

The immune system's influence on sickness behaviour

August 30 2016, by Olivia Carter



Max all wrapped up and not going anywhere shows all the signs of Sickness Behaviour.

It is hard to find the words to describe how I feel at the moment because my brain is only working at about 10% capacity. At least I made it to work today. This is an improvement on last week, when I decided to stay home after waking up exhausted with a warm and unpleasant throbbing pressure spreading into my eyeballs and across my sinuses.

I don't know exactly what flavour of miscellaneous virus I currently have, but I am also sure it doesn't really matter much anyway. My symptoms of coughing, mild fever, loss of appetite, lethargy and

generally feeling crappy represent the familiar and generalised response of the body to the countless viruses responsible for cold and flue like symptoms experienced by most of the population every winter.

This symptom cluster is now often referred to as "sickness behaviour," and is something I have been meaning to write about for a while because it is such a big part of my family's life.

I should clarify that overall we are an extremely healthy bunch, but it is simply impossible to avoid catching different things with three kids exposed to the germ smorgasbord provided by their three different day-care/kinder/school environments. And that's to say nothing about my own daily exposure to the diverse university student and staff population.

There is now increasing evidence that the wide range of symptoms that are frequently experienced with illness reflects a coordinated response to molecular products – cytokines – associated with the activation of the body's immune system.

It now appears that there may be specialised processes in the [brain](#) that detect elevated levels of cytokines and then trigger the subsequent full range of effects that sickness can have on a person's subjective experience and behaviour:

- Fever
- Increased sleep and general lethargy
- Loss of interest or motivation for usual activities
- Increased pain sensation
- Reduced appetite
- Depressed mood
- Decreased social interaction
- Impaired concentration

While the existence of sickness behaviour is not particularly controversial – most of us will have had personal recent experience with it – the exact mechanisms and pathways underlying these responses remain a mystery.

Based on the obvious overlap in symptomatology, a few have suggested that impaired, heightened or persisting sickness behaviour may have some role to play in more severe clinical conditions such as major depression and chronic fatigue syndrome. However, the evidence for these links is still very unclear.

Other researchers have asked why the body would have a distinct system apparently designed to make us feel so horrible. Particularly if it does turn out to be true that these symptoms are really just an indirect form of "collateral damage" that is separate from the front-line attack of the immune system on the underlying infection.

This is a hard question to answer based on detailed scientific evidence. It is however, easy to imagine a possible evolutionary benefit to one's family and local community if the level of social engagement of sick individuals was reduced through this type of self-imposed quarantining mechanism.

The more specific symptoms of pain and fever also require further investigation. [A recent review](#) published in the journal *Brain, Behaviour and Immunity* asks whether fever and sickness behaviour is friend or foe.

It concludes that fever and sickness behaviour are likely to have evolved to protect organisms and improve outcomes. However, it also finds no direct evidence that using over-the-counter medications to reduce the symptoms of pain and fever impairs recovery or causes any other adverse effects (beyond the mild effects such as increased drowsiness and nausea sometimes caused by these medications).

Given the huge economic cost in terms of lost productivity, there are clear reasons why better management of the symptoms of sickness behaviour is important.

The World Health Organisation (WHO) estimates that between [5-10% of adults and 20-30%](#) of children are infected by the influenza virus every year. This, of course, does not include the less serious versions of the common cold that effect the community at even higher rates.

It is not surprising, then, that the economic costs of colds and flu to Australia is informally estimated at between A\$30-50 billion annually (in the last five years no formal estimate has been conducted for Australia).

From the financial perspective, it is clear that the sooner people can get back to work the better. Unfortunately, the ability to manage the symptoms of sickness behaviour before the underlying illness has been overcome will only increase the likelihood the underlying bug will be transmitted to family, friends and colleagues.

This is why many government and industry bodies now strongly encourage, and often support the cost, of [annual flu vaccinations](#). It is definitely a case of prevention being better than a cure.

Back at our house, I seem to be through the worst of the symptoms. However, based on the resent conversation I had with my 4-year-old, I fear it might be a while before sickness behaviour is done with our family

Me: *What would you like for breakfast?*

Max: *Nothing*

Me: *Do you want to go to the park?*

Max: *No I don't want to go anywhere*

Me: *What would you like to do then?*

Max: *I want to do a puzzle. But when I am sick I only do one piece and you have to do the rest.... when I am sick.*

Me: *When do you think you will start feeling better?*

Max: *After all of the numbers on the clock run out*

Me: *You mean at the end of time?*

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