



HIGHLIGHTS

- The spread of the H1N1 virus has led to concerns that the disease will have a negative impact on economic activity.
- While the impact on human lives should not be understated, at the current stage it remains unlikely that the disease will reach a large enough scale to have a noticeable effect on aggregate economic activity.
- In the unlikely case of a more severe outbreak, increased employee absenteeism due to illness could have a negative (albeit temporary) impact on hours worked and therefore economic activity.
- Demand within certain industries such as air transportation, accommodation and arts and recreation would also be negatively impacted though the shock should prove fleeting.
- Overall, a pandemic with similar characteristics to the 1957 pandemic could result in a hit to real GDP of less than 1%, while the highly improbable case of an even more severe outbreak could result in a shock to GDP of up to 3.0%.

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POSSIBLE ECONOMIC IMPACT OF H1N1

In addition to serious concerns about the loss of human life as a result of the spread of H1N1, concerns have been raised about the impact of the disease on economic growth in Canada and the United States. At the time of our Quarterly Economic Forecast in September, the World Health Organization (WHO) had already declared the H1N1 to be a pandemic, meaning its spread had been tracked across countries and regions. The spread of H1N1 was considered in our forecast as a possible downside risk to the economic outlook, but was not expected to actually alter the outcome for GDP growth in a noticeable way. This continues to be our position.

Nonetheless, in an effort to understand what conditions would need to be realized to turn a risk into our base-case forecast this note considers the impact of a more severe outbreak of the disease. Like much in economics, light can be shed on the possible effect of the pandemic on the economy by considering its impact on the forces of supply and demand. All told, a pandemic similar to those experienced in 1957 and 1968 would likely have a fairly limited impact on overall GDP growth and one that would likely be made up by a rebound in activity once the illness has run its course. In the unlikely case of an even more severe pandemic – more akin to the “Spanish flu” of 1918 – a more profound impact on economic activity would be expected as a reduction in labour hours worked as a result of increased mortality would, over time, lead to a requisite decline in economic output.

Background on Influenza and H1N1

According to the World Health Organization (WHO), seasonal flu (non H1N1) varieties, infect roughly 5-15% of people. For most people flu symptoms will last a few days, but in the very young and the elderly and those with pre-existing medical conditions, the disease can prove fatal.¹ While the impact of the seasonal flu on the lives of those impacted by the illness should not be discounted, variance in the severity of the flu from year-to-year is too small to be picked up in aggregate economic data.

In the last 100 years there have been three major influenza pandemics. Of the three, the most serious was the 1918 flu, which infected close to 30% of the world’s population and is estimated to have caused close to 50 million deaths (3% of the global population). Mortality rates were particularly high in developing economies but even in the United States the 1918 flu is estimated to have resulted in close to 500,000 deaths and an overall mortality rate of around 0.5%. The last two influenza pandemics, which took place in 1957 and 1968, while having similar rates of infection as in 1918 featured a much lower overall mortality rate.

The WHO has named the H1N1 virus a pandemic; making it the first influenza pandemic since 1968. While we expect public health efforts to be successful in mitigating the impact of the pandemic, we can use history as a guide to the possible outcome of a more severe spread of the disease. This note draws on research on the economic impact of pandemics and considers two possible negative economic scenarios as a result of H1N1 – the first scenario assumes that the spread of the disease reaches rates of infection and mortality similar to the influenza pandemics

of 1957 and 1968, and the second a pandemic with a higher mortality rate more inline with that experienced in 1918.²

Shocks to supply

The spread of H1N1 could impact the economy through both supply and demand channels. On the supply side, higher incidences of illness and death would act as a shock to the number of aggregate labour hours worked in the economy.

The impact on hours worked depends importantly on assumptions about the rate of infection and mortality. Under a 1957-68 scenario, morbidity rates (the rate of incidence of the disease in the population) could increase to 30% but mortality rates would likely remain low enough so as to have a negligible impact on total hours worked. For the vast majority of those infected with H1N1, it is reasonable to expect symptoms to last no longer than seven days, so the impact on hours worked will be relatively short-lived. In addition to higher infection rates leading employees to stay away from work, higher absentee rates could also arise due to employees staying home to care for family members and possible precautionary absenteeism by employees hoping to lower their chance of infection by avoiding the work place.

In order to assess the possible impact of increased absenteeism on output, it is necessary to make some simplifying assumptions. While the typical flu disproportionately affects children and the elderly, a more severe case of H1N1 may be assumed to impact individuals across the age spectrum. An assumption that 30% of the workforce become infected with H1N1 and would have to miss a full week of work as a result of the illness would cut total hours worked by 0.6%.³ Typical estimates of the immediate change in output as a result of a 1% change in hours worked are 0.6, which implies a drop in real GDP as a result of the influenza of less than 0.4% over the whole year. However, given the temporary nature of the illness the impact should be expected to be even smaller. Many businesses will have contingency plans to avoid the disruption in activity, implying a smaller sensitivity of output with respect to hours worked. In all likelihood, at least a portion of the work will be made up by employees who remain on the job. And, given advances in information technology since the outbreaks in 1957 and 1968 allowing employees to readily work from home, it is reasonable to expect an even smaller disruption to economic activity today given the same incidence of the disease. Given these offsetting factors, the impact on aggregate economic activity should be expected to be no greater than 0.3%.

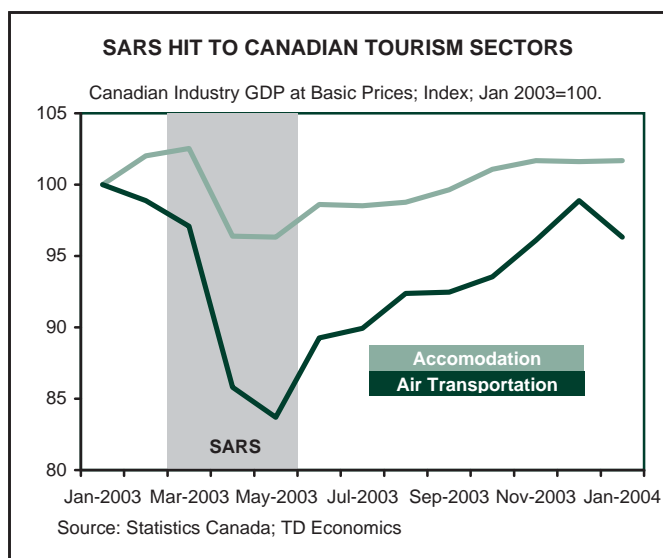
In a more severe scenario, akin to the 1918 pandemic, mortality rates would rise enough to have a noticeable impact on aggregate hours worked, and therefore necessarily

involve a higher overall economic impact. Assuming a mortality rate of 0.5% (approximately the same as the 1918 pandemic) that has the same impact on the labour force, this would result in a 0.5% reduction in total hours worked in a year. Using the same estimated impact of the change in hours worked to overall GDP as above, this would imply an immediate loss to real GDP of 0.3%. Adding in the loss in hours from illness would therefore push the total impact on real GDP to -0.6%. Of course, a more severe outbreak of the disease, accompanied by rising fatality rates would also likely increase the perceived risk of engaging in social situations and may be expected to increase the level of precautionary work-place avoidance. Based on analysis of the social density of occupations in North American economies, James and Sargent (2007) estimate that additional workplace avoidance could subtract an additional 0.15% from real GDP over the course of the year.⁴

As these estimates are on the annual level of GDP, and since the shock would likely take place within one quarter, the impact of the mild case in quarterly growth rates would be around -1.2% (4.8% annualized) and in the severe case would be around 3.0% (12.0% annualized). Moreover, in the severe case, in addition to the immediate shock to output, a permanent reduction in hours worked as a result of higher mortality would lead to an additional longer-term drag on output growth until the capital stock adjusts to the new supply of labour.⁵

Shocks to Demand

Besides the supply impacts, a larger than expected outbreak of H1N1 would also likely have an impact on demand that would become more severe along with the severity of





the outbreak. Shocks to demand would disproportionately affect certain industries, particularly transportation, accommodation and food industries and arts and recreation. On the other hand, there would be some offsetting effects, such as greater demand for healthcare products and home cooked meals.

In the case of a modest pandemic, the experiences of 1957 and 1968 could be instructive. For the United States, the 1957 pandemic coincided with a fairly severe investment led economic recession. Nonetheless, as noted by James and Sargent (2007), the savings rate actually fell slightly in the quarter in which the pandemic hit in 1957 and was stable in 1968, which seems to indicate little change in spending behavior as a result of influenza.

The last major disease outbreak to hit either Canada or the United States was the outbreak of SARS in Toronto, Ontario, Canada. The impact of SARS is evident in declines in monthly GDP by industry data, particularly within the accommodation and air transportation sectors. Overall real GDP declined in Canada by 0.5% (annualized) in the second quarter of 2003, a decline that has been attributable in part to the impact of the SARS outbreak. Nonetheless, this downturn in the Canadian economy can not be entirely laid at the feet of SARS and as referenced by James and Sargent (2007), at least a portion of the decline was due to non-SARS related factors such as the appreciation of the Canadian dollar and travel fears in the U.S. as a result of the outbreak of the Iraq War.⁶

All told, estimates of the overall impact on GDP as a result of demand side factors vary considerably by study and initial assumptions. On the low side, James and Sargent (2007) estimate a mild-scenario would have a negligible

impact through demand channels on overall economic activity (-0.1%), while a more severe scenario would result in a 0.4 % contraction.

At the higher range, a 2006 study by the Congressional Budget Office (CBO) estimates an overall hit to U.S. real GDP as a result primarily of a reduction in demand for entertainment, restaurant and accommodation services of -0.5% for a mild pandemic and -2.0% for a more severe pandemic.⁷ As in the case of the shocks to supply, shocks to demand should prove temporary and as income will continue to flow through the period, a temporary jump in the savings rate would be expected to be accompanied by a rebound in spending activity in the months and quarters that follow the dissipation of the disease.

Bottom Line

Fears about H1N1 have heightened concern over the state of North American economies. While the impact on human lives should not be understated, at the current stage we do not believe the disease will reach a large enough scale to have a noticeable effect on aggregate economic activity. Nonetheless, should the spread of the disease prove worse than currently expected, an influenza pandemic similar to those of 1957 and 1968 would also likely prove to have a relatively mild effect on overall economic activity. The total economic impact of this type of pandemic could be a negative shock to annual real GDP growth of between 0.4 and 0.8 percentage points. And while the prospects for a more severe outbreak of the disease are in our view extremely low, a scenario closer to the experience of 1918, could be expected to have a larger impact on GDP, somewhere in the range of 1.5 to 3.0%.⁸

ENDNOTES:

¹ <http://www.who.int/mediacentre/factsheets/2003/fs211/en/>

² See James, S., Sargent, T. "The Economic Impact of an Influenza Pandemic." Department of Finance Working Paper 2007-04 for a more full discussion of economic impacts of a 1957 and 1918 style influenza pandemic on North American economies.

³ In a 52 week year the average U.S. employee works 33 hours a week. A loss of one week of work for 30% of the workforce implies a cut in total hours worked of $52 - 0.3 = 51.7$. The percentage change in hours worked then is $(51.7/52 - 1) * 100 = -0.6\%$.

⁴ James, S., Sargent, T. "The Economic Impact of an Influenza Pandemic." Department of Finance Working Paper 2007-04

⁵ As per the neo-classical growth model, a shock to labour supply would be expected to push the capital-labour ratio above the level that could be maintained by the level of investment per worker. As a result, in the long-run the initial 0.3% decline in output would rise to a full 0.5%.

⁶ James, S., Sargent, T. "The Economic Impact of an Influenza Pandemic." Department of Finance Working Paper 2007-04

⁷ Congressional Budget Office. "A Potential Influenza Pandemic: Possible Macroeconomic Effects and Policy Issues."

⁸ These estimates are based on simplified assumptions about morbidity and mortality rates and should not be taken as a projection of the actual morbidity or mortality rates as a result of H1N1. For the 1957-68 scenario both the high and low end estimates include a 0.3% reduction in supply as a result of falling hours worked. However, the low end estimate includes a 0.1% reduction in demand and the high end a 0.5% reduction in demand. For the 1918 scenario the reduction in supply is assumed to be 1.0%, while the range for the fall in demand is between 0.5% and 2.0%.



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