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Integrating climate action for health into covid-19 recovery plans

Kristine Belesova and colleagues argue that recovery from the covid-19 pandemic must safeguard the health of current and future generations in the face of the climate emergency

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The covid-19 pandemic caused over a half a million deaths in its first four months and triggered a global recession that threatens to increase poverty and amplify the health effects of the pandemic. At the same time climate change is adversely affecting health, and the effects are projected to intensify worldwide through a range of direct and indirect pathways, including increased frequency and intensity of heatwaves, floods, and droughts.¹

The effects of climate change are emerging over decades and centuries rather than the weeks and months seen for the SARS-CoV-2 virus. However, whereas there is hope for an effective vaccine or treatment for the virus, there are no such prospects for the climate emergency, and, as far as we know, the effects are irreversible. While the covid-19 pandemic is a grave human tragedy, it can be used as an opportunity to implement sustainable economic recovery policies that safeguard the health of the current and future generations including by supporting rapid reductions in greenhouse gas emissions.

Climate and wider health effects of the pandemic

The implementation of physical distancing or complete lockdown by many countries in response to the covid-19 pandemic has resulted in big reductions in economic activity. This in turn has resulted in large reductions in air pollution and greenhouse gas emissions in many places. Estimates suggest that daily global CO₂ emissions decreased by 17% (11% to 25% for ± 1 SD) in April 2020 compared with the mean emission levels in 2019.² Annual emissions could decrease by 4% to 7% (2% to 13%), depending on the lockdown duration.² Satellite images recorded reductions in PM_{2.5} and NO₂ concentrations in some of the examined areas (eg, China and northern Italy) compared with the seasonal levels observed in previous years, although levels were unchanged in others.³ Latest estimates suggest that the direct effect of the response to the pandemic on climate change will be negligible, with a cooling of approximately 0.01°C (95% confidence interval 0.005 to 0.015) by 2030 compared with the trajectory that follows current national policies.⁴

Experience of previous economic shocks shows that reductions in emissions are likely to be transient. The fall in greenhouse gas emissions with the 2008 recession, for example, was followed by a resurgence that exceeded pre-recession levels.⁵ Increased post-lockdown production and lower availability of investment capital for low carbon energy may result in a similar emission pattern. Latest estimates suggest

that there is already a partial rebound in emissions with the easing of lockdowns.²

The current economic recession is driving some populations into poverty and, in some countries, increasing health inequities, which in turn could increase the risk of adverse outcomes from covid-19.⁶ The 2008 recession had pervasive effects on health, particularly among men, with declining self-rated health and increasing morbidity, psychological distress, and suicide, although traffic fatalities and population level alcohol consumption declined.⁷

National responses to the recession largely determined the magnitude and distribution of health effects. Social safety nets and long term investments in health systems in some European countries seemed to protect populations against adverse effects.⁸ A 5% contraction in income or consumption due to the covid-19 pandemic could force an estimated additional 85 million people, mostly in developing countries, below the international poverty threshold of \$1.90 (£1.50; €1.60) a day; 419 million people would be similarly affected by a 20% contraction.⁹ The current economic shock emphasises the need for planned equitable transition from economic growth powered by fossil fuels to policies that ensure health and other social priorities within environmental boundaries.¹⁰

Building a better transition to a net zero carbon economy

By May 2020 governments and central banks had committed to a \$15tn fiscal stimulus globally in response to the pandemic, equivalent to 17% of the global economy.¹¹ The UN secretary general António Guterres and other leaders called for investment of the recovery funds into “building back better” to support a more sustainable, inclusive, and equitable economy that addresses climate change.¹² The EU leaders have proposed a recovery plan based on decarbonisation and digital transformation under the European green deal.¹³

An expert assessment of an early set of fiscal recovery packages suggests, however, that only 4% have the potential for long term reduction of greenhouse gas emissions; 4% are likely to increase emissions, and 92% would sustain the pre-crisis emissions trajectory.¹⁴ The emergency rescue response prioritises the injection of liquidity to prevent economic collapse and meet the immediate needs of saving lives and protecting populations, health systems, and livelihoods. Recapitalising firms that have been badly affected by the recession is an opportunity to integrate health, environmental sustainability, and economic recovery by using

criteria that reflect these objectives to prioritise the use of government funds.¹⁵

Climate action has been hampered by the complexity of the challenges, indirect and complex attribution of the effects, vested interests in maintaining business as usual, and denialist efforts to influence public opinion. The aspirational target of keeping the global average temperature increase below 1.5°C by 2100 requires 7.6% reduction of global emissions each year between 2020 and 2030.¹⁶ That requires the countries to increase their nationally determined contributions to emission reductions under the Paris climate agreement fivefold from their December 2019 levels.¹⁶ Recovery packages that facilitate the removal of fossil fuel and other harmful subsidies and invest in transition to a net zero-carbon economy can substantially contribute to this goal, helping to avoid future warming of 0.3 °C by 2050,⁴ and bring sizeable benefits to human health. Phasing out fossil fuels could, for example, avert about 3.6 million premature deaths related to air pollution annually in the near term, and mitigate climate change effects in the medium to long term.¹⁷ Global action required to meet the 1.5°C target is estimated to deliver an economic benefit of \$264tn-\$610tn by 2100.¹⁸

Employment opportunities

Over the first three months of lockdown in the US, more than 45 million people claimed unemployment benefits and jobs in the oil and gas sector declined by 12%.^{19 20} The oil and gas sector is now experiencing its greatest ever crisis. In the absence of new investment this could accelerate major structural changes away from fossil fuels.²¹ Investment in oil and gas would have negative public health and climate effects and would be less effective in supporting livelihoods than investment to support the zero-carbon transition. Every \$1m spent supporting fossil fuel industries would generate only 2.65 full time jobs compared with an estimated 7.49 and 7.72 full time jobs for the same investment in renewables and energy efficiency.²² It would also contribute to increased health risks for workers and residents in the vicinity of fossil fuel extraction.²³

In the UK, transition to a circular economy based on recycling, remanufacturing, reuse, and shared services could create between about 200 000 and 500 000 new jobs and reduce dependency on vulnerable supply chains.²⁴ The government subsidised unemployment and furlough time could be used to invest in human capital by developing job and entrepreneurial skills required for a net zero-carbon circular economy, including through online training.

Building on behaviour change

When habits are temporarily disturbed, people are more sensitive to new information and may adopt a mindset that is more conducive to behaviour change.²⁵ People have drastically changed their lifestyles in response to covid-19. Some of these changes reduce greenhouse gas emissions and have health benefits. City governments in Mexico City, Bogotá, New York, Milan, Paris, Berlin, and London responded by allocating more street space for pedestrians and cyclists to facilitate physical distancing and promote physical activity.² The reduction in motorised traffic was the largest driver of falls in global emissions during the lockdown.²

The urgency of having to make these changes in response to the pandemic helped overcome some of the barriers to active travel and reduced consumption of non-essential goods and international travel. This could provide momentum to lock in the behaviour changes that benefit health and the environment and might catalyse a shift from a consumerist culture to a more sustainable economy.

Translating the temporary behaviour changes into permanent culture change could be supported through the development of new infrastructure, such as converting roads into pedestrian and cycle lanes, and new policies, including incentivising more flexible working from home, virtual meetings and medical consultations, and less long distance business travel.²⁶ Such policies could help compensate for reduced public transport capacity and avoid a rebound in car use in urban areas as a means of physical distancing. For example, cycling (including electric bicycles for longer journeys and for elderly and some disabled people)²⁷ is likely to be the best way of getting around urban centres while maintaining a safe distance between commuters.

Although in some cities policies and sustainable infrastructure installed in response to covid-19 were temporary, other cities, such as Milan and Paris, committed to making them permanent.²⁸ A case study of transport policy in Ireland shows that times of financial prudence combined with advocacy can allow sustainability initiatives to flourish without the need for radical institutional transformation.²⁹ There is some evidence that in the right circumstances, disasters can act as a spur to major policy change such as after the 2004 tsunami in Indonesia and Sri Lanka and the 2011 earthquake in Christchurch, New Zealand.^{30 31} Confidence in authority, the high status of science in policy making, inclusive leadership, and a well articulated and coherent vision for a sustainable and healthy society facilitated these positive changes.

The covid-19 pandemic differs from these events in scale, scope, extent, and its global context. It will therefore be vital to build a positive case for the zero-carbon transition as we emerge from covid-19, emphasising the health benefits from climate change mitigation policies, particularly through reduced air pollution, increased physical activity, and healthy diets with a low environmental impact.^{32 33} Such policies cross a range of sectors, including energy, transport, housing, urban planning, food and agriculture, industry, and healthcare. Reducing deforestation and tackling the drivers of land degradation and freshwater depletion from unsustainable patterns of food production can benefit health, biodiversity, and the climate.³⁴ Reducing exposure to air pollution, increasing physical activity, and consumption of healthy diets reduce the risks of heart disease and stroke, which in turn influence the risk of adverse outcomes from covid-19.⁶

Advocacy for green recovery

Opinion polls in 16 countries have shown that most people expect the environment to be prioritised in recovery packages.³⁵ Large majorities of respondents supported the proposition that we have a responsibility to protect the planet for future generations, and that environmental degradation poses a major threat to health. In the UK, a climate litigation charity warned the government of legal action against inadequate investment in a “green” recovery.³⁶

How can health professionals respond to support the required profound economic changes in the face of entrenched interests, such as fossil fuel industries? They could start by making their voices heard in the lobbying for resources. The recent letter from representatives of 40 million health professionals to the heads of G20 governments urging investments in a zero-carbon, healthy recovery is an example of the leadership needed.³⁷ They could also support the UN and national actions to create a healthy, low carbon economy. WHO, for example, has issued a manifesto calling for a healthy emergence from covid-19 comprising protection and preservation of nature; investment in essential services; rapid decarbonisation of the energy system; promotion of healthy sustainable food systems and cities; and stopping the use of

taxpayers' money to fund pollution, including halting the \$400bn direct fossil fuel subsidies globally.³⁸

Health professionals can also act to address the climate emergency in their daily work—for example, by supporting the decarbonisation of health services, reducing waste, encouraging reuse of supplies where feasible, promoting healthy sustainable lifestyles, and leading by example.³⁹ Another role is to work with non-governmental organisations bringing health perspectives to advocacy for climate action.

The next year or so will bring major opportunities to unite global actors in decisive action to protect and promote the health of human populations and natural systems. This imperative should motivate increased ambition at the postponed 26th UN climate change conference in Glasgow, UK, in November 2021 and at the 15th Conference of Parties to the Convention on Biological Diversity in Kunming, China. Health professionals can play important and potentially decisive roles in promoting a healthy and sustainable recovery from covid-19 to safeguard the health of current and future generations.

Key messages

- Our society has a responsibility to implement a sustainable recovery from covid-19 that safeguards planetary health
- Economic recovery packages should help build more resilient social foundations, including reducing health inequalities, and cut greenhouse gas emissions
- Low carbon recovery strategies will benefit the economy and health
- Lifestyle and employment changes in response to covid-19 must be harnessed to catalyse decisive action on the climate emergency
- Health professionals have an important role in promoting healthy and sustainable recovery and decisive action on climate change

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- Haines A, Ebi K. The imperative for climate action to protect health. *N Engl J Med* 2019;380:263-73. doi: 10.1056/NEJMra1807873 pmid: 30650330
- Le Quéré C, Jackson RB, Jones MW, et al. Temporary reduction in daily global CO₂ emissions during the COVID-19 forced confinement. *Nat Clim Chang* 2020;10:647-53. doi: 10.1038/s41558-020-0797-x.
- Schiermeier Q. Why pollution is plummeting in some cities—but not others. *Nature* 2020;580:313. doi: 10.1038/d41586-020-01049-6 pmid: 32273616
- Forster PM, Forster HI, Evans MJ, et al. Current and future global climate impacts resulting from COVID-19. *Nat Clim Chang* 2020.[Epub ahead of print.] doi: 10.1038/s41558-020-0883-0
- Peters GP, Marland G, Le Quéré C, Boden T, Canadell JG, Raupach MR. Rapid growth in CO₂ emissions after the 2008-2009 global financial crisis. *Nat Clim Chang* 2012;2:2-4. doi: 10.1038/nclimate1332
- Williamson EJ, Walker AJ, Bhaskaran K, et al. Factors associated with COVID-19-related death using OpenSAFELY. *Nature* 2020; [Epub ahead of print.]. doi: 10.1038/s41586-020-2521-4 pmid: 32640463
- Margerison-Zilko C, Goldman-Mellor S, Falconi A, Downing J. Health impacts of the great recession: a critical review. *Curr Epidemiol Rep* 2016;3:81-91. doi: 10.1007/s40471-016-0068-6 pmid: 27239427
- Stuckler D, Basu S, Suhrcke M, McKee M. The health implications of financial crisis: a review of the evidence. *Ulster Med J* 2009;78:142-5. pmid: 19907678

- Sumner A, Hoy C, Ortiz-juarez E. WIDER working paper 2020/43. Estimates of the impact of covid-19 on global poverty. 2020. doi: 10.35188/UNU-WIDER/2020/800-9
- Whitmee S, Haines A, Beyrer C, et al. Safeguarding human health in the Anthropocene epoch: report of the Rockefeller Foundation-Lancet Commission on planetary health. *Lancet* 2015;386:1973-2028. doi: 10.1016/S0140-6736(15)60901-1 pmid: 26188744
- Wilkes T, Carvalho R. \$15 trillion and counting: global stimulus so far, Reuters. 2020 May 11. <https://uk.reuters.com/article/uk-health-coronavirus-cenbank-graphic/15-trillion-and-counting-global-stimulus-so-far-idUKKBN22N2EP>
- Guterres A. A time to save the sick and rescue the planet. *New York Times* 2020 Apr 28. <https://www.nytimes.com/2020/04/28/opinion/coronavirus-climate-antonio-guterres.html?smid=tw-share>
- Simon F. EU leaders back 'green transition' in pandemic recovery plan. *EurActiv* 2020 Mar 27. <https://www.euractiv.com/section/energy-environment/news/eu-leaders-back-green-transition-in-pandemic-recovery-plan/>
- Hepburn C, Callaghan BO, Stern N, Zenghelis D. Will covid-19 fiscal recovery packages accelerate or retard progress on climate change? *Oxf Rev Econ Policy* 2020;36(Suppl 1):1-48.
- Guerrero C, Haines A, Pagano M. Health and sustainability in post-pandemic economic policies. *Nat Sustain* 2020 [Epub ahead of print.] doi: 10.1038/s41893-020-0563-0
- United Nations Environment Programme. Emissions gap report 2019. <https://www.unenvironment.org/resources/emissions-gap-report-2019#:~:text=As%20the%20world%20strives%20to,towards%20globally%20agreed%20climate%20goals>
- Lelieveld J, Klingmüller K, Pozzer A, Burnett RT, Haines A, Ramanathan V. Effects of fossil fuel and total anthropogenic emission removal on public health and climate. *Proc Natl Acad Sci U S A* 2019;116:7192-7. doi: 10.1073/pnas.1819989116 pmid: 30910976
- Wei YM, Han R, Wang C, et al. Self-preservation strategy for approaching global warming targets in the post-Paris Agreement era. *Nat Commun* 2020;11:1624. doi: 10.1038/s41467-020-15453-z pmid: 32286257
- Rushe D. US unemployment claims rise by 1.5 million as pandemic pain continues. *Guardian* 2020 Jun 18. <https://www.theguardian.com/business/2020/jun/18/us-unemployment-claims-rise-coronavirus-economy-latest>
- Veazey MV. Nearly 94 000 OFS job losses tied to covid-19]. *Rigzone* 2020 Jul 8. https://www.rigzone.com/news/nearly_94000_ofs_job_losses_tied_to_covid19-08-jul-2020-162663-article/
- Gould T, Atkinson N. The global oil industry is experiencing a shock like no other in its history. *IEA*, 2020. <https://www.iea.org/articles/the-global-oil-industry-is-experiencing-shock-like-no-other-in-its-history>
- Garrett-Peltier H. Green versus brown: comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input-output model. *Econ Model* 2017;61:439-47. doi: 10.1016/j.econmod.2016.11.012.
- Baile VD, Meng C-X, Cornelius-Green JN, Kassotis CD, Kennedy R, Nagel SC. Systematic review of the association between oil and natural gas extraction processes and human reproduction. *Fertil Steril* 2016;106:795-819. doi: 10.1016/j.fertnstert.2016.07.1099 pmid: 27568524
- Mitchell P, James K. Economic growth potential of more circular economies 2015. <http://www.wrapcymru.org.uk/sites/files/wrap/Economic%20growth%20potential%20of%20more%20circular%20Economies.pdf>
- Verplanken B, Roy D. Empowering interventions to promote sustainable lifestyles: testing the habit discontinuity hypothesis in a field experiment. *J Environ Psychol* 2016;45:127-34. doi: 10.1016/j.jenvp.2015.11.008.
- Zotova O, Pétrin-Desrosiers C, Gopfert A, Van Hove M. Carbon-neutral medical conferences should be the norm. *Lancet Planet Health* 2020;4:e48-50. doi: 10.1016/S2542-5196(20)30003-6 pmid: 32112744
- Parker AA. Electric power-assisted bicycles reduce oil dependence and enhance the mobility of the elderly. 29th Australasian Transport Research Forum, 2006. https://www.australasiantransportresearchforum.org.au/sites/default/files/2006_Parker.pdf
- Perry F. How cities are clamping down on cars. *BBC* 2020 Apr 30. <https://www.bbc.com/future/article/20200429-are-we-witnessing-the-death-of-the-car>
- Rau H, Hynes M, Heisserer B. Transport policy and governance in turbulent times: Evidence from Ireland. *Case Stud Transp Policy*. 2016;4:45-56. doi: 10.1016/j.cstp.2015.11.006.
- Brundiers K. Disasters as opportunities for sustainability: the case of Christchurch, Aotearoa New Zealand. *Sustain Sci* 2018;13:1075-91. doi: 10.1007/s11625-017-0523-4.
- Birkmann J, Buckle P, Jaeger J, et al. Extreme events and disasters: a window of opportunity for change? Analysis of organizational, institutional and political changes, formal and informal responses after mega-disasters. *Nat Hazards* 2010;55:637-55. doi: 10.1007/s11069-008-9319-2.
- Haines A, McMichael AJ, Smith KR, et al. Public health benefits of strategies to reduce greenhouse-gas emissions: overview and implications for policy makers. *Lancet* 2009;374:2104-14. doi: 10.1016/S0140-6736(09)61759-1 pmid: 19942281
- Milner J, Hamilton I, Woodcock J, et al. Health benefits of policies to reduce carbon emissions. *BMJ* 2020;368:l6758. doi: 10.1136/bmj.l6758 pmid: 32229476
- Willett W, Rockström J, Loken B, et al. Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems. *Lancet* 2019;393:447-92. doi: 10.1016/S0140-6736(18)31788-4 pmid: 30660336

- 35 Ipsos MORI. Majority of people expect government to make environment a priority in post COVID-19 recovery Press release, 2020. <https://www.ipsos.com/ipsos-mori/en-uk/majority-people-expect-government-make-environment-priority-post-covid-19-recovery>
- 36 Figueira JC. Campaign group warns UK Government of "imminent" legal action over plans for a green recovery. Climate Action, 2020 http://www.climateaction.org/news/campaign-group-warns-uk-government-of-imminent-legal-action-over-plans-for?utm_source=ActiveCampaign&utm_medium=email&utm_content=Campaign+group+warns+UK+Government+of++imminent++legal+action+over+plans+for+a+green+recovery+-+Climate+Action+News&utm_campaign=CA+%7C+2020+%7C+10+July+%7C+Newsletter
- 37 Global Climate and Health Alliance. Healthy recovery. 2020. <https://healthyrecovery.net/>
- 38 World Health Organization. WHO manifesto for a healthy recovery from covid-19. 2020. <https://www.who.int/news-room/feature-stories/detail/who-manifesto-for-a-healthy-recovery-from-covid-19>
- 39 Xie E, de Barros EF, Abelson A, Stein AT, Haines A. Challenges and opportunities in planetary health for primary care providers. *Lancet Planet Health* 2018;2:e185-7. doi: 10.1016/S2542-5196(18)30055-X pmid: 29709275

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