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LTOT ranks among the important achievements in respiratory medicine. However, LTOT is a relatively costly therapy and can cause harm—eg, injuries related to burns or falls over the equipment, and sense of shame or mental burden. The work by Lacasse and colleagues is a valuable contribution, providing evidence against the regular use of home oxygen in patients with COPD and moderate hypoxaemia. Additionally, we should also be prepared to scrutinise the classic indication criteria for LTOT primarily related to severe hypoxaemia, because the relevant evidence gained nearly 50 years ago is unlikely to be simply transferable to current medicine conditions.

The Cologne study group, of which WW and FSM are both members, received open research grants from Weinmann (Germany), Vivisol (Germany), Löwenstein Medical (Germany), VitalAire (Germany), Phillips Respironics (USA), and GCI (Great Britain). WW has received speaking fees from Löwenstein Medical/Germany. FSM declares no competing interests.

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SARS-CoV-2: can isolation be limited to those who are truly infectious?

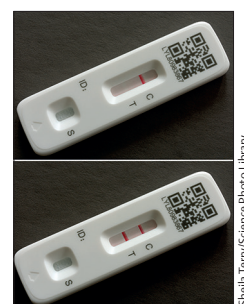


At the height of the COVID-19 pandemic, public health restrictions including self-isolation of positive cases and their close contacts were vital to reduce onward transmission of SARS-CoV-2, thus preventing deaths and the potential overwhelming of health-care services. However, the requirement for prolonged and often repeated episodes of self-isolation has had an enormous impact on individuals' psychological, financial, and educational wellbeing, disproportionately affecting those on lower incomes, the self-employed, and those unable to work from home.^{1,2} Self-isolation policies have also had wider deleterious effects on national economies, infrastructure, and the delivery of public services, such as health care and education.²

Understanding the viral kinetics of SARS-CoV-2 infection is key to optimal self-isolation policies, which need to strike a balance between preventing onward transmission and avoiding unnecessary isolation. Lateral flow devices (LFDs) have been deployed to attempt to limit self-isolation to those who are infectious, but

the guidelines for their use have been driven largely by mathematical modelling,³ based on limited real-world data and a number of key assumptions. In two UK studies published in *The Lancet Respiratory Medicine*, Seran Hakki and colleagues⁴ sought to characterise the window of SARS-CoV-2 infectiousness and correlate LFD results with infectiousness, whereas Nicola K Love and colleagues⁵ assessed the use of daily LFD testing in COVID-19 contacts to circumvent the need for universal self-isolation.

Hakki and colleagues⁴ recruited 57 recently exposed COVID-19 contacts who subsequently tested positive, which allowed them to measure daily viral load and degree of infectiousness (culturable virus from oropharyngeal swab) for the duration of SARS-CoV-2 infection. Median duration of infectiousness was 5 days (IQR 3–7), with both viral load and infectiousness peaking at day 3 of symptoms. LFD results correlated well with decreasing infectiousness but were unreliable in identifying infectious individuals early in the course



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of infection, thus supporting the use of LFD testing to guide de-isolation of COVID-19 cases but not as a screening tool to detect early infection.

This is the first community-based study to characterise infectiousness in the presymptomatic (growth) phase as well as the peak and decline phase of infectious viral shedding in naturally acquired SARS-CoV-2 infection. The results are similar to those of a recent human challenge study,⁶ although with greater inter-individual variability, which is probably attributable to broader demographics and variation in infecting virus dose in the real-world setting. Nonetheless, it is important to highlight that the study, undertaken between September, 2020, and October, 2021, encompassed individuals infected with pre-alpha, alpha, or delta variants, and was underpowered to evaluate the impact of vaccination on viral kinetics. Over half of the contacts were unvaccinated, and none of the vaccinated individuals had received a booster. A more recent longitudinal study of individuals with non-severe COVID-19 demonstrated similar viral decay kinetics between delta and omicron variants, although it also had a small sample size and a higher proportion of the omicron-infected participants had received a booster vaccine (35% vs 3%).⁷

Love and colleagues⁵ conducted a randomised controlled trial of 54923 adult COVID-19 contacts identified from the NHS Test and Trace programme. They concluded that daily LFD testing for 7 days, with a 24-h exemption from self-isolation if the LFD result was negative, was a safe alternative to 10 days of self-isolation in preventing community SARS-CoV-2 transmission. Attack rates (SARS-CoV-2 infections in secondary contacts) were lower in the daily testing group than in the self-isolation group (6.3% vs 7.5%), with a difference significantly below the non-inferiority margin. This adds to the findings of a previous study that demonstrated non-inferiority of daily LFD testing to self-isolation in COVID-19 contacts for controlling transmission within a secondary school setting.⁸

Love and colleagues⁵ reported that 80% of those in the daily testing group submitted at least one LFD result, but did not report compliance with daily testing for 7 days. Behavioural change might have mitigated any effect of poor compliance with testing, with 5946 (57%) of 10443 of participants in the daily testing group who remained negative reporting reduced

non-household contacts despite this not being a requirement. This behavioural change, in addition to a higher proportion of participants in this group being able to work from home (therefore with fewer non-household contacts), meant that the two groups might have been more similar than intended. Both groups reported similar numbers of non-household contacts per case.

Free COVID-19 testing is no longer available to the majority of the population in the UK, and there is no legal requirement to self-isolate if symptomatic or COVID-19 positive,⁹ which reduces the immediate impact of these findings on public health policy. Nevertheless, the two studies highlight the important part that LFDs can play in effectively targeting self-isolation to minimise secondary transmission, and the findings could have an impact in countries where LFDs are still in use. Currently, there are still substantial numbers of patients with COVID-19 in hospital in the UK and elsewhere. LFDs could potentially be used to guide earlier de-isolation of hospitalised patients, thereby facilitating patient investigations and management, and improving patient flow through the hospital. Both studies were conducted before the emergence of the omicron subvariants, and further research is needed to confirm that these findings remain true in the context of subvariants with considerably higher transmissibility, and in a highly vaccinated population.¹⁰

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Tackling the global burden of lung disease through prevention and early diagnosis



Three of the top six causes of death worldwide are lung diseases: chronic obstructive pulmonary disease (COPD), lower respiratory tract infections, and lung cancer. As well as killing 7.6 million people every year, lung disease also causes distressing symptoms and disability for many more. The Global Burden of Disease Study 2017 identified that a country's sociodemographic index was a key factor affecting mortality and loss of health from respiratory diseases.¹ Under the slogan "Lung Health for All", World Lung Day on Sept 25 aims to highlight the global burden caused by lung disease, especially in low-income and middle-income countries (LMICs), and the importance of early detection and the reduction of inequalities. World Lung Day is an initiative for lung health advocacy and action supported by almost 200 organisations, including the Global Initiative for Chronic Obstructive Lung Disease. World Lung Day reminds us that respiratory diseases can, and should, be addressed more effectively. To this end, work is urgently needed to develop treatments and management strategies to alleviate symptoms and shape or halt disease progression, with a focus on primary prevention and early detection.

Because COPD has traditionally been considered a self-inflicted disease caused by tobacco smoking, preventive measures have centred on deterring smoking initiation and encouraging quitting. Although smoking remains a major risk factor for COPD and these public health measures are of undoubted value, we now know that about a third of people with COPD worldwide have never smoked and that many other environmental (most of them preventable) and host factors are associated with reduced lung function during the

lifespan.² From a global perspective, exposures to indoor and outdoor air pollution throughout life, including prenatally, are important risk factors for COPD. Exposure to these factors is increasing in most LMICs as a result of increasing urbanisation. It is estimated that ambient air pollution alone accounts for more than 3 million premature deaths worldwide, with LMICs accounting for most of this disease burden.³ Both acute and chronic low-level air pollutants, even at concentrations lower than current annual limits, are associated with increased mortality from respiratory disease.^{4,5} In addition to affecting lung development, indoor and outdoor air pollution are important risk factors for lower respiratory tract infections in children.⁶ The prevalence of lower respiratory tract infections has decreased since 2000 in several LMICs (eg, Bangladesh, India, and Nepal) as a result of initiatives aimed at reducing household air pollution; however, the benefits of reduced indoor pollution have been negated by increases in outdoor pollution in some countries.⁶ Mortality was tangibly reduced by interventions in the COVID-19 pandemic that led to improvements in air quality,⁷ and the respiratory community must continue to press for policies that target all sources of pollution, including industrial combustion sources, vehicles, and domestic activities (eg, solid fuel use, rubbish burning, and crop burning).

Poor lung growth, both before and after birth, also results from malnutrition and infections, which are related to poverty and are common in LMICs. Poor lung growth can lead to COPD.² The respiratory community must rally support for initiatives to improve maternal nutrition and reduce smoking during pregnancy, such



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For more on the **causes of death worldwide** see <https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates>

For more on the **Global Initiative for Chronic Obstructive Lung Disease** see <https://goldcopd.org>