Important—if uneven—strides towards respiratory health in the UK

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To read about **air quality problems in the UK** see **News** *Lancet Respir Med* 2014; **2:** 606

For more on **Brexit and respiratory health**, see **News** *Lancet Respir Med* 2016; **4:** 608

For **Public Health England's August 2016 Annual Population Survey report on tobacco control** see https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/541964/Official_statistics_short_commentary_local_tobacco_control_profiles_August_2016.pdf

For **Been and colleagues' analysis of smoke-free legislation and childhood respiratory tract infection hospitalisations** see *Eur Respir J* 2015; **46:** 697–706

For more on **Gilmore and colleagues' research on the tobacco industry's misleading arguments and evidence against plain packaging** see http://www.bath.ac.uk/ipr/policy-briefs/evidence-based-policy-making-and-better-regulation.html

For **a summary of Gilmore and colleagues' analysis of the effects of smoke-free legislation** see http://www.bath.ac.uk/ipr/policy-briefs/smokefree-legislation.html

As London hosts the 2016 European Respiratory Society (ERS) Congress, the UK can take pride in the recent strides it has made against tobacco use, including the UK High Court's May 2016 rejection of the tobacco industry's efforts to thwart implementation of plain-packaging and graphic warnings for cigarette packs. But the job is far from finished, and other respiratory-health challenges persist, from faltering efforts to improve air quality, to high rates of hospital admissions and death due to asthma.

Air pollution is a longstanding public health concern; it contributes to an estimated 29 000 premature deaths annually across the UK, noted Frank Kelly (King's College London, London, UK).

With Britain's June 23 vote to leave the European Union, the UK will—eventually—no longer be beholden to EU air quality targets, raising concerns that efforts to curb pollution might be abandoned.

"There was a time when the UK led the world in cleaning up its air, passing the Clean Air Act in 1956 to reduce smoke and sulphur dioxide", Frank Kelly told *The Lancet Respiratory Medicine*. "In recent years, air quality improvements have miserably stalled. We have been breaching EU limit values every year since 2005 for the modern-day pollutants—namely nitrogen dioxide (NO_2) and particulate matter (PM)."

In 2014, the European Commission initiated proceedings against the UK over excessive NO_2 emissions—the first case launched over air pollution violations, Frank Kelly said. In 2013, the WHO concluded that PM and NO_2 present health hazards at concentrations lower than the WHO's guideline values, "which, of note, are lower than the EU limits to which we fail to adhere", Frank Kelly pointed out.

"The lack of progress in improving air quality isn't due to lack of attention by professionals in the field or lack of awareness by Government", said Kelly, who gave evidence about air pollution's health effects to the Commons Environmental Committee in 2010 and 2011.

It is unclear how else Brexit, once implemented, might affect respiratory health in the UK.

The EU had helped to strengthen the UK's tobacco-control policies, including its comprehensive advertising ban for tobacco. The UK was an early adopter of laws that prohibit smoking in enclosed public spaces, which reduced exposures to second-hand smoke. Such efforts appear to have been working. Public Health England's Annual Population Survey update on tobacco control from August 2016 reports that, in 2015, smoking rates in England dropped to the lowest on record—16·9% overall, and 26·5% among manual workers.

Bans on smoking in enclosed public spaces were followed by drops in new smoking rates among teenagers across the UK, and children benefitted from the bans, as well, according to Jasper V Been (Erasmus University MC-Sophia Children's Hospital, Rotterdam, Netherlands). Instead of increasing smoking in smokers' homes, increasing children's exposures to second-hand smoke, as some had feared would occur following public smoking bans, the opposite happened: more smokers made their homes smoke-free, Been reported.

The smoking bans also appeared to yield some much-needed progress against childhood asthma exacerbations.

"Substantial reductions in hospital admissions for childhood asthma were observed following introduction of the smoke-free laws in England and Scotland", Been said. "In addition, in England an estimated 11 000 hospital admissions for paediatric respiratory infections were averted annually since the smoke-free legislation."

Reductions in preterm births also followed the bans. That might help to improve children's lung health in the near future, Been pointed out.

The success of the UK bans "provide strong support for accelerated action to implement similar comprehensive smoke-free laws in other countries to protect the approximately 85% of the world's population not yet covered", Been said.

Anna Gilmore (University of Bath, and UK Centre for Tobacco and Alcohol Studies, Somerset, UK) concurred, noting that her work with colleagues at the University of Bath, UK, showed that adults also benefitted from smoke-free legislation: "We found significant declines in hospital admissions for heart attacks and asthma. 1200 fewer heart attack admissions in the first year following legislation, after controlling for other factors, saving the NHS £8·4 million, and 1900 fewer asthma admissions."

Uniform tobacco packaging with graphic warnings about smoking's hazards were introduced in May, 2016, following the UK High Court's rejection of a challenge brought by several large tobacco companies. The companies had argued that the standardised cigarette-packaging regulations unlawfully infringed on their intellectual property rights by curbing corporate control of cigarette pack design, effectively seizing property without compensation.

"The UK High Court ruling on plain packs was a key victory for public health not just in the UK, but globally", said Gilmore whose research was cited in the judge's ruling. "It showed clearly that the tobacco industry's arguments and the evidence it concocted against plain packs were highly misleading. It

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noted in particular that the industry's intellectual property arguments were wholly inappropriate and that no intellectual property law allows for the use of a trademark to harm public health."

Plain tobacco packaging is the culmination of decades of tobacco control efforts.

Those efforts have met with successes, as evidenced by the latest Public Health England figures. But benefits have been uneven. The prevalence of smoking is highest in Scotland, for example, where an estimated 20% of people aged 16 years and older were smokers in 2014, according to Laura Kelly (University of Pennsylvania, Philadelphia, PA, USA).

Smoking remains the leading preventable cause of death in the UK. "The impact is disproportionately felt in Scotland", Kelly told *The Lancet Respiratory Medicine*. "For the past several decades, Scotland has had the lowest life expectancy not only within the UK, but of any high-income country in western Europe or North America."

Cigarette smoking is the main factor, Kelly said. In 2009, men lost an estimated 3·6 years of life and women lost 3·1 years on average due to smoking. "Contrast that to a mere 1·4 and 2·1 years for the mean of 15 other high-income countries chosen for comparison", Kelly commented. "Scottish women, in particular, are historically heavier smokers than women in other countries; and smoking-attributable mortality accounts for the majority of Scotland's relatively narrow sex difference in life expectancy at age 50."

Kelly predicts that smoking will "continue to worsen Scotland's mortality performance within the UK and on the global stage" because of the high prevalence of smoking among young people.

The UK has implemented a complete ban on point-of-sale tobacco product displays, and a recent audit suggested that small stores' compliance rates are as high as 98%, according to Douglas Eadie (University of Stirling, Stirling, UK).

The UK's comprehensive Stop Smoking Services programmes involve community pharmacies, which play an important but oft-neglected role in smoking cessation by provisioning quit-smoking aids, advice, education, and counselling. Nearly 140 000 smokers in England have set quit dates through community pharmacies, said Reem Kayyali (Kingston University, London, UK). Studies have shown that pharmacy-led quit-tobacco services are more successful than self-quit strategies, Kayyali noted.

"Considering the accessibility of pharmacies to the public and the risks of smoking to public health, it is imperative to try to increase patients' awareness of pharmacy-led smoking-cessation services offered by community pharmacies in the UK", Kayyali said.

Although the UK's tobacco-control interventions have yielded important public health success stories, changing patterns of electronic cigarette, water-pipe, and cannabis use by adolescents and young adults are likely to present new challenges.

Cigarette use is common among regular cannabis users, said Chandni Hindocha (University College London, London, UK). "For the UK, co-use of cannabis and tobacco means that the first time teens try cannabis may also be the first time they try tobacco, because smoking 'joints with tobacco' is the most prevalent route of administration."

An estimated 77% of cannabis users in the UK smoke cannabis mixed with tobacco. Tobacco smoking by cannabis users seems to be associated with cannabis-dependence disorder, Hindocha and others have found.

"Causality cannot be assumed but tobacco dependence and cannabis dependence manifest in similar ways", Hindocha said. "Therefore, it's likely that the dopaminergic pathway is the overlapping mechanism."

Furthermore, THC—the psychoactive cannabinoid in cannabis smoke—modulates nicotine acetylcholine receptors, Hindocha noted.

"Given the current changing legislative environment surrounding cannabis, more focus should be placed on the relationship between these two drugs", Hindocha urged.

Air pollution and tobacco are not the UK's only respiratory health challenges. The UK also has some of the highest asthma mortality rates in Europe. There exists "very substantial" ethnic variations in hospital admissions and deaths due to asthma, according to Aziz Sheikh (Asthma UK Centre for Applied Research, Usher Institute of Population Health Sciences and Informatics, University of Edinburgh, Edinburgh, UK).

Linking census data with national hospitalisation and mortality data allowed an analysis of "virtually the whole of the Scottish population", Sheikh said. "This revealed very considerable variations in risk of hospitalisation or death, with Chinese-origin people faring best and Pakistani-origin populations faring worst." Ethnic-population differences in asthma self-management, as well as primary-care provision, might partly explain the variation, Sheikh said.

Bryant Furlow

For **Laura Kelly and Samuel Preston's analysis of smoking's role in Scotland's mortality disadvantage** see *Popul Studies* 2016; **70:** 59–71

For **Eadie and colleagues' first UK compliance audit of retail compliance with legislation to protect children from exposure to tobacco displays** see *PLoS ONE* 2016; **11:** e0152178

For **Kayyali and colleagues' systematic review of smoking-cessation support services at community pharmacies in the UK** see *Hellenic J Cardiol* 2016; **57:** 7–15

For **Hindocha and colleagues' study of cigarette smoking and cannabis dependence in the UK** see *Drug Alcohol Dep* 2015; **148:** 165-71

For more on **asthma care and mortality in the UK** see *Lancet Respir Med* 2014; **2:** 438

For **Aziz Sheikh and colleagues' study of ethnic variations in asthma hospital admissions and deaths** see *BMC Med* 2016; **14:** 3

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