JOHN DWYER. Exploring COVID-19 controversies

Posted on 10 April 2020 by John Menadue

How do we safely ease social distancing restrictions and reignite our economy?

We are in a far better situation than most countries as we consider this truly important question.There are some danger signs emerging however, as there is palpable pressure from many quarters to prioritise economic rather than health considerations and numerous grumblings about living in a 'police state'. An injudicious rush to reduce current restrictions that might see us forced to reinstate them as new infections increased, would represent a disastrous policy failure.

There is near universal agreement that decisions about easing restrictions should be based on local data derived from a truly comprehensive testing program to determine the prevalence of COVID-19 infections in the community and our capacity to successfully manage the tracing and isolation of those who have been in close contact with a person known to be infected. The task is more important and more difficult because community infections are occurring from contact with individuals who are infected and infectious but not ill. (asymptomatic carriers)

As all must know by now we have an exquisitely sensitive test for the detection of virus in nasal and throat swabs. Obtaining the samples puts the tester at risk so protective equipment is required. To date testing has been rationed as the provision of the reagents needed for the test, the protective gear and even the cotton swabs required has been inadequate to meet demand. We have had no choice but to focus our testing on those with severe symptoms of what could be a COVID infection, travellers, health workers, nursing homes and known contacts of an infected individual. *This weakness in our ability to maximise our harm reduction from this epidemic has got to change*.

We are hearing positive news about increasing our testing capacity, the matter is truly urgent. Countries that have had the most success in curbing their epidemic have done so on the back of data obtained from hundreds of thousands of tests including random testing across their communities. We are spending a staggering 130 billion dollars to prop up our economy. We may need to spend a hundred million dollars for the test kits and the infrastructure needed to implement analyse and apply the results from such tests across the nation. If in so doing, we reduced the demands on the economic stimulus program it would be money very well spent.

Recently we have been identifying 'hot spots', a locality where, despite social distancing restrictions, a cluster of new infections has been identified and continued spread of virus in the area is to be expected. Much media attention has been given to one such spot in the Bondi area. Contact tracing is of course being pursued but not with the thoroughness the situation deserves. The reduction in new cases being reported in the last few weeks suggests that, with social distancing, the number of individuals an infected person is likely to infect has fallen from 3-4 to 1-2. At this rate we can anticipate that contact tracing and focused testing of hundreds of local residents can cool the 'hot spot'. We must expand our testing capability to be able to take this approach. In a number of countries one's mobile phone data is used to investigate likely contacts and in the UK "ping" data is being used to track the movements of infected individuals prior to diagnosis. Some countries are providing apps to self report respiratory symptoms to a central agency that would then arrange for testing.While I can hear the cries of 'police state', surely we should use every evidence based tool available to us. Certainly we want the capacity to test all cases of 'a cold' like illness reported to our doctors.

As a relevant aside the ‘hot spot’ reality brings up the question of mask wearing in such areas. Our thinking about wearing masks in public in this age of COVID has changed. The CDC in the US is now recommending that all Americans wear masks in public based on evidence that masks minimise the risk of cross infection even from asymptomatic carriers. Respected scientists have demonstrated that, in infected individuals, even normal conversation results in infectious amount of virus entering the surrounding air. We have a chronic shortage of masks in Australia (again we have news of new supplies coming) and have prioritised distribution to health care workers but masks should be made available in postcodes with ‘hot spots’.

Now for some Immunology, attention class! After infection with COVID-19 viral spreading occurs within hours and is readily detectable with the test discussed above three days after infection. Symptoms typically develop five and a bit days after infection (If they are going to develop) and resolve between 10 and 14 days after infection. The symptoms that develop around day five result from the release of chemicals associated with the immune system responding to the infection. Most of this early response is generated by T cells (so called because their capacity to recognise and attack foreignness occurs in a gland in our chest called the Thymus gland).

As infected cells are killed that part of the immune response subsides but other immune cells, B cells (B for bone marrow derived) make antibodies that can bind (key in lock fashion) to surface structures of the virus that prevent it from infecting cells. It is the presence of these antibodies that provides us with immunity against further infection. In some cases these specific antibodies persist for many years but in other cases they disappear after a few months. The first antibodies produced (Immunoglobulins, Ig for short) are big molecules designated ‘M’ that only last a few days. Antibodies designated ‘G’ take over and these are the guys we want to hang around. In a major advance in our attempt to understand the immune response to COVID-19 tests have been developed to allow us to measure IgM and IgG antibodies to the virus. The available tests are in the last stages of quality testing in Australia and we hope to use them in the near future.

The use of such tests, which analyse blood from a finger prick, tell us that the owner of the sample has been infected with COVID-19. If IgM predominates infection was recent. The test does not tell us if the donor of the blood is still infected. That is why exciting data will be obtained by simultaneously performing the test for the presence of virus and the new antibody test. On the very likely but not as yet proven likelihood that IgG antibodies to COVID-19 are protective, important research protocols are asking if such antibodies harvested from individuals who have recovered from an infection can help seriously ill patients still struggling with active infection.

With these tests we should soon be able to test reasonable assumptions. Are individuals with a negative virus test and a positive IgG test cured and immune and therefore able to be excused from social distancing requirements? If such an individual is a healthcare worker can we safely use that persons skills to treat patients? How long does the specific IgG persist in our blood after infection. This is important to know for many reasons including the necessity or otherwise of immunising such a person when we have a vaccine. Certainly vaccination should be given to those whose IgG disappears.

For many weeks/months more we will have arrivals from overseas quarantined for two weeks, very expensive, very frustrating and non-productive. We can now test the presumption that if you have no virus detected after one week of isolation you are not infected. If you have IgG antibodies to the virus do you need quarantining at all? I can envisage future travellers to Australia presenting their passports and IgG test to Border officials.

If the studies described are implemented and we find that asymptomatic carriers in the community are few and far between and we have contact tracing 'squads' resourced and ready to pounce on any new infection detected, we can confidently but gradually remove some of the restrictions now mandated. Testing would need to continue to insure that if more infections were occurring we would have early warning of this.

Our post COVID world will be a very different one. Working at home will be the new imperative, large gatherings will be taboo for some time, social distancing 'norms' will change architectural design etc, etc. 'Fortress Australia' will need to exist for a long time as we are undoubtedly going to be surrounded by countries experiencing terrible epidemics after ours is under adequate control. Hopefully we can help our neighbours. Unfortunately it appears that for many less developed nations it will take the development of an effective treatment or a vaccine to arrest their epidemic.

So the big challenge we face in our attempts to implement the above tactics involves the provision of the testing capacity we need and the crucial logistics to support the program. Let's not talk about removing restrictions till we have the necessary journey to that end in hand.

If you are over 6 months of age and reading this and have not done so please have a flu shot tomorrow.

Professor John Dwyer is an Immunologist and Emeritus Professor of Medicine at UNSW.

From Pearls and Irritations