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JEM is a co-founder of International Physicians for Prevention of Nuclear War, the organisation awarded the 1985 Nobel Peace Prize. DGN is a co-founder of Physicians for Social Responsibility. We declare no competing interests.

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- 1 Ghinai I, McPherson TD, Hunter JC, et al. First known person-to-person transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in the USA. *Lancet* 2020; **395**: 1137–44.
- 2 Ervin RR, Glazier JB, Aronow S, et al. Human and ecologic effects in Massachusetts of an assumed thermonuclear attack on the United States. *N Engl J Med* 1962; **266**: 1127–37.
- 3 Lown B, Chivian E, Muller J, Abrams H. The nuclear-arms race and the physician. *N Engl J Med* 1981; **304**: 726–29.
- 4 Abrams HL. Inadvertent nuclear war. *Lancet* 1988; **2**: 559–60.
- 5 Watts N, Amann M, Arnell N, et al. The 2019 report of The Lancet Countdown on health and climate change: ensuring that the health of a child born today is not defined by a changing climate. *Lancet* 2019; **394**: 1836–78.
- 6 The New York Times Archives. The Einstein letter that started it all; a message to President Roosevelt 25 years ago launched the atom bomb and the atomic age. Aug 2, 1964. <https://www.nytimes.com/1964/08/02/archives/the-einstein-letter-that-started-it-all-a-message-to-president.html> (accessed June 10, 2020).



## Gendered effects of school closures during the COVID-19 pandemic

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Governments worldwide have implemented school closures as a preventive measure to the spread of COVID-19. According to UNESCO, school closures have sent about 90% of all students out of school, among them more than 800 million girls. A substantial number of these girls live in the world's least developed countries where getting an education is already a struggle. We agree with Hall and colleagues<sup>1</sup> who recognise girls as a vulnerable group in the COVID-19 pandemic, stress two issues hindering girls' education in developing countries, and challenge progress and commitment toward gender equality, girl empowerment, and the Sustainable Development Goals.

The first issue relates to sexual and reproductive health aspects, where teenage girls might disproportionately drop out of school due to an increased risk of sexual exploitation, pregnancy, and (forced) marriage. School closures during the Ebola outbreak were associated with an increase in teenage pregnancies.<sup>2</sup> Once schools re-opened, many “visibly pregnant girls”<sup>2</sup> were banned from going back to school. With schools closing throughout the developing world, where stigma around teenage pregnancies prevails, we will probably see an increase in drop-out rates as teenage girls become pregnant or married.

The second issue relates to socioeconomic aspects, where girls might spend less time studying or might drop out of school at higher rates than boys because of a disproportionate increase in unpaid household work. Girls aged 5–14 years already spend 40% more time doing household work than boys do.<sup>3</sup> As girls stay at home because of school closures, their household work burdens might increase, resulting in girls spending more time helping out at home instead of studying. This might encourage parents, particularly those putting a lower value on girls' education, to keep their daughters at home even after schools reopen. Moreover, research shows that girls risk dropping out of school when caregivers are missing from the household because they typically have to (partly) replace the work done by the missing caregiver,<sup>4</sup> who might be away due to COVID-19-related work, illness, or death. Therefore, with the current COVID-19 pandemic, we might see more girls than boys helping at home, lagging behind with studying, and dropping out of school.

We warn that school closures in this COVID-19 pandemic may bolster gender gaps in education and girl empowerment dampening any progress already made, particularly in developing countries. We call for public acknowledgment and discussion about the adverse effects school closures can have on widening of the schooling gap

between girls and boys. We call for a gendered perspective in developing policy responses by tackling the sexual and reproductive health and socioeconomic issues addressed here to bring girls back to school after the measures to contain the COVID-19 pandemic end. We also ask governments to collect data specifically on non-paid housework and childcare responsibilities frequently ignored when investigating the consequences of child labour. Addressing the health and socioeconomic issues girls might face during this pandemic, as well as collecting data to quantify their effects, are important in honouring the commitment to the Sustainable Development Goals.

We declare no competing interests.

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- 1 Hall KS, Samari G, Garbers S, et al. Centring sexual and reproductive health and justice in the global COVID-19 response. *Lancet* 2020; **395**: 1175–77.
- 2 Elston JWT, Cartwright C, Ndumbi P, Wright J. The health impact of the 2015 Ebola outbreak. *Public Health* 2017; **143**: 60–70.
- 3 UNICEF. Girls spend 160 million more hours than boys doing household chores everyday. Oct 7, 2016. <https://www.unicef.org/press-releases/girls-spend-160-million-more-hours-boys-doing-household-chores-everyday> (accessed April 10, 2020).
- 4 Huisman J, Smits J. Effects of household- and district-level factors on primary school enrollment in 30 developing countries. *World Development* 2009; **37**: 179–93.

## Challenges for the female academic during the COVID-19 pandemic

Science and innovation benefit from diversity. However, as the global community fights COVID-19, the productivity and scientific output of female academics are disproportionately affected, leading to loss of women's scientific expertise from the public realm.