

Endgame: Egypt's path to eliminating hepatitis B and C

Egypt appears to be on the path to successfully eliminating viral hepatitis. Its approach offers lessons for countries in their fight against hepatitis B and C

The scale of infection with the hepatitis C virus (HCV) in Egypt was unlike any other country in the world—in 2015 an estimated 6.3% of the population was living with the virus.¹ With a population of 93m at the time, that amounted to close to 6m people. In comparison, the prevalence of hepatitis B virus (HBV) was much lower, estimated at 1% of the total population.²

The high prevalence of HCV in Egypt can be traced back to a programme that ran between the 1950s and 1980s to combat schistosomiasis, a water-borne parasitic disease that was endemic in the Nile Delta. Executed by the Egyptian Ministry of Health and Population with the advice and support of the World Health Organisation (WHO), 36m injections were administered to more than 6m people. Undertaken almost entirely with unsterilised and pre-used syringes and needles, the programme inadvertently transmitted HCV, which was not well known at the time.^{3,4}

This, combined with weak infection control measures (such as quality controls for blood donations), led to high transmission rates and high prevalence.

Despite high HCV prevalence, the HBV-HCV co-infection rate was found to be just 0.06%, and the geographical distribution of the two infections differed markedly.⁵ Exposure to household members who are HBV positive has been found to be the main mode of transmission.⁶

The impact of HCV and HBV can be assessed on two fronts: the personal effects of the disease and its impact on economies in terms

US\$3.82bn

Estimated economic burden of HCV in Egypt in 2015

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¹ Egyptian Ministry of Health and Population, "Egypt Health Issues Survey 2015", 2015, <https://dhsprogram.com/pubs/pdf/FR313/FR313.pdf>

² Ibid

³ M R Rao et al, "Further evidence for association of hepatitis C infection with parenteral schistosomiasis treatment in Egypt", 2002, BMC Infect Dis, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC139974/>

⁴ C Frank, et al, "The role of parenteral antischistosomal therapy in the spread of hepatitis C virus in Egypt", 2000, Lancet, <https://www.ncbi.nlm.nih.gov/pubmed/10752705>

⁵ S A Ismail, D F Cuadros, L Benova, "Hepatitis B in Egypt: A cross sectional analysis of prevalence and risk factors for active infection from a nationwide survey", 2017, Liver Int, <https://www.ncbi.nlm.nih.gov/pubmed/28481452>

⁶ Ibid

of employee productivity and direct medical costs. Chronic hepatitis is detrimental to a person's quality of life, as they can experience fatigue and depression.⁷ There is a risk of developing progressive liver damage, which can lead to liver cancer or failure. HCV can increase the risk of type 2 diabetes and other health issues too.⁸ Both adversely impact employee productivity through disability and mortality. Specifically for HCV in Egypt, the economic burden was estimated at US\$3.82bn in 2015.⁹ In terms of direct costs, HCV testing and treatment amounted to some 4% of total health expenditure in 2015 (over US\$700m).

The same study shows that treating over 300,000 individuals with HCV each year with antivirals could reduce its prevalence by 94% and liver-related deaths by 75% by 2030. Under this scenario, direct costs would be incurred, especially in the short-term to test and treat.

But when indirect costs are taken into account, the intervention can be cost saving. Between 2015 and 2030, the estimated savings stand at US\$4.6bn for direct costs and US\$26.9bn for indirect costs.¹⁰

Given the scale of the health issue, the response from the Egyptian government has been to craft and implement a national screening programme for chronic hepatitis, focusing on HCV, as well as treating those infected. The programme reached a milestone in May 2019, having screened 50m people across the country in six months. These efforts have been supplemented with infection prevention and control, ongoing surveillance and continued public education to sustain the positive health impact. As many countries in Africa and beyond battle against hepatitis B and C, there are vital lessons to learn from Egypt's experience.

Figure 1: Egypt's national communication campaign on hepatitis C



Key messaging derived from research:

- 1 Get a test for hepatitis C if you have had surgery, blood transfusion or schistosomiasis injections.
- 2 If you have hepatitis C, register your name on the hccv.org.eg website to receive treatment.
- 3 Avoid hepatitis C infection – do not share injection or personal grooming equipment.
- 4 Routine contact with hepatitis C patients does not transmit the virus.
- 5 Avoid unnecessary as well as unsafe injections, and use oral medicine, whenever possible.

Source: World Health Organisation

⁷ A Gomaa, N Allam, A Elsharkway, M El Kassas, I Waked, "Hepatitis C infection in Egypt: prevalence, impact and management strategies", 2017, Hepatic Medicine: Evidence and Research, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5439968/>

⁸ Other health issues may include circulatory diseases, kidney diseases, renal failure, and cancers of the esophagus, prostate and thyroid.

⁹ A Gomaa et al, "Hepatitis C infection in Egypt: prevalence, impact and management strategies", 2017, Hepatic Medicine: Evidence and Research, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5439968/>

¹⁰ C Estes et al, "Economic burden of hepatitis C in Egypt: the future impact of highly effective therapies", 2015, Aliment Pharmacol Ther, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5034818/>

Reaching millions

As part of the Egyptian government's commitment to address this health issue, they formed the National Committee for Control of Viral Hepatitis (NCCVH) in 2006, comprising representatives from the Ministry of Health and Population as well as liver and viral hepatitis experts.

The initial challenge was the state of public awareness. Three national studies had concluded that there were serious knowledge gaps in people's understanding of hepatitis C.¹¹ The response was to roll out a multi-channel mass education campaign, with clear messages for the public on risk factors (for those who have had surgery, blood transfusions or schistosomiasis injections), transmission modes (including reused syringes and shaving razors) and registering for testing.

In addition to other government initiatives to reach those in rural areas, Gamal Shiha, chairman of the board of trustees at the Egyptian Liver Research Institute and Hospital, and his colleagues at Mansoura University, launched the "Educate, Test and Treat" programme. Implemented across 73 villages, it was designed to educate people about viral hepatitis and start treatment



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Dr Imam Waked, professor of hepatology, National Liver Institute



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rapidly. Education needs to be the first step, advises Dr Shiha. "If you go to a village without talking to the people and say 'please come and be tested', 50% will not come. But after we provide some information, people in the villages were welcoming."

"We spent a lot on the media campaign but it was important to encourage people to come for testing," says Wahid Doss, chairman of the NCCVH. The ambitious screening programme called "100 million healthy lives" cost between US\$250m and US\$300m and was partly funded from a loan by the World Bank.¹² Of the 5m people estimated to have been living with HCV in 2014, 2.5m were treated between 2014 and early 2019, and 1.8m are expected to be treated by the end of 2019. As a result, the prevalence of HCV in Egypt is expected to decline from 7% to less than 1%. "When you cure everybody, there will be no transmission," explains Imam Waked, professor of hepatology at the National Liver Institute at the University of Menoufiya and a member of the NCCVH. "We consider the massive treatment programme one of the pillars of prevention in addition to infection control."

The last mile

At each stage from initial screening, there is a risk of drop-off as people fail to come back for further tests or complete treatment. The problem is most acute in rural areas, given

¹¹ WHO, "Egypt launches national communication campaign on hepatitis C", <http://www.emro.who.int/egy/egypt-events/hepatitis-c-campaign.html>

¹² Reuters, "Millions flock to free tests as Egypt seeks to eradicate hepatitis C", December 3rd 2018, <https://www.reuters.com/article/us-health-egypt-hepatitis-c/millions-flock-to-free-tests-as-egypt-seeks-to-eradicate-hepatitis-c-idUSKBN1O211O>

long distances from testing and treatment centres and high levels of poverty. Layer this with cultural impediments (particularly among women, who are reluctant to leave behind their obligations at home to travel large distances) and it is easy to see why drop-off rates can be high. To reduce the number of visits required, the "Educate, Test and Treat" programme led by Dr Shiha found a way to offer all the tests required to initiate treatment on a single day.

Going forward, a key challenge will be dealing with treatment failures. Even in the best scenarios, cure rates are between 97-98%. The 2-3% treatment failures would translate to about 50,000 patients who will need more specialised treatment that is not readily available in Egypt. To protect against transmissions from treatment failures, adoption of infection prevention and control measures can be effective.

A holistic approach

To eliminate HCV as a public health threat by 2023 requires a well-rounded approach beyond the current mass-screening and treatment campaign. These include a range of infection prevention and control policies, funded through a combination of government



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resources and a loan from the World Bank given to upgrade Egypt's health system, explains Dr Waked.

Injection safety, which addresses an important mode of transmission for viral hepatitis, has improved over the years. A recent assessment by the WHO found that all public-sector hospitals and 98% of private-sector hospitals used needles and syringes taken from a sterile packet or fitted with caps.¹³ To enhance this, healthcare facilities across Egypt will be required to use only auto-disabled syringes by July 2020. Greater adoption of best practice around preparing injections in a dedicated area and cleaning of needles are required.¹⁴

To further strengthen infection prevention and control, blood banks will be conducting more stringent analysis of blood donations.¹⁵ In addition, the WHO's national standards for blood transfusion services are being disseminated across Egypt to ensure that protocols for safe transfusion of blood are followed, complemented by efforts to improve regulatory oversight. This entails the formation of a national blood authority and revising the blood safety law.¹⁶

Figure 2: Infection prevention and control policies in Egypt



Injection safety

Blood safety

HBV vaccination

Source: The Economist Intelligence Unit

¹³ WHO, "Injection Safety Project in Egypt", https://www.who.int/medical_devices/global_forum/3rd_gfmd/AchievementsEgypt.pdf?ua=1

¹⁴ Ibid

¹⁵ Egypt Independent, "World Bank to support health care sector in Egypt with \$530 mn", July 11th 2018, <https://www.egyptindependent.com/world-bank-support-health-care-sector-egypt-530-mn/>

¹⁶ WHO, "Ensuring safe blood transfusion services in Egypt", <http://www.emro.who.int/egy/egypt-events/ensuring-safe-blood-transfusion-services-in-egypt.html>

Prevention measures for HBV have been in place for decades. Egypt began vaccinating infants in 1992, although testing of pregnant women has not been consistent.¹⁷ One study concludes that the existing vaccination programme provides adequate protection.¹⁸ From early 2019, hospitals have been administering the “birth dose”, delivering the first dose of the vaccine within 24 hours after birth (previously the first dose was given two months after birth). As part of the screening and treatment programme for HCV, vaccinations for HBV were also provided.

For further analysis of progress on eliminating HBV and HCV, the government needs to close the reporting gap. To incentivise patients to report on treatment outcomes, the Ministry of Health and Population offered a certificate of cure, which was required to secure employment abroad. This improved reporting rates dramatically to 67%, from 25%; follow-ups over the phone pushed the rate higher, to 75%. Experts we interviewed suggest that all public and private facilities should be reporting into the same database, with a clear link to individual patient IDs.

Sustaining the positive health impact

Looking ahead, health workers and people themselves must remain vigilant for symptoms of viral hepatitis and risk factors for transmission. But the government in Egypt must continue to provide the tools necessary, including frequent training for health workers as conditions evolve and an extended public education programme.

The screening programme accelerated the efforts to reach the millions who were infected, justified by the scale of the health issue. “It required estimating the magnitude of the problem, establishing treatment centres around the country and securing the political will and financing to provide affordable treatment to the people,” describes Dr Doss. But this must be complemented with effective infection prevention and control policies, including injection and blood safety, to reduce transmission. Dr Shiha concludes, “The government’s direction is very good and the commitment makes me happy. My dream is an Egypt, and a whole world, free of hepatitis C and B.”

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¹⁷ I I Salama et al, “Effectiveness of hepatitis B virus vaccination program in Egypt: Multicenter national project”, 2015, World J Hepatol., <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4598613/>

¹⁸ Ibid