

HEALTH HAZARDS AT THE CHECKPOINT:

bare feet, dirty trays and awkward movements

Over the last few years, questions have been raised surrounding the level of hygiene at security checkpoints. Studies have shown that many of the surfaces at the checkpoint, and those of other security screening processes, often show high concentrations of contagious bacteria and viruses. **Lucy Rawlings** has been investigating the world of germs at airports and what can be done to tackle these minuscule malefactors.



Shoes off, belt off, jacket off, LAGs in clear bags, pour liquids away, phone and smart watch in bag, laptop and tablet out of bag (oh, and in their own trays), push trays onto conveyor, walk through metal detector, bracelet sets off the alarm (you always forget about this one), bracelet goes inside tray, walk back through the metal detector again, get a pat down for good measure, collect bracelet, collect bags, one has to for a swabbing... swab, swab, swab... all clear... repack bags, belt on, shoes on, jacket on... jacket off (feeling a little hot after all that), head for coffee. This is my typical checkpoint routine and, although it's all over in a couple of minutes (if I'm lucky), I must admit it's still all a bit of a hassle and often hard to keep up with the different regulations. But, with it all in the name of security, we comply and jump through the hoops. However, all the while we are distracted by our security duties, darker forces are at work; microscopic forces with the ability to rapidly multiply, attacking us from the inside and spreading across the globe. These forces... GERMS!

As people travel around the world, they do not do so alone. Rather, many carry with them viral, bacterial and fungal infections and airports are prime grounds for these imperceptible hitchhikers to spread. The University of



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Nottingham and the Finnish National Institute for Health and Welfare conducted a study in 2016 in which they swabbed a variety of the most-touched airport surfaces to discover where they could find the highest concentrations of bacteria and viruses. The security checkpoint came out the worst with the greatest offenders being plastic security trays - they carried more germs than toilets! To many, the results of this study won't have been a surprise. From bare feet to tens of thousands of hands handling trays into which we place shoes alongside our toiletries, phones and laptops, and from pat-down searches performed by a stranger who has previously been rubbing their hands over the body of another passenger to the uncomfortably close proximity with others in the queue, the whole process is a germaphobe's worst nightmare. One might also wonder just how often the security trays are individually cleaned?

In the study, both traces of rhinovirus (the virus that causes the common cold) and influenza A virus were picked up at the checkpoint. Niina Ikonen, a virology expert from the Finnish National Institute for Health and Welfare stated that the findings, "support preparedness planning for controlling the spread of serious infectious diseases in airports", and that "the results also provide new ideas for technical improvements in airport design and refurbishment". However, we've known about the checkpoint's, and airport's as a whole, ability to facilitate contamination and transmission of bacteria and viruses for many years.

In December 2009, following the global H1N1, or swine flu, pandemic, an article included in *Aviation Security International* detailed the proactive measures taken by Kansai International Airport, Japan, to help prevent the spread of the virus by painting a coating of anti-viral solution onto all of the surfaces which experiences high levels



The security officer may be wearing latex gloves but how many items have been checked since they were last changed

of human contact. This specialised, photo-catalyst coating worked by producing surface oxidation to eliminate viruses and bacteria and only needed to be applied once (providing it was not forcibly scratched off) to ensure effectiveness. Whilst Kansai was praised for being the 'international trail-blazer' who had led the way in countering the anticipated increase in H1N1 influenza rates, this case study also raises questions as to why the most touched contact points in airports (or indeed any mass transportation hubs) such as elevator buttons, escalator hand rails, baggage trolley hand bars etc., are not already receiving this, or similar, treatment.

In 2010, pat-down searches came under scrutiny across a number of media outlets, claiming that the gloves used for pat-down searches were changed too infrequently, with WorldNetDaily's article, entitled *Spreadin' the Glove*, describing them as 'latex coverings' which 'have been in crotches, armpits, touching people who have been ill' and with the same pair used to pat-down 'dozens, perhaps hundreds, of passengers'. We must, of course, take this with a pinch of salt as we know how the media enjoy a bit of sensationalism, but we should also retain a healthy degree of concern. While a number of agencies will expect their checkpoint screening agents to change their gloves

after every pat-down, we are unable to guarantee that this will always be the case in every airport, in every country, around the world.

Another, rather toe-curling example, if you'll excuse the pun, of how bacteria and infections can spread at the security checkpoint, is from the floors across which we are made to walk in our bare feet or socks whilst our footwear takes its place within that nefarious screening tray with the rest of our belongings. Fungal, viral and bacterial infections all have the potential to be contracted by walking barefoot through the checkpoint. Fungal infections have the highest likelihood of transmission with tinea pedis (athlete's foot) being the most easily transmitted. Given the right conditions, tinea pedis only requires skin contact from an object which has been infected by a person with the fungus in order to spread - this could be contact with a towel, clothing, carpet or damp floor - with the fungal spores surviving just long enough to infect unsuspecting travellers on surfaces with frequent foot-traffic. To add insult to injury, even wearing socks may not necessarily protect you from tinea pedis spores. Regarding viruses, certain strains of the human papilloma virus can also spread through the feet, entering the body through cuts and breaks in the skin and causing plantar warts which may take years to go away - just



Athlete's foot is highly contagious and passengers routinely remove footwear at checkpoints

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another stellar reason never to expose oneself without adequate protection. Then we have bacteria which may be caught by those with breaks in the skin on their feet or with compromised immune systems, with a particularly harmful one being Methicillin-resistant Staphylococcus aureus - MRSA, which is disconcertingly resistant to antibiotics.

While the likelihood of infection is fairly remote, it is nevertheless something we must work on preventing, particularly as passenger numbers are continuing to increase year on year. Some airports offer travellers the opportunity to don disposable plastic socks, however, many people can find these awkward to get on and off (especially with the

lack of seating to facilitate the process) and encouraging the use of even more disposable plastic is far from being environmentally friendly.

The final process worthy of scrutiny is biometric fingerprint scanning. Fingerprint identification has been used extensively at airports and immigration checkpoints around the world due to its ease of use, speed at which people can be identified, the small size of the scanners and it being a non-intrusive process. However, despite these advantages, fingerprint scanners simply provide another surface upon which infectious diseases can be spread from one



Can you find our Terahertz Body Scanner in this picture?

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person to another as, along with our fingerprints, our hands can also carry bacteria, viruses and pathogens. With some scanners being touched by thousands of hands per day and with each person averagely touching their face 2000-3000 times per day (approximately 2-5 times per minute!) it is easy to see how a variety of diseases can be easily transmitted. There is the possibility for a number of viruses to harbour on and spread from fingerprint sensors, including: Rotavirus - a common cause of diarrhoea; Norovirus - which causes around 90% of viral gastroenteritis outbreaks around the world; Hepatitis A - which infects liver cells and causes them to inflame; Rhinovirus and Influenza Virus. Of course, a simple way around this is to keep hand sanitiser solution and/or wipes next to each of the scanners and to ask people to use them before and after they touch the surface. However, with many sensors being at self-service checkpoints and with security teams having a number of other challenges to focus on rather than having to counsel travellers to ensure they take responsibility for their personal hygiene, it is difficult to ensure that everyone sanitises their hands or wipes down the sensor after each use. Furthermore, there may be a reluctance by authorities to encourage such hygiene practices as throughput rates will be negatively impacted and, therefore, have a negative impact on passenger facilitation. How then should we best go about preventing the transmission of contagious diseases at our airports?

Fear not, you need not develop a Naomi Campbell-style approach to travel hygiene in order to protect yourself – the supermodel always travels with a surgical mask, disposable gloves, anti-bacterial wipes and disinfects her entire seat and surrounding area once on board - as some very ingenious steps are already being taken, and technologies developed, to minimise the ability for germs to spread from security checkpoints and surfaces across the airport.



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Let's start with biometric identification. As we well know, in order to be identified by ones' biometrics we need not actually touch anything; the face ID on many of our phones is a key example of this and retina scanners and hand-vascular pattern recognition are others. However, fingerprints have typically been the biometric of choice when it comes to the identification travellers worldwide. But to avoid the cross contamination induced by thousands of hands touching scanners in order to prove their identity, why can't the scanners be touch free too? Well, they can be! IDEMIA's (formerly Morpho S.A.S.) MorphoWave 3D fingerprint technology is capable of scanning fingerprints and identifying travellers with a simple wave of the hand - a truly touchless process. The technology allows passengers to remain in motion whilst they are identified, swiping their hand about

an inch above the scanner whilst multiple cameras shoot videos of their hands moving from various angles and a machine-learning algorithm creates a 3D model of their fingers. These touch-free scanners allow for scanning on the move, adding the benefit of reducing queues and bottlenecks at high traffic checkpoints, as well as reducing concerns surrounding hygiene and the spread of germs. The touchless technology boasts the ability to cope with both wet and dry hands, enabling a high throughput rate and convenience, all the while enhancing the security process. In 2017, Kempegowda International Airport Bengaluru, India, introduced the technology as part of its digital transformation to help cope with its increasing passenger numbers.

Another pivotal technology in the battle against the spread of bacteria and viruses at the security checkpoint is the development of antimicrobial trays and a couple of companies have these on offer. CQRTS, a security systems supplier based in Oslo, Norway, developed the CQRT TRAY®, a tray containing an antimicrobial agent which is incorporated into the trays' plastic material and penetrates the cell wall of microorganisms, preventing them from growing, reproducing and spreading. Independent laboratory tests on these trays have shown that bacteria such as E. coli, Salmonella, MRSA, and Staphylococcus aureus are reduced by more than 99.99% within 24 hours of the microorganisms coming into contact with the trays. The antimicrobial agent remains undiminished throughout the lifetime of the tray, without the need for any additional treatments to replenish it. CQRTS developed their first antimicrobial tray in 2009, having been posed the challenge by an airport to find a solution to their bacteria problems. Since then, the company's trays have been in operation at an increasing number of airports across Europe and especially in Scandinavia.

Microban International, a provider of antimicrobial and odour control technologies, recently announced its

partnership with SecurityPoint Media, innovators of a patented system for passenger security screening. The companies have collaborated to develop a range of security trays enhanced with Microban's proven antimicrobial technology. The treated trays are currently being deployed across a number of North American airports including Los Angeles, Washington D.C., and Minneapolis St Paul, in a bid to minimise the spread of harmful bacteria and, hopefully, airports globally will soon follow their lead and adopt similar measures which assist in reducing travellers exposure to harmful microbes. Microban's antimicrobial solutions, however, are not only restricted to their use on security trays. Microban's chemists and engineers have been developing and improving on their technologies over decades to provide solutions for a number of 'high-traffic and hygiene-critical environments' and are continuing to develop and deploy solutions for other airport and airline surfaces including flooring, latex gloves, tray tables, seating textiles, window shades and overhead compartment components. Could these treatments be the answer to all our germ fighting dreams?

Last, but by no means least, let's consider these 'awkward movements'. We've all been there; scrabbling around undoing our shoelaces, pulling off that tight pair of shoes whilst trying

not to hit the person next to you, then getting a frisking by the poor security officer performing the pat-down searches who, otherwise, wouldn't dream of coming anywhere near you. The struggle doesn't end once the screening is complete either, you must then get your shoes back on whilst bent over and keeping an eye on your belongings (which are likely sprawled out everywhere), and, if you've been in a fluster and got things round in the wrong order, doing up those shoes whilst desperately clutching at the waist of your trousers and hoping that an already awkward situation doesn't become more awkward! A few extra chairs certainly wouldn't go amiss and are necessary for those less physically able, but these also take up a lot of space and may be interpreted by some passengers as an invitation to take a more leisurely and lengthy approach at the checkpoint. In addition to the annoyance of the whole process, all these procedures can be rather time consuming and contribute to long queues and restless travellers. However, with the ever-expanding capability of technologies, coupled with an increase in the use of behavioural analysis, perhaps we won't have to worry about all these awkward movements for too much longer.

Despite some of the bad press in recent years surrounding potential health hazards at the checkpoint, it is reassuring to see that steps are

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being taken to ensure that our security processes and technologies are constantly being enhanced, not just to protect against criminal activities but also the growing number of biological threats that we face simply by being an increasingly global society. It is important to remember though that, while we are security professionals who take our duties to defend and protect seriously, we are also humans and travellers and that it is our duty to ensure that we conduct ourselves in a manner which is respectful and hygienic for our fellow globetrotters and to encourage them to follow suit. ■



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