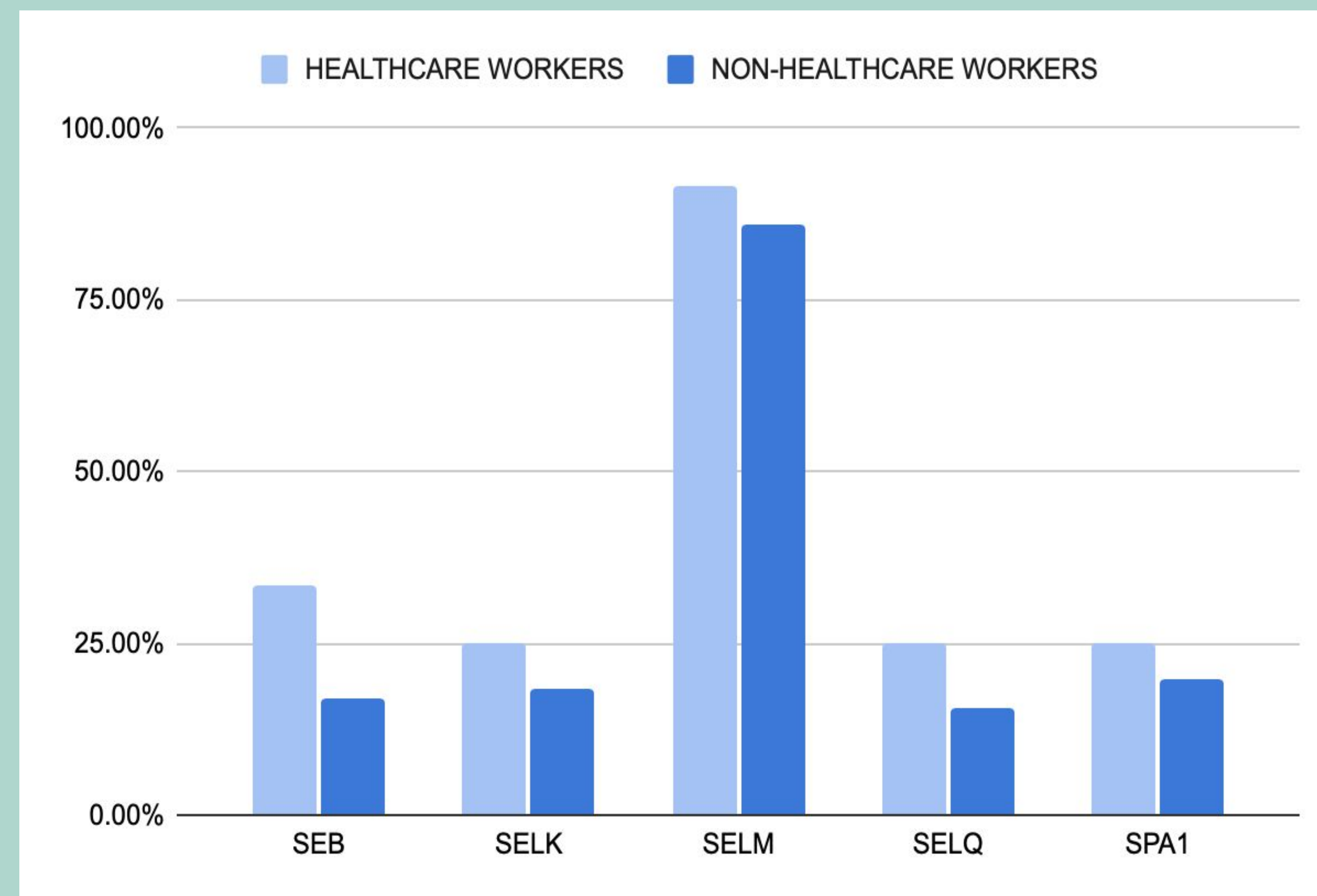
1432 Swabs Processed (through culture tests)

361 Positive

25.2% Carriage Rate



# *Staphylococcal enterotoxin B (SEB)* is more prevalent in Healthcare workers than Non-Healthcare workers



**Figure 1: *S. aureus* strains that are more prominent in healthcare workers than non-healthcare workers.** SEB, SELK, SELM, SELQ, and SPA-1 are strains of *S. aureus* that are more common among healthcare workers. To assess the carriage rate of each strain amongst participants there were approximately 12 healthcare workers and 71 non-healthcare workers observed. The SELM and SPA-1 strains were observed to have at least a 5% difference in carriage rate. The SELK and SELQ were observed to have at least a 7% difference in carriage rate. The most significant difference observed was the SEB carriage rate of 16%. The data above shows that although these strains are more prominent in healthcare workers, there are many external factors that may influence the presence of key toxins of *Staphylococcus aureus*.

## About SEB

- *Staphylococcal enterotoxin B (SEB)* is a harmful common bacterium derived from *S. aureus*
- This toxin is a prominent contributor to food poisoning in human
- This bacteria is typically found in dairy, bakery products, and unrefrigerated meat

## Methods: Identifying *S. aureus*

### MSA:

Growth and yellow color change signifies Mannitol Fermentation

### CNA:

Lysis of RBCs results in beta hemolysis

### DNase:

DNase enzyme breaks down DNA molecules causing formation of a visible halo

### Catalase:

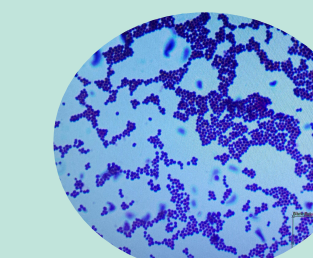
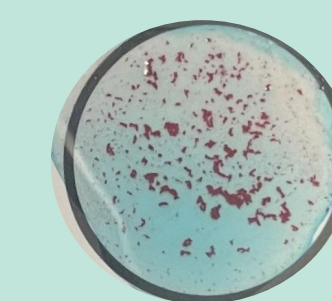
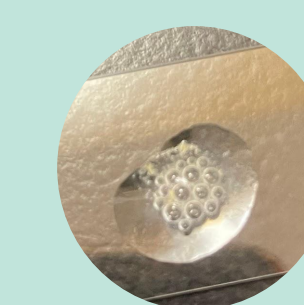
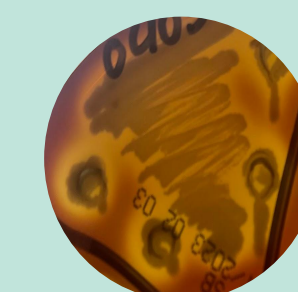
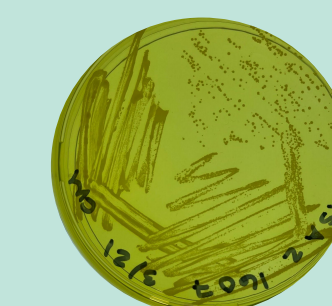
Presence of catalase enzyme is indicated by bubbling which is due to it releasing O<sub>2</sub> when it breaks down H<sub>2</sub>O<sub>2</sub>

### Coagulase:

Enzyme converts fibrinogen to fibrin resulting in clot formation

### Gram Stain:

Purple gram-positive cocci that form in grape-like clusters



## Results

**8 samples underwent culture examinations to identify *S. aureus***

## References & Acknowledgements

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Staphylococcal enterotoxin B (SEB) fact sheet. Available at: <https://www.health.pa.gov/topics/Documents/Diseases%20and%20Conditions/Staphylococcal%20Enterotoxin%20B%20.pdf>.

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