DIRTY DOOR HANDLES

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Purpose: Our experiment was to see which door handle is the dirtiest in a average household.

This research is exploratory. We wanted to find out how dirty our door handles are at home. To get an idea of dirtiness. We choose to swab the door handles in our house and attempt to grow bacteria in petri dishes. The idea being that the petri dish with the the dirtiest handles would grow the most bacteria.

If we swab all the door handles then the front door handle might be the dirtiest in our home because many things touch it like leaves or contaminated air or smoke from forest fires and hands from other people.

QUESTION

Which is the dirtiest door handle at home?

- Petri dishes
- Agar
- Sterile Cotton swabs
- Gloves
- Masks
- Phone (for taking photos)
- Labels or a marker for labeling

Controlled Variables

- Swabs
- Petri dishes

Manipulated Variable

- Location of the door handles

Responding variables

- The amount of bacteria in the petri dishes

Procedure Explained

With sterile swabs we swabbed specific door handles in our homes. We prepared agar in petri dishes. We used the swabs from each door and swabbed the petri dishes. We also used a control petri dish that was not swabbed to control for any bacteria found in the air that may skew our observations. The petri dishes were kept in a warm dark place for 10 days. We took photos each day of the petri dishes to observe.

After the 10 days, we took some of the interesting looking bacteria from the petri dishes and put them under the microscope for fun. We looked at the bacteria from Miles' backdoor and Owen's storage room. We took pictures of them through the microscope.

Door handles from the outside that we swabbed:

- Front door
- Back door
- Bathroom
- Bedroom
- Storage room

Two households:

- Owen's house
- Miles' house

Procedure Step-By-Step

Step 1: Both participants put on gloves and a mask

Step 2: Each door handle was swabbed thoroughly one at a time

Step 3: Rub the swab over the agar surface in the petri dish

Step 4: Place the lid on the petri dish

Step 5: Label the petri dish with the door handle location make sure that there is a unswabbed petri dish labeled as control

Step 6: Repeat the remaining door handles

Step 7: Once done labeling the dishes put them in a safe place that is dark and warm

Step 8: Each day for 10 days take pictures of the dishes and observe them

Owens house:

- Control had 3 medium sized cream coloured cultures and one translucent spot of bacteria, many tiny cream coloured dots of bacteria scattered throughout the dish.
- Bedroom had one medium and many tiny cream coloured bacteria scattered throughout.
- Backdoor had one large, three medium and many tiny dots of cream coloured bacteria throughout the dish.
- Bathroom had one large black fuzzy culture, small amount of translucent bacteria, 5 medium- large cream coloured bacteria, one medium translucent culture, many scattered dots of cream coloured bacteria.
- Storage room had a medium black fuzzy culture with translucent border, 3 large cream colored bacteria cultures, one medium sized yellow mustard culture, many scattered cream sized dots
- Front Door had 2 medium sized cream coloured bacteria cultures, one large translucent culture, and one large cream coloured glob, many tiny cream coloured

Miles' House:

- Control had a couple small specs of cream coloured bacteria cultures.
- Bedroom had 2 large black fuzzy cultures of bacteria and one medium orange circular culture of bacteria.
- Backdoor had 3 large black fuzzy cultures and 3 small cream cultures
- Bathroom had 3 small cream coloured bacterial cultures.
- Storage room had 2 small cream coloured cultures and 1 small translucent culture
- Front door had 2 large black fuzzy cultures

Our hypothesis was that we thought the front entrance door handle will be the dirtiest door handle because it's on the outside where many things touch it like leaves and contaminated air from smoke from forest fires.

However, after looking at the bacteria that was on our petri dishes on day 10, it looked like in Miles' house the back door was the dirtiest, while in Owen's house the bathroom door handle was the dirtiest based on how much bacteria grew and the size of the cultures.
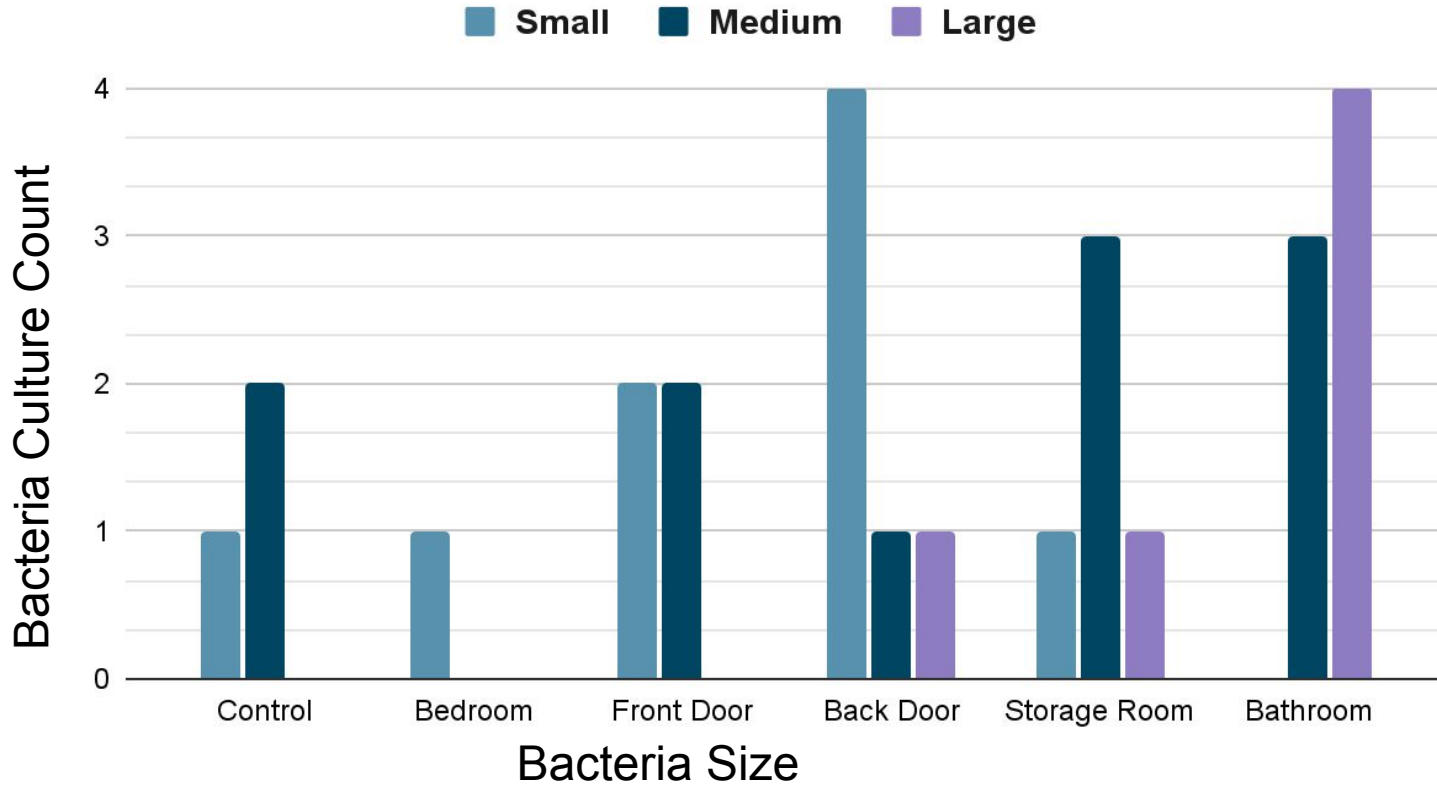
Analysis — Miles' House

Bacteria Culture Count by Size - Miles' House
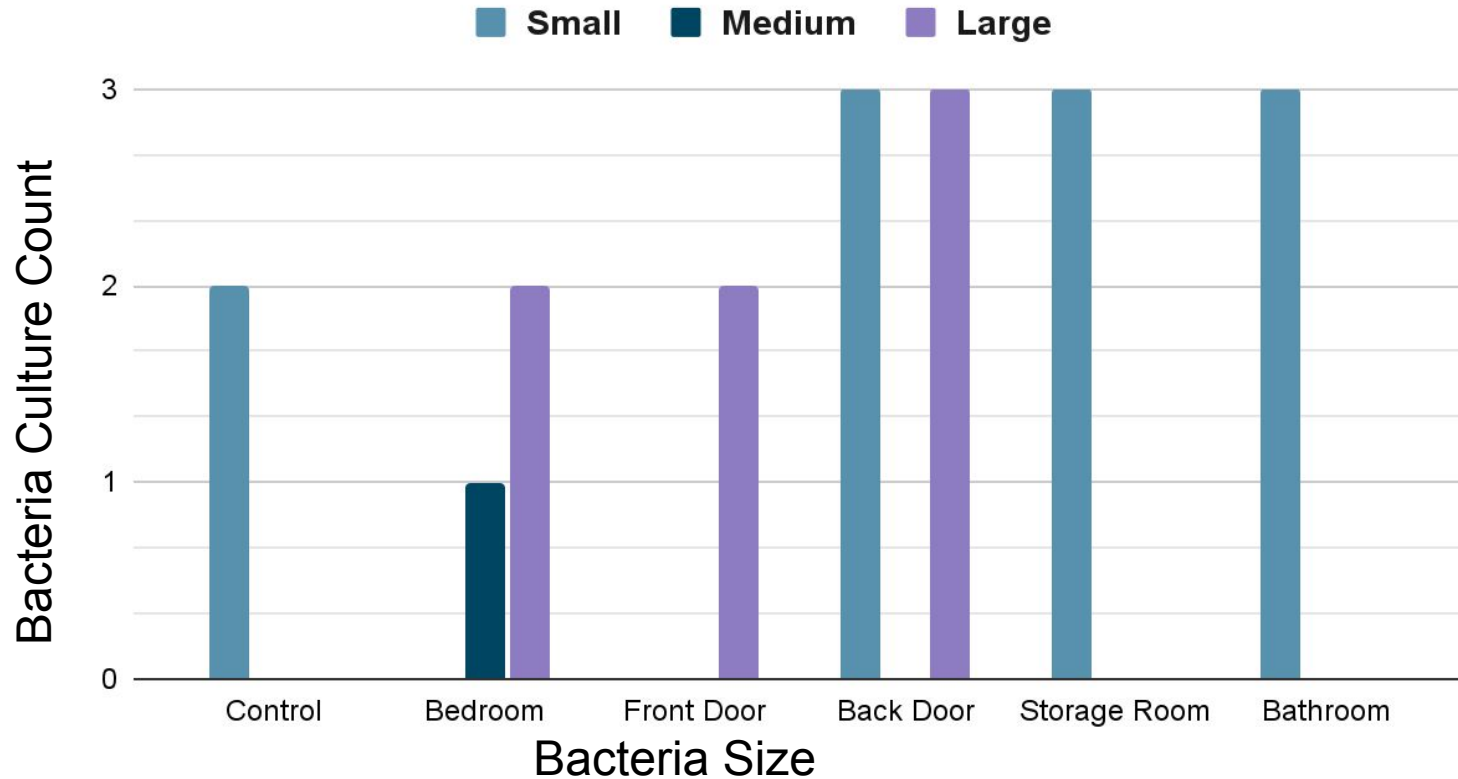
Analysis — Owen's House

Bacteria Culture Count by Size - Owen's House

Based on our analysis we decided that the total number of bacteria cultures will determine the dirtiest door handle.

In conclusion, we found out that for Owen's house the outside of the bathroom door handle was the dirtiest out of the six door handles we did.

 The outside of the back door at Miles' house was the dirtiest door handle out of the six door handles we did.

 Our results were inconclusive for determining which is the dirtiest door handle. We have disproven our hypothesis meaning we have gotten different results than what the hypothesis stated. We may have gotten more accurate results with a larger sample size (more houses swabbed).

https://kids.britannica.com/

https://www.cdc.gov/

https://www.stevespanglerscience.com/lab/experiments/growing-bacteria/

Bacteria are microorganisms that can only be seen with a microscope. Bacteria can be found in all environments, including high touch areas of a household, such as door knobs, keyboards, light switches etc. Bacteria can live for a very long time on dry surfaces. It is picked up on hands and transferred to other objects and people. Some bacteria can cause infections to people but most bacterias don't. Bacteria from our environment can be collected and grown in a petri dishes. Bacteria prefer dark and warm environment to grow well.

The information gained from this experiment is helpful know that your door handles always have some bacteria living on them, some more than others. This is a good reminder of the importance of hand washing and to frequently wash high touch surfaces like door handles