

Covid-19 exposes the gaps in infection prevention and control

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Editorial

The pandemic caused by SARS-CoV-2 has stripped away complacency over current knowledge in areas spanning medicine, soft sciences, ethics, behaviour and public health.¹ Covid-19 has held a mirror up to the world and forced us to evaluate vulnerability and societal worth. It has also highlighted how little we really know about controlling infection.² Even spread of the human immunodeficiency virus (HIV) did not ignite public concern quite the way this one has, presumably because HIV does not fly through the air. This novel pathogen has exposed gaps in an evidence base that stalled last century, thanks to antimicrobial chemotherapy and vaccines.³

Perhaps the most obvious deficit is the confusion and conflict over what actions are needed to protect people from acquiring the virus.^{2,4} Admittedly, the science of infection prevention and control is relatively 'new', only emerging in the late 1950's, but a pandemic that kills people has ignited a tsunami of interest in basic hygiene.³ When did we last hear politicians telling us to wash our hands? Or clean surfaces? How often do we see public health messages on the streets (Figure)? And, in a parody of isolation, a 'lock down' of people in their own homes? In their defence, governments have had little choice but to rely upon a long neglected database of research papers on viral epidemiology and transmission, most of which were written years ago.^{5,6} 21st century living has been grounded by a tiny piece of single stranded RNA.

For the first few months of the pandemic, Australia successfully managed to clamp down on Covid-19. However, there is now a burgeoning second wave in Victoria, with more than 9,000 cases confirmed in July - about half of Australia's total since the pandemic began. At the time of writing, there have been the worst case numbers yet (600-700 cases/day).⁷ The numbers are higher than those modelled by health officials this deep into the lockdown. Outside Australia, Hong Kong is experiencing a third surge – perhaps a lesson to the rest of the world.⁸

At first sight, it seems as if the virus has spared its worst pain on countries located in an equatorial belt around the world. By coincidence, many of these countries also lack the healthcare structure available in wealthy countries.⁹ As the pandemic unfolds across the world, many have expressed concern over the impact on resource-poor countries where

decisions might have to be made over who lives and who dies.¹⁰ Indeed, the apparent sparing of equatorial Africa and other low income countries might only be due to the fact that the virus has not yet gained a hold; or more likely, the true scale may be hidden because of a lack of testing and issues with data.¹¹ Given that not all poorly resourced countries have escaped overwhelming rates lends weight to this premise.

How can infection prevention and control help quell transmission? Top of the list is hand hygiene, in any shape or form; then cleaning; screening; surveillance; and a plethora of physical barriers against airborne emissions, including masks, isolation and ventilation.^{3, 4} Other than hand hygiene, which has already achieved some global flag waving, these traditional prevention props have not achieved widespread recognition outside healthcare. Indeed, all the interest in 'dirty hospitals' evaporated once the so-called golden staph disappeared from the front pages.^{12, 13} But simple as they are, basic hygienic activities keep people safe from infection, inside and outside hospitals. Before the advent of antibiotics, scientists wrote about cleaning; healthy houses; sunshine; and fresh air, natural resources that can protect everybody.¹⁴

Consider the debate over aerosol vs droplet. WHO had little choice but to derive their Covid policies from papers written in the 1930's.^{5,6,15,16} The science of airborne transmission is well and truly on the global stage after years of neglect and that has to be a good thing.⁶ But the gold standard evidence required to prove the mode of transmission for any respiratory virus (the inviolable Randomised Controlled Trial demanded by Cochrane Reviews and WHO) is not available. It may not ever be available. Right now, we don't even know the infectious dose, let alone the chief mode of transmission. Convincing policy makers of the risk from short-range aerosol is reliant upon super spreading events and *in vitro* work with surrogates. Yet history tells us that virus-laden particles in the air spread infection and confirming this is probably only a matter of time.^{14, 15, 17} There are good reasons why we should wear masks in contained indoor venues and wear them correctly. When there is no evidence, something we are used to in infection control, one should always employ the precautionary principle for everyone's sake.

Infection prevention staff freely acknowledge the lack of evidence for most infection control activities.^{3, 18} Many practices remain highly dependent on expert opinion or before-and-

after studies ('We Did This and It Went Away'). In fact, the usual place for 'infection control' hovers just above the bottom of the healthcare agenda, probably because cleaning and germs do not usually tickle managerial fancies.¹⁹ It is quite difficult to cost something that doesn't happen, so safeguarding resources for infection prevention has never been high priority.²⁰ Plus, funding opportunities for basic research remains lamentably low. Until now, most people weren't much interested in opening windows, let alone altruistic hygienic behaviour.^{3, 20-22} But this has all begun to change.

The pandemic has compelled us to re-examine the chain of transmission in more detail than ever before, including a revival of studies performed years ago.⁴ We may not know exactly where the virus is or how it spreads, but infection control champions have studied transmission for years, spurred on by impending antimicrobial resistance.^{3, 20, 22} After only a few months, SARS-CoV-2 has taken our message and branded it all over the world.²³ Very timely, one might add, but it is a shame that it needed a pandemic to expose the holes in our specialty. Perhaps we might now get the support for controlled studies on wiping over surfaces, building design or tracking airborne particles across a crowded room. Studies that should have been done years ago and never were.²⁰ After all, another pandemic is inevitable and exactly the same principles will apply. Covid-19 has reshaped the society in which we live and kick started global interest in some of the most basic interventions in the infection prevention armoury.²⁴ It's a lesson that we should not have needed.

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