Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

other STIs) and have low retention in services, as they do not fit well within traditional models of paediatric or adult medical care. Thus, expanding access to prevention and treatment resources, education, and testing and treatment through adolescent-friendly health services is crucial for the prevention of future HIV and other STI cases among adolescents and young adults.[9]

The prevention of HIV and other STIs among adolescents and young adults needs to address behavioural risk, social determinants, and systems of care. Schools are key locations to reach adolescents through early and comprehensive sex education and school-based prevention and treatment services.[10] Adolescents are deeply influenced by peers; thus, peer interventions through peer educators, social media campaigns, and youth engagement could be effective for future health campaigns. The promise of pre-exposure prophylaxis (PrEP) and rapid initiation of ART after a positive HIV test are important prevention strategies as well. Laws that protect adolescent confidentiality and consent can further mitigate barriers and stigma experienced by adolescents seeking care for HIV and other STIs. Among youth, focusing on behaviour change alone could be perceived as victim blaming or stigmatising sexual health; therefore, integration of comprehensive community-based approaches addressing social determinants of health is essential.

We declare no competing interests.

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Recovery from mRNA COVID-19 vaccine-related myocarditis

Historically, smallpox and anthrax vaccines have been associated with acute myocarditis.[1] Among 790 cases reported in the WHO pharmacovigilance database between 1967 and 2020,[1] vaccine-associated myocarditis primarily affected young male adults (median age 24 years; 84% male individuals). Recently, the mRNA COVID-19 vaccines have also been associated with myocarditis. In the USA, 1626 cases of mRNA COVID-19 vaccine-related myocarditis were reported between December, 2020, and August, 2021, through the Vaccine Adverse Event Reporting System (VAERS).[2] Similar to the previous cases of vaccine-associated myocarditis, the median age of individuals with mRNA COVID-19 vaccine-associated myocarditis was 21 years, and 82% were male.[2] The greater number of individuals with vaccine-related myocarditis in recent reports, compared with previous figures of vaccine-related myocarditis in the WHO pharmacovigilance database between 1967 and 2020, might relate to the high number of adolescent and young adults vaccinated with mRNA COVID-19 vaccines.[3] Unlike previous myocarditis case series, intermediate-term outcomes and time course of recovery after mRNA COVID-19 vaccine-associated myocarditis have not yet been reported.

In the USA, incidence of mRNA vaccine-related myocarditis within 21 days of the second dose peaks in males aged 12–29 years (8·4 to 26·7 cases per 100 000 males).[4] Myocarditis risk is higher after SARS-CoV-2 virus infection than after mRNA COVID-19 vaccination.[4] In fact, myocarditis was diagnosed in


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59·0 to 63·7 per 100 000 males aged 12–29 years within 21 days of a positive SARS-CoV-2 molecular or antigen test.[4] The pattern of myocarditis after SARS-CoV-2 infection is similar to previously reported patterns after viral infection, with adolescent and young adult males more commonly affected potentially due to the effect of testosterone on the generation of interleukin-1 beta.[5] Overall risk of myocarditis and hospitalisation are lower in this age group after vaccination compared with overall risk after SARS-CoV-2 infection without vaccination.[6]

Data from the Clalit Health Services database in 2021 showed the immediate outcomes of mRNA COVID-19 vaccine-related myocarditis based on a limited number of 54 patients and reported a less than 5% risk of death or cardiogenic shock during or shortly after hospitalisation.[7] Although acute myocarditis without signs of heart failure, ventricular arrhythmias, or conduction system abnormalities is associated with a long-term favourable prognosis,[8] intermediate-term outcomes, specifically after vaccine-associated myocarditis in young people, have not been reported. Furthermore, psychological and social sequelae of myocarditis measured by patient-reported outcomes have not been reported in any form of myocarditis.

In *The Lancet Child & Adolescent Health,* Ian Kracalik and colleagues[9] present detailed outcomes of mRNA COVID-19 vaccine-related myocarditis, including clinical recovery, functional status, quality of life, and the results of cardiac MRI, at least 90 days after diagnosis in patients aged 12–29 years. Using validated survey tools, the authors obtained perspectives from adult patients or parents of minor patients and from health-care providers. 519 (62%) of the 836 patients for whom a report had been filed to the VAERS between Jan 12 and Nov 5, 2021, were surveyed. No deaths were reported in the overall population. Among 357 patients with available data, only six (2%) patients had a subsequent hospital admission; in three of these patients, hospital admission was the result of iatrogenic adverse reactions to intravenous immunoglobulin therapy. Only three (<1%) of the 357 patients were hospitalised for cardiac causes: one due to reduction in left ventricular ejection fraction, one due to chest pain and elevated troponin, and one due to pericarditis. A non-response bias of 37·9% (317 patients out of 836) was potentially minimised by the observation that major demographic characteristics and findings at presentation did not differ significantly between survey responders and non-responders.

Among 393 patients with a health-care provider assessment, 320 (81%) were considered to be fully recovered from myocarditis by their health-care provider, and 61 (16%) patients were considered to be improved but not fully recovered. Only four (1%) patients, out of 393 interviews, reported no change in cardiac status from the initial myocarditis diagnosis. The median interval was 191 days (IQR 170–216) between myocarditis and health-care provider surveys. In the patient survey, 178 (50%) of 357 patients reported at least one symptom of chest pain, fatigue, dyspnoea, or palpitations in the 2 weeks before the survey date (after a median interval of 143 days [131–162] from myocarditis onset). Thus, adult patients, or parents of minors, perceived more symptoms of myocarditis than did health-care providers. Health-care providers reported that only 62 (16%) of 393 patients had one or more symptoms in the 2 weeks before the survey. This comparison highlights the need to seek patient-reported outcomes rather than rely only on physiological or biochemical metrics to identify full recovery.

Quality-of-life measurements revealed that, of 249 patients who completed this component of the survey, 49 (20%) reported limitations in performing usual activities, four (2%) reported problems with self-care, 13 (5%) with mobility, 74 (30%) reported pain, and 114 (46%) reported depression. These findings emphasise the need to capture the broad psychosocial effects of cardiac disease, particularly in a young and otherwise healthy population. Notably, mean weighted quality-of-life measure was similar between patients who had mRNA COVID-19 vaccine-related myocarditis (0·91) and pre-pandemic US population norms (0.92; scale range 0 [equivalent to death] to 1 [full health]). Further research is needed to determine whether restriction from physical activities and sports, or the need to take medications, might have been contributing factors in reported limitations in performing usual activities and depression.[10] Other psychological factors could have a role (eg, feeling of vulnerability after a first experience of a serious health issue for most of the young individuals). Future studies should assess how the psychological and physical injuries after mRNA COVID-19 vaccine-related myocarditis compare with

those occurring after COVID-19-related myocarditis in non-vaccinated people.

Finally, Kracalik and colleagues present novel data on post-myocarditis scarring, defined by the presence of late gadolinium enhancement, and residual oedema on cardiac MRI. In 151 patients with cardiac MRI, late gadolinium enhancement was observed in 71 (47%) patients and inflammation or oedema in 22 (15%) patients—rates that exceed the rate of cardiac symptoms. For comparison, in a series of 190 patients (median age 33 years, 82% male) with acute myocarditis and preserved left ventricular ejection fraction,[11] cardiac MRI after 6 months showed scarring defined by the presence of late gadolinium enhancement in 164 (86%) individuals and oedema in 31 (16%) individuals.

These data help to resolve the dilemma between vaccination and no vaccination: health-care providers and individuals should be reassured by the high rate of cardiac recovery in mRNA COVID-19 vaccine-related myocarditis. Nonetheless, the psychosocial burden after a myocarditis diagnosis remains substantial and has been under-recognised. The value of vaccination in protecting against SARS-CoV-2-associated acute myocarditis and in lowering the risk of hospitalisation after SARS-CoV-2 exposure has been shown.[10] Kracalik and colleagues should be applauded because they, to our knowledge, are the first to explore in detail the quality of life and impact of psychological symptoms in young patients after acute myocarditis. Future prospective studies of myocarditis should also include patient-reported outcomes to capture the full illness spectrum.

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The monkeypox outbreak: risks to children and pregnant women

As of July 21, 2022, WHO has reported 15 734 laboratory-confirmed monkeypox infections, including children, in 75 countries across five continents.[1] The unprecedented widespread geographical distribution of this poxvirus shows the risk for a potential public health emergency of international concern. These laboratory-confirmed monkeypox infections are more than double the total number of cases than in the previous situation report published 2 weeks earlier on July 9, 2022, emphasising the sustained transmission of the monkeypox virus. However, these reported figures are likely to be an underestimation of the actual number of infections due to inadequate clinical recognition of monkeypox virus infection and the long incubation period of the virus (5–21 days). Current estimates of disease burden reflect the situation from previous weeks, and the actual number of infected individuals could exceed 30 000.

The potential for sustained human-to-human transmission of the monkeypox virus was previously believed to be low. The re-emergence in 2022 suggests


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