The Effectiveness of Different Cleaning Agents on Cloth Masks

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Abstract:
Research has proven that wearing a mask is one of the most effective ways to prevent the transmission of the Covid-19 virus. We tested the effectiveness of various cleaning agents in their ability to disinfect cloth masks. We found that soap, bleach, and hydrogen peroxide all showed a reduction in microbial growth, with hydrogen peroxide being the most effective. Our research also proved that drying the mask with heat was more effective than air drying, likely due to the sterilizing effects of heat.

Introduction/Background:
With the world facing a pandemic, many people were frantic about protecting themselves and their families from Covid-19. When researchers declared wearing a mask was the easiest way to “stop the spread” many people invested in cloth masks. Various cleaning methods were advertised via social media such as Facebook, Instagram, and Tiktok. Each cleaning method carried evidence on why the method was the best, so we decided to test the methods against each other and see for ourselves which method performed the best. We chose to wash with detergent, bleach, and hydrogen peroxide because they were used most often in recommended mask cleaning methods.

Objective:
To find the best cleaning method for reducing the number of bacteria on a mask.

Procedure:
Individuals wore cloth masks for 4 hours. Each mask was applied to a tryptic soy agar plate to transfer bacteria. Masks were then cleaned with a teaspoon of either tide pods, hydrogen peroxide, or bleach in a washing machine on heavily soiled setting for 50 minutes, and then air-dried for 24 hours or dried in a dryer for 60 minutes. Cleaned masks were then applied to a new tryptic soy agar plate. Plates were incubated at 37°C for 48 hours before colonies were counted.

Results:
1. Every cleaning method resulted in a significant reduction in number of microbes on the cleaned mask (Figures 1 and 2).
2. Peroxide, both air drying and dryer drying, had the most reduction compared to no treatment. The smallest change was observed when using bleach and air drying.
3. For every treatment, drying in the dryer did a better job reducing the number of microbes compared to air drying (Figure 3).

Significance to Society and Future Direction:
In the beginning of the pandemic cloth masks were the easiest to come by as better-quality masks (e.g., KN95, N95, surgical masks) were reserved for healthcare workers. Many thought that allowing bacteria to grow and using the same mask would cause illness causing many people to search for the most effective way to keep their masks clean and families safe.

The limitation of our research is that we were only able to measure the amount of bacterial growth before and after the different cleaning methods; we could not measure the viral growth, specifically the Covid-19 virus growth. To have a better understanding of how effective the different cleaning methods are, we would need to test viral growth.

References: