

Let Battle Commence!

Last year's study from the ETS looking at the spread of bacteria in the washroom was met with outrage by some electric hand dryer manufacturers, not least Airblade inventors, Dyson. In a bid to get to the bottom of the arguments, Tomorrow's Cleaning Editor, Matt Waring, went on a peace-keeping mission to try and resolve the conflict.

Back in November, a study was presented by the European Tissue Symposium demonstrating the spread of bacteria in the washroom. This study, designed by Professor Mark Wilcox of the University of Leeds and Leeds Teaching Hospitals, claimed that jet and warm air hand dryers spread more bacteria into the air, as well as on to users and those nearby, than their paper towel counterparts.

The study in question prompted a fairly large response from those within the cleaning industry, but none more so than from Dyson, creators of one of the most popular and innovative jet air dryers, the Airblade. Such was their dismay with the findings that they invited me down to their Willshire-based headquarters to meet with Toby Saville, one of their longest serving microbiologists, to discuss the findings.

With a Harrier Jump Jet parked right outside the front door, it appears that Dyson are prepared to do battle in more ways than one, and it isn't long before I discover how much of a warzone it has been in the quest for the most hygienic washroom.

"It's been a running battleground ever since we launched the Airblade," said Toby. "Before we launched the product, we did a lot of work to try and prove the hygienic elements, because when we started designing the hand dryer, we found that historically, a lot of industries like infection control,

hospitals, food prep – hygiene critical areas – wouldn't touch hand dryers, they had such bad press.

"So we knew it was going to be critical to educate people on why our design was actually quite different. We did a lot of research up front, we got it published, but fairly quickly we found the paper towel industry coming back with some ripostes of their own."

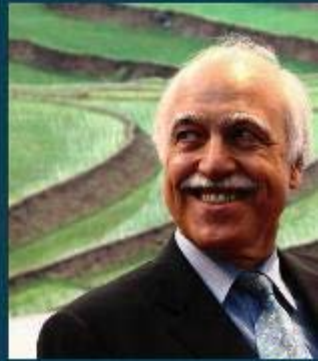
One of these ripostes, according to Toby, is November's study from the ETS, which he felt was "full of holes, and really targeted." He added: "A lot of people in science are looking to prove something when they set up an experiment, but it was very much 'we need to prove that this product is bad in some way, what can you find?' and the way it was then presented; they just left the context out of the situation completely.

"I'm not going to knock Professor Wilcox or anyone involved, I don't doubt that they're approaching this with some scientific rigour. But it's been quite frustrating for us, because we've paid for a number of studies to be done on comparing our products to other technologies to show what's good and what's bad, and we've been very careful to set that up scientifically. If there's something unhygienic about our product, we want to know about it."

However, following my visit down south, I caught up with Roberto Berardi,



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Chairman of the ETS, to get their side of the story, and he assured me that the study wasn't 'targeted' in any way. Instead, he said: "It was considered extremely important that Professor Wilcox was free to do the study."

"We approached him to say we were interested in comparing the aerosolisation of microorganisms with different hand drying systems. There was no direct involvement from the ETS in the experiment, so there's no way that we influenced it."

The study was divided up into two separate parts, the first of which saw participants put paint on their hands and then use the three different drying methods to see where the paint ended up, designed to show the visible spread of water in the drying process. During the second part of the study, participants wore gloves that were contaminated with bacteria not normally found in the washroom, in this instance lactobacilli, 'to simulate poorly washed, contaminated hands'. They then dried their hands using the three different methods, and air samples were collected throughout the washroom to determine the spread of these transient bacteria. These samples were taken at various time intervals to try and see how long the bacteria remained in the air after drying.

What the study then found was that air bacterial counts in close proximity to the hand dryers were 4.5 times higher for the jet air dryers than warm air dryers, and 27 times higher when compared to paper towels. A similar pattern was also found for bacterial counts a metre away from the dryers. Professor Wilcox then concluded that "jet air and warm air dryers result in increased bacterial aerosolisation when drying hands. These results suggest that air dryers may be unsuitable for use in healthcare settings, as they may facilitate microbial cross-contamination via airborne dissemination to the environment or bathroom visitors."



Although the conclusion seems fairly set in stone in terms of what they found, Dyson's Toby Saville felt that it was unfair to generalise the results because of a flawed methodology that, he believes, "doesn't represent reality in any way, shape or form." One of the main points of criticism from him was that tens of millions of bacteria were used when contaminating the gloved hands.

He said: "I've done a lot of sampling on people's hands over the years, and you don't get tens of millions of bacteria on your hands that you can remove, not even your own bacteria. Unless you are the messiest toilet visitor I've ever seen, you don't get that much transient bacteria, it just doesn't happen."

Toby also felt it was important to factor in the level of bacteria already present in the washroom before drying takes place, referencing some studies that Dyson had carried out themselves with the Campden & Chorleywood Food Research Association. He said: "They basically showed that using an Airblade, using paper towels, using another hand dryer, in the context of what was in the air anyway, it was completely insignificant, and it doesn't matter at

all. There are bacteria in the air all the time, we breathe them in every second, they just don't harm you in those kinds of levels."

But, because the study was focussing particularly on infection control, especially in hospital environments, the ETS feel that the high inoculant count was justified and necessary to highlight the potential risks that one might face.

Roberto Berardi added: "It should be pointed out that when somebody visits the toilet and gets contaminated with faecal material, human faeces has literally ten billion bacteria per gram. And if you've got somebody in there with norovirus – it's a very small amount of norovirus that can cause an infection, often less than 100 colony forming units. So if you think of a hospital environment, if you've got a visitor going into a public washroom, using an electric dryer, getting contaminated with norovirus and then going to see a patient with poor immunity, I think it is an issue."

The ETS were also keen to stress that, contrary to what Dyson and other hand dryer manufacturers may think, their study wasn't intended as an attack; instead it was more a case of "putting everything into perspective."

"A lot of people in science are looking to prove something when they set up an experiment, but it was very much 'we need to prove that this product is bad in some way, what can you find?'"



Berardi said: "Professor Wilcox has always been very careful to say that the use of electrical dryers is not dangerous in any way, but it's all about risk and the potential risks. There are situations where hygiene is paramount, and it is another factor that needs to be taken into consideration in the design of washrooms. It may be less critical in a bowling alley or a cinema or something like that, but it's more important in situations where hygiene is important, be it hospitals, restaurants or food preparation environments."

Similarly, and somewhat surprisingly, given their reaction to the study, Dyson also made sure to say that they had no issues with paper either when it comes to hygiene, but that problems only arise in situations when paper may not be readily available.

Toby added: "If paper's there and people dry their hands properly and completely, that's brilliant. It's hygienic and that's a good way of drying your

otherwise. We just need people to understand that using an Airblade is just as hygienic. If you put it all together, and everything is available and there, Airblade and paper are, hygiene-wise, on a par."

Whatever the method though, whether it be with paper or hand dryers, both the ETS and Dyson were in agreement that the act of drying itself is vital in the quest for a hygienic washroom. Berardi explained: "If you wash your hands with soap, you will remove microorganisms and a lot will get washed down the sink. However, there is water on the hands that will contain bacteria, so if hands are wet and you then touch door knobs and things like that, you will spread microorganisms, so good hand drying is important."

While Toby added: "Get your hands dry by whatever method is available, and when you leave and have to grab the door handle, if everybody is doing the same, it's going to be a pretty hygienic environment. With wet hands, all you're going to do is

and move what's on your hands to whatever you touch and back the other way. But if your hands are dry when you leave the washroom, it's about as hygienic as it gets."

So, the ETS and Dyson are in agreement about one thing, at least. But while both say that drying is paramount to curb the spread of bacteria in the washroom, neither side look willing to back down in the argument to find the best method, with Dyson in particular keen to carry on developing new ideas to find the perfect drying method. Toby said: "We're always looking at new technologies that we can bring out. We've got an ever-growing research team that's doubled in size in the last five years, and we're always looking for ways to improve it. It isn't sterile, it's not perfect, but we want to make it perfect."

For now then at least, it looks like the battle could continue to rage on. There's not quite any need to fire up the engines in the Harrier Jump Jet just yet, but until a definitive answer is found, it's time to decide, which side