Potential for public health success in tackling the hepatitis C virus epidemic

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ABSTRACT
New Zealand and Australia both now have the potential for a major public health success in controlling the hepatitis C virus epidemic. The burden of advanced liver disease and drug-related harm is increasing. However, a new range of anti-viral therapies have become available which offer a potential cure for most people with few side-effects. The epidemic is potentially preventable and hepatitis C is now curable. Although public health strategies for blood-borne viruses have been updated, they fall short of what is needed and should be upgraded with more emphasis on prevention, in order to achieve control of this epidemic.

New Zealand and Australia have a major hepatitis C virus (HCV) epidemic which is receiving inadequate public health policy attention. Currently there is a mix of factors that offer the potential for a major public health success in terms of controlling and even possibly eliminating the epidemic, however health policies would need significant ongoing improvement to achieve this. HCV imposes a substantial burden on the population and the health system. Evidence indicates that approximately 54,000 New Zealanders and 230,000 Australians have chronic HCV and many will develop liver cirrhosis and hepatocellular carcinoma (HCC). This epidemic has spanned decades and is international with estimates of up to 170 million people worldwide having HCV infection.

Current situation
HCV infection is potentially preventable and also in 2016 new direct acting anti-viral medicines (DAAs) were publicly funded in both New Zealand and Australia. These DAAs are potentially a game-changing improvement as they offer cure rates of 95% with few side-effects, with only 12 weeks of treatment, much of which can be provided in primary care. This contrasts with previous interferon-based treatments that had poorer outcomes, major side-effects which led to adherence problems, an HCV community view that the “treatment was worse than the disease” and consequent low uptake. Hence the new DAAs offer a major step forward and they are rapidly gaining a good reputation among people infected with HCV who are now hearing good news stories from their peers who have experienced the new treatments. But until 2016, treatment uptake was low. In Australia, 1 to 2% of the chronically infected initiated specific HCV treatments each year, while in New Zealand fewer than 10% had accessed treatment by 2014. Treatment uptake has improved following the public funding of DAAs in 2016 in both countries. Pharmac reported that by July 2017, 2,000 people in New Zealand had been treated with the new DAAs. Australia has made more progress, as from March to December 2016 more than 32,500 people had initiated treatment with DAAs.

There is some opinion that a reduction in stigmatisation is now enabling more people to present for treatment.

New treatments
Recommended treatments are genotype specific. In both countries the prevalent genotypes (Gt) are Gt1 (50–55% of cases) and Gt3 (35–40%). Access to the new DAA medicines is better in Australia where DAAs were approved and publicly funded.
in 2016 for both Gt1 and Gt3. New Zealand is currently behind as DAAs were publicly funded in 2016 for Gt1, while DAAs for Gt3 are not yet publicly funded unless a special case is made on an individual patient basis.\(^4\) Importing a DAA privately directly from the drug company would cost approximately $NZ75,000, so some people have been accessing a buyers club to obtain the medicine at a more affordable private cost of between $NZ1,600–4,000\(^6\). The high prices proposed by the drug companies for government funding for the new DAAs has been a barrier to their being adopted sooner.

For most people the new DAA medicines can be prescribed and managed in primary care, by a GP in consultation with a specialist. However, if the infection has progressed to liver cirrhosis, treatment requires specialist consultation and management, so there has been considerable effort to develop treatment guidelines and coordination between primary- and secondary-care services.\(^3,4\) Recent trends to encourage more treatment in the primary care sector are creating more potential for widespread early intervention and prevention of complications and costs of advanced liver disease.\(^3,5\) Although there is some evidence of possible recent declines in HCV incidence and prevalence in some countries\(^10\) the overall burden of liver disease is increasing, which is placing increased pressure on specialist hospital care, liver transplants and public health resources.\(^5,11\) Specific strategies are required to control and reduce this disease burden.

Causes and prevention

In recent decades, 95% of new HCV infections in western countries have been caused by injecting drug use and sharing of injecting equipment.\(^11,12,13\) Other risk factors include previous blood transfusion, history of imprisonment, tattoos, body piercing, contact with blood and blood products. Studies suggest that in Australia and New Zealand, immigration and mother-to-child transmission account for relatively few cases.\(^10\) Sexual transmission is not significant for HCV, except where there is HIV co-infection. The epidemic varies in different parts of the world, particularly in less developed countries with less resourced health systems and where safe blood supplies may not be available.

Both voluntary and health sector agencies have invested considerably in harm reduction strategies, generating blood safety awareness, the importance of safe injection practices, needle exchanges and avoiding sharing of needles. However, there are recent reports of increases in injecting drug use and associated harms. In the US, studies indicate from 2006–12 there was a nationwide increase in HCV infections and injecting drug use.\(^14\) This has occurred in the context of a nationwide epidemic of opioid use and drug overdose deaths.\(^15,16\) In Australia, New Zealand and the US, there is concern over the increasing injecting of oxycodone, other prescription opioids and methamphetamine.\(^17–22\) In Australia, studies indicate there has been an increase in opioid prescribing and in opioid poisoning since at least 2002.\(^17,19,21\) Similar trends have been reported for the UK, US and Canada.\(^18\) Hence, the evidence of any possible reduction of HCV incidence is at best uncertain and in fact it indicates that drug-related harm is increasing. Therefore, continuing investment should be made in policies and services aimed at reducing such harm, including HCV infections.

People with a history of injecting drug use (PWID) are generally on lower incomes, are often difficult to engage in general primary care services, tend to be marginalised and stigmatised. Similarly, surveys of prisoners and ex-prisoners in both Australia and New Zealand have found HCV prevalence ranging upwards from approximately 25% with higher prevalence in those with a history of injecting drug use.\(^10,23\) Prevention of drug-related harm and blood-borne viruses (BBV) requires multi-faceted harm reduction policies, including alcohol and drug services, needle exchanges and creating much greater awareness of BBVs and how to prevent them. This includes a collaborative partnership with voluntary agencies who are able to engage and communicate with marginalised people such as PWID, prisoners and ex-prisoners.\(^15,24\) Regrettably, in New Zealand voluntary agencies with these aims have been operating with very limited government funding. As those infected with HCV tend to have lower incomes, widening
access to treatment needs to include reducing financial barriers to access such as patient copayments, currently around an average $40 per consultation.

Discussion and conclusion

The outlook for people with chronic HCV infection has improved dramatically in 2016, with improved access to effective medicines that offer every likelihood of a cure for most. However, in both Australia and New Zealand, many infections remain undiagnosed, the majority have not yet been treated and the burden of chronic liver disease is growing. This will place increasing strain on health services. An estimated 5–10% of cases of chronic HCV develop to cirrhosis within 20 years from the time of infection, and approximately 3–5% per annum of those develop HCC. More rapid rate of progression to advanced liver disease is associated with other factors such as coinfection with hepatitis B virus and/or heavy alcohol use. Cirrhosis involves complications that necessitate hospital admissions, and a portion will require liver transplants. This disease burden is potentially preventable and with specific public health policies the HCV epidemic could be contained and reduced. The key elements that are needed include:

- Recognition and willingness at higher levels of government and the health sector;
- Collaborative harm reduction policies to reduce drug-related harms;
- Expanding access to diagnosis and treatment, including drug and alcohol services and primary care. Education of primary care professionals is important. Nurse-led HCV clinics and ways of paying for them should be promoted. Treatment for prisoners and ex-prisoners should be provided. Cirrhosis necessitates regional networks with capacity for specialist management;
- Investment and public funding of DAAAs for all HCV genotypes, with copayments affordable for lower income people;
- Greater investment in prevention and communication strategies to address key populations and including awareness programmes through needle exchanges, alcohol and drug services, prisons and rehabilitation services;
- Management of the overall strategy at national and regional government levels, including regular review of key indicators.

Both Australia and New Zealand have published HCV strategies, with much emphasis on improving the coordination of treatment. Shorter courses of treatment, fewer side-effects and options for general practitioners to be involved with treatment all offer the potential to increase capacity and numbers treated. Australia is making more progress in-so-far that it has achieved a higher diagnosis rate, with an estimated 80% of infections having been diagnosed. In contrast, only approximately half of infected New Zealanders have been diagnosed. Australia has also funded access to new DAA treatments for all HCV genotypes, whereas in New Zealand access to DAAs is currently limited to patients with genotype 1. Progress in Australia has prompted discussion that it could potentially be the first country in the world to attain the World Health Organization's goal of eliminating viral hepatitis as a public health threat by 2030 (defined as a 65% reduction in mortality and a 90% reduction in new infections compared with the 2015 baseline).

However, improved control of the HCV epidemic requires preventive strategies which engage with higher risk populations. Regrettably, government strategies in both New Zealand and Australia fall short on prevention. It would be a significant advance to get more people through treatment, but unless new infections can also be prevented, the HCV epidemic will continue to impose an increasing burden on the health system. A key to prevention is to reduce infections associated with injecting drug use, while also addressing other risk factors such as tattooing, body piercing and barriers to access. There is good evidence that needle exchanges have been effective in helping to control both HIV and HCV and that they are perceived as engaging successfully with PWID, who tend to be marginalised and often do not engage with conventional health services. Government
strategies need to emphasise greater collaboration with such community agencies who can effectively engage higher risk populations, convey preventive measures and assist with accessing healthcare. In Australia, advocacy by non-government agencies has resulted in more funding and emphasis on public awareness and case detection.

Gane and colleagues have modelled the potential for HCV infection to be eliminated from New Zealand within our lifetime. Access to the new DAAs is a key ingredient but they also noted the requirement for ongoing measures to prevent new infections, improve community awareness, increase detection and to provide programmes for people at high risk of infection such as PWID and prisoners. Australian experts have also recommended similar requirements. Agencies working with these populations are not currently able to access sufficient funding to provide adequate ongoing preventive services.

There is potential for a major public health success in controlling the HCV epidemic, but this will require investment in an improved, coordinated, collaborative strategy, including renewed emphasis on prevention as well as the above key ingredients.

Competing interests:
Dr Sheerin is Chairman of the Hepatitis C resource Centre Trust (Te Waipounamu) Inc, which has previously received New Zealand government funding to undertake educational activities to increase awareness about the causes and prevention of blood borne virus transmission.

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