# More Marketing than medical evidence: infrared thermometers to screen for COVID-19

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Many restaurants, theatres and offices are using infrared thermometers to get the country back to work. Multiple companies are advertising these as a way to 'reassure' employers and employees. In China, security guards have even been given infra-red spectacles in order to detect people with fever. But where's the evidence that testing for temperature is a useful intervention?

Testing asymptomatic people for signs of infection – potentially coronavirus- is screening (symptomatic people should, of course, be at home, self-isolating). Screening always comes with the chance of false negatives – missing significant illness, and false positives – detecting a problem where none exists. But there are several hurdles to overcome before temperature screening can be recommended. First, are these temperature devices accurate?

Unusually, the Medicines and Healthcare Products Regulatory Agency issued a statement on the 3/7/20 stating that "thermal cameras and other such "temperature screening" products, some of which make direct claims to screen for COVID-19, are not a reliable way to detect if people have the virus." (1)

The infra-red devices currently being promoted are intended for use in mass screening. They are now planned for use for audiences at theatre or football, and currently being used for attendees of some restaurants and hairdressers. However, the technology, similar to thermal cameras, was designed to detect life in the field, for industrial or military uses, not for individual fever assessment. Skin temperature, rather than core temperature, is measured, which can be affected by cosmetics (2) spectacles (3) antipyretics, and has an uncertain relationship with core temperature (4).

Many devices use algorithms to estimate core temperature, however, the difference between core and infrared facial measurements can be up to 1.5 degrees Celsius – clinically significant (5). The machines themselves are not reliable enough to detect or exclude fever.

Does a person who is infected with coronavirus, and infectious, have a detectable temperature?

The answer is: not reliably. SARS-CoV-2 RNA can be detected 1 to 3 days in people before they become symptomatic. In Vo, Italy, the centre of a large outbreak, 43% of patients testing positive for coronavirus reported no symptoms. (6) People who are asymptomatic are capable of infecting others. While they are at less risk of transmitting coronavirus compared to symptomatic people, the risk is currently unquantified. (7) Infectious people can be either pre-symptomatic or totally asymptomatic. Temperature, therefore, cannot be regarded as a reliable proxy for infectivity risk.

Finally, what do we already know about the real-life use of infrared temperature screening to prevent infectious diseases?

During the H1N1-2009 pandemic, several airports began screening arrivals for fever. Nine million people were screened in Japan; 930 people with potential infection were detected, and none were diagnosed with H1N1 (8). In 2009, four of 300,000 passengers screened through airport travel in Sierra Leone, Guinea and Liberia were later found to have Ebola. None were detected with temperature measurement (9) A CNN investigation found 30,000 passengers screened for coronavirus by temperature in airports in the US in January 2020. Four people whose temperatures were normal later tested positive for coronavirus; no person was diagnosed with coronavirus via the temperature checks (10).

All this adds up to an unreliable device, being used to measure an unreliable proxy, where there is no previous evidence to support its use. The current vogue for use of these machines lends more to marketing than medical evidence.

Infrared screening for temperature results in large numbers of false positives, either offering false reassurance or unnecessary alarm – and potential exclusion of the person from work or leisure activities. The nature of this testing risks public embarrassment and confidentiality when used in the mass setting. Temperature screening is not reliable and should therefore not be used.

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