SUSTAINABLE CONSUMPTION INSTITUTE

Covid 19 and Practice Change in the Everyday Life Domains of Hygiene, Eating, Mobility, Shopping, Leisure and Work. Implications for Environmental and Social Sustainability

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Acknowledgements

In this report, evidence of the current crisis, as it is published by journalists, sector experts, analysts and academics is collated and examined against evidence from peer-reviewed research on social practices. The pandemic-related data drawn upon in this report was collected between March and August 2020. As conditions are constantly changing, not only regarding the spread of the virus and measures taken to prevent/slow down transmission, but also as a consequence of interventions taken and socio-economic effects taking hold across all domains of eveyday life, there is a need for ongoing re-evaluation of new evidence against the data drawn upon in this report.

Executive summary

The Covid-19 pandemic has led to widespread changes in social practices in key everyday life domains. These changes have attracted public and policy interest as they can be conceived as one step towards more sustainable provision for human needs such as food, shelter, leisure, and mobility. This report provides a coherent overview of available evidence to support a discussion of leveraging changes in social practices towards a more sustainable society.

Based on an initial report (SCI, May 2020), which covered the immediate changes as a result of full lockdown in the UK and many other countries, this report takes into account the next phase of the evolving impact of Covid-19. We provide insight into the immediate (during lockdown) as well as ongoing changes in social practices organised along six everyday life domains: hygiene, eating, mobility, shopping, leisure and work. For each domain we include a qualitative discussion of the sustainability impacts, and provide notes on evidence used.

A key question not addressed in the first report concerns the way in which practices in these domains are related to one another. In the current report we provide a full chapter which provides conceptual and empirical insight into the way in which domains. We find initial evidence for the way in which changes in practices in one domain have a ripple effect into other domains; we also find that in cases, practices reinforce each other retain the status quo. A discussion of the factors that shape the interrelatedness of practices provides insight for policymaking.

A key message of our work is that the discussion on how to retain Covid-induced changes in social practices needs to proceed with caution, for a number of reasons:

- The Covid-19 pandemic has led to waves of governmental and public response: "full lockdown", easing of restrictions, and then a partial lockdown. These waves, and to some extent the uncertainty they generate, make it difficult to assess what changes in social practices are likely to be retained.
- Evidence on the sustainability impact of changed practices is patchy. In terms of sustainability indicators like greenhouse gas emissions, air quality, access to healthy food, data is lacking to make a systematic comparison. Also, practices can have positive and negative impacts, which requires a judgment as to what impact is prioritised.
- Social practices, such as for instance eating and working, are closely interlinked. Efforts to retain change in one practice will have implications for the practices with which it connects.

OVERVIEW OF CONTENT

Introduction

The Covid-19 pandemic is deeply affecting societies worldwide and demanding a strong response across society. Part of this response is reflection and subsequent action that emerges from the key question of how societies come out of this crisis.

In the UK, the initial national lockdown in March has led to a substantial disruption of the normality of everyday lives, with some remarkably positive sustainability impacts, including the reduction of air pollution and GHG emissions, as well as increased social cohesion as communities adopt collaborative ways of dealing with the consequences of a prolonged stay inside. This prompts immediate reflections on how the current coping strategies might feed in to the transition to sustainable societies. Helping to understand the challenges and to facilitate this transition is a vital task for academics.

With a focus on the UK, this report seeks to ground the ongoing public debate on the pandemic and the impact that responses such as lockdown rules and social distancing measures have on our lives. These ongoing debates on the pandemic are placed within research insight and evidence from the study of social practices: how they become established and evolve over time and how, under specific conditions, their change can lead to system-wide change, specifically a change towards more sustainable systems of provision. Our research draws on the social sciences, with a focus on processes of technological change, material flows and ecological dynamics.

The main section of this report is structured along six different domains of everyday life in which consumption takes place: Hygiene, Eating, Mobility, Shopping, Leisure and Work. Each of these domains will be discussed along the following five questions:

- **Which social practices have changed immediately as a consequence of the Covid-19 pandemic and the lockdown?**
- **What practice change can we observe during the ongoing pandemic?**
- **In relation to the pandemic-related practice change observed: What are the conditions for these practices to be retained?**
- **What are the sustainability implications of practice change and continuation?**
- **What is the evidence base for these changes and their sustainability impact?**

Looking at these domains separately makes sense as the Covid-19 pandemic has caused distinct impacts in each of them. At the same time, these domains are closely interrelated and the potential for retaining practice change and concomitant positive sustainability impacts requires an understanding of these interrelations. These interrelations are taken up in the final section of this report.

A practice perspective on the disruption of social life through the coronavirus pandemic

The perspective on the consequences of Covid-19 taken in this report is directed by a focus on disruption and change in established social practices, the routine ways in which people have their meals, do their work, care for their personal hygiene and so on. Practices are constituted by shared understandings of how to act effectively in the presence (real or virtual) of other people who engage in similar activities (Reckwitz 2002, Warde 2005). The purposes of such practices are generally agreed upon, the procedures to follow are widely recognised and there is shared understanding of which actions are required in which situations. In other words, we can see the habits and routines referred to as 'normality' as the outcome of the coordination, social order, shared culture and temporalities of practices. Practices undergo long term change, as for instance the continual increase in UK citizens 'eating out' over the past four decades (Warde and Martens 2000, Warde 2016). At times they change rapidly, as when smart phones altered the way in which we coordinate our social lives. At the same time, they tend to be highly routinised and habitual. A key question that we address in this report is whether the current change that we observe is either temporary, and limited to the period of the lockdown/crisis, or will persist more permanently post-crisis.

Our answer to this question will build on our theoretical and empirical understanding of social practices. A basic assumption of theories of practice is that after a period of disruption people will mostly return to their old routines and habits, seeking to perform practices in much the same ways as before. Such bouncing back occurs, unless:

- they have learned new practices to which they have become positively attached in the interim;
- the infrastructure and facilities supporting earlier practices are changed such that old habits are no longer possible or are less congenial. Or, new equipment re-directs attention towards new practices;
- people lack the personal resources, health or finance to return to previous ways of acting;
- new regulations and new prohibitions eliminate some previous practices and enhance or promote others/new ones;
- a changed cultural context alters how people value or conduct activities;
- adjustments in other, adjacent and more distant, practices have knock-on effects.

With disruption and fundamental societal change constituting one possible outcome, change is thought of in terms of socio-technical transitions: the replacement of an existing integrated set of practices and associated infrastructures, institutions and skills with an alternative set. Transitions may materialise slowly over longer periods (decades), such as the shift from horse and carriage to fossil fuel-powered vehicles, but can also happen quickly when triggered by major disruptions. They cannot be explained as a simple shift from one behavioural pattern to another (Geels et al. 2015).

The combined perspectives of socio-technical transitions (Köhler et al. 2019) and social practices (Welch and Warde 2015) underpins the work of research conducted at the Sustainable Consumption Institute, and therefore this report. Social practices are relevant as they are a major factor in shaping the environmental and social impact of the technologies, products and services we use to fulfil our needs. An understanding of evolving and revolutionary transitions is needed to grasp potential pathways to structural change in practices.

This report applies this perspective to our current predicament by applying a practice perspective on different forms of evidence. Evidence of the current crisis, as it is published by journalists, sector experts, analysts and academics, provides the best available insight at this moment. This

evidence is examined in the context of peer-reviewed evidence from historical cases of practice change, disruption and crisis. As it will be shown throughout the report, historical cases prove helpful to make sense of this situation in which unprecedented events are overturning, but they do not necessarily allow us to draw meaningful conclusions (Kalberg 1994, Stinchcombe 1978). It is sets of various conditions which impact practice change and continuation.

Hygiene

- immediate practice changes

The pandemic had immediate implications for domestic practices and the resources associated with keeping clean.

As an instant response of the general population to the virus and related communication on regards to safety, the **use of PPE, cleaning products and disinfectants** has significantly increased both in institutions as well as in people's homes. Sales of hygiene products accelerated weeks before the lockdown. Already in February, sales of hand sanitiser increased by 225% according to Kantar reports (Kantar UK 2020-03-03). Distilleries in the UK and elsewhere worked against both shortages and the threat of losing their customers and income as the lockdown became a reality, by adapting their production of alcohol to creating hand sanitizer (BBC 2020-04-13, Forbes 2020-03-17). Similarly, fashion brands shifted on to the production of face coverings (Forbes 2020-04-27). Recommendations on how to best keep homes Covid-secure through disinfecting and cleaning popped up in various news outlets (Daily Mail 2020-06-01, Good Housekeeping 2020-03-23, Wired 2020-06-16) and already early into the lockdown, disinfectant producers recorded records in sales (Reuters 2020-04-30). The integration of virus-related cleaning and hygiene practices impacts various areas of everyday life, which for example differs dependent on the kinds of products being used. Some households might have mostly stuck to the advice to wash hands, others will have started to frequently disinfect surfaces, washed their outdoor clothes more frequently, wiped newly purchased products or replaced hand washing with the use of hand sanitiser. Further, apart from additional money being spent on such products, their integration into household practices requires the acquisition and application of new knowledge and skills and the change of routines and time use. To some households, these products will have been introduced as novelty as they were integrated into daily routines. Other households might have used some of these products pre-pandemic, but began to use them in bigger quantities and higher frequencies. Given the urgency for adaptation to a pandemic, the practice change happened suddenly and adaptations can vary hugely across households, holding a variety of possible knock-on effects.

With many people suddenly working from home or being out of work, routinised practices of **water and energy use** in the household changed. On the one hand, demands to be 'ready' for work or social engagements were immediately reduced, which led to certain bathroom- and kitchen-based practices, decline or their shift to different times of the day or week. On the other, with people spending more time at home they used their household's sanitary and kitchen facilities during working hours (BBC 2020-04-18) – a change in daily routines that impacted both water and energy use patterns. Water and energy use in households further increased during the lockdown. Anglian Water for example recorded an increase of water use of 20% higher than expected (Anglian Water 2020-06-01) and Thames Water declared that they saw the highest demand for water recorded in May 2020 (@thameswater 2020-05-31).

While we can explain this increase in demand with intensified hygiene practices to protect homes and families against the virus, we also have to acknowledge that people spent more time at home during the lockdown which coincided with one of the driest springs on record (Met Office 2020-05-29).

Knock-on effects of the pandemic had significant impacts on **toilet hygiene practices**. With people staying at home, the use of domestic toilets increased. Simultaneously, many began to panic buy and hoard toilet paper – leading to a massive increase of sales. This led to shortages and subsequently people using and flushing down the toilet other materials such as kitchen towel, facial tissues and wet wipes, causing sewage blockages and fatbergs (The Irish Times 2020-05-09, United Utilities 2020-03-18, Yorkshire Water 2020-05-18). Thames Water for example reported a 20% increase in blockages during the lockdown (@thameswater 2020-04-28).

Coronavirus has exacerbated the issue of **period poverty**. With schools and community centres which would normally allow access to free menstruation products having been closed, UK charities providing menstrual supplies reported a significant rise in packs given out during the lockdown and food banks stocking such products to provide for the most vulnerable (BBC 2020-07-01, Metro 2020-03-22).
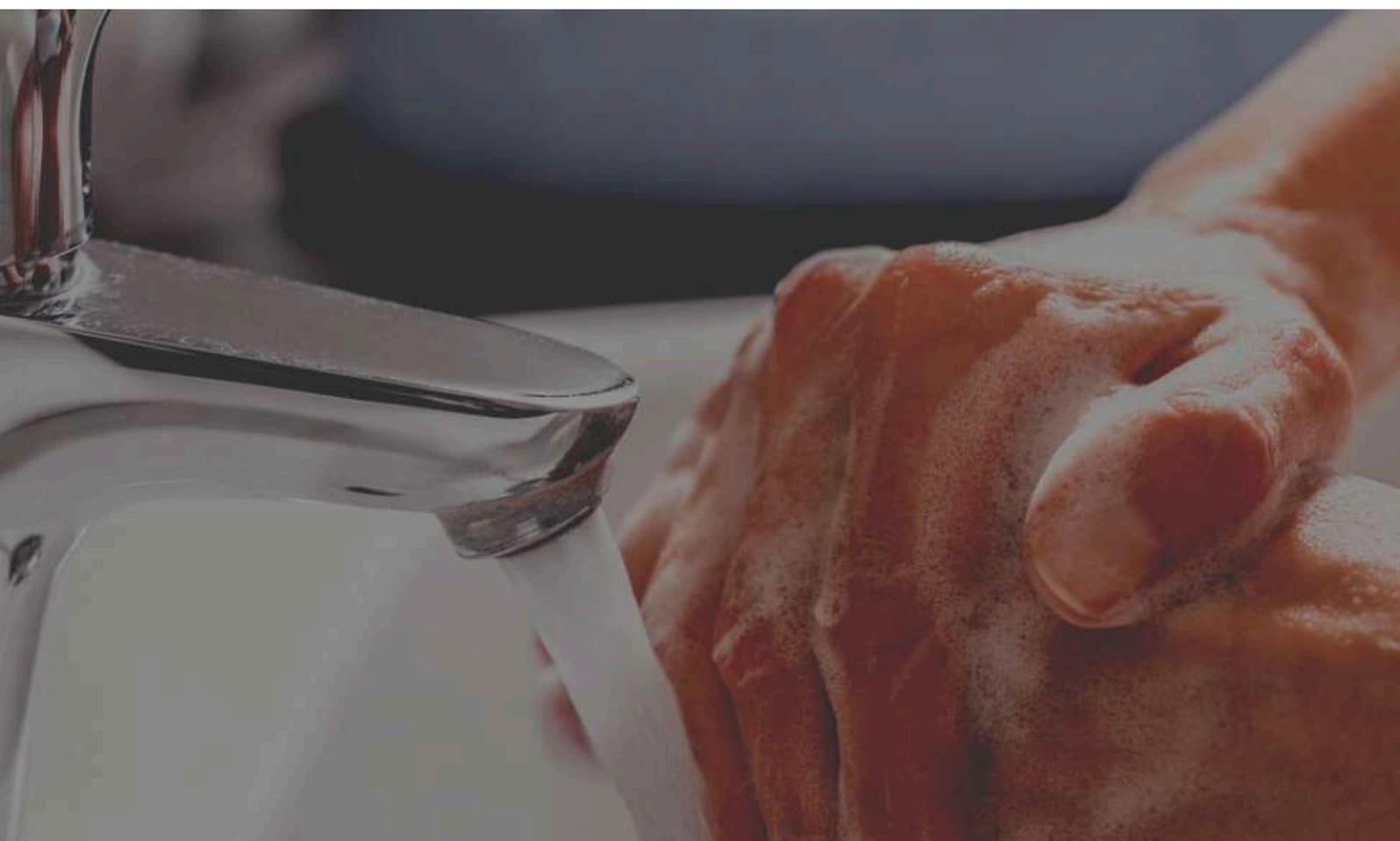
- ongoing practice changes

The widespread **use of PPE, cleaning products and disinfectants** amongst the general population is holding on, and there is an increasing adjustment to hygiene practices in domestic, institutional and business settings, and in public and urban spaces.

Policies that make wearing face masks mandatory have recently been put in place (BBC 2020-07-28), which (at least temporarily) expands the use of face coverings amongst the general population significantly. Some degree of use of PPE amongst the general population will continue for as long as there will be a need for social distancing/to protect from coronavirus. In this context it is important to note that practices of hygiene and cleanliness not only concern the appropriate wearing of such equipment, but also the ways in which such equipment is maintained, stored and cleaned (CDC 2020b, Gainer 2020) and disposed of (BBC 2020-07-08, The Guardian 2020-06-08). Further, the continuous use of such equipment could have knock-on effects which lead to an increased use of other health- and skin-care products, as well as wider cultural alterations embedding face coverings as fashion accessories (BBC 2020-07-25).

Hand sanitiser dispensers that have been installed in large numbers across shopping centres, train stations and other frequented places shared by the public have been in place as the lockdown was lifted, encouraging regular hand sanitising in public. Concerns about cleanliness and hygiene are taken beyond the domestic sphere as places reopen and people go back to work, school and socialising, with questions on how to keep public and shared facilities clean becoming more central (Forbes 2020-07-24). There appears to be an increase in demand for cleaners in all sectors of the economy, but particularly in the healthcare and hospital sector (BBC 2020-07-22). As restaurants are reopening, food services inspections will have to ensure compliance not only with Covid-19- related hygiene standards, but also with changed conditions as many switched to take away and delivery, as well as with food safety standards in general, to catch up with the backlog caused during the lockdown, when scheduled inspections did not happen (The Grocer 2020-07-09).

As lockdown eases and more people are starting to go back to work, **water and energy demand** spreads out more between household and work again. However, heightened demand in domestic homes will continue to some extent, as some degree of working from home will remain (The Guardian 2020-07-16a, UK Government 2020-07-17) and unemployment will rise (The Guardian 2020-07-16b) – conditions which will mean that private homes will be the central and main location for people go about their daily lives unless there is a massive rise of co-working space arrangement and accessible third places. Further adding to this, newly adapted water- and energy-intensive hygiene practices related to the protection from the virus can remain.

Issues caused by the hoarding of **sanitary supplies** such as toilet paper and household cleaners meant that stores have put limits on the purchase of these items in order to resolve the issue of shortages. Whilst the demand for toilet paper has not increased, it has for disinfectants and cleaning products. Manufacturing has to some extent adapted to the increased demand, with factories adapting their production strategies (BBC 2020-04-13, Forbes 2020-03-17). Building on the retailers' experience and strategies developed during spring 2020, measures to limit the availability of goods could be enforced more strongly again if supply or demand become unstable.

The lockdown had made the access to free **period products** more difficult. Some of these issues remain as long as the reopening of institutions remains partial and temporal. At the same time, with financial hardship rising, the number of those struggling to afford menstruation products and seeking out help from volunteer organisations is on

the rise (IFAN 2020). Whilst access to volunteer organisations will become easier with (partial) lockdown lifts, the number of those being unable to afford such products

and facing difficulties to exercise period-related hygiene practices is expected to rise with unemployment rising.

- conditions for retaining practices

Research on people who experienced the SARS epidemic in Hong Kong indicates that previous lived experiences of infectious health crises hold long term effects on the **meaning attached to and routines associated with personal hygiene and cleanliness** (Fung and Caincross 2007, Kwok et al. 2020), which suggests that a decline of hygiene and cleanliness practices established during the Covid pandemic will be rather slow. Lived experiences of the various regional permutations of this global health crisis will influence people's awareness of hygiene, but a variety of hygiene and cleanliness routines could be adapted in everyday life, in- and outside the home – these will depend on pre-existing and newly established socio-material circumstances.

Cultural shifts in hygiene and cleanliness practices are interrelated with the resources, materials, products available and accessible, but also depend on the socio-material environment in which these practices are embedded as well as the meanings attached to this socio-material environment. Thus, infrastructures (e.g. water and sewerage systems) and material conditions (e.g. bathroom design) enable certain patterns of cleanliness and hygiene practices, yet our continued participation in hygiene practices is also based on our understandings of society's expectations. Being faced with heightened hygiene requirements, established systems of provision are built upon. Existing practices are expanded and additional practices emerge almost instantly, but they do so within familiar and conventional meanings and facilities. Though often considered 'personal' practices, hygiene practices are deeply shaped by socio-cultural norms and infrastructural arrangements that enact social inequalities and injustices (Pullinger et al. 2013a, 2013b). For example, recent research

focussing on 'unflushables' (products inappropriately disposed of via the toilet), reveals that disposability is not only about the availability of such products, but relates to infrastructural imaginaries and design, gender dynamics in homes as well as societal hygiene cultures that demand convenience and discretion (Alda-Vidal et al. 2020, Browne et al. 2020). In other words: Only in a societal context in which single-use is common and the toilet provides a facility through which single-use materials are disposed, practices of inappropriate disposal through the toilet can establish. Thus, while the sudden emergence of additional hygiene and cleanliness requirements holds potential for a radical change, new and expanded practices also build on established conventions, which can mean continuation and reinforcement of the existing.

The change or continuation of practices is not only dependent on people's ideas of health and safety and related public health messaging and campaigning, but also on systems of provision, access to resources and regulations in industries to do with hospitality, travel and beyond, as well as in the public realm. One such example concerns the use of hand sanitisers and single-use products over soap and water and reusable products. Even if public health messaging suggests re-usable masks offering protection and handwashing being preferable, established meanings and conventions regarding hygiene and single-use (Lucas 2002) as well as infrastructures (e.g. the instalment of hand sanitiser stations in shared and public places) impact our practices in the public, as well as in the domestic sphere. Further, Covid-related public health messaging suggests that open-air activities and social gatherings would be preferable over those happening indoors, but in order to establish a culture that is built on

such practices, sanitary- and hygiene infrastructures, facilities and services need to be available and accessible. Following public health messaging, people might continue to seek for exercising and socialising in public spaces such as parks, streets and beauty spots (as it happened when indoor spaces were closed during the lockdown), but unless this is accompanied by the provision of facilities such as public toilets and rubbish bins, newly adapted practices to provide health and safety can lead to health and safety challenges in themselves (BBC 2020-07-03, 2020-06-01, 2020-06-24).

The provision of **infrastructures and facilities across shared and public realms** is further relevant to the long-term developments of practices of hygiene and cleanliness.

We know that over the past decades, social practices in the Global North have tended to lead to reductions in the numbers of people sharing their activity either simultaneously or successively across houses, for example in the transition from launderettes to domestic washing machines (Yates and Evans 2016) and reduction in numbers of cinemas and rises in TV watching at home. This shift in infrastructures from public to domestic provisioning is precisely what the response to Covid-19 has required with an enormous number of practices, from social interaction, which is reduced or moved online, to education, with schools shutting, to most employment, which is again reduced through lay-offs and furloughing, or moved into the domestic sphere where people work from home, leaving those in a vulnerable position who depend on going out to earn their income (Yerby and Page-Tickell 2020-05-01), to take care of themselves and their

family (e.g. laundromat users: BBC 2020-06-12).

On the other hand, sharing economy models within the travel and hospitality industries (e.g. Airbnb, Uber) which established over the past years (Belk et al. 2019) have been at odds with meanings of hygiene and cleanliness that established with the pandemic. Given the need for social distancing, in particular taxi- and ride-sharing businesses have been considered problematic. While workers were not able to socially distance according to recommendations business also suffered from significant losses as customers stayed away (Wired 2020-05-15).

Depending on the practices evolving around social distancing, cleaning and personal hygiene in shared and public realms, Covid-related health and safety concerns may establish a lasting culture that is less accommodating of the function of such sharing business models and the concept of 'sharing' overall.

A key factor in terms of the long-term impacts of the pandemic also concerns **regulations and facilities regarding workplaces**, as well as the cultures evolving around certain forms of work and the futures of various industries. Manufacturing and packaging industries relying on low-paid workers cramped into spaces have fallen into disrepute in the context of the pandemic for health and safety breaches (BBC 2020-06-23, 2020-07-22) and the future of co-working spaces and the shape that these might take is unclear (Forbes 2020-07-13). Practices of hygiene and cleanliness and the use of associated products will likely be affected by working- and workplace-practices of the future and vice versa.

- potential sustainability impacts

Changing conventions around hygiene raise concerns regarding **social inequality**. The pandemic has further exacerbated existing social inequalities in access to resources needed for hygiene and cleanliness (e.g. menstruation products, washing machines). Further, basic preventive measures against coronavirus such as staying at home or washing hands more frequently have been simply impossible to certain segments of society, not only in the Global South, but also in counties like the UK. This concerns people in low-paid, precarious employments, who cannot afford to be off work to socially distance (Yerby and Page-Tickell 2020-05-01), notably also many of those tasked with cleaning highly frequented and shared facilities (BBC 2020-07-22). Newly emerging expectations about hygiene may reinforce existing social inequalities such as energy and water precarity, for example, the increasing expectations for new school uniforms everyday may place undue burden on families who cannot afford multiple sets of school clothing to take part in daily laundering of school clothes (Coventry Live 2020-09-02). Affected are also often-overlooked populations such as prisoners, the homeless, refugees, undocumented migrants and displaced people (Staddon et al. 2020). It thus important to consider how expectations of cleanliness are replicated in societal inequalities and infrastructural access issues (Jack et al. 2020).

Changes in conventions concerning hygiene and cleanliness further represent concerns in relation to **gender inequalities**. As established practices of hygiene and cleanliness become more central and frequent, additional practices are acquired, creating additional chores in household tasks, which means there is overall more housework to be done. These impact women more than men, due to a pre-existing housework gender gap. It is well documented that gender inequality translates into a division of caring and domestic labour within heterosexual couple households where women spend many more hours doing unpaid social reproductive labour than men (Elson 2017). In households with dependent children or adults, care-giving must be juggled with paid work, often leading to overburdening of those with greater share of domestic responsibilities (which tends to be women). The evidence thus far from the lockdown indicates that gender roles may be being reinforced as one result of the requirement to conduct all necessary tasks under one roof (Chung 2020-03-30).

A major environmental concern related to emerging practices of hygiene and cleanliness concerns **waste from plastic and other single-use product usage.** With disposable products being strongly intertwined with a historically embedded cultural understanding of hygiene (Lucas 2002), Covid-19 has reinforced practices of using single-use plastics. The widespread use of PPE, in particular disposable gloves and masks, amongst the general public adds another source to the existent issues of plastic pollution. In this sense, existing efforts to reduce the volume of societal use of single-use plastic have been interrupted by health and safety responses to the pandemic (Holmes and Shaver 2020). While research on the level of protection held by different types of masks is still catching up (CDC 2020a, The Guardian 2020-07-24), it is clear that different materials used in such equipment differ regarding their environmental impact. Many of the masks that are currently commercially available are designed to be single use and contain plastics. University College London researchers have found that if every person in the UK used one single-use mask each day for a year, that would create 66,000 tonnes of contaminated plastic waste. As opposed to the use of reusable masks only, this would increase the negative impact on climate change ten times more as opposed to climate change impact than using reusable masks (Allison et al. 2020). While this impact concerns the widespread use of reusable

masks amongst the general population, the situation is different in relation to PPE use of health care professionals in hospital environments, where there are systems in place for their safe disposal, segregation and incineration (Allison et al. 2020).

The occurrence of single-use plastics due to adaptations in everyday hygiene practices however does not only concern the newly widespread use of PPE, but also the increasing use of cleaning products and disinfectants, some of which contain plastic (such as wet wipes) or are sold in plastic containers (Alda-Vidal et al. 2020). Further, recent environmental wins such as the more widespread use of re-useable coffee cups and water bottles has been halted for fear of contamination, adding to the pre-existing problem of single use plastic and recycling issues associated with it (Holmes and Shaver 2020). While established practices that include the use of single-use plastics pose a major challenge, so does the lack of standardisation in infrastructure and facilities for the recycling of such materials (Burgess et al. 2020).

Water and Energy use constitutes a further key sustainability concern regarding adaptations of hygiene practices following the pandemic. Public health messaging recommends washing hands for a minimum of 20 seconds up to 8–10 times per day, which on its own implies a total water requirement of 8–10 litres of clean water per person per day (Staddon et al 2020). Increased hygiene and cleanliness measures in the home could rise water and energy demand through more frequent and warmer washes of clothes, drying facilities such as towels and PPE such as face masks and gloves and cleaning of the body. A shift from office work to working from home brings numerous uncertainties and ambiguities regarding energy use. Existing studies on teleworking tend to suggest it would reduce energy use, however, these studies mostly focus on the savings in the reduced distance travelled for commuting, potentially with an additional contribution from lower office energy consumption. As opposed to this, little is known about the potential impact of home energy use that may outweigh the gains from reduced work travel (Hook et al. 2020). Overall, the ongoing, rapid adoption of new technologies as well as various uncertainties associated with end-use practices makes it difficult to rely on existing data to understand the environmental impact working from home could have on energy and water use in households (Sharmina et al. 2019). For example, variations in pre-existing skills, knowledge and habits will likely impact the amount of water and energy used for these activities across different segments of society. People adapt to skills, knowledge and habits that they are exposed to in the social and environmental contexts they live in. Research has shown that there is a cultural-, religious- and – related to this – experience-based dimension of household water and energy use. For example, UK Muslims and immigrants from countries which suffer from severe draughts and resource scarcity hold approaches to the use of such resources which can differ significantly from Western-centric concepts of normality and which in many ways can be beneficial from an environmental sustainability perspective (MacGregor et al. 2019).

With the increased use of antibacterial disinfectants and cleaning materials, rather than regular soap and water, additional risks for **water pollution** emerge. This does not only concern the use of such products in households, businesses and other shared spaces (Weatherly and Gosse 2017) but already the production processes required to manufacture such products. The production of corn and sugarcane-based ethanol, which is a main ingredient of hand-sanitisers, does not only have a serious impact on water quality, but is generally damaging to the ecosystem, affecting also soil and air quality (Yan et al. 2020).

In UK culture, such as in many Western countries, toilet paper and increasingly other products such as wet wipes are considered central to anal hygiene (Alda-Vidal et al., 2020). Covid demonstrated this reality, given that ensuring the essentials were taken care

of before and during the lockdown meant for many to stock up toilet paper. With the use of such products in itself holding environmental impacts (Ethical Consumer 2019-06-13), major problems arise if supplemented or substituted with other types of wipes. Products such as wet wipes which contain plastic. If not disposed through the bin, but by flushing down the toilet, these products cause water pollution (Ó Briain et al. 2020) and cause blockages in the sewage system because the plastic makes them break down slower (The Irish Times 2020-05-09, United Utilities 2020-03-18, Yorkshire Water 2020-05-18).

Overall, a key determining factor of the sustainability impact of practices of personal hygiene and cleanliness is constituted by the materials used, or more specifically by the use of single-use, disposable products over reusable products, water and soap. Such products are resource-intensive in production and make a significant contribution to the waste disposal of households. They also cause harmful pollution to the ecosystem – as a consequence of both being released into the air and washed down the drain in the context of everyday routines of hygiene and cleanliness and improper disposal (e.g. by being flushed down the toilet or being left behind in the outdoors).

A cultural context in which ideas of hygiene are built on single-use constitutes socio-technical challenges different from rather water-based hygiene cultures. For example, with single-use menstruation products established as the normal and appropriate form of menstrual hygiene, the question on how to access material resources to take care of a menstruating body arises every month, and herefore a continuous struggle for those who have difficulties to access these products. If re-usable products were used more widely, the issue of access would be lessened, although it has to be noted that these are also not free from environmental impact. However, information campaigns and the promotion of reusable products alone will not change this culture, unless appropriate infrastructures of provision (e.g. private facilities and access to water to clean reusable products) are available. Similarly, utility companies in the UK run awareness campaigns on 'flushables'. Problematic behaviours, which need reminders such as "Bin it – don't block it" and the "three Ps rule: pee, poo, (toilet) paper" (@thameswater 2020-04-28, Yorkshire Water 2020-05-18) can only occur in the context of a culture where people are used to disposing single-use materials through the toilet in the first place.

- notes on evidence

As daily practices changed radically, new household habits and routines impacted patterns of water and energy use. Whilst daily routines of 'getting ready' for work were somewhat amended to the changed circumstances, there is not sufficient knowledge available to determine whether long-term impacts of (hygiene-related) practice change due to the pandemic has impacted the use of water in environmentally beneficial or detrimental ways. Evidence from the lockdown suggests

that water use in households increased, however, as it is not clear which (combination of) practice changes have caused this increase and whether the change has to do with intensified hygiene practices, increased garden use, a shift from workplace water use to household water use or any other factors. Knock-on effects of any other practice change and/or pandemic-unrelated seasonal dryness constitute potential causes of increased water use during the lockdown. Understanding the causes of increased water

use is essential to determine the potential for long-term change of practices and therefore the risk for negative environmental impacts.

There is clear quantitative evidence which shows that the use of PPE, cleaning and sanitising products and disinfectants has increased significantly due to the pandemic, as well there is evidence on the potential environmental impact on such products through for example the (their inappropriate disposal of) additional accumulation of waste caused by such products. Practice change in the sense of more of these products being integrated into everyday life, potentially on the long-term, further contribute to environmental pollution from the manufacturing, use, or disposal of cleaners, disinfectants and single-use plastics. However, little is known about how such products are used in households. The establishment of practices in the context of which such products are mis- and over-used holds problematic implications from an environmental perspective. More evidence is also needed on potential wider cultural alterations that come with the use of such products, for example on how the pandemic has shifted expectations of cleanliness and what this means to people in various occupations and in terms of unpaid labour and (in-)equality in access to resources.

Eating

Disruption and change in eating practices as a consequence of Covid-19 and the lockdown was observable in relation to who prepares the food, what is eaten, where it is eaten.

Practice change could be observed regarding the **place of food preparation and consumption**. Prior to the pandemic affecting the UK, restaurants, cafes and canteens were supplying roughly one meal in six to the population of the UK, with about a third of household food expenditure devoted to eating away from home. Food consumed immediately, "on-the-go", as well as digital delivery platforms both were sectors of strong economic growth (IGD 2019).

As part of the 'lockdown', eating out, which had become habitual and routine for many people (Cheng et al. 2007, Warde 2016), was outlawed. The closure of locations to eat in and the decreased need for having meals in public spaces as more people work from home, suspended the lifestyle that was the basis for food to go. This radical shift of eating practices towards eating at home negatively impacted not only restaurants, but also supermarket segments which relied on impulse and on-the-go occasions, as daily working routines became more predictable and stable in terms of location. Even sales of products such as cereal bars declined significantly during the lockdown months (The Grocer 2020-07-09). Also affected was the dairy industry. Due to the closure of cafes and restaurants, demand declined, leading to oversupply and exacerbating the struggles of the industry that has been building up over the past years (BBC 2020-04-09, Department for Environment, Food and Rural Affairs 2020a, Financial Times 2020). This reveals how the consumption of various types of foods is intertwined with, and dependent on everyday contexts and infrastructures of provision, rather than a matter of people seeking out for particular ingredients to satisfy dietary needs or tastes. Thus, for the sake of a longer shelf life, consumers were happy to replace dairy for home consumption with long-life and plant-based products (The Grocer 2020-07-09). Further, with the latte-to-go and socialising- and work-sessions in cafés omitted, so were the drinks that they would consume in such contexts – with the habits, meanings and relationships in which such products were consumed being inaccessible, the desire for foods consumed in this context were curbed.

By contrast, delivering food to homes, be it individually or through platforms such as Just Eat, has continually been permitted. Already before the pandemic hit, food home delivery was growing and according to market insight reports, constituted around 10-20% of the total foodservice market (Big Hospitality 2020-07-21). Since March this year, for many gastronomic enterprises this remained the only way to maintain their business (BBC 2020-07-18, The Grocer 2020-04-27). Thus, during the lockdown, some segments of the population will have replaced their restaurant-, canteen-, or other to-go meals with online food orders. Such services are, however, not equally accessible to people across society and the simultaneous rise of purchases from supermarkets and food bank shows that many resorted to food preparation in their homes. Increased sales of supermarket products to some extent also stem from people engaging in panic buying and stockpiling – practices which, in the context of a pre-Covid normality of all-time-availability of consumer goods, were somewhat unusual and exercised by a rather insignificant number of people (for evidence on this see the section on shopping, especially page 28).

Further, immediate practice changes concerned home **cooking, baking and diets in general**, which have partly been impacted by destabilised supply caused by a

combination of panic buying (in particular pre-lockdown) as well as increased demands for particular product categories during lockdown, with people looking for long-life options and ingredients for home cooking to substitute for meals that were previously consumed outside the home. Flour producers for example were not able to keep up supply to retailers once existing stocks were used up due to stockpiling and a turn to home baking (The Grocer 2020-04-01). People supplemented standard products with alternatives. Dairy alternatives, for example, which had been on the rise pre-Covid, due to people stocking up on long-life options, gained an extra 17.4% in volumes in the 12 weeks to 14 June (The Grocer 2020-07-09). Similarly, people substituted regular products, which were unavailable, with gluten-free products, leading to temporary shortages in supplies for those with dietary requirements, such as coeliac or gluten-free diets (The Grocer 2020-07-09). Thus, practices of food consumption were shifted in the sense of a move towards home baking and cooking, but also in the sense that people had to make do with what was available, do without familiar products and ingredients and/or replace them with products that they were less familiar with pre-Covid, practicing new forms of eating. Market research indicates increased demand for processed meats such as sausages and away from other more valuable cuts due to the lockdown (BBC 2020-06-28). This appears to be similar to developments during the 2008/09 financial crisis, where the total UK market for meat products decreased by almost 10%, but per capita consumption changed much less significantly (Rödl 2019a). Surveys also report that more people have reduced their meat and dairy intake over the lockdown period. Instead, people try animal-free

proteins such as tofu in a move towards 'from scratch' cooking in households (BBC 2020-06-28). According to a consumer survey by The Vegan Society more than a fifth of respondents said they had cut down meat consumption during lockdown and 15% said they had cut down on dairy and eggs. This was to some extend explained with intermittent poor availability of meat in supermarkets (The Grocer 2020-05-14). This observation can be interpreted as an example of a dynamic in which existing meat-eating patterns have not simply been consolidated into one place (away from cafes or other people's homes), but morphed to accommodate changes in the provisioning system and household composition.

The Covid-19 outbreak has also affected the **access to food** for the most vulnerable in society, with emergency food providers who support vulnerable families having become under stress. The UK lockdown led to a decline in volunteers and a shortage in food donations (Power et al. 2020). At the same time, the number of people in need of food aid is rapidly increasing, with around 3 million people living in households where someone had to skip some meals (The Guardian 2020-04-11). Some food banks in the UK have been forced to shut down, to reduce or reorganise the service they offer (The Guardian 2020-03-27, 2020-04-11). Others remained open, despite uncertainty regarding food stocks and the necessity to rearrange spaces to ensure safety to volunteers and users. Food donations by supermarkets, ad-hoc campaigns lead by a British online publisher and even the 750 million extra funding for saving some frontline charities from shutting down were necessary palliatives to allow the system to survive.

- ongoing practice changes

When the pandemic hit initially, manufacturers and retailers put limitations on how many items of certain product categories could be bought by customers in

one shopping trip, in order to maintain supply. Quantitative data shows that compared to early March 2020, in June 13,724 fewer product lines were available in

the top six supermarkets than at the start of March. Analysis has reported that since March Asda and Morrisons have reduced their stock keeping units by about one in seven (The Grocer 2020-07-03), offering a reduced availability of product choice for home cooking, which will continue having an impact on **cooking and eating practices**. With restaurants re-opening, there might be a shift back to getting culinary variety and inspiration from eating out in restaurants. However, uncertainties related to the recession and Brexit might shrink the availability of grocery and product ranges more permanently.

Although lockdown restrictions have been lifted and restaurants have started re-opening, the number of **restaurant visits** taken remain much lower than prior to the pandemic. According to data from Open Table, which compares online, phone and walk-in restaurant reservations made on its platform, UK-wide bookings in the last week of July 2020 were still down by 20-40% in comparison to the same day in 2019 (Open Table 2020). The August promotion of eating out by subsidising meals constitutes a reprieve to these trends (BBC 2020-08-10). Interventions of this kind impact practices temporarily but the new experiences people gain from this, could change eating practices and the relationship to food in the long term and further come with knock-on effects on other practices. For example, if people who used to rarely eat out start to do it regularly, if people getting used to spending small amounts on meals that are eaten out or if people shift from eating out on the weekends to eating out on a weekday or if people who do not eat out get used to eating out, habits around household planning and organisation and socialising could change in the long term.

While many sectors suffer from the economic effects of the pandemic and unemployment rates are on the rise, **grocery and meal delivery** service is one of the areas expanding as lockdown lifts. Retailers continue to expand on logistics and delivery to deliver groceries to people's doors (BBC 2020-07-22). ONS reports for June show that in comparison to February, volume food sales were still 5.3% higher and overall non-store retailing was 53.6% higher (ONS 2020-07-24). Social distancing remains a priority, which will likely keep up delivery rates. Many independent restaurants have joined up with delivery platforms such as Just Eat and Deliveroo during the lockdown, as this remained as the only option to keep their business going. However, high commission rates are putting restaurants off such collaboration (BBC 2020-07-18, Big Hospitality 2020-07-29, The Telegraph 2020-07-13), raising further concerns about future models of meal delivery services.

Problems with **access to food** and the use of food banks continues to rise. In comparison to last year, food banks in the Independent Food Aid Network (IFAN) have reported a 177% increase in the number of emergency food parcels distributed in May 2020. Since March, the number of people supported with emergency food parcels has continuously increased with every month. There has been a general increase since last year, which was unrelated to the pandemic. Figures show that in comparison to February 2019, in February 2020 14% more people relied on food aid services such as food banks. Then, in March 2020, when the pandemic started to take hold, figures were 56% higher than in March 2019. The situation accelerated in April with the number of people supported rising by 118% compared to April last year. The rise in levels of support for people in May 2020 was 135% compared to May 2019 (IFAN 2020).
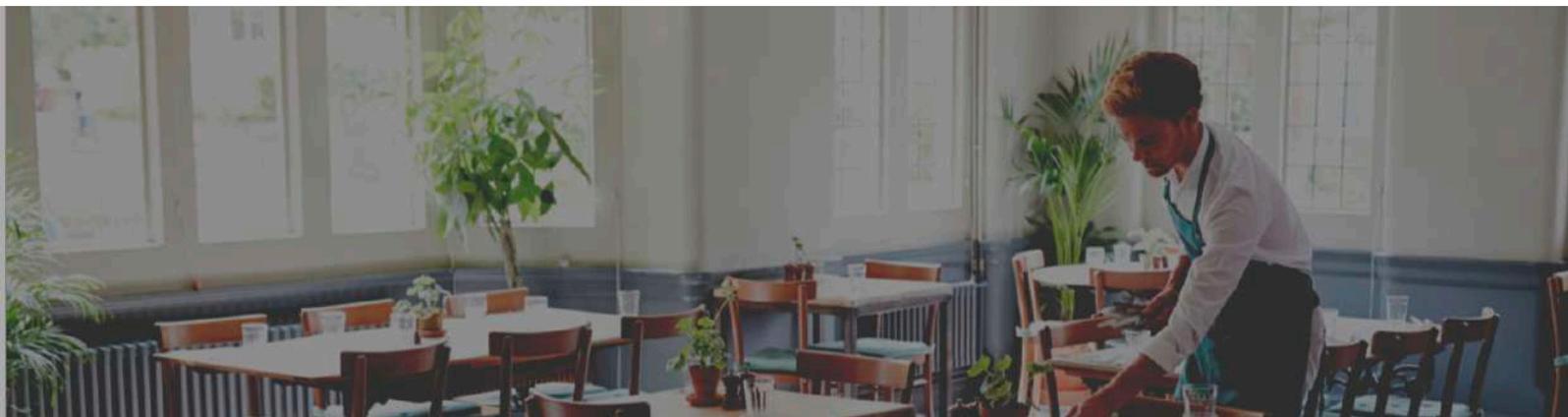
From research on food practices we know that the **composition of our diet** is as much ceremonial and about pleasing other people as it is about the food itself (Mylan 2018; Neuman et al. 2019, Yates and Warde 2015). The changes to practices of meal preparation and the composition of meals prepared and eaten over the past few months have been driven by a combination of change in availability and access to ingredients and products, pre-existing skills and necessity. While there might be some long-term impacts from people having become positively attached to new ways of eating in the interim, these factors hold little power to change the ceremonial and caring aspects attached to established forms of eating. With that said, however, it needs to be emphasised that diets do not only change with changing meaning of food and eating. As the past few months have demonstrated, where there is limited access, there is limited choice. A 'bouncing back' to smooth access would require both the availability of products in supermarkets and peoples' personal and financial resources remaining stable. Given the recession that will follow the lockdown, paired up with the uncertainties of Brexit, it remains highly doubtful that such a "bouncing back" will happen (Lang 2020a and 2020b).

Compositions of meals consumed at society level do change. Research based on data drawn from a big survey data base comparing meal patterns and contents in Great Britain in 1955/6 with 2012 identified an overall simplification of the patterning of eating events and their formats as well as a diversification of meal content (Yates and Warde 2015). These changes are most likely explained by working practices having significantly changed since the 1950s: longer journeys to work, less synchronised working hours, a greater participation of women in the labour market and the demise of employers' responsibility for providing

meals at work. Although working patterns in a post-Covid world could shift significantly in the long-term, a return to more complex meal patterns and contents is not to be expected. People who can work from home might save time from abstaining from journeys to work, however, the re-emergence of more regular working patterns is not to be expected and neither is a sustained voluntary decrease of women's participation in the labour market.

However, what this study also confirms is that the type of meat which are often at the centre of a meal have changed since the 1950, with meats that require minimum fuss and cleaning, such poultry, minced and mixed/chopped meat featuring as the most popular in the survey data from 2012 (Yates and Warde 2015). With people abstaining from supermarket visits and looking for long-life and simple-to-cook options, there was a rise in demand for processed meats and meat alternatives. Thus, given the convenience element of meat alternatives, which are comparable to processed meats in terms of cooking properties, convenience, meal satisfaction, tastes and textures and which can be used in a meal for the same purpose as meat, consumption of such products might continue to rise, if they remain affordable and easily accessible in supermarkets. We know that historical periods of crisis have led to efforts to replace meat and other animal-based substitutes with more affordable and accessible substitutes – events that might repeat in the ongoing corona crisis. Having emerged in response to hardship and enforced by rationing, historically, less-meat and meat-less options had the meaning as a 'second-rate' attached. It is thus of little surprise that such meal options receded, once the economic situation had stabilised (Rödl 2019a). Compared to previous crises, the situation in the current coronavirus crisis is different, given that consumer acceptance of

alternative proteins intended as substitutes for conventional meat, milk and other animal-based food products has been continuously on the rise in the years leading up to 2020, with a whole new narrative landscape having arisen around them (Ehgartner 2020, Morris et al. 2019, Mylan et al. 2019, Sexton et al. 2019,). Lastly, Covid outbreaks in various places have highlighted various serious issues related to the food industry and its resilience. Health and safety regulations, employment and working conditions in the food production- and processing industry can impact supply and prices, which could further impact what we eat in the long-term. The potential for a shift in composition of our diets is, as once again confirmed during this crisis, highly dependent on infrastructures of provision. Governmental grants such as the Dairy Response Fund (Department for Environment, Food and Rural Affairs 2020b) are short term and aim to provide support for businesses who suffer from changed demand brought about by the pandemic. Without further conditions that such as incentives or assistance to adjust to different forms of production, financial support reinforces infrastructures of provisions from the pre-Covid era and does not capture the potential for long-term changes in diets.

Over the past decades, **contexts where and how food is consumed** has steadily evolved towards an increase of eating out and on-the-go over the past decades, supported by a nexus of changes in how people (in particular women) go about their daily lives, supporting material infrastructures that allow quick and easy access to various forms of meals that fit with the financial resources of households across the spectrum. This has been accompanied by an expansion of meanings attached to the concept of eating out – from something special, an event, rather in formal setting, towards something that can also feel very casual, ordinary and mundane. Simultaneously, with meal convenience being brought home and routine cooking from home having increasingly been detached from the dinner table setting at home and moved to different temporal settings and spaces, also the meaning of routine cooking at home as a means to show affection and care for the family has eased up. Thus, the practice of eating out for recreation and convenience has matured over the last fifty years. Despite people having been constrained to buy more food from retailers and to prepare more meals in the home during the months of lockdown, there is no reason to expect a permanent drop in participation (Paddock and Warde 2016).

Eating practices are strongly intertwined with and embedded into everyday practices of work, leisure and care. During the lockdown, we have seen all these practices congregate in in the household. However, it would be untenable to conclude that a new-found joy in cooking and baking during the lockdown or a continued centring of daily life in the home for as long as we continue to socially distance can cause a considerable return to home-cooking and a turn away from consuming meals from outside. During the lockdown, we have seen people experimenting in the kitchen and enjoying experiences of home cooking and baking. While this suggests that many found new, slow ways to enjoy their gained spare time, there were many who faced the opposite situation, as childcare support and care infrastructure was inaccessible. With people not being allowed to visit places of care or other households, the pressures on those with caring responsibilities increased significantly. Even though it was both men and women who increased their inputs, it was women who did the lion's share of housework and childcare – the 'gap' has stayed the same in terms of housework - at around five hours a week (Zhou et al. 2020). Further, eating out has also established as a routine to take a break and to socialise with friends and colleagues. Thus, even if working from home evolves as a more common practice in the long term and childcare support infrastructure increases,

there is no reason to presume this would permanently reverse the trend of eating food from outside. Again, infrastructures of provision play a crucial role for practices to be retained or 'bouncing back', with the 'eat out to help out' scheme contributing to an ongoing manifestation of pre-Covid infrastructures and therefore the 'normality' eating out practices (BBC 2020-08-10).

In terms of the **provision side**, it has to be noted that catering businesses have always been precarious. While some robust international chains operate a large proportion of cafes and restaurants, small enterprises' realistic expectations of survival for more than a few years are slim even in 'normal' times. Employees are poorly paid and jobs are insecure. Turnover in operators and the volume of demand is likely going to be slow to recover in the face of general slump and reduced household income. The pandemic has exposed inherent precarity at the heart of the gig economy for governments, organisations and individuals. Given the lack of legal protections afforded to those working in the gig economy, many workers have faced little choice between keeping themselves safe and having to work. At the same time, food retailing and food service industries have increasingly relied on such precarious forms of work (Yerby and Page-Tickell 2020-05-01). Intervention though legislative change that causes intervention and new regulation on worker's

pay and employment status regarding the commission rates paid by restaurants for using delivery services could cause disruptions to delivery models and the delivery element could be shifted on from the business to the consumer. An expansion of meal pick-ups as opposed to deliveries could potentially promote more local forms of meal provision built on click and collect models.

During the pandemic, food deliveries also played a key role in supplying the most vulnerable. These services largely relied on community groups and volunteers (Blake 2019, 2020, Trussel Trust 2020). The governments' 'Covid Summer Food Fund' (Department for Education 2020a) supports families who are eligible for free school meals, but with many more parents losing their jobs as the effects of the pandemic continue to hit the economy, the number of those suffering from food insecurity will rise. Both the resources available to food banks and similar institutions' infrastructures, facilities and services and the types of food that they distribute will determine the eating practices of these families in the foreseeable future, unless the number of those who are dependent on such services shrink as a consequence of new regulations in support of those in precarious work (who e.g. work on zero hour contracts) as well as those out of work (Oncini 2020).
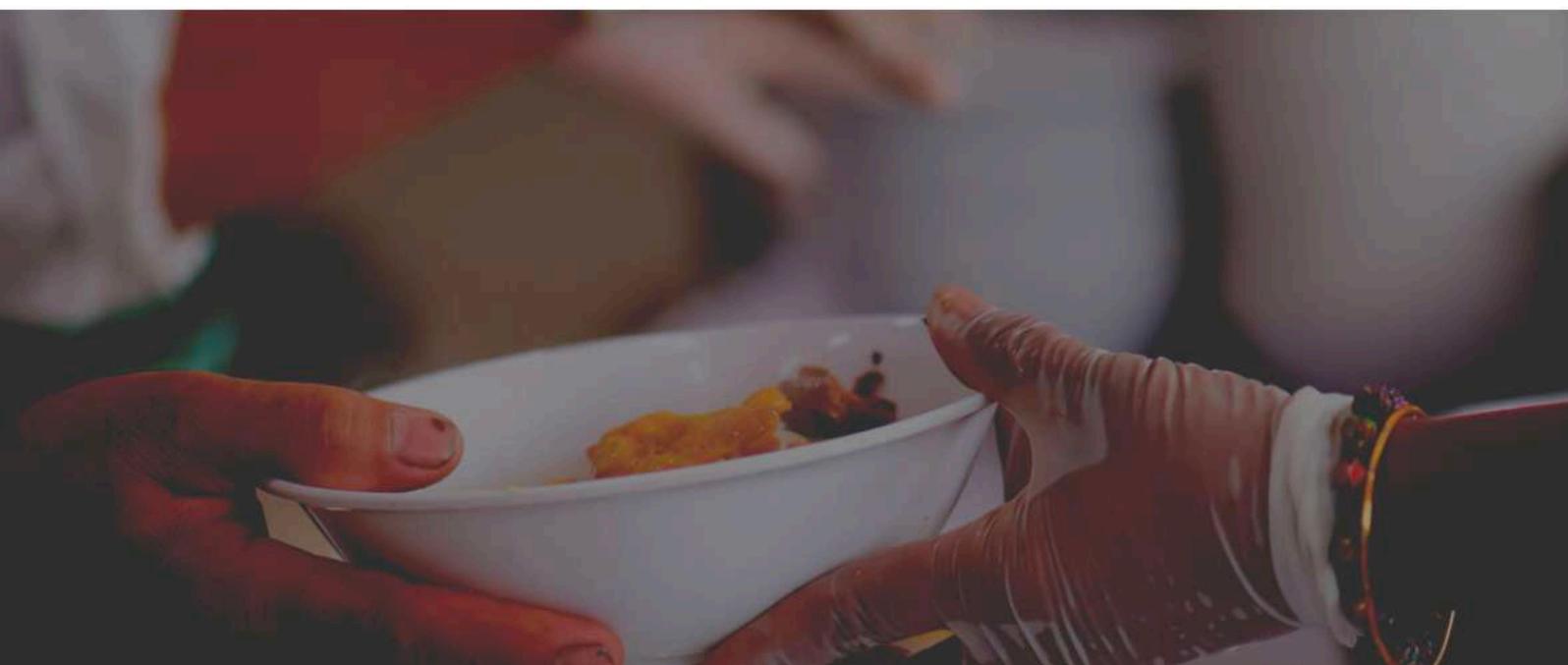
Global and local agri-food systems have come under considerable stress through the Covid-19 crisis, increasing the risk for **food insecurity**. Workers were absent due to illness or self-isolation at home and foreign workers were restricted from travelling due to lockdown measures, which has also put continuous supply of imported goods but also local harvest and production at risk (Pencheva 2020, The Guardian 2020-04-15). Food supply chains have also been affected by firms such as alcohol producers adapting their production to maintain supply of vital products and services, whilst often reducing the range of products offered (BBC 2020-04-13, Industry Europe 2020-04-01).

The fragility of the UK agri-food system, with its high dependency on imports and low-paid migrant workers has been exposed (Power et al. 2020, The Economist 2020-07-23, The Guardian 2020-03-28). With the wider public becoming more aware of the issues related to the Nation's food supply, the (previous) lack of appreciation of skilled staff, who have been considered as 'essential workers' during this pandemic, has been raised. This could lead to a change into more sustainable business models which take into account the restoration of forests, water and land that support our agriculture and value natural capital correctly and help build national and international resilience to shocks such as the coronavirus crisis. The stress on emergency food providers could be addressed in a similar effect (The Guardian 2020-04-11).

Providing only 37% of our protein and 18% of our calories, meat, aquaculture, eggs and dairy use 83% of the world's farmland and make up 57% of all food production-related GHG emissions. Given the low efficiency with which animals convert cereals to food for human consumption (Hirth 2019a), meat production causes a major sustainability challenge. Science-based evidence suggests

that a shift from **eating animal-based food** towards more so-called 'plant-based' food would help to reduce UK greenhouse gas emissions, issues of land use and deforestation as well as tackle some of the major health issues that the UK is facing (de Ruiter et al. 2017, Poore and Nemecek 2018, Willett et al. 2019). Thus, an increase of demand of processed meats over more valuable cuts, as it happened earlier this year when restaurants were closed, has sustainability implications, not only because of increased volumes of meat being sold, but because of carcass wastage as processors struggle to sell higher value meat cuts to supermarkets (The Grocer 2020-04-01). This disruption had, as it happened, negative impacts from a sustainability perspective. However, from a long-term perspective, potential for positive change and a shift away from high levels of consumption of meat is revealed, given that the changed demand during lockdown can be attributed less to a desire to eat cheap meat of lower quality, but rather to a sudden increase of demand for more convenient and longer lasting ingredients, as people found themselves having to cook for themselves, rather than eating restaurant or take-away food. Thus, although the cultural and historical reasons why we consume meat are manifold and complex (Mylan 2018), when it comes to processed meats, from a practice perspective, non-animal-based meat and dairy alternatives such as soy-protein sausages or oat-based milk could replace animal-based products. This could represent one of the most straightforward sustainability improvements for diets, with the brand logo and the location in the supermarket shelf arguably representing the biggest change (Rödl 2019b). Research conducted at the SCI highlights that food sustainability does not exhaust itself in changing *eating* practices, suggesting that responsibility cannot be allocated to the figure of 'the consumer'

alone (Ehgartner 2018, Hirth 2019b, 2020), but has mostly to do with the products that are provided.

Previous situations of shortages that led to meat substitution show that practices 'bounced back' (Rödl, 2019a). However, the conditions of meat consumption in this crisis differ from previous crises. Already prior to the pandemic outbreak a degree of a cultural acceptance towards eating more plant-based foods and a turn away from meat-based meals has been in place. Changing meanings alone, however, will not transform diets. Existing dietary patterns cannot simply be transferred across places but need to accommodate changes in the social networks and the provisioning system. For example, once people are back in pre-Covid social routines, food services would need to provide vegan alternatives to meat and dairy. An unfavourable condition of meat consumption 'bouncing back' post-Covid, is further presented by the meat producing industry in itself representing a danger zone in efforts to contain the virus (BBC 2020-06-23). Improving the working conditions for workers in abattoirs will likely not be without effects on the price of meat, which could shift consumption in addition to direct consumer responses to negative reports about the industry (Reuters UK 2020-07-13). Thus, in summary, changes in cultural meanings, regulations and provision on the macro societal level, as well as impacts on economic resources of households, could lead to the current crisis speeding up already pre-existing changes towards more plant-based diets.

The **ecological footprint of food provision** is a result of meal composition, transportation and packaging and efficiency of transforming ingredients into calories. For each of these, eating out and home cooking do not have radically different ecological footprints. SCI researchers have speculated that household provisioning of meals may be the greater environmental burden (Paddock and Warde, 2016): Efficient restaurant

kitchens can reduce the amount of energy used as opposed to meals being separately prepared in peoples' homes. However, restaurants also use energy outside their kitchens. For example, in the dining space, energy for lightning and heating will be used, which might not be used in the same intensity in people's homes or in a way that combines various practices beyond the intake of a meal (Calderón 2018). The situation can again differ between canteens and restaurants, with the latter being more commonly cooking in batches.

In terms of concerns around food waste, an increase of meals consumed from eating out, it has to be noted that commercial motives of efficiency in the food services can prevent food waste. However, the lockdown may have led to households being more careful in regards to food waste, with for example the North London Waste Authority having reported a 17% reduction in food waste volumes, whereby a lack of material from restaurants might have contributed to the drop (Lets Recycle 2020). SCI research suggests that household food waste is best understood as a product of household dynamics and routines, cultural expectations around cooking and eating and the social organisation of food consumption. Patterns of household consumption and waste are shaped by forces outside of the home (Evans 2014, Evans et al. 2017, Evans and Welch 2015, Mylan et al. 2016, Welch et al. 2018), which could potentially radically change as a long-term consequence of the pandemic.

A shift from eating out towards food delivery can hold consequences for sustainability as it can cause large amounts of packaging waste caused by single use plastic and aluminium takeaway food containers (Gallego-Schmid et al. 2019). Reusable food containers could hold the potential to counteract negative environmental effects. There have been tests of closed-loop reusable packaging schemes in Oxford and Cambridge in 2019 (Packaging News 2019-04-26). An increased

positive perception of disposables in the context of heightened hygiene awareness following the pandemic could counteract such developments. Transport is another issue. Central food provision at restaurants might be more efficient as opposed to households driving private cars to collect ingredients from supermarkets however, meal delivery from the restaurant to the household again can worsen the effect of transport sustainability, depending on the means of transport used.

- notes on evidence

There is a wealth of evidence on the negative sustainability impacts of almost all stages of industrial farming operations (Bhunnoo and Poppy 2020). Data on sales in various product categories since March provide clear evidence on disruptions regarding the kinds of foods people were buying. One element of change concerned the increasing demand of processed and long-life products, which on the one hand led towards a higher demand of processed meats such as sausages, but also rise of sales of vegan alternatives to animal-based products, such as plant-based milks. Although there are studies on consumers' self-reported changes in preferences and habits during the pandemic, reasons for change are partly to be explained with changes to supply and access through radically deranged systems of provision. Consumer motivations for change are multiple and can therefore not be clearly identified and pinned down. Historical diet change and adaptation during times of crisis is clearly evident, however, as outlined, various factors could impact diet change. And whist there is a high potential for environmental benefits to be gained from a change of diets, current practice change is instable and pointing towards various directions and would therefore need closer examination.

Due to more resource-efficient processes in the hospitality sector as opposed to the collective of private households, we can speculate that eating out might have a lower carbon footprint as opposed to home-cooked meals. Whilst reliable scientific evidence on this speculation is missing, the (potential) rise of takeout food, which is prepared by business in the hospitality sector, but eaten at home or in the outdoors complicates questions on how the way we eat impacts the environment even further. There is clear evidence on waste from aluminium and polypropylene containers being problematic, but these could be replaced with re-useable containers, which could lessen the negative environmental impact. Further, food orders are delivered by car drivers are more problematic than of they are delivered via bicycle couriers. Further, schemes might encourage customers to pick up their takeaway meals at the restaurant, which again adds uncertainties regarding the environmental impact of takeaway food. All these variations are also dependent on and hold implications for the working arrangements and conditions for those employed in the sector. Further research is needed to gain knowledge on this potential area of change.

Mobility

Covid-19 has had a dramatic effect on mobility practices. Apart from a shift towards working from home where possible, also forms of socialising and ways to spend leisure time changed in ways that decreased travel significantly. Routines shifted to leaving the house only for essential reasons. Work, leisure and socialising shifted towards virtual interaction and outdoor activities. Due to a combination of all these impacts on practices, unprecedented changes to everyday mobility could be observed: Car journeys and public transport use significantly declined, whilst walking and cycling simultaneously rose.

Public transport was widely avoided as it became regarded a threat to health and safety. Public messaging which advised against all but essential travel added to this (ITV 2020-03-19, The Times 2020-03-25). Quantitative data released by the Department for Transport indicates that as the lockdown started both national rail and local public transport use was down to 5% in comparison to the equivalent week in March 2019 (Department for Transport 2020a). Reports about the death rate of public transport workers, and in particular bus drivers, added to public transport being labelled as posing a setting of heightened risk for infection (BBC 2020-05-21). Across the country, services were significantly reduced during lockdown leading to local leaders publicly raising concerns about the future of public transportation and news such as Greater Manchester Mayor Andy Burham's suggestion that the city-region's light rail system could be mothballed (Manchester Evening News 2020-05-06). Platform-based mobility providers have made moves to adapt to concerns about Covid-safety in shared spaces and facilities and introduced in-vehicle segregation and no-contact deliveries (McMeekin and Hodson 2020-06-12).

On some days during the early weeks of the lockdown, UK **road travel had decreased** to as much as 25% of an equivalent day in February 2020 – an unprecedented low, that had been unseen since the 1950 (The Guardian 2020-04-03). This extreme change, however, only lasted during the early weeks of the lockdown. By mid-May, when the lockdown was still in place, the number of cars on the road had already risen to 50% of the number observed in February and continued to rise to about 75% at the end of June (Department for Transport 2020a). After this initial drop, road travel increased although the lockdown was still in place. This might not have necessarily been linked to essential travel (i.e. driving to work), although the public was specifically advised that if going to work was unavoidable, the journey should be done by car, foot or bicycle (UK Government 2020-05-10).

Movement decreased overall as a consequence of rules to leave the house for essential reasons only. In London for example, pedestrian activity appears to have been down by 60-65% during the first weeks of the lockdown, until mid-April (City Metric 2020-04-20). At the same time, municipalities, as well as national governments introduced initiatives to help nudge mobility practices towards **more active forms of getting around**. Thus, for example, Manchester temporarily pedestrianised Deansgate, one of its major thoroughfares (Manchester City Council 2020-04-30) and Liverpool opened a tunnel under the River Mersey to cyclists (@Merseytravel 2020-04-14). Many local authorities voiced that these changes could become permanent and integrated into long-

term infrastructure projects (Chadwick 2020-05-01). Data on cycling is unreliable and numbers fluctuate, but overall steadily high numbers of cycling on the weekends from the early days of the lockdown until June (Department for Transport 2020a) indicate that increased rates of cycling served as substitutes for leisure activities that are abstained from for reasons of social distancing, rather than replacing necessary journeys such as travel to work.

The radical change of food preparation, eating practices and shopping practices

overall had knock-on effects on traffic during the lockdown, due to the **increase in deliveries**. While retail sales overall fell significantly, spending on food and online purchases reached a high during this period (Essential Retail 2020-05-22). Effects on meal delivery services such as Deliveroo or Uber Eats however, were rather negative. As major restaurant chains were closed, these businesses lost profits during the lockdown (CNBC 2020-04-23, Financial Times 2020-03-27, Wired 2020-05-13).

- ongoing practice changes

As the lockdown eases, people still **abstain from using public transport.** Government messaging around the use of public transport has changed (The Independent 2020-07-17), but as of mid-July, national rail use still appears to be down to about 20% and local public transport in London down at around 25-45% (Department for Transport 2020a). With public transport use remaining low although lockdown restrictions are lifted, local leaders continue to express concerns about future financing of services (Manchester Evening News 2020-07-15, The Guardian 2020-07-22). While the fact that many remain working from home or being out of work and changed daily routines which are more centred around the home can explain abstinence from public transport to some extent, there is a strong indication that continuous fear and discomfort lead to people avoiding public transport whenever possible.

Figures from the later weeks of the lockdown show that percentage of **road travel has been continuously on the rise** since the end of April/beginning of May, which is most likely explained with people travelling for errands and leisure (BBC 2020-05-08). This development is confirmed by data on fuel sales, which reveal that these stared to

recover in May onwards, with a sharp increase in May and further growth in June, although in June sales still remained around 30% lower than in February (ONS 2020-07-24). As of mid-July, road travel was back at around 85-95% of the levels reported in February (BBC 2020-05-08, Department for Transport 2020a). The fact that the decrease in public transport use was much stronger at the beginning of the lockdown and still was at the time car travel already increased indicates that people do not simply abstain from travelling, but use the car instead of public transport where possible. At the end of July, traffic participation of motor vehicles almost reached the number we could have expected if the pandemic never happened, whereby commercial vehicles and heavy goods vehicles contributed slightly more to this number than cars, with car traffic still remaining at around 80-90% of the numbers observed before the lockdown (Department for Transport 2020a).

While the lockdown has meant people abstaining from buying cars, as showrooms were closed (Autovista Group 2020-03-31, SMMT 2020-05-12, The Guardian 2020-05-05), the situation changed as restrictions were lifted, however this changed as soon as socially distanced and online sales options

were put in place. Significant rises of between 10 and 30% of **sales of used cars** have been reported since June and have risen by a third in comparison to before the lockdown (Car Dealer Magazine 2020-07-21, Motor Trade News 2020-07-13, The Guardian 2020-07-21). Moreover, scooter and moped demand also appears to have been on the rise since early June (The Guardian 2020-06-14). The bailing out of carmakers and oilfield engineers further supports a return to individual mobility post-Covid (The Guardian 2020-06-05).

Further, changed shopping practices and therefore increased **delivery services**, seem to remain to some extent, as more warehouse workers and delivery drivers are needed across the UK (BBC 2020-07-22). For example, just after the lockdown was lifted, a parcel delivery firm for example announced the creation of 10,000 additional jobs (The Guardian 2020-07-20).

Some reports based on road use statistics indicate **local change in practices regarding walking and cycling** beyond the lockdown period. For example, Aberdeen Council reports a 66% rise in cycling and 33% more pedestrians across town in comparison to July 2019, with even more significant rises at local parks and the seafront, indicating that

people have gotten into the habit of going for a walk or ride as a regular spare time activity (The Press and Journal 2020-07-30). A further indication of changed mobility practices is represented by reports that bike sales have been on the rise since April. It has been reported that in comparison to the first quarter of the year, the number of electric bikes bought had almost risen by a third, however, this number might not be far off the rise that possibly could have happened anyway, given the electric market has been small but growing before the pandemic hit early this year (The Guardian 2020-06-26). Changing regulations and infrastructural adaptations indicate efforts from national and local governments to support this shift of mobility practices. For example, local leaders are voicing the possibility for temporary pop-up infrastructure in favour of active travel to be installed permanently (Leicester City Council 2020-07-09, Manchester Evening News 2020-07-15). Further, legislation for scooters on UK roads has been pushed forward, signalling support in the future of micromobility (Financial Times 2020-06-30). The governmental 'Fix your Bike Voucher Scheme' represents another such measure (Department for Transport 2020-07-22, 2020-07-28), encouraging cycling by supporting residents to have their old bicycles fixed.

Covid-related regulations, recommendations and norms around socially distancing have had a tremendous effect on mobility practices. For any work commuting or other forms of mobility that has to take place a complicating factor may be a particular resistance to **returning to public transport**, due to lingering fears of close proximity and of touching multiple surfaces that others have touched. A changed cultural context can alter how people value or conduct activities. Such a changed cultural context has arguably been established regarding the use of public transport over the past months, due to a combination of negative messages and news as well as active encouragement to abstain from it for reasons of public health and safety and the ongoing need to socially distance. Further, existing studies on mobility after terror attacks indicate that fear can lead to people abstain from public transport and switch to other forms of mobility (Ayton et al. 2019). The crisis could lead to individual cars substituting the use of public transport, which would be a regression with serious negative knock-on effects for cities, public health and the environment. The market research group Mintel has marked public transport as "one of the sectors most affected by Covid-19 and will be one of the last to fully recover" (Mintel 2020d: 2) and the obvious circumstances make it hard to argue against this prediction. However, there are various factors that could work against such a shift.

A key factor concerns infrastructures and facilities. We know from existing studies that high-quality infrastructure may help to diversify and normalise cycling in low-cycling contexts (Aldred and Dales 2017). However, it is not only road and transport infrastructure that impacts the shape that mobility takes but also uncomplicated access to bicycle storage space and bike maintenance. Moreover, infrastructures also determine differences in access to employment, education, health services, shops and social activities. Thus, infrastructural impact on mobility has to do with wider contexts of land-use and public service planning, which determines the physical location and spatial distribution of these services (Lucas et al. 2019). People who live in areas with poor infrastructure regarding employment, education, health services etc. are more dependent on transport infrastructures that enable mobility over longer-distances, which cannot be covered by active travel solutions alone.

Whilst adaptations to the road infrastructure in favour of walking and cycling can lead to shifts from public transport use to active travel for local trips, visible cleaning, social distancing and ventilation measures on public transport can make public transport feel safer (World Economic Forum 2020-07-01).

Regulations constitute another such factor. For example, measures such as congestion charge and other forms of road tax can constrain switches to car use. Free access to public transport for some groups (e.g. young people in education) further encourages public transport use over other forms of transport.

Access to resources constitutes a key factor as well. Many do not have a driving licence or access to the financial resources necessary to buy and maintain a car and therefore have to stick with public transportation (Department for Transport 2019, Lucas et al. 2019, Ricci 2016). Active travel is not an option for everyone, even for short, local journeys. A significant segment of the population lacks access to resources to cycle, such access to a bike and skills, knowledge, confidence and the social capital required to cycle (Stehlin 2019) or walk (Middleton 2016). Further, there are significant class differences in different forms of active travel, which cannot be simply

overcome with campaigning (Steinbach et al. 2011). Walking is more widespread amongst lower income groups, whereas cycling is more common form of transport of higher income groups (Department for Transport 2019). In particular in relation to cycling in the UK, evidence shows how this form of everyday mobility is bound up in a social identity built on a specific constellation of social class and ethnicity and the expression of particular sets of values and aspirations (Steinbach et al. 2011).

Financial incentives might also encourage active car users to switch to active travel or even public transport. In addition to all these factors, change and continuation of mobility practices are strongly dependent on adjustments in other everyday practices – changes adjacent and more distant domains can have knock-on effects on mobility.

Lastly, the future of mobility does not have to be a choice between existing modes of transport, i.e. between public transport and individual automobility. Pre-Covid, digital innovations have begun to rethink and reconfigure urban mobility systems. Digital platform technologies are experimented with in different realms, inspirited by a variety of actors and institutions, holding big potential to fill the vacuum (McMeekin and Hodson 2020-06-12).

Mobility practices are strongly interlinked with other everyday practices.

Thus, the long-term development of mobility practices will also depend on the extent to which people retain **working from home**. As offices remain closed whilst the country is moving out of lockdown, major companies endorse and encourage their employees to work from home, there are predictions of a permanent decline of working at the workplace (Forbes 2020-07-27, The Guardian 2020-03-13, 2020-05-21), although it has to be noted that this is possible for only part of the workforce, specifically those in jobs consisting of administrative and other laptop-based work, as well certain managerial tasks. Lockdown mobility data has shown that there has been a greater drop in workplace mobility in areas with a higher proportion of people in professional occupations (City Metric 2020-04-17).

The viability of long-term or permanent working from home arrangements will be affected by employers considering potential savings in the real estate cost associated with office space. Moves from a traditional office-based model to hybrid methods of working and company decisions to abandon office space will be a powerful enabler of retaining remote working practices. With (partial) working from home arrangements, travel time will be saved. This could not only save journeys altogether, but have knock-on effects on transport mode choice when travelling, in particular as people, when leaving their home, might seek to build in exercise into their journeys. However, it has to be noted that although travel time is an important determinant of mode choice, also the stage of lifecycle that people find themselves in, as well as routines involved with childcare and family commitments determine the perception of time available for a journey (Goodman 2001). Thus, while it is clear that if more people work from home, roads traffic will be relaxed during the typical peak times, also various other areas of everyday life may change as a consequence of the pandemic and have knock-on-effects on each other as they do, it is not possible to make a judgement on how a change towards working from home routines can impact mobility practices overall.

A clear area of impact on mobility practices is represented by how **shopping and eating practices** will play out in regards to online shopping. What we know already as we move out of lockdown is that while many sectors will suffer and employment rates are on the rise, more delivery drivers will be needed. Already during the lockdown, the

rise of online shopping has led to an increase of people hired in the sector and the industry remains as one of the few that is expanding as lockdown lifts. Delivery drivers needed across the UK, both by companies that had based their business model solely or mostly on delivery, such as Amazon as well as businesses which are expanding their delivery services following increasing demand over the past few months, such as for example food retailers (BBC 2020-07-22). With delivery services having increasingly contributed to traffic (and related issues) over the years leading up to 2020 (The Guardian 2020-02-11), this pre-existing trend might accelerate as a consequence of the pandemic.

The ways in which we spend our leisure will further have an impact on mobility practices. This concerns **leisure activities** after work and during weekends, as well as forms of holiday making. Thus, changes to work-break and after-work practices of those working from home might interlink with changes in their mobility practices. For example, they might increase travel frequency outside of working hours as they seek for more social interaction outside of

their own homes (The Guardian 2020-07-14). Further, as the countryside appears to gain popularity for weekends activities and getaways (Daily Mail 2020-07-28, The Guardian 2020-07-27), as well as for new homes (Financial Times 2020-07-11, The Telegraph 2020-07-28), it will matter how people get to and move around rural areas, which again will depend on the infrastructures available and the meanings attached to new changed ways of life. The ways in which models of holiday making evolve overall will also have an impact on mobility practices. Currently, travel restrictions, bans and quarantine measures are decreasing the number of those who fly business trips or on holiday. Whether practices of holiday making that do not require flying will be established, depends on various factors, such as whether health and safety concerns relating to airports and planes remain, whether air travel prices remain affordable and competitive with other forms of transport (which in itself will depend on various factors) and whether people become positively attached to 'staycations' or slower forms of travelling (e.g. by train or caravan) in the interim (Sharmina, *accepted*).

- potential sustainability impacts

Accounting for about a third of all carbon dioxide emissions, whereby the large majority of transport emissions are caused by road transport (Department for Business, Energy and Industrial Strategy 2019), the transport sector has a major contribution to **climate-changing emissions**. While these were temporarily reduced due to the lockdown, they have been on the rise again since the end of May, with researchers concluding that lasting effects to global temperature change caused by this short period of disruption in itself are close to negligible (Forster et al. 2020).

The environmental impact from the lockdown's widespread near normalisation of homeworking and the requirement for only essential travel produced stark and immediate environmental consequences, including improved air quality and lower carbon dioxide emissions. This has renewed debate about the potential for more effectively addressing the environmental and public health effects of air pollution through building low carbon mobility networks that are also more resilient to future crises. Whilst working from home and more flexible working hours can cushion such an effect to some extent, daily practices involving

mobility are not limited to work, but also constitute an integrated element of how we spend our leisure time, how we shop, eat, run errands and how we socialise. If infrastructures and facilities for such activities are missing around where people live, journeys will be taken.

The biggest challenge posed by the current situation is that moving towards individual car use could appear as the self-evident solution to the need to travel while socially distancing, in particular given that walking and cycling alone does not represent a feasible option for many who live outside urban areas and have to take longer journeys for work, leisure and regular errands. Further, environmental challenges do not only arise with private forms of mobility. Through the use of delivery services, also lifestyles which are centred around the home and local active mobility can significantly increase carbon footprints (Shahmohammadi et al. 2020, van Loon et al. 2015,).

The pandemic has also exposed and exacerbated issues of **social inequality** regarding mobility.

It is often the economically disadvantaged who are employed as bus-, taxi-, private hire or delivery drivers, having to expose themselves to the risk of infection (BBC 2020-05-21, Yerby and Page-Tickell 2020,). ONS data shows that road transport drivers, including male taxi and cab drivers and chauffeurs had some of the highest rates of death involving Covid-19, whereby men from Black, Asian and minority ethnic (BAME) backgrounds, in particular from a Bangladeshi or Pakistani background are significantly overrepresented in these occupations (ONS 2020-06-26).

In the UK, those on lowest income levels are the most affected by mobility constraints, which is most often caused by the lack of car ownership. Restrictions to the number of trips and the distances that can be covered come with restrictions in access to activity-

and life change opportunities and the risk of social exclusion. Many societal work and lifestyle patterns are based on an assumption of mass car ownership, making those who do not have access to a car more vulnerable (Ricci 2016, Ricci et al. 2016). Data shows that pre-Covid, almost half of the lowest income households did not have access to a car (Department for Transport 2019, Lucas et al. 2019).

Many in socially and economically deprived areas have no access to a car but have to take significant journeys on public transport to follow occupations where working from home is not an option, which is for example the case for those who work in warehouses, factories, supermarkets and care (Patel et al. 2020). It is not expected that people of this group will be able to afford a car as economic pressures exacerbate during and after the pandemic. Further, there is also evidence that the enforced possession of a car, in turn, can be the cause of material deprivation and economic stress in other life domains. Thus, if people do end up feeling forced to and are able to buy a car as a consequence of the pandemic, either for reasons of health and safety or to secure a job at a location that is inaccessible by other forms of transport, this can have knock on effects and push some (further) into social and economic deprivation, e.g. leading to struggles to afford domestic energy and housing costs (Mattioli, 2017). Further, given the situation car trade was in before Covid, as well as with the recession looming, the car trade industry does not expect rises in sales to be ongoing beyond this summer (Auto Blog 2020-07-20, BBC 2020-05-05, The Guardian 2020-05-05).

While the pandemic led to an increase to bikes being bought through cycle to work schemes (BBC 2020-05-07), as well as e-bikes (BBC 2020-06-07, The Guardian 2020-06-26), market research indicates that sales of new bikes are likely to fall later in the year, as more people will be affected by the recession (Cycling Industry News 2020-

07-30). The number of those finding themselves in a position to make larger purchases of these kinds are likely to decrease as unemployment rises.

The provision for both public and shared forms of transport, as well as active travel play a major role to allow for more equal access to mobility as well as to lessen the environmental impacts of mobility. However, their further expansion also holds challenges from a social equality perspective. Thus, efforts to increase regular participation in active forms of mobility and the use of shared forms of transportation are in place, but there are open questions regarding the establishment of transport networks that enable access and safety for all. This concerns Covid-security, as well as inclusivity. For example, not all types of cycling infrastructure are inclusive of all types of cyclists (Wheels for Wellbeing n.d.). Further, hired e-scooters were made legal on roads in July, however, given the lack of clear regulation, there are concerns about

how these can be safely integrated into traffic. Campaigners have raised concerns about their speed and the lack of noise, posing a danger to pedestrians and in particular the blind and partially sighted (BBC 2020-07-29, The Independent 2020-07-15).

Finally (and as noted earlier on delivery platforms), if new forms of mobility were to emerge, issues related to casualised forms of work would need to be tackled in order to make these more sustainable. Innovative digital platform technologies pre-Covid have been problematic in terms of fostering problematic working conditions, adding to social inequality. The highly insecure and contingent income and the daily working conditions that come with zero hours contracts in a casualised, precarious and on-call jobs market lead the exploitation of those working for these platforms (van Doorn 2017, Rogers 2015, The Guardian 2019-06-28)

- notes on evidence

The lack of environmental and social sustainability of mobility practices that had been established pre-Covid is scientifically evident. As the dominant means of transport, motorised road travel represents serious issues in terms of emissions and socio-economic inequality. The unprecedented decrease of road traffic earlier this year led to immediately observable and radical changes to cityscapes and perceptions of quality of life in cities, which in public debates were widely welcomed, even romanticised. However, as things stand at the moment, long-term effects could range on a spectrum from a reduction of overall mobility and an emergence of overall sustainable forms of travel towards a serious acceleration of pre-existing issues.

Hope for cleaner air and less congested roads emerged in the context of public

debates on the possibility of long-term adaptations towards home working or more flexible working hour patterns, with the temporary positive effect on air quality and the 'feel' of public space earlier this year widely associated with the unprecedented reduction of work commutes. However, from an environmental sustainability perspective, it is not so much the commute in itself which is problematic, but rather the means of travel. Further, while a change of work practices could relieve burdens of air pollution, congestion etc, it is only certain segments of the population who can work from home. Adding to uncertainty is the circumstance that potential opportunities and challenges of a shift towards working from home are yet unclear, as well as it is unclear whether this would lead to people giving up their cars or using them less. While

these are key areas to be researched in order to better understand work practice changes and their implications for various other domains of everyday life, it is also clear that work practice changes alone will not lead to favourable outcomes regarding pre-existing sustainability issues of transportation. Specific attention will have to be paid to the complex problems of motorised road travel and possible alternatives – some of which the pandemic might have caused to appear more feasible than previously considered and some others of which the pandemic appears to have complicated.

Increased public transport based on trains, electric coaches and buses, combined with forms of active travel for shorter distances would lower negative environmental impacts significantly. The extent to which people abstain from public transport is not yet fully understood. Further, following the lockdown, hopes for more enjoyable cities and cleaner air evolved from increased participation in active travel. However, from the evidence available on practice change since March, it is unclear to what extend peoples' engagement in activities such as walking and cycling supplemented journeys they would have otherwise taken through more air-polluting means of transport. There is no strong evidence on forms of active travel being taken as a way to get to work, school or run errands and as a form of travel that replaces journeys that would have otherwise been taken by car. Due to the restrictive measures during the pandemic, reasons for an increase in walking and cycling are manifold: People without access to a car might seek to replace journeys on public transport with active travel for safety reasons. Others who cannot or choose to not access indoor sport facilities or other pre-

Covid forms of spending leisure time, might instead be active in the outdoors. Some might simply have more time to engage in such activities, due to being out of work or school. Lastly, also the exceptionally good weather coinciding with the pandemic might have contributed to a higher degree of engagement in such activities. These aspects would require further research, in particular as we approach the colder months, to draw conclusions on mobility practice change during the pandemic.

Moreover, while we might mostly think about the impact of individual mobility and how an overall increase of working from home practices could lead to environmental benefits due to reduced commutes, there are working-from-home-practice changes outside of the realm of individual mobility, which could have a negative impact on air quality. For example, increasing demand of home delivery could add to pollution caused by delivery vehicles. The environmental impact of this is dependent on the types of vehicles used. While it is known that the demand of all sorts of deliveries has increased during lockdown, there is a lack of knowledge on the (additional) vehicles and fuel used and their impact on air quality. The exploration of this area of change must include research which establishes the effects the pandemic had on those working in this sector, but also others who are employed as drivers – of buses, taxis, or private hire vehicles. Further, there are also concerns about the situation of those who have been car-less and dependent on such services during the pandemic. How the changed circumstances affected these groups' access to healthcare and other services and forms of provision, as well as their social life, requires more research.
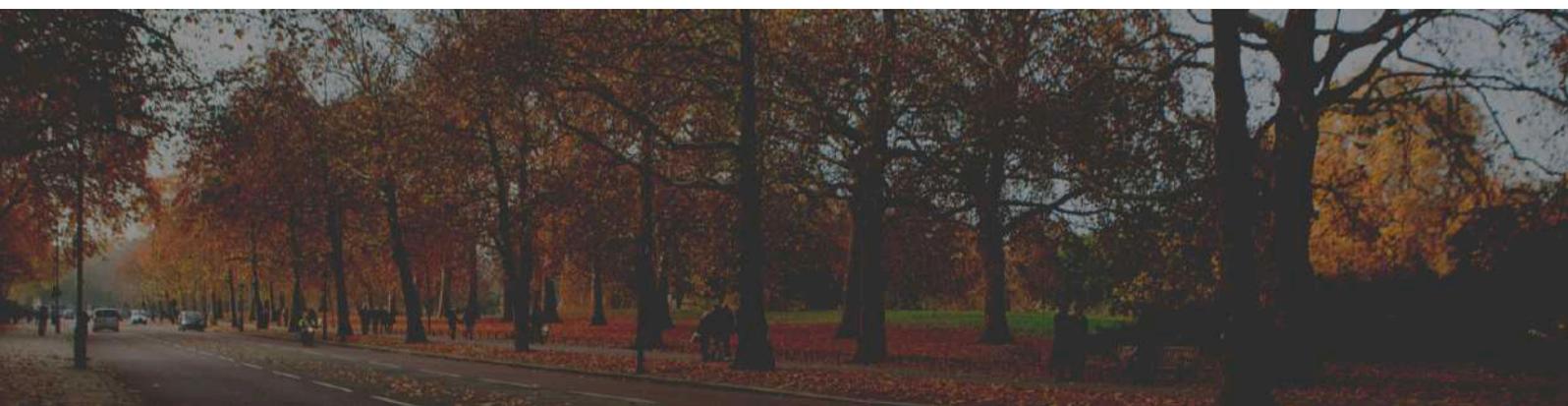
Shopping

Immediate shopping practices concerned the types of products bought, the amount of money spent on shopping trips as well as the frequency of shopping trips taken.

In March, during the days leading up to the lockdown, peoples' **stocking up on food and sanitary products destabilised supermarket supplies**. Facing the insecurity of the virus and the looming lockdown measures, many adapted their shopping practices. Purchases of certain product categories increased by over 60%, which seriously challenged the just-in-time supply chains of supermarkets. According to ONS data, in March food stores saw a 10.4% growth of sales volume, the strongest growth on record (ONS 2020-04-24). Reports further claim that in the second week of March 2020, consumers spent 22% more on groceries than in the equivalent week of 2019 (The Grocer 2020-03-27). While people potentially made more shopping trips as they were 'panic buying' in the days leading up to the lockdown and in the early days of the lockdown, this was soon adjusted to people limiting the number of shopping trips as supermarkets became considered a potential place of infection. This concerned mainly groceries and hygiene products, as well as products such as bottled water (Mintel 2020a). In order to stabilise supply, regulations such as night-time delivery curfews and competition laws were relaxed. Supermarkets themselves took measures to regulate purchases by, for example limiting the number of goods people could buy of any particular food item and allocating time slots for key workers and vulnerable people (The Grocer 2020-03-19). Some manufacturers changed their production immediately in response to changed demands, with, for example, beer and gin producers switching to the production of hand sanitisers (BBC 2020-04-

13, Forbes 2020-03-17), which was the first product category to be affected by people engaging in so-called panic buying activities (Kantar UK 2020-03-03).

Issues and concerns regarding social distancing and the risk of infection led to an unprecedented increase of demand for **online purchase and deliveries**, with online sales as a proportion of all retailing having reached a record high of 22.3% in March 2020 (ONS 2020-04-24). Having not been able to keep up with the sudden rise of demand, retailers took measures such as limiting online deliveries to existing customers or vulnerable customers only. Small and independent shops and other businesses gained support through social media and some of who previously did not offer online shopping started to do so (Hug London 2020-03-17, The Guardian 2020-06-12). Also businesses which are solely based on online services took temporary measures. For example, Amazon announced a block on non-essential goods from entering their warehouses in order to be able to better keep up with the demand for household products and Ocado suspended its online food delivery service altogether after struggling to meet the suddenly increased demand (The Grocer 2020-03-19). This shift towards online shopping contributed to a decrease of individual mobility and people overall becoming more familiar and confident with online shopping.

The pandemic also gave rise to niche offers and **alternative forms of provisioning** (Holmes 2018). Whilst some bought directly from farms, another model of online and outside-of-the-supermarket provision that has been on the rise as a consequence of Covid-19, are the so-called 'box schemes', through which food producers sell their produce more directly, cutting out retailers

as intermediaries (BBC 2020-04-27, Farming UK 2020-04-22, 2020-05-11). The disruption caused by the pandemic raised people's awareness of the fragility of supply chains and raised the degree of willingness to engage with forms of grocery shopping beyond the big retailers – which was also reflected in raised engagement with local corner shops (Retail Gazette 2020-08-27). In this way, Covid made people familiar with shopping practices that they had not engaged with before. Many had not engaged in such activities much pre-Ccovid or potentially engaged with them for the first time.

The impact of the lockdown on **product sales varied hugely between sectors**. Sales figures of paint, plants and other home and DIY products indicate that due to people staying at home, DIY activities increased far beyond the usual (BBC 2020-07-22), which can have long-term consequences to the ways in which we relate to our homes and engage with them, which as such can have various knock-on effects on how people engage in day-to-day practices related to various domains of everyday life. DIY products were purchased online, after click-and collect and home delivery options were made available, but much was also purchased directly from the shops. While shops for non-essentials were closed for much longer, DIY shops started reopening across the UK less than a month into the lockdown (BBC 2020-04-23). At the same time, the unlikely increase in demand for

goods like bread makers indicate shifts in the ways in which people spend their spare time, which could possibly also be linked to a higher desire for self-provisioning as a means of limiting visits to shops (Forbes 2020-06-04, The Guardian 2020-07-26).

With the UK under lockdown, the focus of value of consumer goods clearly shifted. As many spent most of their time at home, communicated with friends and family solely online, used streaming services etc. more frequently as a way to spend their spare time and/or did not have access to their office devices, the demand for good quality devices and services increased. Whilst the amount of electronics bought during the lockdown increased, sales of other consumer goods, for example fashion items decreased (BBC 2020-07-30, 2020-07-15). According to ONS data, sales of clothing items decreased by almost 30% in March 2020 in comparison to March 2019 (ONS 2020-04-24). As shops were closed in April, textiles, clothing and footwear had the largest proportion of online-only trading sales at 41.0%, however the pandemic continued to have an overall significantly negative effect on the volume of clothing sales, which dropped by 50.2% in April when compared with March 2020 (ONS 2020-05-22). As a consequence of this, many fashion retailers announced permanent closure of some or all their high street stores (BBC 2020-07-22, The Telegraph 2020-07-04).

After the unprecedented fall of volume of retail sales In March and April, in May and June 2020 **total sales** have been brought to a similar level as prior to the pandemic. This recovery can mainly be attributed to department store- and household goods sales. Textile, clothing and footwear stores show the sharpest decline in total sales at a negative of 34.9% (ONS 2020-07-24).

Although shops in England started to open in mid-June, the proportion of **online shopping** remained high continuously (BBC 2020-06-15). Increase in shopping in June was driven mostly by online spending on DIY, electrics, furniture and food (ONS 2020-07-24). Mobile phone location data analysed by Google suggests that by the end of July, shop visits still remained far below pre-pandemic levels. A digitalisation of shopping is also taking place in the sense that small shops continue to use social media for online or phone orders or get their own (Small Business UK 2020-06-04). Community groups and local councils run online and social media initiatives to support their local shops and restaurants (Hammersmith and Fulham Council 2020-06-15, Waltham Forest 2020, The Guardian 2020-06.18). Mobility trends for 'retail and recreation' which subsumes visits of restaurants, cafes, shopping centres, theme parks, museums, libraries and movie theatres indicate that participation was still down by around 30-35% in comparison to corresponding day of the week in January or February this year (Gstatic 2020-07-27a). This is in contrast to mobility levels in Germany and France, where at the same point in time participation in the for 'retail and recreation' category appears almost back to re-pandemic levels (Gstatic 2020-07-27b, 2020-07-27c).

Supermarkets remain different from as they were prior to the pandemic. Product ranges and services available in supermarkets prior to the pandemic, such as self-service stations, salad bars, hot food bars have changed or been eliminated. The anytime availability of everything in supermarkets remains affected post-lockdown, as stores still offer a limited range of products (The Grocer 2020-07-03). Various forms of supermarket adaptations to enable physical distancing and protection from contagion remain in place. Although data shows that footfall overall has been increasing moderately since the re-opening of non-essential shops in England, it is still low compared to post-pandemic levels (ONS 2020-07-30). At the same time, online grocery sales still continue to grow, the average spending on a shopping trip remains much higher and sales of frozen foods have significantly increased – developments that indicate that lockdown routines of less frequent visits and buying in bulk remain to some extent (Kantar World Panel 2020-07-21). Research conducted by marketing scholars suggests that with the threat of contagion being ever-present, taking action to decrease the risk of infection and protecting themselves takes priority in navigating through the aisles. This would be reinforced by in-store adaptations that create a sense of awareness of the ever-presence of the risk of infection (Szymkowiak et al. 2020). Industry voices confirm this perspective, perceiving that with the risk of infection and social distancing measures continuing, people would not be able to relax in stores and therefore limit the time they spend in store and stick to buying familiar and essential items (The Grocer 2020-06-29, 2020-07-14).

Covid-19 led to profound changes to practices related to the shopping for goods and services, in terms of both their acquisition and their appropriation and use in day-to-day life.

With everyday hygiene practices adapting to the pandemic, **single-use (plastic) products** gained popularity. Iconic examples of environmentally harmful single-use plastic products such as carrier bags and bottled water have gained a degree of revival, in efforts to maintain safety (BBC 2020-08-31). Aiming to counteract this trend, campaigns have begun by raising awareness of reuseables being safe to use during the pandemic (Refill 2020). How our relationship with such product will develop on the long term, again, depends on various factors related to resources, infrastructures and meanings, as well as adjustments in other, adjacent and more distant practices. For example, a persistent meaning of single use as hygienic is a factor in support of the consumption of such products, whereas individual financial struggles during the recession and working from home could support a reduction of consumption.

Since March 2020, many households reduced expenditures to cover necessities only. With rising economic insecurity and unemployment, this trend is likely to continue, with markets for **durable goods** adversely affected. This trend could also be observed in previous economic downturns, where the demand for durable goods recovered much slower than other parts of the economy (Deelensnyder et al. 2004). Following the financial crisis of 1929, for example, consumers in the US held on to their possessions for much longer periods, an effect that lasted for nearly a decade (Evans et al. 2003). In the current crisis, unlike in the past, government-imposed social isolation and closures of shops meant that core practices that support purchasing

decisions – from personal expert advice to trying on clothes – had to be given up. Aside from that, households acquired goods specifically to adapt to the situation of social isolation, such as for example exercise and office equipment. Staying at home, households have relied on the continued functioning of appliances and electronics more than ever (Mintel 2020b), a circumstance which is adding to the complexity of our relationship with appliances and consumer goods during this crisis.

A crisis does not simply make certain practices obsolete; rather it requires people to reclaim, invent and adopt **alternative practices of consumption**. Research has demonstrated that elements of thrift are – and have always been – inherent in people's everyday practices, motivated not only by financial necessity, but also by conscience and enjoyment. Periods of scarcity and austerity represent points in time when such practices of thrift become manifest and reinvented (Holmes 2019).

During the pandemic, motivations related to resource scarcity, financial necessity, conscience and enjoyment are having an impact our practices in- and outside the home. To mention the example of baking, resource scarcity and financial need, whether perceived, anticipated or actually experienced, may have motivated a recourse to basics and a rush on baking ingredients, particularly during the earlier days of the pandemic. However, we could also observe people satisfying their desire to follow their conscience to take 'proper' care of themselves and their loved ones, when external sources for this satisfaction were not accessible or simply enjoying the activity of baking as a new-found hobby. Similarly, a mix of thrift motivations has led to the rise of people re-inventing their homes with DIY work and embellishing and utilising their

balconies, backyards and gardens with gardening activity.

Whilst the coronavirus pandemic further accelerated existing motivations of thrift practices, it also extended our familiar continuum of thrift into another realm: resource scarcity. Due to (fear of) shortages, rationing-types of measures taken by retailers and the overall restriction of shopping trips to a minimum limit the risk of infection, the pre-Covid 'normality' of all-time-availability of consumer goods was shaken. (Perceived) resource scarcity is accompanying our lives since the beginning of the crisis and has an ongoing effect on our practices (e.g. planning ahead or being cautious and avoiding waste due to a fear of not being able to replenish).

Changed relationships to resources and making as opposed to buying emerged suddenly from the serious disruption of the pandemic, but this does not mean that the newly adapted practices remain temporary and bounce back, as soon as going out is considered normal and safe again. Since the lockdown was lifted, a transition back to pre-Covid shopping practices in some areas has arguably happened to a degree, but also this re-emergence might be of a temporary nature. The degree to which change sticks is, just as it is the case for any other domains, heavily dependent on time scales of potential future lockdowns. Further, segments of society lack the means to participate in this re-emergence already and with a potential recession to follow, this group of people will likely grow. Further, adjustments made to routines and rhythms could remain beyond the temporary disruption and have effects on the ways in which people consume. For example, long-term adjustments towards working from home and spending spare time in the outdoors could have knock-on effects on shopping. Abstaining from common pre-Covid activities of consumption has freed up time and interest to engage with other

practices – these might have gained meaning and been integrated into people's routines.

Whether recently emerged practices will remain or bounce back, will also depend on continuation and change in how goods are designed and the interaction that they allow with their owner, as well on the durability of goods. Efforts to regulate the durability of products have been instigated over the past few years (Maitre-Ekern and Dalhammar 2016, Wieser 2016) and grassroots initiatives dedicated to repair and maintenance have established (Ehgartner and Hirth 2019). In this sense, there is a pre-existing foundation to the meanings and necessities that have suddenly emerged with the crisis, which could help accelerate change as people will be less able to spend money on purchases of new products or unessential services.

Further, similar to citizens adopting practices of thrift, firms need to handle **disruption of supply chains** by improving how they make use of resources available. After the first World War, firms improved resource efficiency in response to blockage of international supplies of raw materials. Countries differed in the extent to which they were able to engage in practices of resource efficiency; for example, in Germany existing centralised structures for waste collection enabled these practices to a greater extent than in Britain. During WWII, research indicates that an effective and officially sponsored system of salvage and recycling was established, which was kept in place as long as scarcity persisted immediately after the war ended (Reimer and Pinch 2013). We can see different firms' variable capacity to engage, however, as being partly a function of size – so far, the crisis and bailout measures have significantly favoured large firms specialised in online ordering and delivery operations, but not exclusively. Concerning the supply of groceries and food products, agriculture policy, regulation and investment into measures that assist the creation of processing facilities and distribution networks will have an impact on

the future business models that are based on direct sales from smallholder farmers to members of the public via schemes such as 'veg boxes'. Platforms for online food provisioning as such hold the potential to create more resilient, local supply chains by scaling up alternative food networks (Oncini et al. 2020).

- potential sustainability impacts

During the lockdown, sales decreased in most product groups, with the exception of hygiene products, food and DIY materials and equipment. While participation in consumption did increase with restrictions having been lifted, they remain lower than pre-pandemic levels and with the recession looming participation is expected to remain low for the foreseeable future. The pandemic has already seriously disrupted our consumer culture, seriously enough to change it on the long term. Whether the change will help reduce environmental issues such as emissions, water and air quality will depend on multiple factors, which are deeply intertwined with social sustainability.

As noted in previous sections of this report, a potential cause of increasing **pollution** related to shopping practices is posed by delivery services. This concerns transport, but also packaging. Legislative change and the emergence of new infrastructure, facilities and technologies could counteract such an impact, even if delivery services will rise (Forbes 2020-07-24, Oliveira et al. 2017, The Guardian 2019-11-04).

Interruptions to the cycle of consumption and disposal would crucially aid a **reduction of waste and resource use** caused by the limited durability of consumer goods. A shift towards a higher degree of reuse and repair could be triggered by factors such as a lack of financial resources in households and new regulations and prohibitions regarding production and product design.

Food waste might be reduced simply due to the lack of financial resources or resource scarcity, which is – needless to say – not favourable from a social equality perspective, however crucial to respond to with appropriate policy to allow equal access to resources available.

It should also be noted that the pandemic could challenge established motivations for waste reduction. Practices particularly around reuse are fundamentally challenged by Covid and the risk of infection (Holmes and Shaver 2020). For example, reusable water bottles and coffee cups which had begun to be more widespread prior to the pandemic, were then banned from major coffee chains (The Times 2020-05-24).

Also changing cultural contexts can play a role. For example, clothing has become a big area of concern for its environmental impact over the past few years and in particular in 2019, with Extinction Rebellion and Greta Thunberg making headlines. The emergent pandemic has brought about developments which add to a pre-existing disapproval of fast fashion. Factory scandals, such as the one around Boohoo, have revealed the working conditions in their factories, the low wages, the lack of sick pay and the lack of safety measures (The Guardian 2020-07-11). Further, lockdown in itself appears to have disrupted fashion trends, with dress codes relaxing and wardrobe curation emerging as a way to express fashion sense (Vogue UK 2020-05-15). Such developments could aid the long-term establishment of a changed cultural context in how fashion is valued or expressed, while a change in laws to safeguard the rights of workers would aid such a development. In terms of the consumer side and the willingness to spend

money on clothes, it is crucial to think about clothes consumption beyond the purchase. Thus, while financial struggles will undermine people's commitment to buying higher priced clothes from ethical brands, they might make use of the pre-existing wardrobe for longer. Activities of wardrobe-related care, maintenance, repurposing and repair developed during the crisis can lead to the acquisition of knowledge and skills, which people become positively attached with – a foundation to maintain practices.

Inequality of **access to essential consumer goods and services** will increase significantly unless counteracted with public programmes in support of those in precarious work and out of work directly and indirectly via initiatives for alternative economies. Local forms of economy and 'slower' forms of consumption as opposed to 'mass consumerism', of maintenance, rather than buying new or of buying from farmers directly rather than from big supermarkets, further hold socially equitable as well as environmentally sustainable benefits (Holmes 2018).

Initiatives such as the 'Fix your Bike Voucher Scheme' (Department for Transport 2020-07-22, 2020-07-28), are helpful in allowing initial motivation and access to initiate practice shift and hold the potential for such economies to expand. Indeed, in order to maintain such a practice shift during a recession, local, accessible and affordable forms of support to maintain such practices need to be in place. Bicycles require regular maintenance and occasional repair, which not only enhances the mobility of the user, but also (re-)engages them with its materiality and utility, reinforcing the practice of cycling. Beyond the direct material impact, repair counters the tendency of advanced industrialised societies towards consuming new replacement goods rather than repairing the broken (Batterbury and Dant 2019). Whilst

this applies to many consumer goods, the bicycle is a good which makes apparent how consumption practices cannot be restricted to market exchange but has to be viewed in the context of various spheres of everyday life (Warde 2005): In 2018, in England, cycling accounted for only 1.7% of all trips (numbers are lower for Scotland and Northern Ireland), a figure that has hardly changed for at least 17 years (Cycling UK 2019). At the same time, bicycles are constantly sold, outselling cars (NPR 2013), with a Mintel report from 2019 suggesting that one five cyclists bought a new bike within a period of 12 months (Mintel 2019). This gap between the purchase of goods and ongoing engagement in appropriation and appreciation in everyday life is prevalent in advanced industrialised consumer societies. Repair and maintenance initiatives can fill this gap. They do not only keep goods alive, but build user skills, knowledge and confidence, contributing towards the accounting for our material lives and taking responsibility for the things we possess and use (Batterbury and Dant 2019). In this way, they serve a double purpose for sustainability: they are of social benefit as they support people in connecting deeper with the goods they own, as well as being environmentally advantageous, extending the lifetime of goods and saving energy and raw materials needed to replace them. However, as noted, such initiatives have to be supported by product design that makes goods suitable for repair, as well as adequate regulations and infrastructures have to be provided for such initiatives to further establish. Overall, a further expansion of various types of alternative economies could potentially mark a return to community reciprocity and local social networks of old, yet differentiated by their reliance upon digital media to connect to others and provision their services through platforms and social media such as WhatsApp, Twitter and Facebook.

The pandemic has an unprecedented impact on our shopping practices. Since early March, rapid and severe changes of demand in various product categories could be observed. Developments such as the digitalisation of social life, the decline of the high street, increased online shopping and the return to local convenience stores became more prominent, giving an indication of how our shopping practices could change in the long term. However, while some pre-existing trends definitely accelerated as an immediate effect of the crisis, it is not possible to predict whether these are really 'here to stay'. The situation is still highly unstable and ongoing developments of legislation, governmental support schemes, social-distancing restraints in everyday public life, changing routines regarding work and leisure as well as economic insecurity make the long-term consequences unpredictable.

Concerning the changes that have happened over the past few month, quantitative evidence is available in relation to shopping engagement with mainstream retailers, however, there is little reliable data on how alternative economies have been affected by and adapted to this disruption. Whilst there is quantitative evidence showing that the engagement with smaller, local shops has increased, evidence on success stories is anecdotal. More research will have to be conducted to establish what kinds of local shops have been thriving during this crisis and, most importantly, where they are located. Further research will also be needed to establish how the pandemic has changed people's needs in terms of shopping practices and what this means in terms of provision in local areas in different parts of the country.

Statistical data shows that the past few months were turbulent in terms of people's shopping for goods such as electronics, clothes and equipment for home improvement. To properly understand this data and to better understand long term challenges and opportunities for sustainability, qualitative research to establish potential practice adaptations in how people deal with their 'stuff' in day-to-day life will be needed.

Leisure

Lockdown rules meant people had to **stay at home** whenever possible and leave the house for essential reasons only. In terms of leisure this meant that except physical outdoor activity in the neighbourhood, leisure activities were physically restricted to the home and offline social interaction was restricted to people living in the same household. With restrictions being lifted gradually, stay at home rules were adjusted. People were able to travel further, e.g. to visit national parks, beaches and beauty spots.

Staying at home has **exacerbated pre-existing trends on media use**. The lockdown led to a rise of video streaming service subscriptions and also the use of social networks increased. With fewer people going to work or making other trips outside the home, the overall engagement with print media decreased (Mintel 2020b).

The time spent on **home-based physical leisure activities** increased significantly. Survey-based research has found a sharp rise in time spent on gardening and DIY (Roberts 2020), which is supported by the rise in sales figures of paint, plants and other home and DIY products (BBC 2020-07-22), as well as the rise in water use (@thameswater 2020-05-31, Anglian Water 2020), with paddling pools and sprinklers having been identified as the biggest challenge (BBC 2020-06-02). Social media trends further indicate that many spent their spare time in the kitchen, experimenting with cooking and baking (The Guardian 2020-07-26, Forbes 2020-06-04). Thus, it appears that 'banana bread' alone reached 45,000 new photos on Instagram in April alone, while it became the most-searched recipe on the BBC website (The Grocer 2020-07-24).

News outlets reported that many residents have been setting their garden waste on fire as a way to dispose of it while **garden waste collection was temporarily suspended**. Many councils across the UK urged their citizens not to burn household waste in their gardens, in order to avoid air pollution which could worsen the condition of those with pre-existing respiratory conditions (BBC 2020-04-13, Which UK 2020-04-09). With people spending more time at home, some engaged more with the upkeep of their gardens and backyards, started to grow food etc., which perhaps led to an increase of garden waste that occurred this spring. However, rather than constituting a problem caused by practice change in leisure or other everyday life domains, this was a result of a disruption of infrastructures of provision, which led to residents attempting to rid themselves of their waste by burning it.

Early anonymised smart meter data from March 2020 suggests that up to 30% of households have **changed energy and gas consumption patterns** markedly, with average electricity bills increased between £1.34 and £2.85 per week and gas bills between £1.65 and £1.93 (Octopus Energy 2020-03-22).

With **gyms closed** for an extended time, people who did not exercise much pre-Covid, became active in an effort to find a balance to the restrictions imposed by the lockdown. A survey of girls in the UK suggests that 40% of those who had increased their physical activity tended to be the least active before the lockdown. The study found that physical activity during lockdown was commonly associated with positive mental health benefits (Metcalfe 2020-08-05).

Many shifted their exercise routines to the outdoors or online sports classes, which expanded the market opportunities of

companies offering home workout software and equipment (Forbes 2020-09-03). Investments in innovations in such areas could widely establish workout practices which were niche or non-existent pre-Covid. This would have knock-on effects on the amount of time spent on workout, but also the timing of workouts and their integration into daily routines. It would further affect workout infrastructures and equipment in- and outside the home, as well as the socialising element of sports. For example, people might get into doing workouts at different times of the day, in different frequencies, they might travel less to do sports, might adjust their homes to 'fit' equipment, software and fitness programming and might adapt to different forms of socialising through such software or separate socialising element from the

workout – all holding a variety of implications for knock-on effects in other areas of day-to-day life.

In terms of engagement with outdoor-based activities, survey-based studies indicate that since the beginning of the pandemic about a third of adults spent more time outdoors. At the same time, others reported that they were not getting outside because they were worried about contracting or spreading coronavirus, some were particularly concerned about over-crowding and not being able to keep a safe distance from others. Also concerns about the lack of facilities such as public toilets, baby changing areas or benches were amongst the reasons which people reported as the cause for them to stay at home during the pandemic (Natural England 2020-07-07).

- ongoing practice changes

Further opening allowed people to meet up outdoors, invite people to their homes and the re-opening of non-essential retail, then cafés, pubs and restaurants and later also gyms restored a sense of pre-Covid normality in spending leisure, although constrained by the need for social distancing.

Whilst many **out-of-home venues** such as pubs, restaurants and theatres have reopened, many still face heavy restrictions on what they are able to do (Food Standards Agency 2020, Mintel 2020c). At the same time, the 'Eat Out to Help Out' scheme, under which the government subsidises meals, encourages people to engage more with this form of leisure activity (BBC 2020-08-10). Schemes such as this potentially suggest a 'back to normal' on spending leisure time for some, while it encourages others to engage with practices they have not engaged with before, such as eating out during the week or visiting restaurants in general. Many will also abstain from

engaging in such activities due to the risk of infection.

Being in the outdoors became a crucial element to spend leisure time. Overall steady high numbers of cycling on the weekends from the early days of the lockdown until June (Department for Transport 2020) indicate people substituted leisure activities, which were not possible during lockdown. Cycling, rather than replacing necessary more carbon-intensive journeys such as travel to work, served as a substitute for leisure activities that were abstained from for reasons of social distancing. During the later weeks of the lockdown people also started to travel further to enjoy the nature, with road travel having been continuously on the rise since the end of April/beginning of May (BBC 2020-05-08). Over the summer, the masses of people heading to beaches concerned local authorities across different areas in the UK (The Guardian 2020-07-31).

Live events such as the Glastonbury Festival and the Wimbledon Tennis Championships were cancelled this year. Music and sporting events are overall still not happening – a condition that will remain for the foreseeable future. This also has a knock-on effect on the wider industry. Not only those directly working in sports and music industries are affected by this, but also staff from supplying industries, such as security, catering, cleaning and commercial vehicle businesses (BBC 2020-08-12). Much of the support staff and suppliers to the arts industry are self-employed and will therefore not benefit from the governments' arts bailout (ITV 2020-08-12). Further, also bookmakers have been seriously affected by the absence of live sport events (Mintel 2020c). Thus, the absence of such events does not only cause practice change in the sense of people finding ways to spend their evenings or weekends differently, but also in the sense of various industries shrinking and people seeking to make a living within other areas.

Holidays have been cancelled or been changed to 'staycations'. Initially, vast parts of the aviation network were shut down. Although flights were taken up again for the holiday period, many people abstain from flying or put up with uncertainties and restrictions such as quarantine measures, as rules for overseas travel keep changing and adapting to second rises in cases (BBC 2020-08-07), which means that many get to experience different ways of holiday making, which they might value or disapprove of for various reasons. At the same time, the infrastructure for flying is kept alive with airlines taking large bailouts from the governmental rescue plan (The Guardian 2020-06-05, UK Parliament 2020-06-13).

- conditions for retaining practices

Regulations and the provision of infrastructure are key influencing factors on the long-term development of engagement in leisure time activities as well as on who will engage in them. This concerns for example social distancing-related **adaptations of infrastructures and services in various leisure industries**, e.g. outdoors sports lessons and more outdoor seating areas of cafés, restaurants and pubs. Models for change in terms of regulations, infrastructures and facilities are provided by schemes which make it easy for hospitality businesses to adapt to offering outdoor seating, such as Liverpool City Councils' 'Without Walls Hospitality Fund' (Liverpool City Council 2020), which waives the fee business would usually pay for a licence to have outdoor seating, as well as it supplies restaurants with a grant to buy outdoor furniture. Such initiatives can have knock-on effects on other areas of everyday life. The impact on how people spend their leisure time and the settings of eating out are obvious, but it is crucial to recognise that such transformations of public space also interfere with mobility practices by both impacting and being interrelated with the ways in which people get around places. Vice versa, the bailing out of various sectors keeps pre-Covid infrastructures (such as theatres, but also airports) active, which supports a going back to a pre-Covid normality of leisure practices.

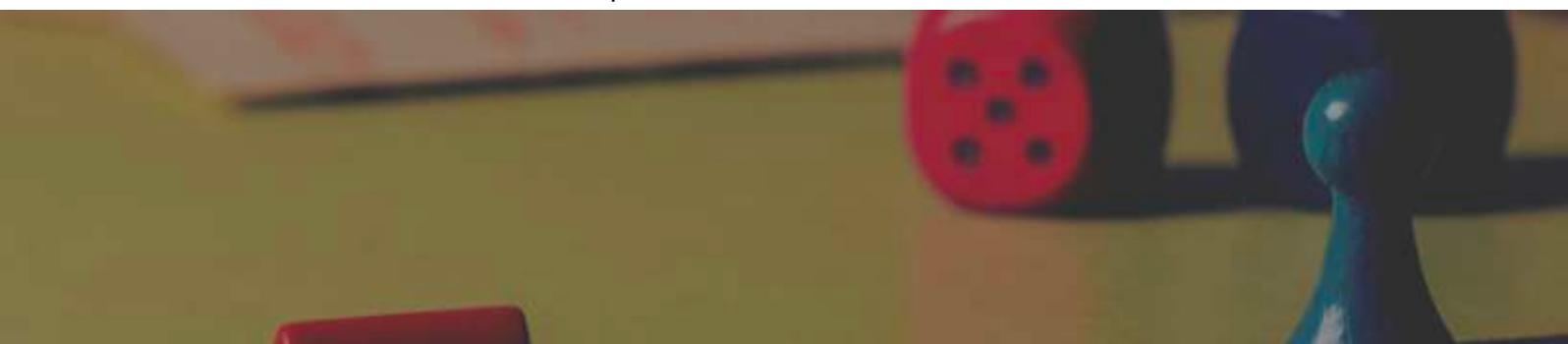The experience economy (Pine and Gilmore 1999) is overall considered strong and consumer research suggests that the trend for experience over possessions will continue (Mintel 2020c), however it is open about **what kinds of experiences** these will be and whether and how much people will be paying to have a nice day out or time away from home. People's access to economic resources will have an impact on the future

participation in costly leisure activities. For example, younger people, who are more likely to take part in leisure activities such as events, are particularly exposed to the risk of unemployment or a reduction of income (Mintel 2020c). Further, during the lockdown, many have engaged in activities within their own backyard or garden or in free outdoor activities. The lived experience of these activities may have created a positive attachment to such activities, while the ongoing need for social distancing might change the cultural context for how other activities are valued. It also has to be noted that many socially inclusive indoor spaces that offer co-production, social engagement and support (Engel-Johnson 2017) have been closed during the lockdown and remain considered unsafe as the pandemic goes on. How people who used to frequent such places will spend their leisure time will depend on how such places adapt as well as whether new spaces free of costs and social boundaries will emerge.

The (forced) change in sports participation during the lockdown and beyond highlights the meaning of **sports as a practice beyond its means to maintain public health**, or an activity for an isolated public health aim, such as to tackle obesity. Research on activities during the lockdown suggests that newly discovered forms of physical activity and the experience of physical activity in the context of the unprecedented experience of the lockdown constraints has had wide ranging beneficial impacts on how those participating in these activities relate to their bodies (Metcalfe 2020-08-05). Infrastructures and resources that encourage people to retain exercise routines established during the lockdown can have a transformative impact on actions (e.g. physical activity built-in into daily routines which are interrelated with other practices),

meanings (e.g. ways of taking care of oneself and relate to one's own body), as well as social relations (e.g. sense of community in local areas) in or daily lives. Local access to activities constitutes one factor to impact whether momentum will be maintained throughout the pandemic and beyond. This might be established in some local areas, but less in others. Research on sport participation has shown how austerity measures of policy change and funding cuts affected local councils' ability to spend on sport and leisure provision, with reports having shown that over 2,500 facilities, including athletics tracks, playing fields, swimming pools and tennis courts, have disappeared from Britain since the 2012 London Olympics, with grassroots sports initiatives particularly affected (Gérard et al. 2020, 2020-06-19).

In terms of **holiday making**, the year 2020 was certainly different from the usual in many ways. This however, does not mean that practice change is happening. The circumstances caused by the pandemic certainly mean that many experience holiday making differently and attribute values to these experiences can be positive or negative, which can impact holiday planning in the future. However, these are rather isolated experiences related to disruptions/inconveniences over one summer or one or two vacations, rather than a change in practices. Only after a few seasonal cycles it will be possible to determine whether the experiences gained during the pandemic caused some sort of practice change. Public debates on 'change' in this regard have mostly depicted the contrast between flying abroad and staying in the UK. Interventions and financial aid for industries on both sides will have a strong impact on shifts in peoples' engagement with these two models.

The interruption caused by the need for social distancing shifted the ways in which leisure time is spent towards an overall increased household use of all utilities: electricity, water, heating, rubbish collection and internet/cable use. While it can be argued that the environmental impact of this change is negligible or even positive, given that resources were saved due to communal places of leisure having been closed (such as gyms and cafes), the rise of use of utility services matters for individual households, given that costs are likely to rise and pre-existing issues of lack of access might exacerbate.

Changes to household electricity and gas consumption may put already vulnerable households at greater risk. Poorer households spend a larger proportion of their household income on essential services, a phenomenon known as the 'poverty premium'. The more people stay at home, the higher their energy bills, especially for those only using electricity to heat their homes. Fortunately, the lockdown period occurred during a period of warmer weather. Future lockdowns which may occur during winter months would place further financial and emotional stress on households. Equally, lockdowns during increasingly hotter summer months will negatively impact households in poorly ventilated homes, particularly those in flats. As such, poorer and vulnerable households will be more affected both in their energy practices and ability to pay for energy by the lockdown measures. In Scotland, 25% of households are in fuel poverty (Scottish Government 2020) and 10% in England (Department for Business, Energy and Industrial Strategy 2020). For many of these households, small changes in energy practices and prices can increase financial and emotional distress. In August, Ofgem announced the continuation of the

price cap to protect energy consumers, particularly those in vulnerable situations (Ofgem 2020). However, existing energy inequalities have been exacerbated by the crisis.

Importantly, customer services have undergone significant changes during the crisis as energy suppliers sent their staff to work from home. This placed stress on the communication channels for customers to contact their supplier with some cases of customers struggling to make contact. With customers increasingly directed to online services, the crisis has potential for widening digital exclusion as those unable to access internet services face being left behind or ignored. Furthermore, the onus is placed on the customer to contact their supplier in the event of a problem - either in the ability to pay their bills or an interruption of supply (i.e. a power cut). There is significant variation in the quality of support services provided by suppliers to customers and particularly vulnerable customers (MSE News 2020-03-17). Many customers are not aware of the Priority Service Register, some of whom would have benefitted from during the crisis (Ofgem 2013). This is particularly the case for customers on prepayment meters, who are more likely to be vulnerable customers.

(Potential) changes to the sharing of resources, goods and services as a consequence of Covid-19 has sustainability implications.

With shared spaces of utility use being inaccessible or less accessible, **those living on their own are most affected** by a change in practices towards spending more time at home. Lone occupants need to heat pretty much the same space as couples and a third person needs only maybe one room more (Burgess 2016).

Whether practices are carried out in households or in public is now critical for the current and public health response to Covid-19, but this question also offers opportunities for a better response to environmental crisis. The household plays an important role in conjunction with other 'scales' of sharing goods and services and these varying economies of scale affect their environmental implications (Yates 2018, Boons and Bocken 2018). A population always 'shares' its resources, from our use of roads, libraries, parks and shopping centres, to kitchens, heated space and meals. **We can benefit from economies of scale by using resources simultaneously** (when we eat together or watch a football match together in the pub) and successively (using the same bathroom in our homes, the same park but at a different time to most others). In the current context, the ways in which we share our space and resources in our daily practices – in visiting the shops, our living arrangements and how and with whom we spend our leisure – matter enormously for managing infection rates as a society and measures taken can have long-term effects on practices. Economies of scale are affected by shifts in the site where practices take place. The risk of contagion around sharing space or facilities simultaneously may lead to increased consumption, although this could be offset by reductions in travel.

There are **social inequality implications to the availability and access to indoor and outdoor spaces of encounter.** The few indoor spaces that are free of costs and social boundaries are considered unsafe during the pandemic and so are many local places that can create a sense of community. The Covid-19 crisis has revealed important inequalities in local infrastructure – for example, the accessibility of green space and unevenness of garden ownership, with implications for health and wellbeing as well as water use (The Guardian 2020-04-07). According to OS map data, one in eight households in Great Britain had no access to a private or shared garden during the coronavirus lockdown (ONS 2020-05-14). Data from Natural England suggests that in England the number of Black people who have no access to a home outdoor space is almost four times higher than for White people (ONS 2020-05-14). Outdoor spaces such as streets, parks, beaches and woodlands are free of cost, but not necessarily neutral and not equally inviting to everyone (Engel-Johnson 2017, Gérard et al. 2020-06-19, Johnson 2016, Trevatt 2020).

Increased engagement with the outdoors can have both positive and negative sustainability impacts.

Social distancing measures in the current crisis undoubtedly affect ordinary patterns of household garden usage for those that have one and it is important that the short- and long-terms impacts of these changes are understood. In many countries the garden has been reframed during social distancing; for some a space for food self-sufficiency, for others a space for exercise or a second living room. **The resource implications of an increased use of private outdoor areas are multiple**, not least the possibility of increased water use as people who previously cared for a garden maintain and improve these outdoor spaces. Even more interesting however is that previous research identified that **the everyday habitual engagement with the backyard makes people understand and participate in networks of resource use**, providing a considerable potential for a shift towards more sustainable cities. As the garden has now become part of the physical space where they live their everyday lives, the pandemic could impact such a shift (Head and Muir 2007).

On the other hand, **more people spending more time in the outdoors can lead to more environmental destruction**. There are various reports about increased littering related to people spending more of their spare time in public spaces such as parks, beaches, streets and beauty spots (BBC 2020-07-03, 2020-06-01, 2020-06-24,).

News outlets have further reported that countryside 'staycations' have caused fires triggered by portable barbecues, as well as wildlife having been endangered (The Guardian 2020-08-14).

When it comes to ways to spend leisure time away from home, **flying constitutes a major environmental issue**. The activity of flying abroad has become more and more common over the past years, but was seriously disrupted by the pandemic. Covid-recovery packages for the aviation industry (The Guardian 2020-06-05, UK Parliament 2020-06-13), unless paired with regulation which supports alternative forms of travel such as trains pose a difficulty to a long-term practice change towards less carbon intensive forms of travelling (abroad) for leisure. With the serious challenge posed by the aviation industry, it should be noted that this concerns practices of a specific segment of the population, rather than an overall common practice. Findings from recent enquiries reveal that it is not many people flying, but rather few people taking flights again and again, which poses a problem, with 10% of the most frequent flyers having

taken more than half of flights abroad in 2018 (The Guardian 2019-09-25). Also for the same time period, the European Commission reported that one in four Europeans were not able to afford holidays away, a number which is likely to rise during a recession. Even though this number marked a significant rise in comparison to earlier years (Eurostat 2019).

In terms of the environmental impact of holiday making, it further has to be noted that **emissions and pollution from holiday making is not solely caused by the means of travel**. Also the construction industry which serves the tourist industry and associated activities, as well as goods and services related to restaurants, hotels and shops contribute severely to the negative sustainability impacts of tourism (Carbon Brief 2018, Lenzen 2018). So, even in a scenario in which all British holiday makers abstain from flying and change from going abroad to UK 'staycations' or take other means of transport to go abroad, this will not automatically lead to great environmental benefits.

- notes on evidence

There are several concerns regarding issues of waste and pollution caused by Covid-related practice change towards more time being spent at home. One such concern is that more waste would be produced in individual households and heating in individual homes would be used more extensively, if less people went out to work. Both these factors could lead to increased air pollution – through waste not being disposed of safely or harmful materials being burnt as people are heating their homes. In April, the potential dangers of fires lit in private gardens were identified and acted upon, but potentially also evoked, by various councils around the country. However, no clear link between this issue and everyday practice

change due to Covid could be identified. Due to the warm weather thus far, domestic burning in the context of increased amount of time spent at home has not been a prevalent issue in the context of pandemic-related practice change, which means there is no evidence available on the effects on air quality.

Changes to the ways in which leisure time is spent can also contribute to various forms of pollution, due to littering in the outdoors. Evidence on an increase of this issue is mostly based on news reports which focus on anecdotal evidence. It is unclear where these issues occur and whether there are differences between various locations, just as well as the reasons behind these

occurrences could be various. Enquiry into these aspects would be needed to draw conclusions regarding both the extent and types of practice change during the pandemic, as well as their environmental impact.

The shift towards home- and outdoor-based activities is evidenced mostly based on sales figures of certain product categories (home gym equipment, DIY tools etc.) and survey-based data on peoples' self-reported home-based and outdoor activities during the pandemic. This allows us to indicate trends to some extent, but various uncertainties remain. This concerns for example activities for which no further goods were acquired. There is further uncertainty about how people engaged with the goods they acquired during the pandemic – differences in this regard can come with significant variations in terms of the environmental impact of new-found activities and self-reports in survey provide little reliability in these regards.

Statistical data on visits of national parks, public parks and beaches etc. during the pandemic is mostly based on people's self-reporting or Google mobility reports, which compare activities during each month of the pandemic with the five-week period 3 January – 6 February 2020, which makes this data currently unreliable to compare to the pre-pandemic engagement in such activities. Changing weather also makes it difficult to compare different months of the pandemic with each other.

Further, as noted before, some leisure activities are not part of day-to-day practices, but are dependent on the season (e.g. outdoor picnics) or are engaged with only one or a few times a year (going on holidays) making it hard to talk about changes imposed by the pandemic as practice change. In these cases, longitudinal studies, which follow continuation, change and adaptation over several years.

Work

Covid-19 has profoundly changed our working lives.

Many have had **no choice but to continue going to work** and putting their own health and the health of those close to them at risk. Many NHS and care staff, transport workers and other key workers have died after having been exposed to the virus (BBC 2020-04-28). Further, with socially distancing measures put in place and many institutional services suspended, many suddenly had to take on unpaid labour such as childcare and home education (Power 2020). A study from UCL conducted during the lockdown found considerable disparity in the impact on different genders, with women reporting spending an average of 5 hours per day on home schooling and men 2 hours per day (The Guardian 2020-07-30).

The radically different situation society found itself in also **changed the meaning of various jobs**. NHS and supermarket workers. Not only health care staff became "heroes of the front line", also people working on farms, bus drivers and supermarket workers gained public attention and appreciation for playing an essential role to keep things going when the country was under lockdown (Time 2020). Such roles were also in high demand. Already before the lockdown, retailers were seeking to employ more staff. As a consequence of increased shopping activities for groceries and household products for example Aldi announced they would recruit 9,000 people, 4,000 of which were intended to be placed in permanent positions (The Grocer 2020-03-20).

Many others lost their jobs due to the introduction of social distancing and the closure of many activities during lockdown. In this initial situation, support measures such as the Job Retention Scheme, the Business Interruption Loan Scheme and the Self-Employed Income Support Scheme have helped maintain a degree of employment (ONS 2020-06-16). In addition, many office workers shifted to working from home, adding to the **great number of people who spend most of their time at home**, which led to significant changes to everyday routines.

Technology has been key to maintain home working (ONS 2020-05-01), which significantly impacted energy use. While the use of electricity decreased overall, with factories, businesses and shops being closed, **domestic energy demand rose** (BBC 2020-04-18, National Grid ESO 2020). The demands on students to continue their education at home will have further increased energy consumption, particularly as many home study tasks rely on energy-intensive electronic devices. In May, the Department for Education launched the 'Get Help with Technology' scheme, providing funding for local authorities and academy trusts to purchase tablets and 4G wireless routers for economically-disadvantaged students (Department for Education 2020b). Such devices may also have been purchased directly by household members to facilitate students' home study.

With many people working from home and businesses – especially in the hospitality sector – reducing their output, **more rubbish was produced in households**, in particular plastic and glass for recycling (Lets Recycle 2020).

Changes related to work practices still remain as lockdown restrictions are lifted, both in the sense of a shift of the daily lives of many being set in the home rather than at the workplace, whilst others are at risk of exposing themselves to the virus as they continue their work.

Unemployment is on the rise. ONS estimates suggest that between March and July 2020, 730.000 people have been taken off payrolls (ONS 2020-08-11). Based on numbers of quarterly GDP falls, Covid-19 had caused the largest recession on record by June 2020. Industries such as clothes and car manufacturing, food services and sports saw a rise in June 2020, but most remained substantially below their February 2020 level (ONS 2020-08-12). The number of those who find themselves being made redundant after having initially been furloughed is growing (BBC 2020-08-11).

Working from home remains prevalent across various sectors. As lockdown restrictions were gradually lifted, many employers began to signal that they would support their employers to continue working from home or to make it mandatory until the end of the year 2020 at least, with some already suggesting their employees would work from home for good (Forbes 2020-07-27, The Guardian 2020-05-21). International business meetings and conferences still happen mostly online and continue to affect jobs in various industries – above all the aviation industry. According to reports of the New York Times, business travellers only make up about 10 percent of all passengers on the major airlines but generate about half the airlines' revenue, as they buy more expensive tickets and are most likely to use additional services, hold airline credit cards and buy airport lounge memberships, among other services (New York Times 2020-07-13). Home education may also continue beyond school closures, particularly for children with complex health or learning needs. Whilst home schooling represents a minority of educational practice in the UK (Kraftl 2013), some local authorities have reported a rise in enquiries from parents and carers about voluntary home schooling since the lockdown (ITV 2020-08-28, Suffolk News 2020-07-15).

With lockdown restrictions having been lifted, **more expose themselves to social contact whilst doing their job**, exposing themselves to the risk of infection. At the same time, regulations have been put in place to the safety of those who do encounter others, with various measures being taken and the wearing of face masks being compulsory for example in shops, on public transport and at hairdressers (Department of Health and Social Care 2020-08-14).

From a practice perspective, we can view the impact of the pandemic on work in a twofold way: *Firstly*, changed routines and priorities had an impact on the kind of work needed on a societal level, which is strongly interrelated with changes in other domains of everyday life, such as eating, shopping and leisure. Over the past few months, various forms of work, some of which previously did not receive much public attention or appreciation, became considered essential. This form of collective appreciation during a time of crisis could constitute a key condition for practices established and furthered by the pandemic being retained in the long term. However, at the same time, a shift towards the expansion of size and visibility of certain types of work is also dependent on related changes of legislation and regulation. Many of those who were considered 'essential' or 'key' workers during the pandemic, such as warehouse workers and delivery drivers, have been employed under rather precarious conditions, both before and during the ongoing pandemic. These issues will further increase if these sectors grow as a consequence of the pandemic. Further, not all those who kept the country running during the pandemic received the same public attention. Arguably, the work of cleaners and teachers, who are also acting as care workers has received less public attention, but their work and commitment during the ongoing pandemic will have a strong impact on how others will go about their day-to-day lives. Employment in some other areas has been seriously disrupted. Whilst certain economies were mostly affected by the lockdown and will recover, others might rebound initially, but be affected by the rising unemployment and some sectors might remain negatively affected on the long term and shrink. Further, different and new forms of economies, which were niche or unknown pre-Covid,

might emerge. *Secondly*, change regarding work due to Covid-19 has impacted individual household organisation. With schools and nurseries closed and many people having been out of work or working from home and others working as key workers who needed to separate themselves from vulnerable people in their families or close social circles, the lockdown has disrupted routines around work, coordination and sharing in households and beyond.

The pandemic has significantly disrupted practices, allowing many to experience different models of going about their day-to-day lives, which can aid the success of more radical policies concerning employment conditions.

One aspect of change that has been given public attention concerns the **value attributed to 'essential' work during the pandemic** as well as the acknowledgment that many such jobs are vastly undervalued in contemporary societies.

This is signified by amplified demands for better pay and social status for people employed in the care sector (including the NHS, adult social care and childcare) and some reflections on the need to put care work at the heart of a 'just recovery' (as opposed to 'just transition') after the pandemic (UK Parliament 2020). This shift in public consciousness could aid systemic changes that enables care work, which is currently often unpaid, to be valued and accounted for in economic and social policies (Power 2020). However, special programmes and services set up by the state under extreme circumstances to mitigate hardship or enable economic survival can just as easily be withdrawn when crisis conditions have ended. For example, the services that were set up to enable women's paid employment (such as state-run nurseries and canteens) were discontinued

after both World Wars (Santana 2016). Similarly, labour force gains were also transitory as women were demobilised from 'men's work' to make way for the returning military personnel. The pandemic may lead to some changes in attitudes and some policies around the social provision of care, but unless there are fundamental changes in power structures and the basic assumptions and principles of orthodox economics (amongst other disciplines), the chances of a return to the way things were pre-Covid-19 are high (Chung 2020; MacGregor 2019; Norris 2020).

Many jobs such as warehouse workers, delivery drivers and cleaners which are to a large extend based on **flexible employment relationships**, have become labelled as 'essential' during the pandemic. Whether changes will affect the working conditions of these people in the long term and whether these will be positive or negative depends on a variety of factors. Covid did and continues to affect different people in flexible work in different ways. For example, while the demand of workers in some sectors rose immediately, others suffered from a severe immediate disruption. Thus, with major restaurant chains closed and demand for rides dropped during the lockdown many lost work, but social benefit schemes were designed for those in stable employment (Financial Times 2020-03-26), whilst others had no choice but to continue working whilst exposing themselves to the risk of infection (BBC 2020-05-21, Yerby and Page-Tickell 2020) – revealing once more the precarious working conditions of people in such employments and the need for urgent reforms in legislation. Changed conditions in terms of ongoing demand of such jobs could empower people working in the gig economy, which could, together with changed public consciousness lead to more forceful request for workers' rights (Spurk and Straub 2020).

A rise of unemployment could be noted since the early days of the pandemic. When support schemes for businesses are withdrawn, more people will lose their jobs. A discontinuation of these therefore has knock-on effects on practices in all other domains of life. If paired with a loss or serious decrease of income, these impacts are more severe. A continuation and acceleration of unemployment thus intersects with many areas of everyday life. Various models of financial aid or redeployment and re-training and -education for people to work in areas that are more needed during (and perhaps also after) the pandemic could cushion the **wide-ranging effects of practice change due to unemployment** at the same time as building resilience, which in itself would contribute to establish a redefinition of 'essential work' in the long term and further contribute to the reinforcement of existing practices and the establishment of new ones.

New, 'slower' economies could evolve around changing demands in goods and services (Holmes 2018), with for example a focus on repair, maintenance and skill- and community-development (Ehgartner and Hirth 2019b). Covid-related funding under the umbrella of 'social prescribing' (Department for Health and Social Care 2020-08-16) or 'active travel' (Department for Transport 2020-07-22, 2020-07-28) supports activities for immediate recovery, however, if appropriate regulations and infrastructures would emerge around these initiatives, they could create long-term change and lead to systemic changes with adapted forms of employment.

Newly established (home) work routines might be retained, as people have become positively attached to them or get stuck in in them due to a lack of resources or support structures. In affluent countries such as the UK, the private home has been seen more as a site of consumption and leisure than as a place of employment or production. Although the internet, broadband and other telecommunications technologies have made it increasingly possible to shop and

perform paid work 'from home', doing so has, up to now, remained the exception rather than the norm. Restrictions on leaving the house have inevitably led to alterations in who is at home and for how long, as well as the type of tasks that are performed by those living there. Whilst the effect of disruption and change on household routines is difficult to identify in a generic way, as 'normality' is highly differentiated to begin with, it is clear that with the lockdown restrictions having been lifted, these changes have not 'bounced back', as many remain out of school, work, working from home and vulnerable to infection. Depending on household composition, the way in which income is generated across household members and the division of unpaid tasks and the extent to which household members are designated as 'key workers' creates a variegated set of starting conditions that will play out differently during the 'lockdown'. For some people, restrictions on access to activities outside the home will have increased the time available to engage in practices they would not normally have the opportunity for, such as reading, painting and gardening tasks. For others, the concentration of existing household tasks, paid work, childcare, schooling and food provision will have greatly increased pressure on time and skills for coordination. Research on everyday practices has demonstrated the importance of household coordination, as visible in efforts to manage time spent on work, domestic duties and other social responsibilities, to our understanding of collective patterns of resource use (Southerton 2006, 2020, Mylan and Southerton 2016). Many households will have found a new temporally organised distribution of changed practices, which can be reinforced and established as long-term normality, as new practices are learned and valued, coordination with others is adapted and the cultural context in which these are embedded is altered. Practices that people are less positively attached to or suffering from might however also remain if infrastructure and facilities supporting earlier practices are changed such that old habits are no longer possible or are less congenial. Further, people might simply lack the personal resources, health or finance to return to previous ways of engaging in paid or unpaid work.

- potential sustainability impacts

The effects of the pandemic raise a number of serious social sustainability concerns.

During the pandemic, groups of workers have been **defined as "essential", however many of them are among the lowest paid** – warehouse workers, fruit pickers and delivery drivers, to name a few. Reforms will be needed to protect the rights of people in such employments.

The pandemic has **increased the burden of unpaid care work** on those who were already most affected by this prior to the pandemic. With institutional support having been disrupted, many families need to raise and educate their children full time, looking after sick family members etc. whilst following their paid employments. Particularly affected by this are women, who hold disproportionate responsibility for domestic duties. Research suggests that without proactive interventions it is likely that the negative impacts for women and families will last for years (Power 2020). In that sense, Covid-19 holds the serious risk to reverse the limited progress that has been made on gender equality and women's rights (Burki 2020).

Unemployment caused by the pandemic is not equally distributed across the population. ONS data from August suggests that it has been the youngest and oldest

workers and those in manual or elementary occupations that are most likely to be temporarily away from paid work during the pandemic (ONS 2020-08-11).

Ongoing working from home practices and unemployment make the private household more central as a location of everyday life, which leads to changed social and environmental challenges.

Most modern private dwellings have been **designed according to life patterns that involve household members 'going out' to work, learn and shop**; few have been designed for internal privacy or the stockpiling of goods and nor have they been designed for cooperation and sharing between households. Research on co-housing suggests that growing numbers of people are turning to alternative housing designs and arrangements precisely because of the limitations of single-family dwelling (Aeby and Heath 2019, Heath et al. 2018, Maalsen 2019, Tummers and MacGregor 2019). Lockdown during the pandemic has raised awareness that the built environment builds-in dominant assumptions about the purpose of the domestic sphere and the activities that take places within it, making it very difficult to adapt to social changes. For example, houses designed for the nuclear family (with a master bedroom, small children's rooms and open-plan kitchen-dining areas) are poorly suited to adult co-habitation, self-employment and household groupings that do not have lots of 'disposable time' for full-time housework and cleaning; they also tend to be energy inefficient and designed for unsustainable levels and types of consumption (Tummers 2016). It is becoming increasingly evident from the impacts of the Covid-19 crisis and backed up by research, that typical modern households, as spaces and social units, play a significant role in sustaining environmentally and socially unsustainable practices (Tummers and MacGregor 2019).

The blurring of boundaries between household and workplace has enabled greater flexibility in the way people combine paid and unpaid work (such as caring responsibilities) as well as having the potential to reduce transportation-related environmental impacts of employment. At the same time, **households are sites of inequality** and 'home' as a living space is experienced in vastly different ways by individuals depending on a range of social factors including age, gender, class, ethnicity, citizenship status and dis/ability (Elson 2017). For many, home is a site of conflict over roles and responsibilities at the best of times, oppression and exploitation at the worst of times. Evidence clearly indicates how gender inequality translates into a division of caring and domestic labour within heterosexual couple households where women spend many more hours doing unpaid labour than men. In households with dependent children or adults, care-giving must be juggled with paid work, often leading to overburdening of those with greater share of domestic responsibilities (Southerton and Mylan 2016). As noted, the evidence from the Covid-19 lockdown thus far indicates that sexist gender roles may be being reinforced as one result of the requirement to conduct all necessary tasks under one roof (Power 2020).

Reports on the dramatic increase in **domestic violence** during the lockdown have been covered by the UK media (New York Times 2020-04-06, The Independent 2020-04-09). This finding is not surprising because there is a wealth of social scientific evidence that during times of stress, such as unemployment and impoverishment, power imbalances in households result in increased levels of interpersonal violence against the less powerful members (e.g. children and women). There is evidence that homes are not safe places for many people and for people living in violent relationships the current 'stay home' guidance means being locked in with their abuser (Bradbury-Jones and Isham 2020, Chandan et al. 2020).

Working from home has been celebrated for its **positive effect on the environment due to a significant reduction of commutes and business trips**. Working from home did not only reduce emissions due to less traffic (Department for Transport 2020a), but air travel was also seriously affected by the pandemic. Vast parts of the aviation traffic was shut down and, in some regions, nearly all passenger traffic was suspended (BBC 2020-04-30).

However, **internet activities also have an ecological footprint** (The Guardian 2019-11-26). The think tank 'The Shift Project' states that in 2018, online video viewing generated 1% of global emissions (The Shift Project 2019). The energy source of the energy provider used, as well as the energy efficiency of end-user devices plays a role in this regard.

Moreover, offices are more efficient in the sense that **heating and air conditioning** is commonly shared. If people spend more time at home, they will use their domestic heating more intensively. The initial lockdown happened during a very warm spring. Cooler lockdown periods or ongoing working- and staying at home practices might lead to more emissions due to people using the domestic heating more intensively. during which we might expect more emissions (Anderson and Dirks 2020). In the long term, and as summers become hotter, the inefficient use of air conditioning systems could also cause environmental issues (IEA 2018). Working from home can further increase **waste-related issues**, given that people produce more waste at home if they spend more time at home (EADT 2020-08-14) and systems for waste segregation might be less in place in people's homes as opposed to workplaces, canteens etc. This was particularly the case at the beginning of the pandemic, when waste management systems were disrupted (BBC 2020-03-24) and illegal waste disposal increased (Sarkodie and Owusu 2020).

The social and social inequality impact of changing work practices which lead to people spending most of the time (working) at home is overall well researched and evidenced: The effects of unemployment and the division of caring and domestic labour were outlined above. Evidence on the social impact of mandatory working from home arrangements is emerging. Future research might focus on the impact that various living arrangements play in this regard. Not enough evidence is available to determine the environmental impact of working from home. For example, more data will have to be generated on how rubbish composition in private homes has changed during the crisis. There is also no clear evidence on how working from home affects overall energy consumption. More evidence on the impact of home heating can possibly be collected during the colder months to come.

Rising numbers of demand for workforce in certain areas give an indication of the sectors in which more work is needed during the pandemic. However, these numbers do not capture changing working conditions of those in ongoing employment as well as the life situation of those who are doing unpaid care work during the pandemic. Both quantitative and qualitative data is missing to capture how the pandemic changed conditions of paid and unpaid work in various contexts and how these impact various areas of day-to-day life, both on an individual and societal level.

There is evidence of support of small local businesses and local authority initiatives coming both from the general public as well as local and national governments. There is also scattered evidence on the success of some of these as well as peoples' commitment to voluntary organisations, social enterprises and charities. However, a systematic analysis of change and continuation within pre-existing community economies as well as emerging new alternative economies and their challenges and capabilities to build economic resilience during the pandemic is missing. Likewise, evidence on established community organisations struggling or finding themselves unable to discontinue is rather anecdotal – research into this area could further help to illuminate new challenges and opportunities emerging during this crisis. In-depth ethnographic studies are needed to gain a better understanding of the roles that various local community economies play during the pandemic and how they both adapt and contribute changing social practices.

Covid-19 and practice change across domains

In this report we presented evidence on practice changes with focus on individual everyday life domains (Hygiene, Eating, Mobility, Shopping, Leisure and Work). Whilst they are discussed separately, their examination also made apparent that the domains are connected. This is crucial when considering the likelihood of these changes to be retained over time, as well as policy interventions affecting that likelihood. In this closing section we explore these connections without taking attention away from the fact that there are also many instances where practice change is limited to specific domains. We firstly present our general understanding of these connections, followed by an overview of links across domains as we have identified them as a result of the Covid-19 pandemic.

- how practices connect across domains

Practices in different domains may affect each other in four basic ways:

	practice B same	practice B different
practice A different	strengthening status quo	ripple effect
practice A same	interlocked status quo	undermining status quo

Strengthening status quo: If a change in one practice reinforces an existing practice in another domain, it serves to strengthen the status quo in that domain. For example: when work practices change towards more working from home, the already existing practice of communication through email is reinforced.

Ripple effect: When practices presuppose each other, change in one practice can quickly lead to change in practices in another domain.

Interlocked status quo: In many cases, practices in different domains keep each other in place, one practice presupposing another one. Examples are online shopping which requires home delivery; or having lunch on-the-go which interlocks with office work. This interlock is strongest when it is reciprocal: practice A presupposes practice B, which in turn presupposes practice A.

Undermining status quo: Persistence of a practice can lead to change of practices in another domain; one example is that when practices of shopping and eating out are maintained in the case of a pandemic, hygiene practices change.

Developing policy interventions, it is crucial to understand the reciprocal impacts of practice change across the everyday life domains, whilst the following forms of interlock may be taken into consideration:

1. **Shared infrastructure**: Practices A and B tend to change together because they involve the use of the same infrastructure; once that infrastructure is available it invites both practices (but be aware of possible scarce capacity, which at some points leads practices to compete for the shared infrastructure). An example of shared infrastructure are IT facilities which enable working at home as well as online shopping.

2. **Resources**: Practices A and B can compete for resources like time, money and space. If such competition is ongoing, one practice becoming more dominant means the other will be reduced; this type of interlocking also leads persons to engage in coordination of their own and others' calendars.

3. **Providing conditions**: Practice A provides the conditions for practice B; a key example of this is work generating the resources for persons to engage in other activities (shopping, leisure).

4**. Chains of practices**: Sets of practices that are performed in routinized sequences: hygiene + commuting + office work + eating on-the-go food + commuting + leisure; or: online shopping + home delivery + waste generation in the household.

- Covid-19 and practice change: Instances of ripple effects and strengthening of status quo

Given that this report has focussed on practice *change* (rather than continuation) during the pandemic, we observe mainly instances of strengthening of status quo and ripple effects:

The following table summarises how Covid-19 related practice change in different domains of everyday life (Practice Domain A) impacts practices in other domains (Practice Domain B).

Hygiene, leisure and work represent the domains which most strongly impact other domains. This is of little surprise: hygiene plays a key role to the protection from the virus and radical change to the domains of leisure and work were specifically targeted by interventions for social distancing.

Covid-related changes in terms of practices of hygiene, leisure and work impact not only one another, but changes in each of these domains also have multi-layered consequences on practices of eating, mobility and shopping. Additional hygiene practices lead to people experiencing and engaging activities in various areas of day-to-

day life in ways that can be very different from pre-pandemic 'normality'. Changes to leisure and work both impact different areas of everyday life in various ways. These are also the areas which are experienced very differently across the population – some have gained spare time due to having been furloughed or having lost their jobs, whilst others suffer from more intense pressures in their pre-existing jobs and/or found themselves suddenly also occupied with unpaid care work. Needless to say, just like all these groups, also those who switched from the office towards working from home, found themselves engaging with non-work-related activities in different ways. The radical shift towards activities having been confined to the household vastly altered leisure activities which had huge impacts on practices in various everyday life domains. Also change to eating practices in itself impacts multiple areas of day-to-day life associated with the areas of mobility, shopping, leisure and work.

Whilst being heavily impacted by practice change in other domains, Covid-related

changes to mobility and shopping practices have comparatively few knock-on effects on other areas. However, the type of change they drive, in particular also the mutual practice change in these two domains deserves particular attention as it concerns essential aspects of day-to-day life – the ways in which people do or do not engage with their local neighbourhood and the future of online vs. in-store shopping – both of which can have serious implications for sustainability.

Developing policy interventions, it is crucial to understand these reciprocal impacts of practice change across the everyday life domains. Asking people to work from home has impacted our day-to day lives way beyond our work routines. Similarly, the closing of pubs and gyms has not only meant that people abstain from these activities, but also what they buy, what and how they eat and how they socialise. Changes to practices since the beginning of the pandemic are multiple and complex, and so are their implications for environmental and social sustainability.

However, knock-on effects of practice change on other practices represent only one parameter to stabilise change on the long-term and they can be disrupted or supported by various cultural, socio-political and economic circumstances and interventions. As noted at the beginning and illustrated with numerous examples across the report, positive attachment to changed practices and a change to the cultural context which alters how people value or conduct activities often play a significant role for new forms of practices to remain on the long term. Moreover, changing access to personal resources represents a key factor to the continuation and change of practices – a factor that has played a key role already over the past months. Highly impactful, and related to all other factors mentioned, is the supply and access to infrastructure and facilities – their support of 'new' rather than 'old' practices is playing a vital role in sustaining recent practice change. Lastly, and perhaps most apparently, new regulations and new prohibitions have a very direct the effect on the elimination of some previous practices. During the pandemic, targeted efforts to support social distancing have had such effects and led to practice change in the targeted areas, but also led to unplanned effects in other areas.

Practice Domain B

Practice Domain A		Hygiene	Eating	Mobility	Shopping	Leisure	Work
	Hygiene	x	Types of food consumed; Experience and engagement regarding eating out activities	Daily routines of mobility; Experience and engagement with various forms of transportation; Appeal of private/individual mobility	Product consumption and application in the home (and beyond); Experience and engagement regarding various forms of shopping	Experience and engagement regarding various forms of leisure activities (outdoors vs. indoors, online vs. face-to-face, degree of sociality and sharing)	Experience and engagement with work (online vs. face-to-face, degree of sociality and sharing)
	Eating	--	x	Frequency and type of trips to restaurants and shops; Use of delivery services	Grocery shopping routines	Place, setting and (social) context of meal consumption	Place, setting and context of meal consumption
	Mobility	--	--	x	Engagement with local shops	Engagement with the local area; Types of and locations for holiday making	--
	Shopping	--	Types of products consumed	Use of delivery service; Frequency and type of trips to shops	x	Type and frequency of engagement with shopping as a leisure activity	--
	Leisure	Types, times and places of body hygiene	Place, setting and (social) context of meal consumption	Visits to (local) outdoor places; Engagement with active forms of mobility; Outside vs. home-based engagement with activities	Type and frequency of engagement with shopping as a leisure activity	x	Patterns and routines of desk-based work
	Work	Daily routines of body hygiene; Engagement with support services	Meal preparation; Types of products/groceries being consumed; Engagement with support services	Daily routines of mobility; Appeal of private/individual mobility	Acquisition, appropriation and engagement with technology; Engagement with the consumption of various product categories	Blurring of work and leisure time; Resources and access to leisure time activities	x

Moving forward: What we (do not) know and what we can do

This report brings together interdisciplinary social science work with evidence on pandemic-related practice change in the UK, to bear on urgent questions about the impacts the Covid-19 pandemic on societies now and in the future. Answering our questions on page 4, we have provided insight into the ways in which the pandemic and the stay-at-home order have led people to adjust their daily lives; leaving behind normality, they have reconfigured their daily rhythms and as part of that have adopted new practices, adjusted existing ones and are abstaining from others. Whilst the report focussed on the UK specifically, this is happening on a global scale.

Alongside the collection and examination of empirical evidence on practice change in different domains of everyday life, we have provided an account of the general conditions under which the changes in practices might be retained, rather than bouncing back to the previous normal. This question is important because changed practices are considered a seed for the more structural change – which in many ways is desirable from a sustainability perspective. We added depth to this insight by distinguishing the various sustainability impacts of changed practices, as practice changes are multi-layered and not clearly good or bad news from a sustainability perspective. We have further pointed out areas which have gained importance during the pandemic but lack in reliable evidence. Taken together, these insights allow for an understanding of the complexity of using changed practices as the source for an accelerated transition.

The overarching argument we are making is that while it is not possible to control the future, understanding how changed practices may lead to a qualitatively different, more socially and environmentally

just society after the pandemic or add further challenges requires not only taking into account the dynamics that provide the context for these practices, but also developing skills, resources and insights needed for moving in that direction.

The argument is premised on two key points that have implications for policy. The first is that social change happens as a result of social learning and collective choices over time, often informed by past responses to disruptions and crises. As the response of SARS-affected countries to Covid-19 has shown, one reason why the aftermath of the Covid-19 crisis can be expected to be different from previous crises is the fact that, due to experiencing those crises, societies may choose to respond differently. We may not be able to control the future, but we can and must make choices. These collective choices should be made on the best available scientific evidence.

Second, interventions are needed in order to bring about substantive and long-lasting change towards a more just and sustainable society. The Covid-19 pandemic demands interventions that could pave or obstruct the path toward sustainability. Our practice approach in the SCI is founded on the view that for interventions to be effective they need to look beyond the individual to consider all of the contexts – material, structural, social and individual – that shape people's behaviour (Evans et al. 2012; Watson et al. 2020). By understanding the different contexts, and the multiple factors and relations which influence the way people act in their daily lives, more effective policies and interventions can be developed. This means taking a critical stance towards behavioural models which place a disproportionate emphasis on individual consumer-citizens (Ehgartner 2018, 2020, Evans et al. 2017), their personal choices

and responsibilities. A more systemic, sociological approach will lead to more effective policies and strategies, resulting in lasting social change that has greater potential to benefit everyone.

There are of course a vast number of questions that are impossible to answer a few months into a global crisis that is widely seen to be unprecedented and changing every day. There remains much that we do not and cannot know yet. However, the Covid-19 pandemic presents an exceptional opportunity for gathering new evidence and carrying out research that will inform economic, political and environmental policy for generations. Building on the existing social scientific evidence on social practices, sustainable consumption and social change will play a vital part in this process.

References

@Merseytravel (2020-04-14) To assist key workers making essential journeys cross river, the Queensway (Birkenhead) Tunnel will temporarily be open to cyclists Before using your bike in the tunnel, please check the information on our website https://merseytravel.gov.uk/coronavirus via Twitter: https://twitter.com/Merseytravel/status/1250077816345047042

@thameswater (2020-04-28) We've seen a rise in blockages across our region of 20% - which is an increase of about 10 sewer blockages per day compared to normal. Remember, only the 3ps (pee, poo and toilet paper) belong down the loo, the rest should be placed in the bin! https://bit.ly/2W5MHRJ #BinIt via Twitter: https://twitter.com/thameswater/status/1255119539924279296

@thameswater (2020-05-31) The month of May saw the highest ever demand for water that has been recorded in the Thames Valley. Please help us make every drop count as demand for water across our region has increased due to the hot weather and people observing lock down - https://bit.ly/3gytz8t via Twitter: https://twitter.com/thameswater/status/1267081954161233920

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