

Ventilation as a Preventive Strategy

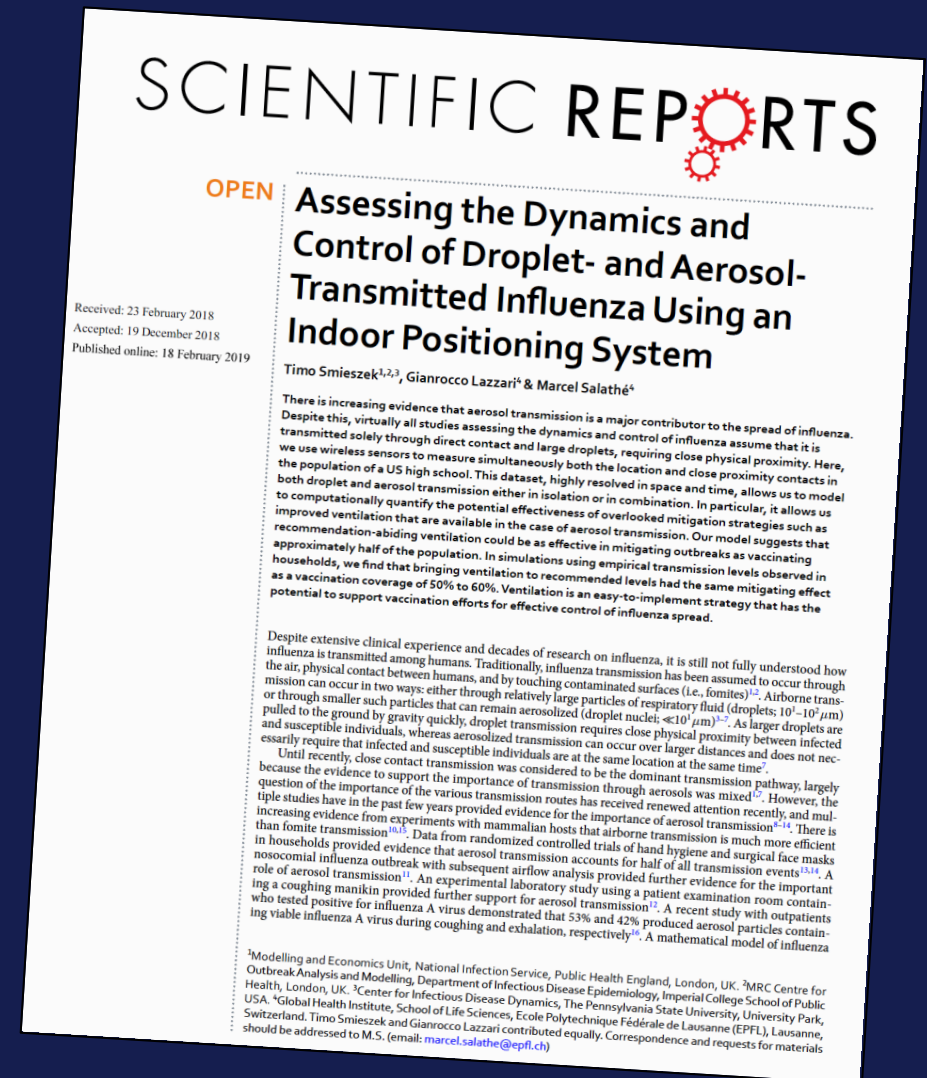
There is increasing evidence that aerosol transmission is a major contributor to the spread of influenza. ... assume that it is transmitted solely through direct contact and large droplets, requiring close physical proximity.

...Our model suggests that recommendation-abiding **ventilation could be as effective in mitigating outbreaks as vaccinating approximately half of the population.**

In simulations using empirical transmission levels observed in households, we find that **bringing ventilation to recommended levels had the same mitigating effect as a vaccination coverage of 50% to 60%.**

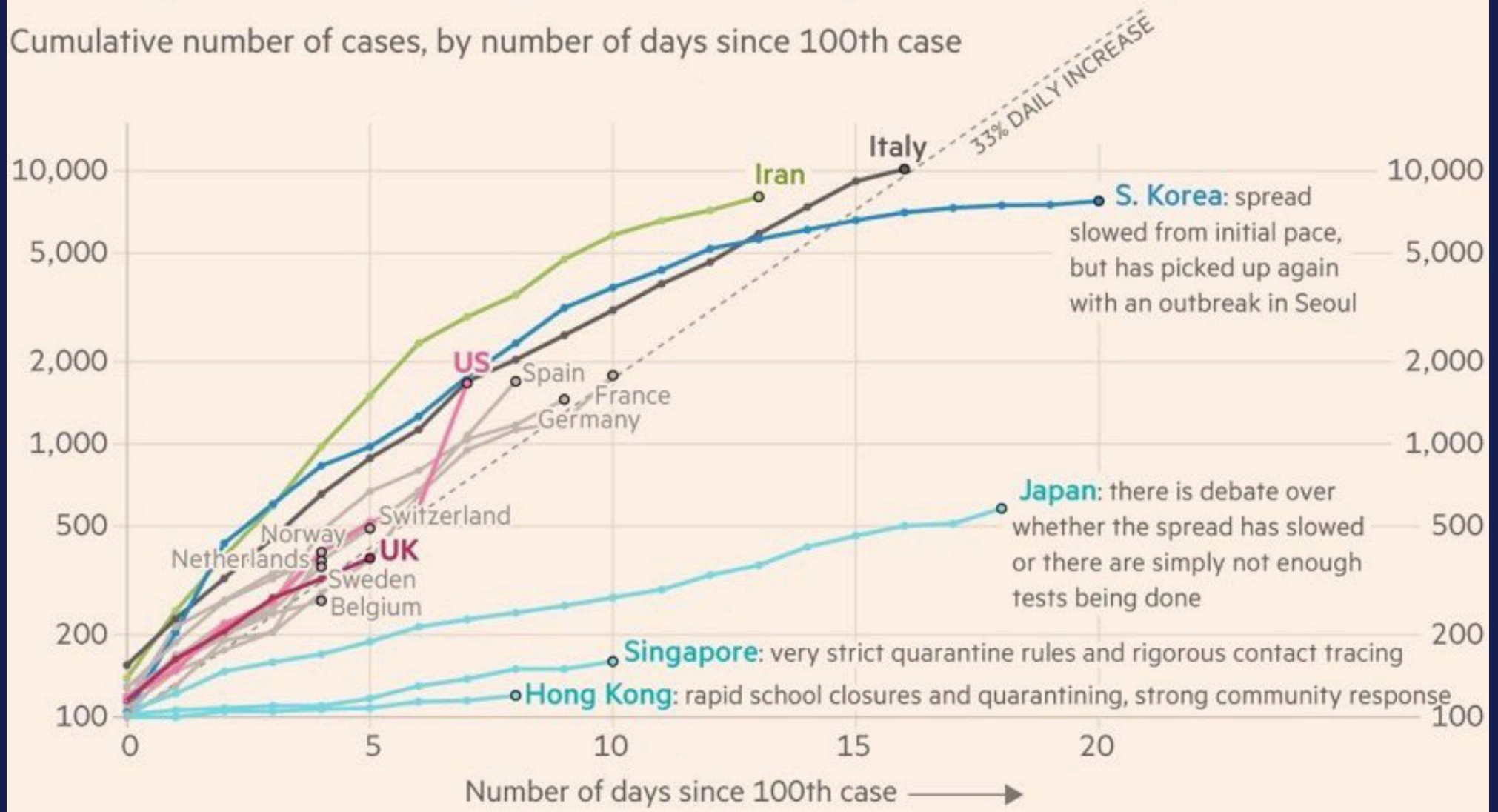
Ventilation is an easy-to-implement strategy that has the potential to support vaccination efforts for effective control of influenza spread.

[nature.com/articles/s41598-019-38825-y.pdf](https://www.nature.com/articles/s41598-019-38825-y.pdf)



Most western countries are on the same coronavirus trajectory. Hong Kong and Singapore have managed to slow the spread

Cumulative number of cases, by number of days since 100th case



Source: FT analysis of Johns Hopkins University, CSSE
 FT graphic: John Burn-Murdoch / @jburnmurdoch
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Ventilation as a Preventive Strategy

New data are presented showing an association between indoor humidity above 40 percent and reduced healthcare-associated infections.

Is low indoor humidity a driver for healthcare-associated infections?

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SUMMARY

The essential and preventive role of indoor climate management for infection control in hospitals will be discussed with special emphasis on relative humidity. Each year in the US and worldwide, healthcare-associated infections kill more people than do automobile accidents (Reed and Kemmerly, 2009; Anderson, 2013). New data are presented showing an association between indoor humidity above 40 percent and reduced healthcare-associated infections. Current infection prevention strategies are discussed with consideration of this new insight.

PRACTICAL IMPLICATIONS

Managing indoor air relative humidity in hospitals could prevent a significant percentage of healthcare-associated infections. This prevention strategy is equally applicable to office and residential buildings.

KEYWORDS

Healthcare-associated infections (HAIs), Indoor Air Quality (IAQ), Relative Humidity (RH), built environment microbiome, control of airborne microbes

1 INTRODUCTION

In the US and Europe, errors during in-patient medical care is a leading cause of death (James, 2013). A significant portion of this staggering statistic are deaths due to new infections, called nosocomial or healthcare-associated infections (HAIs), that patients acquire while in the hospital. At least 10% of all patients who enter an inpatient healthcare facility for treatment will develop a HAI (Classen et al. 2011). Tragically, in the US alone, the number of deaths from these infections is over 100,000 annually. What are the factors behind this situation and what more can we do to control the epidemic?

HAIs occur in an environment of biological extremes coexisting within limited physical space. Vulnerable patients often have decreased immune defenses from illnesses, medications, or loss of skin integrity from surgery, indwelling medication lines or injuries. In contrast to the patients, bacteria, viruses and fungi which originate from the patient's own micro-flora, other people in the hospital, or reservoirs in the build-environment can be more virulent than pathogens found outside the hospital. This virulence, manifested as increased infectivity, results from anti-microbial medications and housekeeping disinfectants attempting to eradicate all pathogens. Micro-organisms that survive these powerful selection pressures (survival of the fittest) rapidly reproduce and repopulate the environment with communities of decreased diversity yet increased virulence through medication resistant genes and transmission modes keenly adapted to the indoor

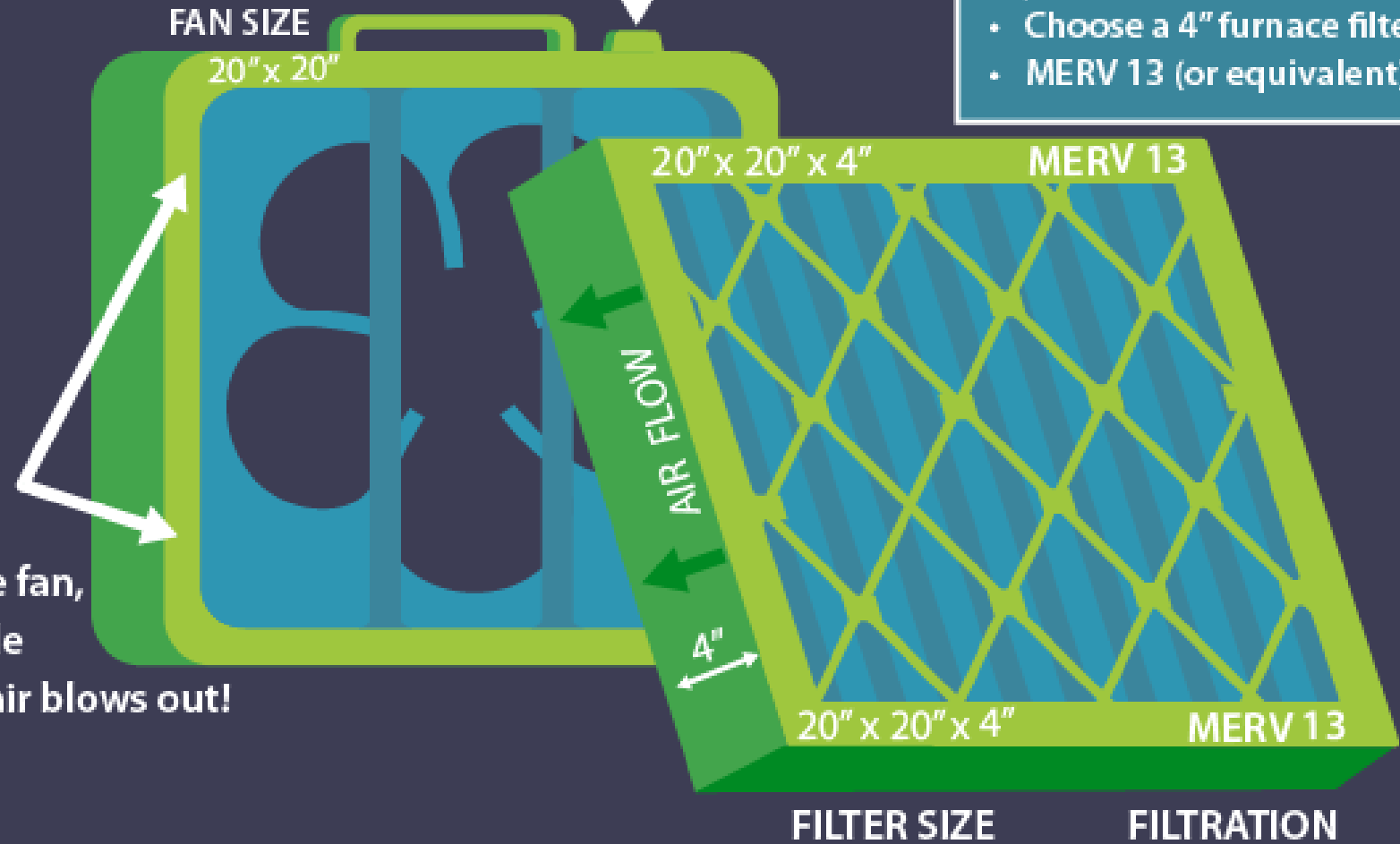
DIY Filtration

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Control located on
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- Choose a 4" furnace filter
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Attach the filter to the
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NOT the side
where the air blows out!



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