1. Introduction and Objectives

Aerosols can be generated in a washroom due to different activities, like walking, flushing a toilet, and using a tap. The COVID-19 pandemic has led to increased concern about potential aerosolisation during hand drying.

In this study hands rinsed with water (no soap) or washed with soap for 20 seconds were then dried using Dyson Airblade™ hand dryers or paper towels. The objective was to determine the effect of the different hand drying methods on concentration of aerosols and bacteria in air.

2. Methodology

The study was performed within the controlled environment of a test chamber. A sink was installed in the chamber. The Dyson Airblade™ Wash+Dry hand dryer (integrated tap and dryer) was mounted in the sink. The Dyson Airblade™ dB, V and 9kJ hand dryers, and a supply of paper towels were placed beside the sink. The chamber air was purged prior to each test. During the test air samples were collected at three locations to quantify the airborne levels of different particle sizes (indicated by "P" in Figure 1A) and at three locations (indicated by "V" in Figure 1A) to quantify total viable bacteria in the air. Relative to the dryer/paper towels, samplers were placed immediately beside (1 in Figure 1A), 0.65 m to the side (2 and 3 in Figure 1A) and 1.20 m from the front (4 in Figure 1A). The samplers were 1.5 m above the floor (Figure 1B), to represent the breathing zone of an adult.

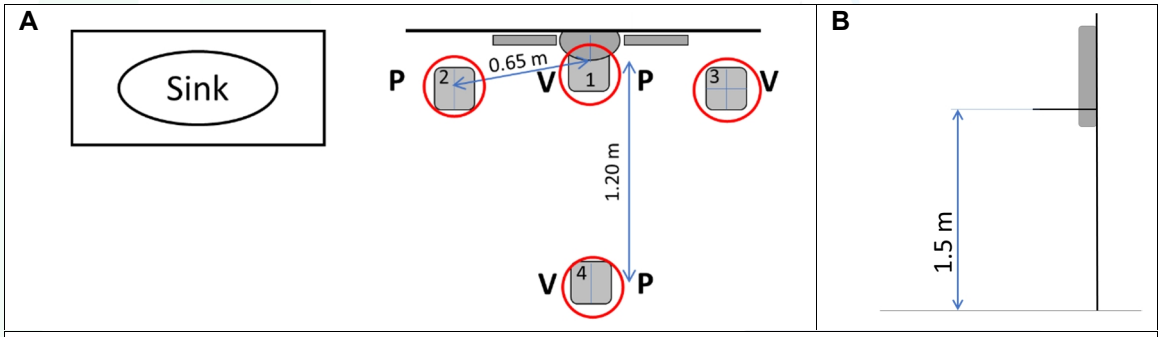

Figure 1. Diagram of the sampler locations in relation to **A** the sink and to the hand dryer (Dyson Airblade™ dB, V and 9kJ hand dryers) or paper towels, and **B** distance to the floor.

Fifteen volunteers in total participated in the test as three groups of five people. One volunteer entered the chamber after the previous volunteer left the chamber. The chamber air was purged before each test and between each group of five volunteers to establish the base line aerosol levels. Two controls (no hand drying) were performed to establish the contribution of volunteers (a) walking and (b) walking and washing hands to the levels of aerosols and bacteria in the chamber. Two tests were conducted to quantify the effect of hand drying on the levels of aerosols and airborne bacteria after (i) rinsing hands in water alone (no soap) to represent poorly washed hands, and (ii) hands washed with soap for 20 seconds. During the test, volunteers walked into the chamber, rinsed (i) or washed (ii) their hands, dried them with one of the drying methods, then left the chamber.

3. Results

In general, the difference between the increase of aerosols and bacteria after drying with any of the Dyson Airblade™ hand dryer models and the increase from walking and washing hands without drying is not statistically significant. Results also showed the increase of aerosols and bacteria numbers after drying with any of the Dyson Airblade™ hand dryer models is comparable to the numbers obtained when hands are dried with paper towels.

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