Government
Office for Science

Rebuilding a Resilient Britain

Summary of the work of the Areas of Research Interest Working Groups

ARI Areas of Research Interest

List of acronyms

AI	Artificial Intelligence
ARI	Area of Research Interest
AHRC	Arts and Humanities Research Council
BAME	Black, Asian and Minority Ethnic
BBSRC	Biotechnology and Biological Sciences Research Council
BEIS	Department for Business, Energy and Industrial Strategy
CBI	Confederation of British Industry
CJS	Criminal Justice System
CO	Cabinet Office
COVID-19	Coronavirus Disease 19
CSA	Chief Scientific Advisor
DCMS	Department for Digital, Culture, Media and Sport
Defra	Department for Environment, Food and Rural Affairs
DfE	Department for Education
DfT	Department for Transport
DH	Department of Health
DHSC	Department of Health and Social Care
DIT	Department for International Trade
DWP	Department for Work and Pensions
EPSRC	Engineering and Physical Sciences Research Council
ESRC	Economic and Social Research Council
FCDO	Foreign, Commonwealth and Development Office
FSA	Food Standards Agency
GCSA	Government Chief Scientific Advisor
GOS	Government Office for Science
HMRC	Her Majesty's Revenue and Customs
HMT	Her Majesty's Treasury
HO	Home Office
HSE	Health and Safety Executive
MHCLG	Ministry of Housing, Communities and Local Government
MoD	Ministry of Defence
MoJ	Ministry for Justice
MRC	Medical Research Council
NERC	Natural Environment Research Council
NGO	Non-Governmental Organisations
NICE	The National Institute for Health and Care Excellence
ONS	Office for National Statistics
PHE	Public Health England
R&D	Research and Development
SAGE	Scientific Advisory Group for Emergencies
SME	Small and Medium-sized Enterprises
STEM	Science, Technology, Engineering, and Mathematics
STFC	Science and Technology Facilities Council
UKRI	UK Research and Innovation

Government Chief Scientific Adviser Foreword

The demand for the collection and use of evidence to inform policy is increasing sharply, as government departments respond to the pandemic, its consequences, and the challenges of the years to follow. The *Rebuilding a Resilient Britain* (*RRB*) programme was launched in July 2020 to bring together over two hundred researchers, funders, and policy makers from all career stages.

Their challenge was to identify evidence and uncover research gaps around a set of cross-cutting Areas of Research Interest (ARIs) chosen for their relevance to the recovery from the pandemic.

This new initiative, led by the Government Office for Science, was made possible by the ARI Fellowships programme, funded by the ESRC. This programme embedded two academics with expertise in supporting the use of evidence in our office and with them we worked across government to refine the dialogue between policy makers, funders, and academics.

Discussions highlighted the need for greater evidence synthesis, and for effective mechanisms to support evidence-based policy making. It also became clear that, to implement central interventions aimed at improving the use of evidence in policy making, we must invest in intermediaries and translators who can drive these changes to fruition. The programme also started to compile a research agenda to support recovery and inform the challenging policy choices that we face in the months and years ahead.

Rebuilding a Resilient Britain experimented with new ways of engaging academics with policy challenges. This process prioritised pressing issues and created a group of experts, known to policy makers and capable of providing critical mass, scrutiny, and advice. We now have an opportunity to build on this excellent work to better integrate policy, research, and research funding agendas.

This programme has been informed by a wide range of researchers, funders, and government officials, and I am very grateful for their time and insights. I am particularly grateful to ESRC for working in partnership with us to develop the ARI Fellowships.

Sir Patrick Vallance
Government Chief Scientific Adviser

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Introduction

The COVID-19 pandemic presented a fundamental challenge to our society, economy, and ways of living. We must ensure that the long-term response to these challenges is informed by the best possible evidence, by engaging with the right stakeholders, at the appropriate time. As a first step towards this goal, the *Rebuilding a Resilient Britain* programme of work was launched in July 2020 to bring together researchers, funding bodies and policy makers to identify evidence and uncover research gaps around a set of cross-cutting Areas of Research Interest (ARIs).

ARIs were initially developed in response to the recommendations of the *2014 Nurse Review of Research Councils*, which called on government departments to communicate clearly where their research objectives lie. The ARIs take the form of an annually updated list of priority research questions, which invite the academic community to engage with government departments to inform robust evidence-based policy making.

With the advent of the COVID-19 pandemic, however, it became clear that the societal issues affecting Britain's recovery over the medium- to long-term cut across departments. The ESRC funded GOS ARI Fellows worked with the CSAs and Council for Science and Technology to identify a set of ARIs relevant across all departments and sectors. Under the meta-themes of Rebuilding Communities, Environment and Place, and Local and Global Productivity, each led by two CSAs, nine Working Groups were formed:

Rebuilding Communities led by Robin Grimes (MoD Nuclear CSA) and Osama Rahman (DfE CSA)	**Environment and Place** led by Robin May (FSA CSA) and Andrew Curran (HSE CSA)	**Local and Global Productivity** led by Paul Monks (BEIS CSA) and Mike Short (DIT CSA)
1. Vulnerable Communities	5. Supporting Lower-Carbon Local Economies	8. Local and National Growth
2. Supporting Services	6. Land Use	9. Trade and Aid
3. Trust in Public Institutions	7. Future of Work	
4. Crime Prevention		

With input from the Universities Policy Engagement Network, UKRI, the What Works Centres, and the National Academies, each Working Group was populated with subject experts and representatives from funding bodies and government departments.

The working groups met several times over the summer and used their networks to:
   a. identify a diverse range of existing or ongoing research.

b. synthesise evidence which can be quickly brought to bear on the issues facing departments.

c. identify research gaps in need of future investment.

This paper summarises the process that each WG went through to identify evidence and research gaps against those ARIs they were assigned and provides a useful compendium of the evidence itself. A link to the full reports from each Working Group can be found at the start of each section.

We are already seeing initial impacts of this work in:

- Creating and strengthening relationships across government, and with more diverse research voices.
- Opportunities for engagement with Early Career Researchers.
- Realising that for many of the ARIs there is already existing evidence to draw upon.
- Influencing the Strategic Priorities Fund programmes, e.g. by expanding an existing Defra/NERC bid to include more social and urban research
- Influencing departmental ARI refreshes by connecting policy officials with different research voices
- Connecting with high-level policy discussion, e.g. supporting the Council for Science and Technology with their levelling up work
- Wider government engagement, for example feeding our work into that of the Cabinet Office Evaluation Taskforce.
- Connecting with other key stakeholders and investments, particularly the National Academies and significant research investments like the ESRC Productivity Institute

As well as providing deep expert reflection on the cross cutting ARIs, it is hoped that this work will prompt further collaboration between government, academia, and funders. Working across government and drawing from the extensive expertise of our academic community will be essential in the recovery from the COVID-19 pandemic, to rebuild a resilient Britain.

1. Working Group on Vulnerable Communities

The Vulnerable Communities Working Group was asked to respond to 11 ARIs reported by 8 government departments (HO, DfE, DHSC, MHCLG, FCO, DfT, MHCLG, DWP).

The group met twice in plenary over summer. The focus of these meetings was on defining vulnerable communities, recognizing that COVID-19 is creating new, possibly uncharted vulnerable groups, and discussing key messages under each ARIs. The group agreed on the need for clarity on definition of good evidence and on the importance of focusing on complex systems linking up different levels of analysis.

Between meetings all the 26 members of the group populated a shared document with the existing evidence against each of the ARI questions posed to the Working Group. The strength of the evidence has been taken into account when compiling the key messages, although there were many times no systematic reviews nor large evidence base to rely on.

To reference this report, please cite:
Rebuilding a Resilient Britain Working group 1 (2020) *Vulnerable Communities Report [Online]. Chair: Teixeria, L.*

Available at https://www.upen.ac.uk/go_science/RRB1_VulnerableCommunities.pdf

1.1. Participants and contributors of this Working Group
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1.2. ARIs considered by this Working Group

1. Identifying, protecting, and serving vulnerable populations.
2. Impact of COVID-19 on BAME groups in terms of health, education, behavioural and employment outcomes, and mitigating risks to members of these group bearing in mind sex, faith, and race.
3. Proportion of vulnerable populations including children who are not accessing services, and how this will exacerbate inequalities; how best to reach and support these people.
4. Local community protection of vulnerable populations (e.g. at-risk of re-offending).
5. Role of voluntary sector in community resilience.
7. Role of local authorities in protecting vulnerable populations.
8. What is the most effective and efficient way to provide support, across government and with third parties, to separated families?
10. Analysis of how COVID-19 may affect relations between generations and/or ethnic, religious or other identity groups in different countries.
11. Analysis of whether, where and how states or non-state actors use the disruption caused by the crisis to curtail minority rights or promote ideologies.

Not addressed due to insufficient expertise
6. Providing mobility services while protecting vulnerable from COVID-19.
9. Analysis of the relevance of demographics for the impact COVID-19 has in different parts of the world.

2. Working Group on Supporting Services

The Working Group on Supporting Services was asked to focus on 15 ARIs covering a very broad range of services and issues. To make the task manageable in the time, they identified clusters of ARIs, and members of the group volunteered to work in subgroups comprising individuals with expertise in one or more of the ARIs in each cluster. These subgroups sought to identify the evidence and evidence gaps using their own knowledge of the subject and their wider networks. A convenor for each of the subgroups brought together the key messages relating to the cluster of ARIs they were leading on and submitted a report on behalf of their subgroup.

Subgroups were encouraged to consult as widely as possible in the short time available to ensure that a diversity of voices was included in the process. They were also asked, where possible, to consult with policy and analytical colleagues in government departments. The importance of a systematic and transparent approach to evidence gathering was emphasised.

Two online meetings of the whole group provided opportunities to discuss the process and share learning on the approach taken by each subgroup. They first collated existing evidence, asking for contributions from other group members. Subgroup convenors then summarised the key messages through a combination of email exchanges and online meetings. The chair and facilitator pulled together the key materials from each of the subgroups into an overall report.

In total we have been able to provide evidence on about nine of the 15 ARIs allocated to the group. There were two ARIs which the working group was unable to address because none of its members had expert knowledge of them.

To reference this report, please cite: ARI Working group 2 (2020) *Rebuilding a Resilient Britain: Supporting Services. ARI Report 2. [Online]*

Available at: https://www.upen.ac.uk/go_science/RRB2_SupportingServices.pdf

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2.2. ARIs considered by this Working Group
Subgroup 1: Children and young people
1. Childcare and early years' service provision, particularly around training and protocols for reopening.
2. Supporting children and young people who have had disrupted education, particularly looking at the inequalities in impact of COVID-19 and access to technology.
3. Understanding impact of COVID-19 on service use and access across mental health, substance abuse, and children's social care.

Handed over to DWP for analysis

4. Benefit repayment processes.

5. How effective are the child maintenance arrangements and winder welfare system at ensuring parents have the financial support they need to achieve the best outcomes for them and their children? How can we improve compliance and the effectiveness and affordability of child maintenance arrangements?

6. To what extent can we better segment claimant services to reflect both different needs and capabilities, and to improve efficiency, effectiveness and customer service through more personalised support and preventative measures?

Subgroup 2: Public service staff

7. Recruitment and retention of staff, particularly sectors where there is a high proportion of overseas staff.

8. Supporting careers in public services.

12. Recruitment, progression, well-being and retention in the police and fire workforces.

Subgroup 3: Supporting integration and recovery

9. Improving integration between services (e.g. rehabilitation and justice; health and education around special educational needs and disabilities).

10. Supporting recovery from, and preparation for pandemics in the NHS and Social Care.

Subgroup 4: Local government

14. Role of local government in empowering local communities and delivering/supporting services.

Not addressed due to insufficient expertise

11. How do we support emergency service?

13. How can DWP policies, in combination with those of other government departments, facilitate and encourage inter- and intra-generational social mobility?

15. Potential role of digitalisation and technology-enabled services, looking at inequalities, access and innovative service delivery.

3. Working Group on Trust in Public Institutions

The 7 ARIs addressed by this Working Group were identified by departments, either through their ARI departmental refresh or through conversations with officials, and subsequently prioritised by departmental CSAs. The priority areas were consulted more widely with the CSA Network, GCSA and Council for Science and Technology.

Members of the group were identified with the support of UKRI and the Universities Policy Engagement Network, with particular emphasis being placed on diversity and inclusion. The group met on four separate occasions from the launch of the work to the submission of the report to the CSA meta-theme leads, however throughout this period, participants were encouraged to reach out to their existing networks to access a broad range of expertise.

To reference this report, please cite: ARI Working group 3 (2020) *Rebuilding a Resilient Britain: Trust in Public Institutions. ARI Report 3. [Online]*

Available at: https://www.upen.ac.uk/go_science/RRB3_TrustInPublicInstitutions.pdf

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3.2. ARIs considered by this Working Group

1. Changing behaviours and attitudes towards the government and COVID-19, and role of the media and scientific community in influencing these.
2. Supporting trust in public institutions and professional and scientific advice at a time of crisis, including attitudes and behaviours towards professionals and how public trust in democratic, religious, and social institutions is evolving in different countries and communities.
3. How will fear of pandemic resurgence affect the willingness of publics to accept greater surveillance?
4. Importance and prevention of cybercrime and misinformation.
5. Importance of GCSA and a strong science system to produce and deliver robust evidence.
6. Improved knowledge management systems.
7. How can government priorities be influenced by the evidence of the effects of different policies on the wellbeing of the people.

4. Working Group on Crime Prevention

The 7 ARIs addressed by this Working Group were identified by departments, either through their ARI departmental refresh or through conversations with officials, and subsequently prioritised by departmental CSAs. The priority areas were consulted more widely with the CSA Network, GCSA and Council for Science and Technology.

Members of the group were identified with the support of UKRI and the Universities Policy Engagement Network, with particular emphasis being placed on diversity and inclusion. The group met on four separate occasions from the launch of the work to the submission of the report to the CSA meta-theme leads, however throughout this period, participants were encouraged to reach out to their existing networks to access a broad range of expertise.

To reference this report, please cite: ARI Working group 4 (2020) *Rebuilding a Resilient Britain: Crime Prevention. ARI Report 4. [Online]*

Available at: https://www.upen.ac.uk/go_science/RRB4_CrimePrevention.pdf

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Note, because of time constraints, many but not all contributors had the opportunity to review and approve the final recommendations.

4.2. ARIs considered by this Working Group

1. Drug use and availability.
2. Monitoring of threats and hazards to improve crime prevention, detection and response.
3. Using big data to assess criminal behaviour and trafficking.
4. Enabling sharing of data, evaluation and monitoring to enable better joint working.
5. Detection and prevention.
6. Monitoring and analysing threats and hazards at incident scenes in real time, including the use of multiple and non- traditional sources such as crowd sourcing and social media.
7. How do we detect and mitigate threats, crime and smuggling?
8. Increased exposure to cyber harms and use of online platforms to facilitate extremism.
9. How will disinformation techniques evolve to profit from the crisis? How do different societies or groups imbibe, use or combat rumour and misinformation?
10. Changes in the opportunity structure for crime and in the drivers of the tendency to criminal behaviour, whether social, innate, or environmental.

11. Relationship between extremism and integration, dynamics of friendship/familial and community relationships, and links between hate crime, other crimes, and extremism.
12. Supporting integration of services around rehabilitation and prevention of re-offending.
13. Understanding the contribution of forensic techniques to the Criminal Justice System, within investigations and in court, including issues such as attrition of cases in the system.
14. Decent and safe prisons: prisons are decent, safe and productive places to live and work.
15. Understanding which individuals are at risk of becoming offenders (and/or victims), for what reason and at what stages of their lives.
16. Public protection: the public are protected from harm caused by offenders.
17. Lessons learned from investigations.
18. Reducing reoffending: the rate of reoffending is reduced and the life changes for offenders are improved.
19. How is the landscape of crime changing?
20. Improved knowledge of the harms and impacts of serious organised crime, including economic impact.
21. Understanding how serious organized crime markets work, and how they interact with each other.
22. Analysis of how conflict and terrorist dynamics may change as a direct or indirect result of COVID-19.
23. Analysis of what new conflicts may arise and where there might be new opportunities to resolve conflict.
24. Analysis of how COVID-19 interacts with other factors of instability in different countries.

5. Working Group on Supporting Lower-Carbon Local Economies

Our working group on Supporting Lower-Carbon Local Economies divided the initial 17 ARIs into 5 thematic subgroups, each of which was chaired by a member of the Working Group. Chairs were tasked with reaching out to their networks to maximise access to diverse expertise and evidence. Each subgroup collated resources and evidence, synthesised key messages and identified evidence gaps through virtual meetings and via email exchanges. The working group then came together virtually three times in order to share subgroup findings and identify cross-cutting key messages for the working group.

To reference this report, please cite: ARI Working group 5 (2020) *Rebuilding a Resilient Britain: Supporting Lower-Carbon Local Economies. ARI Report 5. [Online]*

Available at: https://www.upen.ac.uk/go_science/RRB5_LowCarbonEconomies.pdf

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5.2. ARIs considered by this Working Group

1. Capturing and maintaining sustainable changes to travel behaviour, including locking-in good practice.
2. How will public attitudes be affected? Are individuals, cities or communities motivated by the drop in emission levels resulting from reduced travel? Are they more/less fearful of ambitious decision making to protect the climate? What opportunities does this present in the UK?
3. Future of travel in terms of systems and choices, reflecting decarbonisation goals, reduced aviation opportunities and changing working practices.
4. Charging infrastructure – understand the requirements for Electric Vehicle charging, and how effective the policies are to support this, including the Electric Vehicle Homecharge Scheme, the Workplace Charge Scheme, and the On-street Residential Scheme.
5. Scope for digital platforms to support commercial activity.
6. What are the benefits of investment in innovative technologies such as AI, automation and decarbonisation, and how best can we unlock these benefits? What role does international collaboration have to play?
7. Changes to housing stock to support lower-carbon future.
8. How to encourage the uptake of smart construction and support the use of robotic, off-site, and modular construction.
9. Supporting regional diversity and industrial growth while contributing to net-zero
10. How can we best stimulate/maximise the green jobs market to combine economic recovery with a green and just transition?
11. Role of investment in emerging technologies to support economic regeneration.
12. How will the economic impact of COVID-19 affect governments' ambitions for climate change targets and biodiversity?

13. What is the impact of COVID-19 on the multilateral and international alignments on climate change consensus?
14. What are the competing pressures, trade-offs and synergies of different land-use in relation to climate change in a post-COVID world?
15. How to protect new low-carbon infrastructure from damages caused by increased climate variability. How can we measure resilience to identify when further action needs to be taken?
16. How can we predict the potential impacts of a changing climate on actions and strategies to mitigate climate change (e.g. how will future climate change impact the delivery of carbons sequestration by different habitats)? What tools are available to allow for effective planning of climate change mitigation strategies that are resilient to a changing climate?
17. What are the positive and negative environmental impacts of increasing renewable energy production (wind, solar, geothermal, etc.) and other actions taken to decarbonise the economy?

6. Working Group on Land Use

The Working Group on Land Use was asked to focus on 4 ARIs originally. The Working Group felt that this was not reflective of the priorities shared by governmental departments on the topic of land use.

In order to identify a meaningful set of priorities, the Working Group engaged government officials in conversation to identify a further set of questions. They therefore report a set of ARIs which have been developed in conversation with MHCLG and Defra relating to land use.

To reference this report, please cite: ARI Working group 6 (2020) *Rebuilding a Resilient Britain: Land Use. ARI Report 6. [Online]*

Available at: https://www.upen.ac.uk/go_science/RRB6_LandUse.pdf

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6.2. ARIs considered by this Working Group
1. Changes to the housing and planning system to support a lower-carbon future.
2. How will the economic impact of COVID-19 affect governments' ambitions for climate change targets and biodiversity?
3. Changes to our agricultural sector following COVID-19.
4. Supporting community regeneration through use of parks and public spaces.

6.3 New ARIs developed by this Working Group
How does land use and development serve communities best?
- How can land use, supply and demand be balanced and optimised between areas of the country?
- What has been shown to work effectively in shaping Governments' role in land use management to drive sustainable local sustainable growth?
- How important are amenity, social, health and ecological benefits in ensuring community gains when land use changes?
- What do communities' value and understand in terms of how land is used and allocated? And to what extent does this change in different geographical areas? What is the most effective way of ensuring these values are recognised and recirculated locally and regionally for the public good?
- How do you capture the value of an amenity for the benefit of local communities, and which ones create co-benefits? What value gets recirculated on the basis of development gain, and recirculated to whom? How can more value be retained locally to support COVID-19 recovery?
- What is effective in increasing the transparency, accessibility and availability of data for development on land to community and public bodies through increased digitalisation of the planning process?

How do we overcome the uneven development of the UK?
- What are the key elements of a coherent spatial strategy that balance and optimise land use in different regional contexts and for different types of inequality?
- How to ensure the maintenance and improvement of a range of economic, ecological and social benefits to land functions when land use changes?
- How to balance local community needs for land (e.g. recreation, amenity, woodland amenity) with use for other purposes (housing, infrastructure, transport etc)

- Given recognized population and density pressures, what planning principles would underpin a flexible, socially and ecologically equitable approach to development based on key priorities such as net zero place making?
- How could we regenerate and finance existing city spaces along net zero and active travel neighbourhood principles?
- What constitutes a sustainable community? And how can in practical ways local communities and neighbourhoods achieve this, especially in terms of relocalisation and ideas such as the 15-minute neighbourhood?
- How can government, market and civic actions and actors co-produce solutions to foster this process?
- How can current land uses and occupancy be adjusted to deliver sustainable communities?
- How could government interventions promote more equitable outcomes to land use policies while meeting public health, climate and biodiversity targets?

How can UK land use change better deliver multiple outcomes for people's health and prosperity to deliver a just transition for all?
- What roles do green jobs, local employment, renewables, recreation, and thriving biodiversity play in delivering these multiple outcomes?
- What is most effective in designing nature-based solutions to meet the net zero place making challenge?
- What can we learn from other countries about how can spatial planning be best used to support design green infrastructure and improve mental and physical health?
- What are the legislative, sociocultural and regulatory barriers that need to be overcome to transform UK land use towards sustainable production systems and ecosystem services? What are the risks of unintended and inequitable consequences and how can they be mitigated?
- How will crop, livestock and woodland resilience alter in a changing climate, impacting optimal agricultural, amenity and forestry practices for the UK? 'What works' in terms of increasing resilience in these areas?
- What is the greenhouse gas emissions reductions potential of different land-based interventions per unit area per year? How does this change over time and what are the timeframes for delivery from implementation? What the potential for both urban, rural and peri-urban interventions?
- What are the real-world barriers that prevent land-users and owners taking up low/negative carbon measures, and how can these be overcome? How can we improve the estimation and validation of take up for these practices?
- How can a more integrated and regionally sensitive approach to land use be developed through aligning climate change objectives (adaptation and mitigation)

with objectives for biodiversity, social equity and ecosystem services. How can the environmental co-benefits of mitigation actions be identified and quantified?

- What are the competing pressures, trade-offs and synergies of different land-use in relation to climate change in a post-COVID world?
- Can other land-based approaches to greenhouse gas removal such as enhanced weathering and biochar as well as place-based approaches such as local reafforestation help achieve net zero without negative environmental impacts?

Land ownership, governance and finance
- Financial flows and capital release – how can we ensure equitable and more fluid flows of capital so that land can address climate emergency and social justice?
- How can land be released for more local community needs (e.g. growing, recreation, amenity, woodland amenity)?
- Liquidity in land for community benefit – how can we ensure release of land to meet urgent social-ecological objectives of COVID-19 recovery?
- Development and green recovery – what mechanisms could ensure that under-used or 'banked' land is released to stimulate an equitable green recovery (for biodiversity, community renewables, community housing, active travel, amenities)
- Which new mechanisms for community ownership – grants and support organisations for cooperatives, Community Land Trusts, custom build, cohousing etc – could help the UK achieve its priorities for land use most cost-effectively?
- What relationships between different scales of ownership: local, national and international – could help ensure a coherent UK spatial plan to avoid overheating, dereliction especially within and between regions?
- What are the implications for how 'levelling up' subsidy regimes are designed and the levels of in spending per head (e.g. for arts, transport, greenspaces)
- How can new re-localised and regionalised markets for environmental goods and services be created?
- Is the allocation of land to different transport types (private vehicle, active travel) optimised to ensure climate, social and health objectives are met?

How can we deliver early warning systems to monitor signals in the environment relevant to public health and other societal outcomes?
- Monitoring the prevalence of COVID-19 and similar viruses through water systems.
- Developing environmental surveillance and/or sentinel systems offering early warning signals
- Better tracking for safety and sustainability of UK food production
- How can we develop effective early warning systems that are able to assess and interpret a wide range of signals in local environmental systems (e.g. covering flooding, biodiversity loss, amenity loss, air pollution, soil loss)?

- How do we use new sensor capability, and combine it with data analytics to deliver predictive capability from near real time to multiyear scenario planning?
- How can we develop accurate biological sensors throughout the food system to detect changes/ issues in real time combined with decision support tools?

What is the role for UK land in supplying healthy, safe, sustainable and affordable food, and how can innovation boost productivity to transform the UK food and farming system?

- How to maintain food security and equitable access to a decent diet in the face of challenges such as a rapidly growing population, changing consumption trends, changing climate, globalized markets and black swan events such as COVID-19?
- How best to develop agritech, robotics and automation to drive change and enable UK food and farming sectors to compete globally?
- How do the public view the role of the technologies above in the transformation of the UK's agri-food system post-Brexit?
- How can we prepare for divergent regulatory frameworks (in the USA, European Union and other trading nations) for agricultural inputs such as seeds and livestock?
- Use of new data science techniques, including AI, to unlock opportunities for improved and more efficient environmental monitoring, regulatory compliance and land management
- How to value changes in land use / use of an amenity and the implications for regulation and access
- How to incorporate effective local and regional approaches into the development of more resilient food supply chains, processing infrastructures and public sector food procurement processes
- How to create a growth in shorter- more localised and regionalised food supply chains? How to invest in local urban and regional food processing infrastructures and market innovations?
- How to stimulate local and regional food procurement in the public sector (post-COVID and Brexit)?
- How to extend knowledge networks advisory and extension systems and new innovations to landholders and farmers?
- How can under-utilised urban land be used to support a supply of nutritious affordable food?

How can management of the UK's land use footprint in other countries reduce likelihood of zoonotic disease emergence along with improved sustainability outcomes?

- How do we deploy science and technology innovations to help deliver a risk-based approach to animal and plant biosecurity, i.e. to move from post-disease/outbreak surveillance to pre-emergence surveillance and mitigation of risks?

- How will the prevalence and incidence of animal and plant pathogens in domesticated organisms and wildlife adjust to climate change?
- How can we better join up animal and human health research, capability and digital backbone across government to facilitate agile responses?
- How to assess and reduce the role of UK imports in driving biodiversity loss, climate change, chemical pollution and the introduction of alien species
- How do we better understand how the UK land use promotes zoonosis emergence, and environmental transmission and can it be sued to create barriers to spread?
- How can we build resilience in food systems, recognising that prevention is better than cure?
- How can we boost productivity on existing agricultural land whilst using less inputs (nitrogen, pesticides, water)?
- How can UK research and insights support sustainable urban development and SDG11 in the global south in ways that will reduce peri-urban sprawl and the urban encroachment on pristine ecosystems?

7. Working Group on The Future of Work

The Working Group used its own expertise and reached out to its networks to collect existing evidence in each of its ARIs. For ARIs 6 and 8 a literature search was undertaken using the Database Business Source Complete. The Chair reviewed the evidence collected in August and invited an expert on transport to join the group as existing expertise within the group was inadequate for considering ARIs 1 and 2.

The group met for a second time to further review the evidence, to agree key messages and to identify research gaps. This meeting agreed to cluster the ARIs into three groups as shown below.

To reference this report, please cite: ARI Working group 6 (2020) *Rebuilding a Resilient Britain: Land Use. ARI Report 6. [Online]*

Available at: https://www.upen.ac.uk/go_science/RRB6_LandUse.pdf

7.1. Participants and contributors of this Working Group
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7.2. ARIs considered by this Working Group

Cluster 1

1. Preventing and reducing overcrowding on commutes and in the workplace and supporting active travel choices and reduced transport capacity.
2. Ensuring transport is inclusive, accessible, age friendly to all and addresses social inclusion and social mobility.

Cluster 2

3. Health and safety of homeworking across age-groups.
4. Supporting flexible and home-working practices, including employer responsibilities, working regulations and required infrastructure.
5. What new and better approaches are there for delivering joined-up, tailored and personalised health and work support? How can we effectively engage employers, health professionals and other stakeholders to improve work and health outcomes?
6. What are the current and future trends in disabilities and health conditions that working-age people face that require targeted policy measures to improve employment, health and wellbeing outcomes?
7. Effects and risks of social distancing on working patterns and practices, and how these will affect different groups and sectors.

Cluster 3

8. What are the different ways to define and measure labour market progression and sustainable work? How does this vary between groups and at different times in people's lives?
9. Identifying populations at risk of joblessness and poverty and intervening and evaluating successfully to prevent poor outcomes.
10. Supporting and identifying individuals with multiple complex needs.

8. Working Group on Local and National Growth

This Working Group was large and the topics we covered far-reaching. We decided to break the work down into 5 subgroups on related topics:

- Subgroup A – education, research, and innovation
- Subgroup B – productivity, business, and national economy
- Subgroup C – local economies
- Subgroup D – global issues
- Subgroup E – employment

Each group was chaired by a volunteer with particular interest in the subject. Each group produced a report responding to the three tasks: evidence collation, key messages, and evidence gaps although they each chose to do the task is a slightly different way.

To reference this report, please cite: ARI Working group 8 (2020) *Rebuilding a Resilient Britain: Local and National Growth. ARI Report 8. [Online]*

Available at: https://www.upen.ac.uk/go_science/RRB8_LocalNationalGrowth.pdf

8.1. Participants and contributors of this Working Group
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Jacqueline Wood, NERC

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Subgroup E members:
Luke Price, Centre for Ageing Better
Paul Nightingale, UKRI

8.2. ARIs considered by this Working Group
Subgroup A
1. Role of universities in supporting local regeneration and skills.
2. Impact of university and school closure on productivity in terms of short term and long-term outcomes.
3. How will COVID-19 impact on international cooperation on emerging technologies?
4. What will future international scientific collaboration look like in a post-COVID world? Will scientists collaborate in a different way?
5. How will COVID-19 impact on the uptake of international study? What are the longer-term implications for the research ecosystem in the UK and internationally? What will be the impact on the UK's reputation as a leading science nation?
6. Importance of strong national research base to support effective policy.
7. Role for analytical and scientific skills to support national need.

Subgroup B
8. What role does productivity play in the UK economy?
9. What are the effects of the UK's approach to business regulation, and how can the system develop to meet the economy's needs in the future?
10. Unlocking the benefits of investment in skills and entrepreneurship.
11. Mitigating the effects of business closures and redundancies.
12. Role of government in stimulating demand (procurement).
13. What are the future trends for demographics and working/saving behaviour and what is driving these trends? What further reforms to state and private pension

provision might we require to ensure long-term sustainable financial security for older people and pensioners?

Subgroup C
14. How do we best support high streets during the current crisis and beyond?
15. What is the impact of improving physical connectivity between towns and cities, as well as rural and rural/urban transition zone?
16. What are the drivers of regional economic disparity?
17. What drives differences in productivity at the firm and regional level, and what are the effects of these differences on enterprise and business growth?
18. What are the implications of reduced cash transactions for local economies and businesses?

Subgroup D
19. Is COVID-19 accelerating trends in emerging technologies?
20. How might these trends affect global employment and immigration patterns?
21. How might COVID-19 affect migration trends? For example, as an amplifier or driver of migration in itself? If it impacts, which regions of the world are most likely to be affected?

Subgroup E
22. Responding to probable higher levels of youth unemployment.
23. The impact of demographic change on the health and safety of the future workforce.

9. Working Group on Trade and Aid

This Working Group was asked to consider 30 ARIs covering a very broad range of issues. To make the task manageable in the time, we identified clusters of ARIs, and members of the group volunteered to work in subgroups comprising individuals with expertise in one or more of the ARIs in each cluster. These subgroups sought to identify the evidence and evidence gaps using their own knowledge of the subject and their wider networks. A convenor for each of the subgroups brought together the key messages relating to the cluster of ARIs they were leading on and submitted a report on behalf of their subgroup.

Subgroups were encouraged to consult as widely as possible in the short time available to ensure that a diversity of voices was included in the process. They were also asked, where possible, to consult with policy and analytical colleagues in government departments. We also emphasised the importance of a systematic and transparent approach to evidence gathering.

Five online meetings of the whole Working Group provided opportunities to discuss the process and share learning on the approach taken by each subgroup. They first collated existing evidence, asking for contributions from other group members. Subgroup convenors then summarised the key messages through a combination of email exchanges and online meetings. The chair and facilitator pulled together the key materials from each of the subgroups into an overall report.

To reference this report, please cite: ARI Working group 9 (2020) *Rebuilding a Resilient Britain: Trade and Aid. ARI Report 9. [Online]*

Available at: https://www.upen.ac.uk/go_science/RRB9_TradeAid.pdf

9.1. Participants and contributors of this Working Group
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9.2. ARIs considered by this Working Group

1. Impact on global trade and supply chains, particularly around changes to our food supply chains and maintaining access to key goods, and monitoring and preventing panic buying of key goods
2. How will COVID-19 impact on forecasted global peak oil demand? What implications does this have for the transition to renewable resources?
3. Exploring the opportunities to improve the way people and goods move in the UK including longer distance travel and last mile deliveries
4. Monitoring and preventing panic buying of key goods
5. Changes to our food supply chains and maintaining access to key goods
6. What impact will COVID-19 have on global attitudes to traditional medicines derived from animal products?
7. How will the health and economic impacts of COVID-19 affect the attitude of governments and publics to the illegal wildlife trade?
8. How will the composition of sovereign debt change in countries post-COVID?
9. What are the implications for stability of the euro area?
10. How will global patterns of consumption, saving and investment change post-COVID? How will productivity growth change?
11. How are state and non-state actors are adjusting their approaches to geopolitical issues during the course of the pandemic?

12. Analysis of the role of soft power efforts, public diplomacy and international aid in geopolitical contest between larger powers
13. Analysis of the impacts of the pandemic on international cooperation and relationships between states
14. International institutions
15. Analysis of the impact of COVID-19 on key constituencies' approach to global governance and to particular institutions or groups of them within the multilateral system
16. Analysis of the responses of, and dynamics within and between, multilateral institutions and the implications of these developments for global governance as a whole
17. Analysis of possible reforms to the World Health Organisation and of measures to improve implementation of the International Health Regulations
18. Supporting trade recovery
19. Market access and non-tariff measure
20. What methods enable evaluation of a country's sectors and regions of dynamic comparative advantage?
21. What is the role of trade and investment in national economic performance indicators, for example, national and regional growth, employment and macroeconomic stability?
22. What factors make countries attractive as places for investment in high potential, early stage, technology-based business and entrepreneurs?
23. The compatibility of COVID-19 related restrictions with human rights law obligations or with other obligations under international law
24. Analysis of the extent to which sanctions inhibit humanitarian responses to pandemics and the impact of humanitarian exemptions on sanctions policy
25. Analysis of international polling and other survey indicators of the impact on public attitudes towards globalisation. Are there differences between developed vs. lower- and middle-income countries, or generational differences, and do these suggest significant changes compared to results from recent decades?
26. What are the public and state attitudes in China and the US towards the provision of 'global goods', particularly health provision in developing nations (for example hospital building or support for NGOs and the World Health Organisation)? How is the 'global good' narrative promoted at home and overseas?
27. How will COVID affect the rate of technological adoption around the world and what will that mean for the structure of the global economy in the future, and the balance of trade?
28. How can UK trade policy best support recovery from COVID-19 and wider international development? How can policy levers such as trade agreements, unilateral trade preferences and tariffs be used to support economic development and poverty reduction in developing countries?
29. How can we better understand the impact of COVID-19 on trade in services and support developing countries trade in services given the lack of reliable data?

30. Which global economic sectors (e.g. agriculture, aerospace, financial services) are most likely to grow and shrink in a post-COVID world?

Annex 1. Resources identified by the Working Group on Vulnerable Communities

ARI	Resources
Identifying, protecting, and serving vulnerable populations	• The Centre for Homelessness Impact's (CHI's) Intervention tool quickly summarises the strength of evidence, the cost-effectiveness and the impact of the main interventions in the homelessness sector, but also gives more details for each type of intervention (e.g. outcomes affected, groups affected, implementation considerations). • CHI's Evidence and Gaps Maps classify existing studies on interventions for people experiencing or at risk of experiencing homelessness by type of interventions and types of outcomes. It allows us to see the big picture of what we know and what we don't know. The effectiveness map includes 394 quantitative impact evaluations, while the implementation map currently includes 246 qualitative process evaluations. • CHI will release a systematic review on the effectiveness of various accommodation-based interventions. • Cardiff University and the Centre for Homelessness Impact are conducting a randomised controlled trial to estimate the effectiveness and cost-effectiveness of settled housing vs temporary (congregate) housing. • Aubry et al. (2015) Housing first for people with severe mental illness who are homeless: A review of the research and findings from the At Home-Chez soi demonstration project. • Baggett, T., Lewis, E., Gaeta, J. (2020) Epidemiology of COVID-19 among people experiencing homelessness: Early evidence from Boston. • Baggett, T., Keyes, H., Sporn, N., Gaeta, J. (2020) COVID-19 outbreak at a large homeless shelter in Boston: Implications for universal testing. • Collinson, R., Johns, E., Raithel, J., Reed,D. and Schretzman, M. (2017) Predicting homelessness for better prevention. • Culhane, D., et al. (2020) Estimated Emergency and Observational/Quarantine Capacity Need for the US Homeless Population Related to COVID-19 Exposure by County; Projected Hospitalizations, Intensive Care Units and Mortality. • Office for National Statistics (2020) Coronavirus and deaths of homeless people, England and Wales: deaths registered up to 26 June 2020. • Rosenthal, D. et al. (2020) Impacts of COVID-19 on vulnerable children in temporary accommodation in the UK. • Shinn, M., Greer, A., Bainbridge, J., Kwon, J., Zuiderveen, S. (2013) Efficient Targeting of Homelessness Prevention Services for Families. • Stergiopoulos et al. (2015) Effect of Scattered-Site housing using rent supplements and intensive case management on housing stability among homeless adults with mental illness. • Tsemberis et al. (2004) Housing First, Consumer Choice, and Harm Reduction for Homeless Individuals with a Dual Diagnosis.

	• Von Wachter, T., Bertrand, M., Pollack, H., Rountree, J. & Blackwell, B. (2019). Predicting and preventing homelessness in Los Angeles. • Power M, Doherty B, Pybus K and Pickett K. (2020) How COVID-19 has exposed inequalities in the UK food system: The case of UK food and poverty. • ONS – Social impact – Weekly update – https://www.ons.gov.uk/news/statementsandletters/ourfutureanalyticalworkprogrammeinresponsetocovid19
Impact of COVID-19 on BAME groups in terms of health, education, behavioural and employment outcomes, and mitigating risks to members of these group bearing in mind sex, faith, and race	• Ala, A. (2020). Developing and delivering targeted SARS-CoV-2 (COVID-19) health interventions to Black, Asian and Minority Ethnic (BAME) communities living in the UK. Brandilly, P. et al. (2020) A Poorly Understood Disease? The Unequal Distribution of Excess Mortality Due to COVID-19 Across French Municipalities. • Dickerson, J., Kelly, B., Lockyer, B., et al. (2020) Experiences of lockdown during the Covid-19 pandemic: descriptive findings from a survey of families in the Born in Bradford study. • Hatch, S. (2020). Identifying and mitigating the impact of COVID-19 on inequalities experienced by people from BAME backgrounds in health and social care. • McEachan, R.R.C., Dickerson, J., Bridges, S. et al. The Born in Bradford COVID-19 Research Study: Protocol for an adaptive mixed methods research study to gather actionable intelligence on the impact of COVID-19 on health inequalities amongst families living in Bradford. • Platt, L., and Warwick, R. (2020). Are some ethnic groups more vulnerable to COVID-19 than others? • Pan, D et al. (2020) The impact of ethnicity on clinical outcomes in COVID-19: a systematic review.
Proportion of vulnerable populations including children who are not accessing services, and how this will exacerbate inequalities; how best to reach and support these people	• Appel et al. (2012) Housing First for Severely Mentally Ill Homeless Methadone Patients. Journal of Addictive Diseases. • Bell et al. (2015) A randomized controlled trial of intensive care management for disabled Medicaid beneficiaries with high health care costs. • Benjaminsen, L. (2018). Housing First in Denmark: An Analysis of the Coverage Rate among Homeless People and Types of Shelter Users. • Bond et al. (1990). Assertive community treatment for frequent users of psychiatric hospitals in a large city: A controlled study. • Borland et al. (2013) Does coordination of welfare services delivery make a difference for extremely disadvantaged jobseekers? • Bradford et al. (2005). Can shelter-based interventions improve treatment engagement in homeless individuals with psychiatric and/or substance misuse disorders?: a randomized controlled trial. • Calsyn (2005). Impact of assertive community treatment and client characteristics on criminal justice outcomes in dual disorder homeless individuals. Criminal behaviour and mental health. • Chareyron, S., Domingues, P. (2016). Take-Up of Social Assistance Benefits: The Case of the French Homeless.

	•	Chinman, M. et al. (2000) Comparing consumer and nonconsumer provided case management services for homeless persons with serious mental illness.
	•	Dennis, D. et al. (2011) Helping adults who are homeless gain disability benefits: the SSI/SSDI Outreach, Access and Recovery (SOAR) program.
	•	Drake et al. (1998) Assertive community treatment for patients with co-occurring severe mental illness and substance.
	•	Essock et al. (2006) Comparison of ACT and Standard Case Management for Delivering Integrated Treatment for Co-occurring Disorders.
	•	Gesmond, T. (2017) The impact of Housing First on financial poverty and the take-up of income support: evidence from a French randomised controlled trial.
	•	Hwang, S. et al. (2010) Universal Health Insurance and Health Care Access for Homeless Persons.
	•	Martin, J. et al (2020) Covid-19 and early intervention: Evidence, challenges and risks relating to virtual and digital delivery.
	•	Rosenheck, R. et al. (1999) Improving access to disability benefits among homeless persons with mental illness: an agency-specific approach to services integration.
	•	Shinn, M., et al. (2015) Longitudinal Impact of a Family Critical Time Intervention on Children in High-Risk Families Experiencing Homelessness: a Randomized Trial.
	•	Zlotnick, C., Tam, T., Zerger, S. (2012) Common needs but divergent interventions for U.S. homeless and foster care children: results from a systematic review.
Local community protection of vulnerable populations (e.g. at-risk of re-offending)	•	On the definition of Community resilience: The BA's programmes on Conflict, Stability and Security and Urban Infrastructures of Wellbeing.
	•	Hanratty et al. (2020) Discharge programmes for individuals experiencing, or at risk of experiencing homelessness: a systematic review.
	•	Mak, K., Fancourt, D., Wang, S. (2020) The arts: good for mental health and satisfaction.
	•	Van de Vyver, J., & Abrams, D. (2017). Community connectedness through the arts.
	•	Van de Vyver, J., & Abrams, D. (2018). The arts as a catalyst for human pro-sociality and cooperation.
Role of voluntary sector in community resilience	Intelligence on third sector context (impact beyond research activity):	
	•	Impact of COVID-19 on the charity sector a report from the Institute of Fundraising, The National Council for Voluntary Organisations (NCVO) and Charity Finance Group (CFG) details the results from a survey of charitable organizations (between 23 March – 12 May 2020). On average, respondents to the most recent survey reported that they were expecting a reduction of 24% to their total income for the year, which would mean a £12.4bn loss of income if the average was applied to the sector as a whole.
	•	The House of Lords select committee on public services has launched an inquiry to examine what the experience of the coronavirus outbreak can tell us about the future role, priorities and shape of public services including the role of civil society – the private sector, charities, volunteers and community groups – during coronavirus.

	• The Local Government Information Unit (LGIU) provides intelligence to membership organisations (councils, trade unions, charities, public sector partners and private sector organisations) including two briefings on the impact of COVID-19 on the third sector; COVID-19 and civil society responses (March 2020) and Size matters COVID-19 and small charities (April 2020). • The National Council for Voluntary Organisations (NCVO) produce a monthly charity policy round up July 2020 and are supporting their 14,000 members (a third of the voluntary sector workforce in England) through the creation of extensive online resources including; Supporting staff, volunteers and beneficiaries and keeping safe; Contingency planning and financial implications; How charities are helping; Involving volunteer and; Further information and resources. • Abrams, D. Lalot, F., Broadwood, J., & Platts-Dunn, I (2020) All in it, but not necessarily together: Divergent experiences of keyworker and volunteer responders to the COVID-19 pandemic. • Belong's (Cohesion and Integration Network) research and monthly reports on implications of COIVD-19 for community organisations and Local Government policy. • Relevant resources from the New Philanthropy Capital (NCP) include a blog on the need for systems thinking: analysis of Covid-19 data from Turn2us and Covid-19 charity redundancies monitor. • See also Pro Bono Economics How do you expect Covid-19 to affect your charity's ability to deliver on its objectives in the next six months? And; Weathering the storm: PBE Covid Charity Tracker and a briefing from the Charities Aid Foundation 3 months into lockdown, how are charities in the UK fairing? UKRI COVID-19 Rapid call: • How to understand, scale and maximise the effectiveness of volunteer responses to COVID-19 (Burchell, University of Sheffield). • Assessing financial vulnerability and risk in the UK's charities during and beyond the COVID-19 crisis (Mohan, University of Birmingham). • COVID-19 and VCSE organisations response (King, Nottingham Trent University).
Role of local authorities in protecting vulnerable populations	• The Local Government Information Unit (LGIU) provides intelligence to membership organisations (councils, trade unions, charities, public sector partners and private sector organisations) including two briefings on the impact of COVID-19 on the third sector; COVID-19 and civil society responses (March 2020) and Size matters COVID-19 and small charities (April 2020). • Note also the Local Area Research & Intelligence Association (LARIA) is a UK-based membership body largely run by volunteers working in the public sector. We represent in excess of 1,000 people, and around 100 organisations, who improve lives and local areas through the use of research, intelligence and policy. Our work is supported by our partners and sponsors. A series of webinars is being organised jointly by Health Statistics User Group (HSUG) and the Royal Statistical Society (RSS) Official Statistics Section on topics relating to COVID-19. The focus of these webinars is on sharing experiences and discussing approaches to the methods being used to produce the statistics for each of the topics in the four

	nations of the UK. https://laria.org.uk/2020/06/collecting-and-reporting-statistics-for-covid-19/.
	- Belong's (Cohesion and Integration Network) research and monthly reports on implications of COVID-19 for community organisations and Local Government policy. - Abrams, D., Lalot, F., Broadwood, J., Davies Hayon, K, & Platts-Dunn, I (2020). The social cohesion investment: Local areas that invested in social cohesion programmes are faring better in the midst of the COVID-19 pandemic. - The Business and Local Government Data Research Centre (BLG), University of Essex www.blgdataresearch.org may have further relevant research insight and have amongst other things fed into the publication 'What impact has the global pandemic had on our society?' by Essex University Human Rights Centre and School of Law on how the COVID-19 pandemic has affected our societies, which has relevance to the overarching theme of the working group, including possible relevance to Q9 and Q11. Note specifically chapter on 'The Impact on Vulnerable Populations' which covers; Vulnerability: A Discussion; The Politics of Identity in the UK: Before, During and After COVID-19; COVID-19 And Social Inequalities in Health in the UK; Forced Displacement in a Time of a Global Pandemics; Detention and Pandemic Exceptionality; Imperfect Models of the World: Gender Stereotypes and Assumptions in COVID-19 Responses and; the Human Rights of Older People During COVID-19: Social Wellbeing and Access to Care and Support for Older People in the United Kingdom.
What is the most effective and efficient way to provide support, across government and with third parties, to separated families?	- CHI's Intervention Tool reports the existing evidence on the effectiveness of reconnection interventions (encouraging people experiencing homelessness to return to an area where they have history of familiarity), or on the effectiveness of family mediation and conciliation interventions (seeking to repair the relationship between a young person and their parent or carer). - Coren, E. et al. (2013) Interventions for promoting reintegration and reducing harmful behaviour and lifestyles in street-connected children and young people. - Fowler, P. and Chavira, D. (2014). Family Unification Program: Housing Services for Homeless Child Welfare-Involved Families. - Milburn, N. et al. (2011) A Family Intervention to Reduce Sexual Risk Behaviour, Substance Use, and Delinquency Among Newly Homeless Youth. - Slesnick, N., et al. (2010) A Review of Services and Interventions for Runaway and Homeless Youth: Moving Forward. - Wang, J. et al. (2019) The impact of interventions for youth experiencing homelessness on housing, mental health, substance use, and family cohesion: a systematic review.
Analysis of how COVID-19 may affect relations between generations and/or ethnic, religious, or other identity groups in	Research from More in Common (see here and here) suggests that despite gains in national unity, strains on cohesion and relationship between different groups within and beyond the UK are growing, and that these are not necessarily tied to political orientation or ideology.

different countries	
Analysis of whether, where and how states or non-state actors use the disruption caused by the crisis to curtail minority rights or promote ideologies	• COVID-19 Rapid Call: Identity, Inequality, and the Media in Brexit-COVID-19-Britain • Ferstman, C., Fagan, A. (2020) COVID-19, Law and Human Right: Essex Dialogues. A Project of the School of Law and Human Rights Centre.

Annex 2. Resources identified by the Working Group on Supporting Services

ARI	Resource	Key Messages
1. Childcare and early years' service provision, particularly around training and protocols for reopening. 2. Supporting children and young people who have had disrupted education, particularly looking at the inequalities in impact of COVID-19 and access to technology.	1. Marmot, M. et al. (2020) Health Equality in England: The Marmot Review 10 Years On. London: Institute of Health Equality P. 37 http://www.instituteofhealthequi ty.org/resources-reports/marmot-review-10-years-on/the-marmot-review-10-years-on-full-report.pdf 2. Asmussen, k., Brims, L. (2018) *What works to enhance the effectiveness of the Healthy Child Programme: An evidence update*. Early Intervention Foundation 3. Brooks, S. et al. (2020). *The psychological impact of quarantine and how to reduce it: Rapid review of the evidence*. Lancet, 395, 912– 920. 4. Shultz J., Baingana F., Neria Y. (2015). 'The 2014 Ebola Outbreak and Mental Health: Current Status and Recommended Response'. JAMA. 2015;313(6):567– 568. doi:10.1001/jama.2014.17934 5. Janke, K., Lee, K., Propper, C., Shields, K and Shields, M., 2020. *Macroeconomic Conditions and Health in Britain: Aggregation, Dynamics and Local Area Heterogeneity*. Institute of Fiscal Studies: Economic and Social Research Council. https://www.ifs.org.uk/uploads/ WP202012-Macroeconomic-Conditions-and-Health-in-Britain.pdf 6. Ghiara, V., Pote, I., Sorgenfrei, M., Stanford, M. (2020) Reducing Parental	

Conflict in the Context of Covid-19. Adapting to a virtual and digital provision of support. Early Intervention Foundation 7. Children's Commissioner for England (2020) Briefing: Children, domestic abuse and coronavirus. https://www.childrenscommissioner.gov.uk/wp-content/uploads/2020/04/cco-briefing-children-domestic-abuse-coronavirus.pdf 8. The Alliance for Child Protection in Humanitarian Action (2019). 'Technical Note: Protection of Children during the Coronavirus Pandemic', Version 1. 9. The Alliance for Child Protection in Humanitarian Action. 'Guidance Note: Protection of Children during Infectious Disease Outbreaks' 10. UNICEF (2020). 'COVID-19: Children at heightened risk of abuse, neglect, exploitation and violence amidst intensifying containment measures'. 11. https://www.ifs.org.uk/uploads/BN288-Learning-during-the-lockdown-1.pdf 12. https://www.suttontrust.com/our-research/covid-19-and-social-mobility-impact-brief/ 13. Wilson, H & Waddell, S. (2020) Covid-19 and early intervention: Understanding the impact, preparing for recovery. https://www.eif.org.uk/report/covid-19-and-early-intervention-understanding-the-impact-preparing-for-recovery	

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22. Bonetti, S. (2020) The
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	31. https://www.youthimpact.uk/youth-sector-data-standard.html	
3. Understanding impact of COVID-19 on service use and access across mental health, substance abuse, children's social care.	1. Ongoing work/prof: "Responding to the Covid-19 domestic abuse crisis: developing a rapid police evidence base"; Dr Katrin Hohl (Current Map)	The project provides a near real-time evidence base to inform the police approach to the apparent surge in domestic violence and abuse (DA) triggered by the COVID-19 lockdown in the UK. Police case file data from seven diverse police forces are pooled to track the impact of the pandemic on DA, analysing changes in the risk factors, frequency, nature and profile of DA reported to police. These changes are mapped closely to shifts in the restrictions imposed during lockdown,

		transitional phases and post lockdown, when DA calls to police are expected to spike. The statistical analysis is complemented by regular focused semi-structured phone interviews with police officers, to identify emerging challenges and best practice in the frontline response to DA. The mixed-methods study addresses urgent questions on the impact of COVID-19 on DA, which may have significant implications for the complex task of accurate police risk assessment, victim safeguarding, and criminal prosecution as the COVID-19 pandemic evolves.
	2. Ongoing work/prof: "COVID-19 and child criminal exploitation: Closing urgent knowledge and data gaps on the implications of pandemic for county lines"; Dr Ben Brewster (Current Map)	This project will inform efforts to urgently safeguard children from Child Criminal Exploitation (CCE), as the impacts of COVID-19 unfold. This project will detail the impact of social distancing measures on offenders' ability to groom, methods for mobilising 'county lines' operations, and the prevention, detection and safeguarding abilities of police and other organisations. By analysing data across statutory and voluntary sectors, we will show the impacts of mitigating actions and statutory reprioritisation on prevention and safeguarding, and how criminals adapt their methods. This will assist police and safeguarding authorities to protect vulnerable children and adults. Our research will provide substantial evidence upon which police, safeguarding and care organisations' can formulate interventions that address county lines related offending, and reduce risk to vulnerable children and adults.
	3. Ongoing work/prof "Reducing the unanticipated crime harms of COVID-19 policies"; Prof Graham Farrell (Current Map)	Lockdown requires people to stay home, leading to domestic violence and child abuse increases. Yet social distancing means police are arresting fewer suspects and that that there are reduced services at time of greater need. This study will analyse national police data, detailed data from three police partners, fraud and e-crime data from industry, and sources from other agencies where available such as children's agencies (for unreported crime) in order to address the crime harms of COVID-19, such as increased domestic violence and child abuse. The

		aim is to inform policy and practice, producing deliverables including policy and practice briefings and research articles.
	4. Ongoing work/prof "Domestic abuse: Responding to the shadow pandemic"; Prof Sandra Walklate (Current Map)	Evidence suggests that COVID-19 has led to an increase in the rates of domestic abuse and intimate partner homicide, and that the number of assaults and murders will continue to rise considerably this year. In April, the 2020 Home Affairs Committee noted that the police and courts are currently struggling to protect the vulnerable. This research will review literature on the impact of COVID-19 on domestic violence, document any changes in service responses being offered to victims by criminal justice and other agencies and map the demography and social characteristics of the victims and perpetrators. It will also evaluate the efficacy of policy and practice innovations by both the police and courts to deal with the immediate crisis and explore their viability for future practice in face of ongoing service demands and the fiscal impact of such as the longer-term consequences of the global pandemic take root.
7. Recruitment and retention of staff, particularly sectors where there is a high proportion of overseas staff. 8. Supporting careers in public services.	1. "Domestic abuse: Responding to the shadow pandemic"; Prof Sandra Walklate (ongoing). https://whatworks.college.police.uk/Research/Research-Map/Pages/ResearchProject.aspx?projectid=847 2. "COVID-19 and child criminal exploitation: Closing urgent knowledge and data gaps on the implications of pandemic for county lines"; Dr Ben Brewster (ongoing). https://whatworks.college.police.uk/Research/Research-Map/Pages/ResearchProject.aspx?projectid=843 3. "Responding to the Covid-19 domestic abuse crisis: developing a rapid police evidence base" Dr Katrin Hohl	

	(ongoing). https://whatworks.college.police.uk/Research/Research-Map/Pages/ResearchProject.aspx?projectid=842 4. "Reducing the unanticipated crime harms of COVID-19 policies"; Prof Graham Farrell (ongoing). https://whatworks.college.police.uk/Research/Research-Map/Pages/ResearchProject.aspx?projectid=846 5. Walsh, G., Purdy, N., Jones, S., Dunn, J. and Harris, J. (2020) Homeschooling in Northern Ireland during the COVID-19 crisis: the experiences of parents and carers. Belfast: Centre for Research in Educational Underachievement, Stranmillis University College. https://www.stran.ac.uk/research-paper/creu-home-schooling-during-covid/ 6. Parental experiences of home-schooling during pandemic. O'Connor, U., Bates, J., Finlay, J., Roulston, S. and Taggart, S. (2020) Northern Ireland parent surveys: Experiences of supporting children's home learning during COVID-19 https://www.ulster.ac.uk/coronavirus/research/impact/understanding-parentsexperiences-of-home-schooling-in-northern-ireland 7. Manion, R. (in progress) Quality and Efficiency of Mental Healthcare Provision in a time of Covid-19: A Mixed Method Study of Mental Health Trusts. Project funded by The Health Foundation (reporting Feb 2022) 8. COVID-19 Psychological Research Consortium Study.		

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20. The Street Triage project. Rivka Smith (ongoing). https://whatworks.college.police.uk/Research/Research-Map/Pages/ResearchProject.aspx?projectid=615 21. Evaluation of Hull Adult Female Triage Scheme. Iain Brennan. http://library.college.police.uk/docs/Police-Female-Triage-Report-Hull-University-2015.pdf) 22. Interagency working with police, health and social care professionals in adult support and protection: a realistic evaluation approach (Phase 2). Dr Sundari Joseph https://www.researchgate.net/publication/329379238_Inter-agency_adult_support_and_protection_practice_A_realistic_evaluation_with_police_health_and_social_care_professionals 23. COVID-19 and child criminal exploitation: Closing urgent knowledge and data gaps on the implications of pandemic for county lines"; Dr Ben Brewster (ongoing). https://whatworks.college.police.uk/Research/Research-Map/Pages/ResearchProject.aspx?projectid=843 24. Community engagement: A pilot for an exploratory knowledge exchange platform for policing. Stuart Lister https://essl.leeds.ac.uk/downloads/download/32/an_exploratory_knowledge_platform_for_policing_exploiting_knowledge_assets_utilising_data_and_piloting_research_co-production 25. Parker, A et al (2018). *Interagency collaboration models for people with mental ill health in contact with the*	

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9. Improving integration between services (e.g. rehabilitation and justice; health and education).	1. Ongoing PhD: "The role of migrants in building city resilience for emergency response and disaster risk reduction (DRR): A case study of Birmingham (UK) and Sendai" Szymon Parzniewski (Current Map)	The aims of the research project are to clarify and compare how resilience policy-making at the city level is made in the UK (Birmingham) and Japan (Sendai) and to examine the ways in which migrants can be better integrated into resilience decision-making, policy-setting and implementation of emergency response and disaster risk reduction (DRR) initiatives. This study aims to advance new ideas and approaches about city resilience and migrant inclusion in disaster risk reduction.
	2. Ongoing work/prof: "TOCAT - Transnational Organised Crime and Translation"; Dr Joanna Drugan (Current Map)	More than 300 languages are spoken in the UK today, therefore police therefore increasingly need translators to be able to investigate serious crimes such as people trafficking and child sexual exploitation. In the Transnational Organised Crime and Translation (TOCAT) project, researchers, the police and translation providers will work together to create practical guidance to help police officers and translators work together as effectively as possible.
	3. Ongoing work/prof: "Collaborative problem solving for community safety"; Dr P Bloom (Current Map)	As part of their response to the Fresh Start Agreement issued by the Northern Ireland Assembly, Police Service of Northern Ireland (PSNI) are working with the Centre for Policing Research and Learning (CPRL) on the design, delivery and evaluation of a new learning intervention which aims to improve community engagement in target neighbourhood areas. PSNI have developed a skills framework for officers working in communities based on collaborative problem-solving which they would like to test out in terms of impact on officer practice, and ultimately on community

		relations. Broadly speaking this encompasses: • Collaborative working • Problem solving • Listening and negotiation skills • Conflict handling • Community assets mapping (Stakeholder engagement) • Critical thinking
	4. All Levels of Research: "N8 Policing Research Partnership: Innovation and the Application of Knowledge for More Effective Policing"; Professor Adam Crawford (Current Map)	This research aims to explore key issues within policing and to build research co-production capacity and test mechanisms for exploiting the knowledge and expertise of the higher education sector in order to strengthen the evidence base on which police policy, practice and training are developed and so support innovation and the professionalisation of policing. It intends to build a regional policing research platform with national impact and international significance. One of the aims of the study is to build policing research and knowledge exchange capacity in higher education institutes and to facilitate the efficient and effective transfer of knowledge that is vital to developing sound, evidence-based policing policy and practice.
	5. Ongoing PhD: "Multi-agency situated learning - learning together to develop effective practice delivery"; John Booker (Current Map)	This piece of research aims to explore: when encountering strategies requiring multi-agency delivery against common aims and objectives (e.g. Counter Terrorism Prevent Strategy, Every Child Matters, Care Act etc) does multi-agency situated learning develop effective practice in contrast to isolated learning when agencies only collaborate for delivery? Does this add value to practice?
	6. Ongoing PhD: "The Street Triage project"; Rivka Smith (Current Map)	This study aims to critically examine the delivery of Street Triage schemes in England and Wales, by exploring: • What is understood about the role, purpose and delivery of Street Triage by service users with lived experience of the schemes, police officers and mental health practitioners? • What is the nature of multi-agency partnership working in Street Triage? • Has the implementation of Street Triage schemes impacted upon the

		operational role of police officers when attending incidents where a mental health issue is evident to the attending officers?
		• Should Street Triage be delivered in the future?
	7. Ongoing work/prof: "COVID-19 and child criminal exploitation: Closing urgent knowledge and data gaps on the implications of pandemic for county lines"; Dr Ben Brewster (Current Map)	This project will inform efforts to urgently safeguard children from Child Criminal Exploitation (CCE), as the impacts of COVID-19 unfold. This project will detail the impact of social distancing measures on offenders' ability to groom, methods for mobilising 'county lines' operations, and the prevention, detection and safeguarding abilities of police and other organisations. By analysing data across statutory and voluntary sectors, the findings aim to show the impacts of mitigating actions and statutory reprioritisation on prevention and safeguarding, and how criminals adapt their methods. This will assist police and safeguarding authorities to protect vulnerable children and adults. The research will provide substantial evidence upon which police, safeguarding and care organisations can formulate interventions that address county lines related offending, and reduce risk to vulnerable children and adults.
	8. Ongoing PhD: "Promoting Neurodiversity through Police-Community Partnerships"; Alice Corbally (Current Map)	This PhD study aims:
		• To investigate whether the police use neurotypical procedures and to explore how these practices affect neurodivergent citizens.
		• To examine the influence and relationship between the police and public and third sector organisations that support neurodivergent people.
		• To contribute to discussion at the local and national level about how to improve the policing of neurodiversity.
	9. Ongoing PhD: "Working together during major incidents and emergencies: optimising interoperability during major incident management using the social identity approach"; Louise Davidson (Current Map)	This project will look at the ways that people work together both within and between different organisations, and how this understanding can be applied to better understand the way in which emergency responders come together in a major incident to work towards a collective goal. Furthermore, this

		research will help to enhance our understanding of why problems in multi-agency response persist and what interventions can be put in place to reduce the reoccurrence of them in the future. This research will advance our understanding of the barriers and facilitators to effective joint working during incident management, in order to enhance the response of Fire and Rescue, Police and Ambulance Services and their partners to major incidents.
	10. Completed work/prof: "Interagency working with police, health and social care professionals in adult support and protection: a realistic evaluation approach (Phase 2)."; Dr Sundari Joseph https://www.researchgate.net/publication/329379238_Inter-agency_adult_support_and_protection_practice_A_realistic_evaluation_with_police_health_and_social_care_professionals	This project has been funded by The Scottish Institute for Policing Research and compromises two phases. The first phase will investigate the 'state of play' for cross boundary working between police and health and social care professionals by: identifying the gaps in interagency practice; evaluating the education and training needs of professionals working in the area of adult support and protection, and identifying information sharing practices. The second phase will develop interprofessional and interagency training resources with key performance indicators to enable subsequent evaluation and monitoring of practice for all professionals involved in adult support and protection. The outcome of this project will be of value in enabling a comprehensive evaluation of adult support and protection practices in order to inform education practices that prepare tomorrow's workforce of police and health and social care professionals to effectively support and protect vulnerable members of society.
	11. Completed work/prof: "Evaluation of Hull Adult Female Triage Scheme"; Iain Brennan; (Completed) http://library.college.police.uk/docs/Police-Female-Triage-Report-Hull-University-2015.pdf)	A community safety partnership project has been developed within the city of Kingston upon Hull between Humberside Police, Hull Youth Justice Service (HYJS) and the Together Women Project (TWP) to create a pilot scheme for assessment and referral of female adult suspects and/or offenders, known as 'Adult Female Triage'. The aims of the scheme are to reduce the potential for reoffending through early identification of risk; divert female offenders away from the criminal justice system by providing alternative,

		proportionate, effective and targeted alternatives; increase community confidence in the criminal justice system through greater involvement of victims and witnesses and use of restorative justice; to empower and support female adult offenders to take responsibility for the management of their risk of offending. This study will involve a quasi-experimental evaluation with a nested process evaluation.
	12. Completed work/prof: "Community engagement: A pilot for an exploratory knowledge exchange platform for policing"; Stuart Lister (Completed) https://essl.leeds.ac.uk/downloads/download/32/an_exploratory_knowledge_platform_for_policing_exploiting_knowledge_assets_utilising_data_and_piloting_research_co-production	The project is a collaboration between West Yorkshire Police (WYP), the Office of the Police and Crime Commissioner for West Yorkshire (OPCCWY) and the University of Leeds and will build a strategic and innovative knowledge exchange and research co-production platform. The overall objective of the partnership is to explore various means of fostering greater collaboration between academia and the police in order to enable greater translation of evidence into practice, to help identify the priority research needs of police and to support the emergence of an evidence-based profession. The pilot will evaluate process issues and context dimensions concerning how police-community engagement policies are enacted on the ground. It will explore the attitudes and experiences of frontline police tasked with implementing these policies, as well as any social or organisational factors influencing the nature and extent of the practices to which they give rise.
	Other Sources Completed Research: Parker, A et al (2018). *Interagency collaboration models for people with mental ill health in contact with the police: a systematic scoping review*: http://eprints.whiterose.ac.uk/129056/1/e019312.full.pdf	We identified 13 different interagency collaboration models catering for a range of mental health related interactions. All but one of these models involved the police and mental health services or professionals. Several models have sufficient literature to warrant full systematic reviews of their effectiveness, whereas others need robust evaluation, by randomised controlled trial where appropriate. Future evaluations should focus on health-related outcomes and the impact on key stakeholders.
12. Recruitment, progression,	1. Ongoing work/prof: The well-being of the Special Constabulary within Devon and	The well-being of Special Constables is important not only in terms of their mental and physical well-being as

well-being and retention in the police and fire workforces	Cornwall Police; Dr Ashley Frayling (Current Map)	individuals, but also in terms of their absence, sickness levels and levels of retention. Retention of Specials remains a key priority for police forces with Special Constables figures continuing to fall nationally, despite large scale recruitment drives and successful campaigns. The research aims to explore what support mechanisms are in place to provide Specials with short-term support for difficult jobs or incidents and what processes, policies or practices are in place to support those individuals in the long term. It is envisaged that the overall research for this project will be in two phases. This proposal relates to Phase One only, which focuses on identifying whether Specials feel supported and if there are any interventions or training that they believe would assist them with their well-being. Phase Two would see the recommendations emerging from Phase One being implemented, and quantitative measures such as absence, sickness levels and retention rates being used to evaluate the impact and success of these recommendations over a one-year period.
	2. Ongoing PhD: "How does joining the police affect a candidate's social identity and social network?"; Gareth Stubbs (Current Map)	This piece of research aims to understand why previous research in Lancashire has indicated that prospective police recruits who previously knew police officers tended to be more successful in the recruitment process. When recruits join the police, there is a period of assimilation as they 'become' police. This period may affect social networks and social support frameworks that they have previously relied on. This study aims to answer what does this change look like, and what does it mean for police recruitment, their wellbeing, and their identities? This research will follow a cohort of recruits through their probationary period. It will map their social networks, and the level of contact with them, together with indicators of identity change, and physical and mental health. The tools will be drawn from

		social psychology (adapted SONAR Survey) and have previously been used in the analysis of identity change in therapeutic communities during addiction rehabilitation.
	3. Ongoing work/prof: "Understanding voluntary resignations from the police service"; Dr Sarah Charman (Current Map)	The aim of this research is to consider the reasons for individual officer's decisions to voluntarily resign from the police service. This research will aim to more fully understand and appreciate the pressures of the policing working environment, the changing nature of crime and policing and the impact of these issues upon the wellbeing and job satisfaction of police officers. It will also provide the policing organisation with useful information to potentially avoid wastage of police resources which are invested in the recruitment and training of new policing recruits.
	4. Ongoing work/prof: "Policing and COVID-19: Emergency powers, social distancing, and the interruption of police recruitment and probationer officer training and education"; Prof Pauline Ramshaw (Current map)	This research will be useful in identifying and sharing good practice across UK police organisations, developing sound solutions to aid national recovery plans, and preparing a robust response for future needs in the eventuality of a second wave or future pandemic. This research aims to provide insight across the following key themes: a) Assess UK police forces' preparedness and resilience under COVID-19 conditions to support ongoing and future recruitment activities and deliver education and training to new recruits in the classroom and workplace b) Develop a comprehensive evidence base to understand how best to support the student officer learning experience, classroom and workplace, under COVID-19 conditions and during the phased relaxation of lockdown conditions. c) Assist the development of recovery/business continuity plans taking into account the restrictions and inevitable interruption to normal practices and procedures. d) Strengthen and inform future UK police recruitment, training and education activities to ensure readiness to adapt practices in the event of a

			second wave of COVID, or a future pandemic.
		5. Ongoing work/prof: "Trauma resilience in UK policing: Self-directed neuroplasticity training"; Dr Jessica K Miller (Current map)	Neuropsychological research has invested heavily over the past 5- 10 years into the structural and psychological impact on resilience of self-directed neuroplastic training through meditation. This has been translated into law enforcement training abroad and has been referred to in behavioural science work in UK intelligence services but has yet to be brought into the everyday operational UK policing. This 4 day course will be trialled in a feasibility study in April 2019 to determine just how teachable and how relevant these cognitive agility techniques may be for areas of policing which demand high levels of executive function, trauma exposure processing and compassion management under stressful conditions.
		6. Ongoing work/prof: "Dealing with the unthinkable. The cognitive and emotional effects of child homicide on police investigators"; Dr Jason Roach (Current Map)	This research represents an exploratory study comparing the cognitive and emotional stressors experienced by police when investigating child and adult homicides. The results of an online survey questionnaire with 99 experienced UK police investigators are presented, with key differences found in the cognitive and emotional stress experienced depending on whether the victim is a child or an adult, key differences and similarities identified in the ways investigators deal and cope with adult and child homicide cases.
		7. Ongoing work/prof: "A comparative study examining prior learning in Canada and England; An alternative route for police officers into higher education"; Anne Eason (Current Map)	This study seeks to compare the alternative admission routes to police related undergraduate programs, through assessment of prior learning, training, and the experience of police officers. It will further examine how two different universities (Wilfrid Laurier, Canada and University of Worcester, England) support the bridging of the academic gap between new recruits and long-serving officers, supporting the professionalisation transition of the police, and identifying evidence-based best practices. The research will consist of an evaluation of Recognition of Prior Learning (RPL) processes and criteria adopted by the two universities that enable police officers' access to

		higher education who do not hold formal academic qualifications.
	8. Ongoing work/prof: "Aspirations and expectations of Female BAME police officers' career progression; A two-phase study"; Dr Vicki Elsey (Current map)	This study aimed to combine mixed methods in order to explore whether female career progression aspirations and expectations differ between groups with one or more protected characteristics (race and gender) and potential reasons for this formation. Research Questions aimed to be answered in the online questionnaires: 1. Do career expectations and aspirations differ for female BAME officers? If so to what extent? 2. Are there any common themes when discussing career expectations and aspirations that could relate to increasing diversity?
	9. Ongoing PhD: "How to increase female representation in specialist tactical roles"; Ashleigh Bennett (Current Map)	This study aims to: 1.Explore the reasons why females are not applying to specialist tactical roles; 2.Conduct literature review to explore the issue and establish what has worked in other specialisms or organisations; 3.Identify potential solutions to address the issues; 4.Apply the solutions to future selection processes; 5.Evaluate which interventions are effective in increasing the number of successful female in role.
	10. Ongoing work/prof: "Evaluation of the Police Constable Degree Apprenticeship" (PDCA); College of Policing (Current Map)	The evaluation will address two broad areas: a) How is the PCDA being implemented – what has worked well and where are the barriers/challenges? b) What outcomes have been delivered by the PCDA? Findings from the evaluation will be used to help refine the implementation approach as well as identify lessons for those forces introducing the apprenticeship at a later date.
	11. Completed randomised controlled trial: "Feasibility study for a randomised controlled trial of trauma processing techniques with new police recruits" Greater Manchester Police (Completed) https://www.policingtrauma.sociology.cam.ac.uk/techniques	This randomised controlled trial tests the teachability and applicability of post-incident trauma processing techniques which target the hippocampal memory system, stimulating spatial and episodic processing and contextualisation of traumatic material. Similar techniques have already been piloted in a therapeutic model for combat-related Post-Traumatic Stress Disorder and

| | | this new trial is to pilot them in a preventative model of everyday operational UK policing.

Session One data suggested 75% of trial participants felt an improvement in emotional response to the event processed as a direct result of applying the techniques and 46% reported improvement in recall of the event (i.e. new information reported). 50% showed initial capacity for the more advanced hippocampal processing task. Session Two data indicates a statistically significant improvement in 'ease of feeling' about a traumatic event after applying the techniques, which was independent of the impact of age and current trauma on such feeling. 71% of participants used the techniques in between sessions without prompting and 81% said they'd pass them on. 68% reported new recall of events after having applied the techniques. Longer term between group data showed the control group to be more unsure about whether they had experienced trauma exposure during their first year, and both groups were more likely to check in to report expose when impact was low. |
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| | 12. Completed randomised controlled trial: "What works in wellbeing: a randomised controlled trial of mindfulness in policing"; College of Policing, (Completed) https://whatworks.college.police.uk/Research/Documents/Mindfulness_RCT_report.pdf | The College of Policing want to improve the evidence base on mindfulness training for those working in policing. This randomised controlled trial will test whether providing either one of two types of online mindfulness training to officers and staff across five UK police forces improves their resilience, wellbeing, and job performance. The first type of training is access to Headspace, a readymade mindfulness app currently available to the public. The second type of training is a bespoke eight-week online mindfulness course that has been created for those working in policing.
The testing in the five forces will enable a cost/benefit assessment of the two mindfulness interventions. |
| | 13. Completed work/prof: "A brave new world revisited – pre-entry policing route"; Sean Butcher (Completed) | The development of the FdA Policing programme has been designed in partnership between Buckinghamshire New University and Thames Valley Police (TVP) to serve as one form of |

65		pre-entry into TVP. The inaugural cohort of students began study in September 2012. The aim of this research is to build upon a previous, similar empirical undertaking in the 2012-13 academic year; observing and analysing the progress of 2012-13 entry students as they complete their second year on the newly-developed programme. Themes to be monitored include perception of self and others, expectation and understanding around the police role, and of what 'policing' constitutes. Observation and analysis of a complete two-year cycle of the programme will allow for on-going and considered reflection, in terms of delivering core competencies effectively and in recognising progressive student understanding.
	14. Completed PhD: "Learning to lead the police: a comparative study of methods preparing officers for promoted posts in the Scottish Police Service"; Ron Fyffe (Completed)	This longitudinal study focuses on a paradigm shift in relation to the process of achieving eligibility for promotion of police officers in Scotland. These are the change from Police (Scotland) Promotion Examinations: a test of memory in relation to law and process, to the Diploma of Higher Education in Police Leadership & Management: a taught learning programme with examinations and marked assignments in line with current academic structure and accredited by the Scottish Qualifications Authority. The questions asked are: • To what extent do officers from both the old and new systems feel prepared for promotion? • To what extent has completion of the old examination process or new diploma programme had on officer's performance in their current ranks? • Can a discernible difference be identified in operational performance and personal confidence of officers promoted from the old and new systems? • To what extent do officers from the old examination process and new diploma programme perceive their own development and manage this process?

		Key findings to date: Although the data collection and collation is incomplete some trends are discernible at this stage: • Participants who completed the Police Promotion Examinations feel they would have benefitted from the learning the Diploma provides. • Participants who completed the Diploma feel that they are better equipped with knowledge relevant to their roles than if they had completed the Police Promotion Examinations. • Most participants who completed the Diploma feel they would like to continue with study in order to improve their leadership and management skills. • Participants who completed the Diploma were surprised to discover the political aspects of policing such as the tripartite system of accountability. • Police leadership in Scotland is contextual, no two identical definitions have been provided by existing leaders.
	15. Completed work/prof: "Supporting staff within Greater Manchester Police with 'psychological illness' to avoid absenteeism"; Adele Owen (Completed) http://library.college.police.uk/docs/theses/OWEN-Supporting-staff-GMP-Research-Initiative-Focussing-on-Understanding-Absenteeism-Linked-to-Psychological-Illness.docx	The number of staff absent from the workplace with anxiety, stress and/or depression ('psychological illness') is high and growing. This has a huge impact on the organisation both financially and in terms of morale. Future resource reduction demands mean new ways of supporting staff to avoid absenteeism when appropriate, are required, ensuring that we have a productive workforce with improved morale for the future. This study will consist of focus groups and one to one interviews with police officers (of all ranks), Police Community Support Officers' and police staff within Greater Manchester Police who have experience of mental ill health while in the organisation and supervisors with experience of managing staff with such conditions.
	16. Completed PhD: "Well-being"; Ian Hesketh (Completed) http://library.college.police.uk/HeritageScripts/Hapi.dll/search2?searchterm=well-being%20austerity&Fields=%40&Media=%23&Bool=AND&searchterm=hesketh&Fields=%40&Media=%23&Bool=AND	This research focuses on wellbeing in relation to Environment, Leadership and Resilience. It explores to what extent these vary as employees are faced with considerable changes in working practices, terms and conditions that are being enacted in the face of unprecedented cuts to police budgets. What threatens these phenomena? Can managers become competent in

		recognising attitudinal shifts and signs of deteriorating Well-being? What interventions are effective and enable a fulfilling working life for employees? This research takes the form of an intervention study and is predominately ethnographic (qualitative) in nature. Quantitative data is modelled in the form of ASSET (Faragher et al, 2004), which illustrates employee attitudes, perceptions and general health. The accompanying narrative is provided from the use of extensive cultural audit surveys and existing engagement tools that capture the 'mood' of staff, and their opinions of their life within the organisation. The use of this mixed methods approach is wholly appropriate for this type of study.
	17. Completed work/prof: "The impact of leadership styles on police officer behaviour and well-being"; Jamie Kathleen Ferrill (Completed) https://repository.lboro.ac.uk/ndownloader/files/17122904/1	This research uses ethnographic methods to explore the effect of leadership styles on behaviour and well-being of officers. The study focuses on front-line leaders including Inspectors, Chief Inspectors and Superintendents; the subordinates in the study are Police Constables. The analysis seeks the 'how' and the 'why' of the relationship between leadership styles exhibited and resulting officer behaviours and well-being. Through ethnography, this study seeks to fully understand the observed behaviours that exist by understanding the cultures within the police organisation, and also explains why the behaviours are being impacted the way they are by leadership styles and the conditions they exist in. The study will involve observing a range of behaviours, which are inductively coded throughout the observation.
	18. Completed work/prof: "Is joining the police less viable and affordable in light of the proposed qualification changes"; David Tasker (Completed) https://www.researchgate.net/profile/David_Tasker3/project/Is-joining-the-police-less-viable-and-affordable-in-light-of-the-proposed-qualification-changes/attachment/5c2405c1	The recent decision to increase the entry qualification for new police recruits to a higher education degree has been well researched and the consultation phase has received a good response albeit mainly from within the policing family. This study aimed to find out from young people in college, who are studying towards a career in the public services, whether the newly proposed entry

	cfe4a764550bd0ad/AS:703865 494188033@1544826019847/ download/Will+the+qualifiactio n+change+deter+you+from+joi ning+the+police.docx?context= ProjectUpdatesLog	qualifications will influence their vocational aspirations and indeed, if affordability forms part of that equation and why.
	19. Completed work/prof: "Trauma management in UK policing survey"; Dr Jessica K Miller (Completed) https://www.policingtrauma.soc iology.cam.ac.uk/	The project develops work undertaken by the University of Cambridge with the European Working Conditions Survey (EWCS)- looking at job quality- and expands this into the area of contemporary policing, with a specific focus on trauma exposure and trauma management. The national study is the first to address the prevalence of Post-Traumatic Stress Disorder (PTSD) in the UK police and Complex PTSD (CPTSD) in a professional population, using the new International Trauma Questionnaire (ITQ) from the ICD-11. The dataset provides insight into force-level access to treatment pathways and interventions and analysis will consider how experiences of trauma management influence perceptions of policing as 'decent work' in the current labour market.
	20. Completed work/prof: "Trauma resilience in UK policing: Atypical trauma exposure"; Dr Jessica K Miller (Completed) https://www.policingtrauma.soc iology.cam.ac.uk/	Research in police wellbeing published in 2016 reflected the well-established vulnerability of officers and staff from atypical and increasingly extreme trauma exposure, with examples being cited in Counter-Terrorism, Child Sexual Exploitation and call handling. The aim of this qualitative study is to better understand how our knowledge of how the brain processes trauma can support atypical trauma exposure in these demanding roles.
	Other Sources Ongoing research: De Camargo, C. *Policing 'dirty work' during the Covid-19 Pandemic.*	Exploring the anxieties and fears around contracting COVID-19 as well as the practical solutions and rituals of purification that officers are undertaking to protect themselves and others
	Drake, G. (2020). *Officer Wellness during a Global Pandemic: Long Term Recommendations for Police Leaders as they Navigate the Aftermath of COVID-19.* Centre for public safety initiatives: https://www.rit.edu/liberalarts/si	Recommendations for police leaders on how to support staff during the pandemic.

	tes/rit.edu.liberalarts/files/docs/ CRIM%20Resources/Officer% 20Wellness%20During%20a% 20Global%20Pandemic_%20 WP%202020_02.pdf	
	Completed research: Fisher, E. et al (2020). *COVID-19, stress, trauma, and peer support— observations from the field*: https://academic.oup.com/tbm/ article/doi/10.1093/tbm/ibaa05 6/5860854	One might imagine that the value of non-professionals providing "ancillary" assistance would be reduced amidst pressing needs for clinical services and hospital beds and the immense economic, social, and logistic needs brought about by the pandemic. Just the opposite, the role of peer support has increased and become more complicated amidst the pressing demands for food, housing, safety, and economic assistance. Although COVID-19 entails stressors shared by all, speaking with someone "who has walked in my shoes" and understands how broad stressors may strike "people like me" is especially helpful. Peer support workers are providing informational or instrumental support to clients who are dealing with very concrete challenges. Emotional support also can be conveyed by such instrumental support is clearly valued as "space to talk," and will likely be important in the coming months as the peak of COVID-19 psychological distress emerges after the peak of the virus has passed.
	Completed research: Fraher, A. (2017). *Recruitment and Retention in London Metropolitan Public Order Police: A study of the Public Order Cadre*: http://library.college.police.uk/d ocs/PKF1/02_033.pdf	92% of study participants report that they enjoy working in the Metropolitan Police Service (MPS) Cadre. 94% believe that Public Order work helps them to be a better police officer overall. Examples of Cadre skill development include: Leadership (98%), Decision-making (94%), Critical thinking (88%), Teamwork (78%), Communication (78%), Performing outside my comfort zone (76%), and Managing pressure (74%). Almost half the study participants believe that current Cadre staffing challenges can be traced back to a regime change after the 2012 Olympics and drop-in support for Public Order by senior MPS leaders during which both talent and resources seemed to decline. Many study participants reported that their Cadre work was often mistakenly viewed as a "hobby" or "necessary evil"

		not an important area of professional expertise. Only 18% of Cadre surveyed feel that senior MPS leaders recognize and value the unique skill it takes in the Cadre to safely and successfully police Public order events. Only 25% of respondents agree that "there is a fair distribution of good roles for everyone in the Cadre". Only 16% agree that "there is transparency about Cadre role assignment". 54% of Cadre agree that they would volunteer more if it were easier to get release from their other work. A majority (69%) of survey respondents believe "no one should be required to work in Public Order unless they want to volunteer". After the 2011 riots, strategic reviews1 recommended: a Cadre Individual Plan (CIP) to identify and develop individuals in the role of Gold to ensure resilience and experience into the future; Cadre insight days to recruit potential Cadre officers from across the MPS. This does not seem to have been effectively achieved.
	Completed research: Marston, H., Hadley, R., Pike, G., Hesketh, I. (2020). *Games for health & mHealth apps for police & blue light personnel: A research review.*	Previous research has reported adverse health outcomes for emergency services personnel (ESP), outcomes that research more broadly has shown can be improved using a gamification and mobile health (mhealth) apps approach. We conducted a review of research on gamification and mhealth apps for ESP that had been published in the last 19 years using 6 major research databases. The results demonstrated that virtually no relevant research has been published, suggesting a significant gap in the evidence base of an approach that could potentially have significant benefits for the health of ESP.
	Completed research: Richins MT, Gauntlett L, Tehrani N, Hesketh I, Weston D, Carter H and Amlôt R (2020) *Early Post-trauma Interventions in Organizations: A Scoping Review.* Front. Psychol. 11:1176. doi: 10.3389/fpsyg.2020.01176	This scoping review was designed to identify research which evaluates the use of early interventions in emergency and other high-risk organizations following exposure to primary or secondary trauma and to report on the effectiveness of the early intervention models in common use.
	Completed research: University of Cambridge	The online survey covering issues about trauma management, wellbeing

		(2020). *Policing: The job and the life:* https://www.cam.ac.uk/sites/www.cam.ac.uk/files/inner-images/thejobthelife_findings.pdf	and working conditions collected 18185 responses between 15 October – 16 December 2018 (and its two pilots 14-25 August and 29 August – 20 September). After rigorous data cleaning, a sample of 16857 serving UK officers and staff provides a reliable UK evidence base from which to benchmark force-level data for 22 forces.
		Completed research: College of Policing (2016). *Review of police initial recruitment. Final report with recommendations.* https://www.college.police.uk/What-we-do/Development/Documents/Review_of_police_initial_recruitment_final_report.pdf	The College of Policing undertook a review of police initial recruitment between September 2015 and June 2016. This was in response to concerns from the police service that current police recruitment may not be designed for the current and future recruitment needs of police forces. The findings of the review make it clear that, in order to implement an effective attraction strategy, organisations need to focus on attracting quantity and quality of applicants. The strongest evidence base of the review was proven selection procedures that are predictive of on-the-job performance. Evidence-based interventions should be put in place aimed at improving applicant experience and subsequent enhancements in applicant performance. Consideration should be given to developing a national police e-recruitment platform. As part of an evidence-based practice approach, interventions should be reviewed and evaluated on a regular basis.
		Completed research: College of Policing (2019). *Day One Pilot Assessment Centre. Interim evaluation report with recommendations.* https://www.college.police.uk/What-we-do/Development/Documents/Day-One-Evaluation-Interim-Report-v1.2.pdf	One of the recommendations from the College of Policing 2016 review of police initial recruitment was that the College works with the Metropolitan Police Service (MPS) to develop the specification for a new recruit assessment centre. The assessment centre was to be based on the findings of the best available evidence on improving selection decisions and minimising adverse impact on minority groups. A number of assessment centre (AC) design principles known to be effective at reducing disproportionality between BAME and white candidates were implemented during the design of Day One.

| | | Ongoing research: *College of Policing evaluation of online police recruit assessments.* | The College of Policing, working closely with the Police Uplift Programme (PUP), developed at pace, the online police recruitment assessment process which is enabling forces to continue recruiting police constables during the COVID-19 pandemic. The College is now conducting an evaluation of online assessments which aims to identify iterative enhancements to the online process itself and also draw out learning in relation to incorporating online technology into the assessment process in the longer term.

A key part of the research is telephone interviews with force recruitment leads, regional leads and senior stakeholders who are involved in the process to explore their experiences and perceptions. A team of College researchers will conduct these interviews during August and early September and a broad sample of recruitment leads will be invited to participate.

The evaluation will also draw on candidate and assessor surveys, an inter-rater reliability study to explore consistency of assessments between assessors and analysis of assessment results. Evaluation findings are due to be presented to the PUP board in October 2020 to inform decisions about a possible blended approach to assessments in future. |
| | | Completed research: College of Policing (undated). *Tackling unconscious bias in recruitment, selection and promotion processes: A rapid evidence assessment:* https://whatworks.college.polic e.uk/Research/Documents/Unc onscious_bias_REA_exec_su m.pdf | This rapid evidence assessment (REA) aimed to identify interventions that might reduce unconscious bias in organisations, specifically in relation to recruitment, retention and career progression of under-represented groups. Although there were few studies found that examined impact on behaviour change, there was some evidence, from both laboratory and field studies, of approaches that may be promising. Positive reinforcement of BAME candidates, through priming in pre-test communications, increased their pass rate in online tests. More generally, using interactive sessions to educate participants about unconscious bias along with practical training on techniques to tackle it, were found, in laboratory settings to have a sustained |

		positive impact on levels of concern about discrimination and levels of implicit bias.
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	Journal of Public Sector Management.	
79	https://www.education-ni.gov.uk/childrens-services-co-operation-act-northern-ireland-2015#:~:text=The%20Children's%20Service%20Co%2Doperation,Royal%20Assent%20in%20December%202015.&text=The%20Act%20requires%20the%20Executive,and%20young%20people%20in%20NI Dilnot, A., 2017. The burden of triumph: meeting health and social care needs. *The lancet, 390*(10103), pp.1630-1631. Glasby, J., Zhang, Y., Bennett, M. and Hall, P. (2020) 'A lost decade? A renewed case for adult social care reform in England', *Journal of Social Policy* (in preparation). doi: House of Commons and Involve (2018) *Citizens' Assembly On Social Care: Recommendations For Funding Adult Social Care.* Available at: https://publications.parliament.uk/pa/cm201719/cmselect/cmcomloc/citizens-assembly-report.pdf. Carter-Davies, L. and Martin, S. (2016) 'Improving Public Services: Existing Evidence and Evidence Needs'.	

Annex 3. Resources identified by the Working Group on Trust in Public Institutions

ARI	Resource	Key Messages
Changing behaviours and attitudes towards the government and COVID-19, and role of the media and scientific community in influencing these	Onora O'Neill on Trust vs Trustworthiness: https://www.ted.com/talks/onora_o_neill_what_we_don_t_understand_about_trust?language=en Onora O'Neill on Intelligent Openness and trustworthiness: http://downloads.bbc.co.uk/rmhttp/radio4/transcripts/20020427_reith.pdf https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4953592/pdf/269.pdf Data on trust in science/scientists/governments and media sources, Apr-Jul, from around the world: https://osf.io/jnu74/ Jackson et al (2020) The lockdown and social norms: Why the UK is complying by consent rather than compulsion? Bradford et al (2020) Policing the lockdown: Compliance, enforcement and procedural justice Posch et al (2020) What makes Britons trust police to enforce the lockdown fairly? Communicating the Pandemic: Improving Public Communication and Understanding (forthcoming research project led by Professor Stephen Coleman) Yesberg et al. (2020). Track, trace and trust Solymosi et al. (2020). Functional and Dysfunctional Fear of COVID-19: A Classification Scheme.	Onora O'Neill says we cannot seek to be trusted, only to be trustworthy. She argues that we can demonstrate trustworthiness through honesty, reliability and competence. And "intelligent openness": allowing our information to be accessible, useable, and assessable. Trustworthiness is usually said to have three main criteria (different researchers describe them slightly differently): competence/reliability, honesty, and caring/concern. O'Neill argues that we can demonstrate trustworthiness through 'intelligent openness': allowing our information to be accessible, useable, and assessable. (i.e. you can find the information, it is in a useful form, and you can assess its quality for yourself – such as seeing all the references or knowing the workings of the algorithm). Panel survey research showed that, during the first weeks of the lockdown, high levels of compliance appeared to be largely driven by a sense that: a) it was right to comply to "save lives and protect the NHS", b) it was normative to do so, and c) it was a legal requirement to do so. Crucially, the law seemed to play a role not through the traditional levels of deterrence and legitimacy, but rather through its coordination function: making lockdown a legal requirement clarified to people what they should be doing and why to "save lives and protect the NHS". Light-touch police enforcement in the early phase of lockdown seems to have (a) been possible given these high levels of normative compliance and (b) been successful, in that police legitimacy and trust in the police was not damaged by heavy-handed enforcement. Note from Winton Centre: We have found that trust in the communicator is a necessary precursor to accepting

Paul Slovic on perceived trust and risk perceptions: Slovic, P. (1993). Perceived Risk, Trust, and Democracy. Risk Analysis, 13(6), 675–682. doi:10.1111/j.1539-6924.1993.tb01329.x

Eiser & White on trust in institutions: https://www.kent.ac.uk/scarr/events/Eiser%20%2B%20White%20lsepaper.pdf

Bavel, J.J.V., Baicker, K., Boggio, P.S. et al. Using social and behavioural science to support COVID-19 pandemic response. Nat Hum Behav 4, 460–471 (2020).

Wolf, M. S., Serper, M., Opsasnick, L., O'Conor, R. M., Curtis, L. M., Benavente, J. Y., . . . Zheng, P. (2020). Awareness, attitudes, and actions related to COVID-19 among adults with chronic conditions at the onset of the US outbreak: a cross-sectional survey. *Annals of internal medicine*.

Anneliese Depoux, PhD, Sam Martin, PhD, Emilie Karafillakis, MSc, Raman Preet, MPH, Annelies Wilder-Smith, MD, Heidi Larson, PhD, The pandemic of social media panic travels faster than the COVID-19 outbreak, *Journal of Travel Medicine*, Volume 27, Issue 3, April 2020.

Fancourt, D., Steptoe, A. and Wright, L. (2020) The Cummings effect: politics, trust, and behaviours during the COVID-19 pandemic.

UKRI Public Opinion on Science Tracker – due to publish results early September (fortnightly opinion tracker running across 20 weeks April to August 2020)

and acting on advice. And when asked why people trusted/distrusted various sources of information on COVID the most common reason given was judgement of the source of the information and their motivations (e.g. "I think they might be trying to reassure people so are playing down the numbers" or "A more dramatic story clearly sells for them" as reasons for low trust; "I think they have our best interests at heart" as a reason for high trust).

Research carried out in May found that people were generally willing to use a contact-tracing app associated with the NHS, partly because doing so signals collective solidarity in the fight against the virus. Levels of trust in government were also crucial. People who trusted the government to put out clear messages, make the right decisions in terms of protecting the public, listen to the science, and steer the economy in the right way, not only tended to trust that their privacy and data would be safeguarded, they also tended to infer as a result that contact-tracing was an appropriate tool to help fight the pandemic.

Worry can be a negative and debilitating experience that damages mental health and discourages healthy re-engagement with the world, but it can also be a problem-solving activity, directing people's attention to problems, and encouraging them to act accordingly. This study found that dysfunctional fear of COVID-19 was not a predictor of compliance with lockdown or willingness to re-engage with social and economic life.

Paul Slovic argues that risk perceptions increase when competence in those in a position to mitigate the risks is seen to be lower. So 'crises in trust' are often the result of 'crises in confidence' of those in power/control (imagine your perception of the risk of a nuclear power plant near you if you did/did not

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		think that the management of it was competent).

It's well known that negative events tend to have a greater impact than positive ones ('trust arrives on foot and leaves on horseback'), but Eiser & White suggest that overall trust doesn't go extinct so there must be some maintenance of trust despite a constant stream of bad events. They suggest that it is maintained by a few other psychological effects: 1) We don't like to change our minds/opinions (so we will tie ourselves in mental knots to avoid believing information that conflicts with our prior beliefs) 2) We distinguish between one-off events and a pattern of behaviour (or policy). Whilst single negative events have a greater impact than positive ones; a positive pattern of behaviour or policy can sometimes outweigh a single negative event. 3) We forgive false alarms much more than we forgive missed chances to stop a bad event – possibly because it's a way of assessing motives (does this person/institution prioritise our lives/wellbeing over the disruption of a false alarm?). So the 'precautionary principle' applies. In addition, they acknowledge the importance of openness as a demonstration of honesty.

Using African studies of Ebola crisis suggests that enlisting local voices to help build engagement and trust in health officials can increase the success of such public health measures. US cross-sectional sample suggests that only 1 in 10 respondents was very confident that the federal government could prevent a nationwide outbreak. Those with low health literacy had greater confidence in the federal government respons and they were also less worried and less prepared.

Stereotypical images (e.g., Chinese setting, Chinese people) attached to |

		the pandemic become more viral leading to negativity towards a particular community. Social media intelligence should be harnessed to enhance the needed mobilization of the public and local communities to avoid such occurrences. Trust / trustworthiness / mistrust and distrust differ significantly. Moreover, absence of trust is not mistrust. People undulate across these dimensions based on the context and circumstances.
Supporting trust in public institutions and professional and scientific advice at a time of crisis, including attitudes and behaviours towards professionals and experts, and how public trust in democratic, religious and social institutions is evolving in different countries and communities	**PUBLIC TRUST IN SCIENCE** NatCen (2019) Public confidence in official statistics 2018 Wellcome Monitor Dommett, K., & Pearce, W. (2019). What do we know about public attitudes towards experts? Reviewing survey data in the United Kingdom and European Union. *Public Understanding of Science,* Department of Science and Technology Studies (UCL) **PUBLIC TRUST IN INSTITUTIONS** Bradford et al (2014) Why do 'the law' comply? Jackson et al (2012) Why do people comply with the law? Mazerolle et al (2013) Legitimacy in policing: A systematic review Nagin and Telep (2020) Procedural justice and legal compliance Fair cop 2: Organisational justice, behaviour and ethical policing: An interpretative evidence commentary Roberts and Herrington (2013) Organisational and procedural justice: A review of the literature and its implications for policing	Findings from Dommett and Pearce review (2019): • There is insufficient survey data available to strongly support any claims regarding public attitudes to experts. • The evidence that does exist suggests broadly positive public attitudes towards experts, rather than the somewhat bleak commentary associated with descriptions of a 'post-truth' era. • There is scope for survey questions to provide improved macro-level descriptions of some of the attributes and expectations associated with experts, and that concepts from the academic literature can provide structure for such questions. Survey data has the potential to complement more granular, qualitative approaches. There is a large, international evidence base on the relationships between public trust in power holders, the perceived legitimacy of those power holders, and the willingness of the public to comply and cooperate with those power holders on a voluntary basis. Much of this work is on policing and public compliance with the law, but there are studies in a wide range of other services and institutions (e.g., tax, courts). Statistical models based on survey data from developed, capitalist countries typically show that self-reported public compliance with the law and cooperation with the police

	Marinthe, G., Brown, G., Delouvée, S. and Jolley, D., 2020. Looking out for myself: Exploring the relationship between conspiracy mentality, perceived personal risk, and COVID-19 prevention measures COVID Social Study Freeman et al (2020) Risk Perception of COVID-19/coronavirus Ipsos: Trust the Truth https://www.theage.com.au/national/victoria/lessons-of-black-saturday-ignored-as-australians-forget-research-shows-20190205-p50vtw.html	are more strongly predicted by the perceived legitimacy of the police than they are the perceived likelihood of being caught and punished. 'Legitimacy' is defined in various ways, but often seen in terms of a felt obligation to obey and moral alignment. The models also consistently show that perceived legitimacy of the police is more strongly predicted by trust in the procedural justice of officers than it is by trust in their effectiveness. 'Procedural justice' is seen as having four components: impartial decision making, citizen participation in decision making, trustworthiness, and respectful treatment. The theory suggests procedural (in)justice affects a person's self-identity and the extent to which they internalize (or reject) social norms. There is also evidence that when police officers are treated in procedurally just ways, they are more likely to identify with their institution, see it as legitimate, and comply and cooperate with its goals and rules. In developing, divided and post-conflict countries, procedural justice has been found to be less important because more fundamental questions about the basic functioning of the state, the police and other institutions (e.g., because of corruption). There is also extensive evidence from a range of sectors to suggest that similar relationships are found within organisations. Employee perceptions of procedural justice by supervisors and senior leaders predict identification with the organisation, which in turn predicts a wide range of positive work behaviours. This is important because internal procedural justice may be necessary for external procedural justice. People can trust science and still not act on it – the way it is communicated will affect the interpretation (see catastrophic fire warnings

		ignored in Australia leading to needless deaths).
		Citizens views about politics and public institutions are multi-layered. For instance, people have implicit trust of the government as a public institution, however, they also are skeptical about various component parts. Sometimes, the trust is reversed wherein there is a greater trust in the component part (i.e., the local Member of Parliament) than the overarching body (i.e. the parliament).
		People develop baseline of trust and then discount facts. Thus, the role of scientific community and trust needs further reflection.
		Structural inequalities play a role in shaping public trust, so that trust can be seen as a privilege enjoyed by majority groups - see this summary of the literature by Helen Kennedy on why distrust is logical for many disadvantaged groups; this is important as it goes beyond questions of misinformation and political polarisation https://www.adalovelaceinstitute.org/shoud-more-public-trust-in-data-driven-systems-be-the-goal/ People feel greater trustworthiness towards local actors that they can relate to and thus a consistent, clear, and relational message that is percolated throughout the local systems from central systems will be highly trusted. Citizens have varying levels of trust towards different public institutions. For example, trust towards NHS is vastly different than department of health or the government. Thus, a segmented approach should be taken into account when building, maintaining or re-establishing trust.
How can government priorities be influenced by the evidence of the effects	The European Social Survey (2016): Looking through the Wellbeing Kaleidoscope accompanied by the What Works Wellbeing Summary	Where there is a) low wellbeing and b) a big difference in wellbeing, it affects public trust compliance and resilience.

| of different policies on the wellbeing of the people? | Adler, M. (2013). Happiness surveys and public policy: what's the use? *Duke Law Journal, 62*, 1509–1601.

Clark, B.; Chatterjee, K.; Martin, A. and Davis, A. (2019). How Commuting Affects Subjective Well-Being. Forthcoming in *Transportation.* doi.org/10.1007/s11116-019-09983-9

De Neve, J.; Ward, G.; De Keulenaer, F.; van Landeghem, B.; Kavetsos, G. and Norton, M. (2018). The Asymmetric Experience of Positive and Negative Economic Growth: Global Evidence Using Subjective Well-Being Data. *Review of Economics and Statistics,* vol. 100, no. 2, pp. 362–375

Foa, R.; Gilbert, S. and Fabian, M. (2020). COVID-19 and Subjective Well-Being: Separating the Effects of Lockdown from the Pandemic. *Bennett Institute for Public Policy Working Paper.* Retrieved 16/09/2020 from: https://www.bennettinstitute.cam.ac.uk/media/uploads/files/Happiness_under_Lockdown.pdf

Frijters, P.; Clark, A.; Krekel, C. and Layard, R. (2020). A happy choice: Well-being as the goal of government. *Behavioural Public Policy, 4*, 126–165. doi:10.1017/bpp.2019.3

Layard, R.; Clark, A.; De Neve, J.; Krekel, C.; Fancourt, D.; Hey, N. and O'Donnell, G. (2020). When to Release the Lockdown: A Well-Being Framework for Analysing Costs and Benefits. *CEP Occasional Papers,* #49. Retrieved 16/09/2020 from: https://cep.lse.ac.uk/pubs/download/occasional/op049.pdf | Those with higher wellbeing are more likely to <u>look after their health and play their community part.</u>

Recent years have seen an upsurge of interest in wellbeing among policymakers. In the UK, ONS has been collecting well-being data since 2011, and the What Works Centre for Well-Being acts as a knowledge warehouse and connects research to policymakers. Elsewhere, New Zealand and Wales have made well-being a government priority and reoriented both budgeting and impact evaluation around the concept (New Zealand Government 2019, Wales Government 2015). While the exact definition of "well-being" remains hotly debated in the literature, advocacy for well-being policy broadly emphasises a shift away from traditional material concerns like income and life expectancy towards psychological health and ensuring the social and economic conditions for human flourishing (e.g. political enfranchisement, environmental quality, walkability, reduced local crime, and easier commutes). There has been interest also in well-being during the pandemic and lockdown (Foa et al. 2020, Layard et al. 2020). While the scientific understanding of psychological well-being is still developing (Martela and Sheldon 2019), we know enough to consider policy applications. Some scholars advocate the use of life satisfaction data in cost-benefit analysis (Frijters et al. 2019), though this ambitious agenda is controversial (Singh and Alexandrova 2020, Adler 2013). Other efforts include assessing the efficacy of policies designed to improve psychological well-being, such the Healthy Minds curriculum (Lordan and MacGuire 2018), which teaches mood management and other mental health skills in schools. Researchers are also investigating the impact of various policy settings on psychology, such as how commuting time affects subjective well-being (Clark et al. 2019). This research is increasingly |

87	Lordan, G. and Macquire, A. (2018). Healthy minds: Interim paper, retrieved 04 March 2020 from: https://pdfs.semanticscholar.org/64d5/4ba84b847902af82dcc74d58bb1150cdd1ad.pdf Marsh, H.; Huppert, F.; Donald, J.; Horwood, M. and Sahdra, B. (2020). The Well-Being Profile (WB-Pro): Creating a Theoretically Based Multidimensional Measure of Well-Being to Advance Theory, Research, Policy, and Practice. *Psychological Assessment*, vol. 32, no. 3, pp. 294–313 Martela, F. and Sheldon, K. (2019). Clarifying the Concept of Well-Being: Psychological Need Satisfaction as the Common Core Connecting Eudaimonic and Subjective Well-Being. Forthcoming in *Review of General Psychology.* doi.org/10.1177/1089268019880886 NZ GOV (2019). Wellbeing Budget 2019. Retrieved 15/09/2020 from: https://www.treasury.govt.nz/sites/default/files/2019-05/b19-wellbeing-budget.pdf ONS (2018). Children's well-being and social relationships, UK: 2018. Retrieved 16/09/2020 from: https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/measuringnationalwellbeing/march2018 Singh, R. and Alexandrova, A. (2020). Happiness economics as technocracy. *Behavioural Public Policy, 4*, 236–244. doi:10.1017/bpp.2019.46 Wales GOV (2015). Well-Being of Future Generations ACT 2015	being translated into policy action. For example, the Cox Commission on Loneliness resulted in the appointment of a 'Minister for Loneliness'. As the science of measuring well-being settles and more data becomes available, research to policy links are likely to increase. The ONS additionally collects data on anxiety, feelings of meaning in life, and 'happiness' (positive mood), and is developing indicators children's well-being, as under-16s are typically excluded from official statistical surveys (ONS 2018). Longer psychometric surveys, such as the 15-item well-being profile (Marsh et al. 2020), can be used to measure additional aspects of psychological wellbeing. In summary, well-being data can influence policy in a variety of ways, as a benchmark or as one of many inputs alongside other economic and social indicators.
How will fear of pandemic resurgence affect the	Links to health surveillance/contact tracing, inequality and broader human rights implications:	Acceptance of surveillance is heavily conditioned by social location and experience of policing etc. Drawing on the work on 'chilling effects' of

willingness of publics to accept greater surveillance?	Evidence on human rights implications of contact tracing app published by Joint Committee on Human Rights Range of surveillance impacts and approaches towards effective human rights compliant oversight: Murray, D. and Fussey, P., (2019) Bulk Surveillance in the Digital Age: Rethinking the Human Rights Law Approach to Bulk Monitoring of Communications Data. Israel Law Review. 52 (1), 31-60 (also includes summary of chilling effects research – skip to p43) Fussey, P., and Murray, D. (2019) Independent Report on the London Metropolitan Police Service's Trial of Live Facial Recognition Technology Varied impacts of surveillance among different communities (including chilling effects). Much of the work is from the US. These two papers focus on mental health impacts: Abigail A Sewell and Kevin A Jefferson, 'Collateral Damage: The Health Effects of Invasive Police Encounters in New York City'(2016) Journal of Urban Health: Bulletin of the New York Academy of Medicine Abigail A Sewell, Kevin A Jefferson and Hedwig Lee, 'Living under Surveillance: Gender, Psychological Distress, and Stop-Question-and-Frisk Policing in New York City' (2015) *Social Science & Medicine* Often cited general chilling effects studies: Elizabeth Stoycheff, 'Under Surveillance: Examining Facebook's Spiral of Silence Effects in the Wake of NSA Internet Monitoring' (2016) Journalism and Mass Communication Quarterly 296	surveillance, it is highly likely that those communities experiencing high levels of police surveillance are less likely to accept greater surveillance. In short, chilling effects are felt most keenly among marginalised and disadvantaged groups. It is here that a potential tension may arise between police surveillance and public health surveillance. The chilling effects research identifies how high levels of existing surveillance have been proven to manifest in mental health impacts and other outcomes within communities. This means attempts to cultivate trust will resonate unevenly across different communities. Moreover, these are also likely to be the places of highest vulnerability to COVID-19. Attempts should therefore be sensitive to this and be attenuated accordingly. Crucially, this also links to connections between trust and trustworthiness, as discussed on the call and is central to Onora O'Neill's work on trust. Therefore, enhancing trustworthiness is key to building trust: A common approach to building in safeguards, and, by extension, invite public trust in surveillance activities is to focus on privacy and data protection provisions. While useful, these are insufficient to mitigate the wider (a) harms and (b) concerns over the impact of such technologies. Therefore, oversight should address the range of harms and concerns, and also be effective in its operation. Something also missing in many forms of surveillance oversight is an accessible provision for remedy.

	Jon Penney, 'Chilling Effects: Online Surveillance and Wikipedia Use'(2016) Berkeley Technology Law Journal 117 More contextually, the two most prominent US studies of race/ethnicity and surveillance are probably: Browne, S. (2015) Dark Matters: *On the Surveillance of Blackness*, Durham, NC: Duke The CUNY report 'Mapping Muslims', comprising interviews with communities under enhanced NYPD surveillance	
Importance and prevention of cybercrime and misinformation	**CYBERCRIME** Home Office (2013) Cybercrime: A review of the evidence Wall et al (no date) Policing cybercrime: Evidence review Centre for Criminal Justice Studies (University of Leeds) Cybercrime and Security Innovation Centre (Leeds Beckett University) Cybercrime Centre (University of Cambridge) Cybercrime Research Unit (University of Central Lancashire) The Defence Science and Technology Laboratory Online Harms and Cybercrime Unit (University of East London) **MISINFORMATION** Infodemic: Combatting Covid-19 conspiracy theories (forthcoming research project led by Professor Peter Knight) https://www.pnas.org/content/116/7/2521.short	There is no clear evidence that demographics such as age, gender and income are definitive predictors of vulnerability to fraud. Individual difference variables such as risk-taking behavior may actually play a role. However, much further evidence is required. From Winton Centre: we see a correlation between performance on our numeracy tests and susceptibility to misinformation. The link is probably not so much about numeracy but about a way of thinking. Others have found links between performance on what are called 'cognitive reflection tasks' and belief in misinformation. Both of these are about critical thinking rather than knee-jerk emotional responses to things. "Prebunking" or innoculation to misinformation has been found to be a successful strategy: overtly warning people "some people might tell you..." and giving specific examples of likely misinformation. This allows people to be "on their guard" for misinformation around a topic.

	https://doi.org/10.1177/09567976 20939054	
	The Alan Turing Institute	
	Crime and Security Research Institute (Cardiff University)	
	Dawes Centre for Future Crime (UCL)	
	Department of Journalism, Media and Cultural Studies (Cardiff University)	
	The Defence Science and Technology Laboratory	
	Human Rights Big Data and Technology Project	
	The RAND Corporation	
	University of Liverpool	
	Inoculation against COVID misinformation project: University of Cambridge: https://www.psychol.c am.ac.uk/covid-19-research	
	AARP (2003). Off the hook: Reducing participation in telemarketing fraud. Retrived fr om https://assets.aarp.org/rgcent er/consume/d17812_fraud.pdf	
	Anderson, K. B. (2019). Mass-market consumer fraud in the United States: A 2017 update. Staff Report of the Bureau of Economics, Federal Trade Commission	
Importance of GCSA and a strong science system to produce and deliver robust evidence	Cash, D. W., Clark, W. C., Alcock, F., Dickson, N. M., Eckley, N., Guston, D. H., Jäger, J., & Mitchell, R. B. (2003). Knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences*, *100*(14), 8086–8091. https://doi.org/10.1073/pnas.1231 332100	The literature on science advice has developed steadily since its foundational texts (Cash et al., 2003; Doubleday & Wilsdon, 2013; Jasanoff, 1990; Pielke Jr., 2007). Key insights include how the production and use of science for decision-making varies according to national traditions (Jasanoff, 2005, 2011), the existence of inherent tensions and trade-offs around the content and processes of science advice (Pearce

Cassidy, A. (2019). *Vermin, Victims and Disease: British Debates over Bovine Tuberculosis and Badgers*. Palgrave Macmillan. https://doi.org/10.1007/978-3-030-19186-3

Doubleday, R., & Wilsdon, J. (Eds.). (2013). *Future Directions for Scientific Advice in Whitehall*. Centre for Science and Policy. http://sro.sussex.ac.uk/47848/

Jasanoff, S. (1990). *The Fifth Branch: Science Advisers As Policymakers*. Harvard University Press.

Jasanoff, S. (2005). *Designs on Nature: Science and Democracy in Europe and the United States*. Princeton University Press.

Jasanoff, S. (2011). Cosmopolitan Knowledge: Climate Science and Global Civic Epistemology. *The Oxford Handbook of Climate Change and Society*. https://doi.org/10.1093/oxfordhb/9780199566600.003.0009

Obermeister, N. (2020). Tapping into science advisers' learning. *Palgrave Communications*, *6*(1), 1–9. https://doi.org/10.1057/s41599-020-0462-z

Palmer, J., Owens, S., & Doubleday, R. (2019). Perfecting the 'Elevator Pitch'? Expert advice as locally-situated boundary work. *Science and Public Policy*, *46*(2), 244–253. https://doi.org/10.1093/scipol/scy054

Pearce, W., Mahony, M., & Raman, S. (2018). Science advice for global challenges: Learning from trade-offs in the IPCC. *Environmental Science & Policy, 80*, 125–131.

et al., 2018) and how different communities value evidence in diverse ways depending on their background and interests (Cassidy, 2019). The most authoritative review of the field is supplied by SAPEA, who provide a range of recommendations based on empirical evidence, the theoretical literature and the personal reflections of science advisers (2019, pp. 15–17). These can be summarised as:

- Science advice must focus on a critical review of the available evidence and its implications for policymaking, including an assessment and characterisation of uncertainty.
- Science advice should inform, not prescribe, policies.
- There is no universally applicable model for structuring scientific advice for policymaking.
- Science advice for policymaking involves many legitimate perspectives and insights so it is essential that the complete range of scientific opinions is represented and that all uncertainties and ambiguities are fully disclosed.
- Access to diverse disciplinary perspectives, particularly from the humanities and social sciences, can help correct for unintended and hidden biases when interpreting data.
- Science advice is not 'value-free'; rather actors from both science and politics should be open about their values and goals, helping to build mutual trust.
- The most highly recommended science advice process combines analytic rigour with deliberative argumentation.
- Stakeholders and citizens should be integrated into the process.
- Science advice is not limited to policymakers but includes science communication to the wider society.

	https://doi.org/10.1016/j.envsci.2017.11.017 Pielke Jr., R. A. (2007). *The Honest Broker: Making Sense of Science in Policy and Politics*. Cambridge University Press. SAPEA. (2019). *Making Sense of Science for Policy Under Conditions of Complexity and Uncertainty*. Science Advice for Policy by European Academies. http://doi.org/10.26356/masos Bradford et al (2020) Live facial recognition: Trust and legitimacy as predictors of public support for police use of new technology Fussey, P., and Murray, D. (2019) Independent Report on the London Metropolitan Police Service's Trial of Live Facial Recognition Technology. Davies et al (2018) an evaluation of South Wales Police's use of automated facial recognition The Academy of Medical Sciences 'Preparing for a challenging winter 2020/21' report (produced following Chief Scientist's request, and discussed at SAGE) The Royal Academy of Engineering and National Engineering Policy Centre (NEPC): COVID-19: Engineering a resilient future: from ideas and insights to collective engineering advice Supply chain challenges, lessons learned and opportunities Rapid review of engineering factors that will influence the spread of COVID-19 in hospital environments Rapid review of the engineering approaches to mitigate the risk of COVID-19 transmission on public transports	There are multiple measures of system effectiveness, especially for complex AI-driven surveillance tools such as facial recognition. Scope exists to use specific measures in instrumental ways to pursue a specific argument (e.g. for or against deploying a technology). Building trust should be predicated on an open conversation around the full range of evidenced benefits and harms. Very course-grained/utilitarian views of public support are often used to justify new surveillance measures. Part of the issue – identified separately in the Bradford & Fussey work – is the significant variation of acceptance, trust and outcomes depending on social/demographic location. Given heightened emphasis on racial justice and minority rights, among other concerns 'evidence' in this sense should account for such disparities, e.g. the significance of minority views.	

93	Stimulating R&D for a faster and better recovery Work on using engineering systems approaches to tackle complex problems: The Royal Academy of Engineering and National Engineering Policy Centre (NEPC) "Sustainable Living Places, a systems perspective on planning, housing and infrastructure" The Royal Academy of Engineering and National Engineering Policy Centre (NEPC) Net Zero: a systems perspective on the climate challenge. The work builds on work done for the Council for Science and Technology, A Systems Approach to Delivering Net Zero: Recommendations from the Prime Minister's Council for Science and Technology (unpublished).	
Improved knowledge management systems	Example of a tool for public engagement with knowledge management systems: https://storymaps.arcgis.com/stories/17ffb61f988c4cc7bce7dc98e3022c79 Evidence Synthesis for Policy report (Royal Society/Academy Medical Sciences): https://acmedsci.ac.uk/file-download/36366486 EPPI centre report on communication of policy-level evidence via online portals: https://eppi.ioe.ac.uk/cms/Portals/0/PDF%20reviews%20and%20summaries/CFHI_EVIDENCE_STANDARDS_REPORT_V15_PRINT.pdf?ver=2018-12-03-105142-067 Communicating policy-level evidence: https://doi.org/10.1057/s41599-018-0121-9	

Annex 4. Resources identified by the Working Group on Crime Prevention

ARI	Resource	Key Messages
1. Drug use and availability	Windle, J., Moyle, L. and Coomber, R. (2020) 'Vulnerable Kids Going Country: Children and Young People's Involvement in County Lines Drug Dealing', *Youth Justice,* 20(1-2): 64-78. https://doi.org/10.1177/1473225420902840 Coomber, R. and Moyle, L. (2017) 'The changing shape of street-level heroin and crack supply in England: Commuting, holidaying and cuckooing drug dealers across 'County Lines', *British Journal of Criminology,* 58(6): 1321-1342. https://doi.org/10.1093/bjc/azx068 Coomber, R. and Moyle, L. (2014) 'Beyond drug dealing: developing and extending the concept of 'social supply' of illicit drugs to 'minimally commercial supply'. *Drugs Education, Policy and Prevention,* 21(2): 157164. http://dx.doi.org/10.3109/09687637.2013.798265	Two main areas of sometimes overlapping concern are non-'proper' dealer involvement and the issue of vulnerability and organised crime/supply, and that too many individuals that are not dealers proper or involved with organised crime (even though they might 'run'/'sell' for them) get treated by the CJS as though they were. A consequence of this is inappropriate CJS processing and/or harsh sentencing. Social Suppliers (those that supply to friends and acquaintances for little or no profit) are not involved with organised crime but low thresholds can see them incorrectly classified as 'dealers' and prosecuted as such and Minimally Commercial Suppliers (such as heroin user-dealers or runners) who mostly earn very little and mainly do so for their own supply purposes may well be 'connected' to organised crime but in reality sit outside the general machinations of the organised crime group. Other vulnerable groups such as drug addicted women/men that are exploited by organised crime groups and young children are of course of major concern.

2. Monitoring of threats and hazards to improve crime prevention, detection and response	(See also 19) In addition to government's own resources (Home Office (2019). Future Technology Trends in Security. Home Office: London. https://www.gov.uk/government/publications/futuretechnology-trends-in-security; MoD (2015). Strategic Trends Programme: Future Operating Environment 2035, https://www.gov.uk/government/publications/future -operating-environment-2035) the Dawes Centre for Future Crime at UCL, research conducted and underway covers a variety of relevant topics: https://www.ucl.ac.uk/jill-dando-institute/research/dawescentre-future-crime Johnson, S.D., Ekblom, P., Laycock, G., Frith, M.J., Sombatruang, N., Valdez, E.R. (2018). Future Crime. In the Routledge *Handbook of Crime Science*. https://www.routledgehandbooks.com/doi/10.4324/9780203431405-32	Futurists consider a number of classic dimensions — encapsulated by the acronym PESTLE (Political, Economic, Social, Technological, Law, Environment) - when considering how change will affect a business or other organisation. [Government should] routinely engage in systems thinking. Changes in any PESTLE dimension can impact upon crime, so changes implemented by any department have the potential to impact upon crime. Such unanticipated consequences should become anticipated consequences, the effects of which are purposefully designed out. In many cases, crime opportunities emerge from the launch of new products and services. While products undergo health and safety risk assessments, little to no consideration is given to their crime and security implications. Government should consider what might be done to encourage businesses to do so, either through regulation, self-regulation or other incentive models, such as labelling schemes.
3. Using big data to assess criminal behaviour and trafficking	Williams, M.L., Burnap, P. & Sloan, L. (2017). Crime Sensing with Big Data: The Affordances and Limitations of Using Open-source Communications to Estimate Crime Patterns. *The British Journal of Criminology*, Volume 57, Issue 2: 320–340, 1 March 2017.	Examines the strengths and limitations of using big data to establish associations between aggregated opensource communications data and aggregated police data to estimate crime patterns
	Babuta, A. (2017). *Big Data and Policing: An Assessment of Law Enforcement Requirements, Expectations and Priorities*. The Royal United Services Institute Occasional Paper, September 2017.	Comprehensive overview of the current use of big data for crime prevention, including its current use within police forces, the future of big data and policing, and challenges.

	Kennedy, L., Caplan, J. & Piza, E. (2018). *Risk-Based Policing: Evidence-Based Crime Prevention with Big Data and Spatial Analytics*. Oakland: University of California Press.	Discusses the use of big data for evidence-based strategies for crime risk reduction, and present case studies of risk-based policing assisted by big data technologies in the US.
4. Enabling sharing of data, evaluation and monitoring to enable better joint working	Assessed to be a more structural or technical question, rather than a social science question	
5. Detection and prevention	Food Fraud Prevention: Policy, Strategy, and Decision-Making – Implementation Steps for a Government Agency or Industry, J. Spink et al (2016) CHIMIA, 70 no5. http://docserver.ingentaconnect.com/deliver/connect/scs/00094293/v70n5/s2.pdf?expires=160033851 3&id=0000& titleid=10984&checksum=4589910 5B7D5911DF949370F541047B D	Focus should be on prevention of food fraud opportunities as detection is very difficult. Explicitly state food fraud as a crime, multi-agency approach needed to detect and prevent.
	https://www.sciencedirect.com/science/article/abs/pii/S0924224417302066	Apply routine activity theory to food fraud research into opportunities, motivations and control measures need to be defined. Key aspect is determining what food fraud vulnerabilities are in order to prevent them from being exploited. Global issue due to supply chains, economic drivers and cultural/behavioural factors contribute to motivations heightened by events such as a pandemic.

	http://clok.uclan.ac.uk/26402/1/26402%20Manuscript_Food%2520fraud%2520vulnerability%2520assessment_Accepted%2520version.pdf	'Estimated that fraud costs the UK food economy £11 billion a year but this is only the tip of the iceberg as fraud is massively underreported. By preventing fraud in food supply chain, it is possible to reduce these estimated costs. In fact, by tackling fraud, this could boost the UK food industry's profit by £4.5 billion (Fraud Review Team, 2006; White 2017). However, to date, there is very little information regarding the number of reported frauds committed in the food industry or number of food industry / supply chain victimised by fraud. As fraud is not a policing priority this has resulted in substantial numbers of un-investigated cases (Doig, 2018). A culture within the food industry that questions the source of its supply chain and wider food integrity should be encouraged.'
6. Monitoring and analysing threats and hazards at incident scenes in real time, including the use of multiple and non-traditional sources such as crowd sourcing and social media	The Open Source Communications, Analytics Research (OSCAR) Development Centre Brief Papers and Reports, http://upsi.org.uk/oscar/	Methodology for providing near-real time open source insights across a range of issues including impacts of and reactions to terror events; (dis)information operations; public order; public perceptions.
	Innes, M., Innes, H., Dobreva, D., Chermak, S., Huey, L. & McGovern, A. (2018). *From Minutes to Months: A rapid evidence assessment of the impact of media and social media during and after terror events.* A Report to the Five Country Ministerial Countering Violent Extremism Working Group, July 2018.	Report written for the 'Five Eyes' governments and illustrates the kinds of empirical data and conceptual modelling that can be distilled from social media analytics.
	Innes, M. (2020). *Soft Facts and Digital Behavioural Influencing after the 2017 Terror Attacks, Full Report.* Centre for Research and Evidence on Security Threats, February 2020.	Showcases application of the method to hostile state disinformation.

7. How do we detect and mitigate threats, crime and smuggling?	We did not identify a source in this area – the area is broad, and aspects are addressed under questions 2, 19 and 20.	
8. Increased exposure to cyber harms and use of online platforms to facilitate extremism	Macklin, G. (2019). The Evolution of Extreme-Right Terrorism and Efforts to Counter it in the United Kingdom. *CTC Sentinel* 12 (1):15-20.	
	Holt, T., Freilich, J. & Chermak, M. (2017). Internet Based Radicalization as Enculturation to Violent Deviant Subcultures. *Deviant Behavior* 38 (8): 855-869.	
	Lee, B. & Knott, K. (2020). More Grist to the Mill? Reciprocal Radicalisation and Reactions to Terrorism in the Far-Right Digital Milieu. *Perspectives on Terrorism* 14(3): 98-115.	
	Carnegie Partnership for Countering Disinformation: Resources and Research Questions, https://carnegieendowment.org/specialprojects/counteringinfluenceoperations/io ESRC Research Centre on Protecting Citizens Online (commences 1 October 2020).	
	Fisher, A., Prucha, N. & Winterbotham, E. (2019). *Global Research Network on Terrorism and Technology: Paper No. 6 Mapping the Jihadist Information Ecosystem Towards the Next Generation of Disruption Capability*. London: The Royal United Services Institute.	
	Smith, L.G.E., Blackwood, L. & Thomas, E. F. (2020). The Need to Refocus on the Group as the Site of Radicalization. *Perspectives on Psychological Science, 15* (2): 327-352.	
	Smith, L.G.E., Wakeford, L., Cribbin, T.F., Barnett, J. & Hou, W.K. (2020). Detecting psychological change through mobilizing interactions and changes in extremist linguistic style. *Computers in Human Behavior,* 108,106298.	

	Violent Online Political Extremism (Vox-Pol) network, https://www.voxpol.eu/	Academic research network focused on researching the prevalence, contours, functions, and impacts of Violent Online Political Extremism and responses to it.
	Global Internet Forum to Counter Terrorism, https://www.gifct.org/about/	Group of companies, dedicated to disrupting terrorist abuse of online digital platforms.
	Tech Against Terrorism: https://www.techagainstterrorism.org/	Working on behalf of the United Nations Counter-Terrorism Committee Executive Directorate to support the global tech industry to tackle terrorist exploitation of their technologies.
	Vox-Pol and Council for Registered Ethical Security Testers (CREST) projects.	One the most comprehensive project on online violent extremism is the Vox-Pol and CREST project. This project produces publications and researchers from various institutions and in multiple languages on a very regular basis. Their research also encompasses findings derived from a variety of different disciplines including social sciences, law and computer sciences.
	Cyber Threats Research Centre, https://www.swansea.ac.uk/law/cytrec/projects/	Work on cyber terrorism and radicals.
	The Royal United Services Institute, https://rusi.org/publication/other-publications/international-cyber-terrorism-regulationproject	Work on cyber terrorism and radicals.
	Papasavva, A., Zannettou, S., De Cristofaro, E., Stringhini, G. & Blackburn J. (2020). Raiders of the lost kek: 3.5 years of augmented 4chan posts from the politically incorrect board. *Proceedings of the International AAAI Conference on Web and Social Media*, 14(1): 885–894, May 2020.	For researchers, having large-scale datasets is an integral asset for any social media research. However, collecting these datasets is often a very time-consuming task which can take years on end, which they cannot afford to spend. Recently, it is becoming more common for researchers to collect large-scale datasets and publish them so that they are available to the wider research community and can open doors for collaboration between researchers. These dataset papers are extremely useful resources for researchers, these are examples.
	Zannettou, S., Bradlyn, B., De Cristofaro, E., Sirivianos, M., Stringhini, G., Kwak, H. & Blackburn, J. (2018). What is gab: A bastion of free speech or an alt-right echo chamber. *Companion Proceedings of the Web*, Conference 2018.	

	Baumgartner, J., Zannettou, S., Keegan, B., Squire, M. & Blackburn, J. (2020). The pushshift reddit dataset. *Proceedings of the Inter-national AAAI Conference on Web and Social Media*, 14: 830–839, May 2020.	In addition to this, the International Conference on Web and Social Media (ICWSM) has a dataset track which publishes several of these dataset papers (https://www.icwsm.org/2020/index.html#papers_accept ed). Dataset papers can also be found at more technical venues such as The WWW Conference, and International Conference on Data Mining which focuses on Data Mining.
	Baumgartner, J., Zannettou, S., Squire, M. & Blackburn, J. (2020). The pushshift telegram dataset. *Proceedings of the International AAAI Conference on Web and Social Media*, 14(1): 840–847, May 2020.	
	Pushshift, https://pushshift.io/	Pushshift is a social media data collection, analysis, and archiving platform that has collected data from several platforms including Reddit and Telegram and made it available to researchers. In addition to monthly dumps, Pushshift provides computational tools to aid in searching, aggregating, and performing exploratory analysis on the entirety of the dataset. This tool makes it possible for social media researchers to reduce time spent in the data collection, cleaning, and storage phases of their projects.
	Mott, G. (2019). A storm on the horizon? 'Twister' and the implications of the blockchain and peer to peer social networks for online violent extremism. *Studies in Conflict & Terrorism*, 42 (1-2).	One of the key ways that stakeholders remove extremist content from online platforms is to censor it from centrally owned servers. The need to censor has gained increasing prominence in recent years, including from governments, traditional media platforms (for instance newspapers) and online platforms themselves. In particular, Twitter

		has become notably more effective at censorship of extremist material on its own platform. Key reference Mott, G. (2019). This, however, is a one trick pony. It relies upon the extremist material being posted by a centralised server that is not owned or run by the extremists themselves. Whilst centralised platforms remain ascendant in terms of their widespread use, it must be acknowledged that extremists now have relatively easy means by which to host their own servers (via federated networks) or indeed operate on an entirely peer-to-peer platform (facilitated by blockchain and BitTorrent protocols, on which censorship would be very difficult indeed. In effect, the marked success of the censorship model is likely to be short lived as extremists increasingly migrate to platforms that operate either federated or peer-to-peer models.
9. How will disinformation techniques evolve to profit from the crisis? How do different societies or groups imbibe, use or combat rumour and misinformation?	Pennycook, G., McPhetres, J., Zhang, Y., Lu, J. G., & Rand, D. G. (2020). Fighting COVID-19 misinformation on social media: Experimental evidence for a scalable accuracy nudge intervention. *Psychological Science.*	In terms of academic research, the current work of Gordon Pennycook, David Rand and others is cutting edge and likely to be useful.
	Pennycook, G., Epstein, Z., Mosleh, M., Arechar, A. A., Eckles, D., & Rand, D. G. (2019). Understanding and reducing the spread of misinformation online. (*under review*) http://dx.doi.org/10.31234/osf.io/3n9u8	
	First Draft, https://firstdraftnews.org/about/	First Draft are doing excellent work. Their three part series on the psychology of misinformation https://firstdraftnews.org/latest/the-psychology-ofmisinformation-why-were-vulnerable/ is of value
	The Computational Propaganda Project, https://comprop.oii.ox.ac.uk	Most authoritative source (Howard, *et al*).

	Global Disinformation Index, *Adversarial Narratives: A New Model for Disinformation*, https://disinformationindex.org/wp-content/uploads/2019/08/GDI_Adverserial-Narratives_Report_V6.pdf	High-quality, topical research. This paper looks at modern, hybrid disinformation and uses a case study of "Stop 5G". Page 12, which gives an overview of hybrid threat actors, is particularly useful. For an overview of how disinformation is profitable, I'd recommend the Global Development Institute's *The Quarter Billion Dollar Question: How is Disinformation Gaming Ad Tech?* paper (link). The Global Development Institute also have a paper specifically looking at profitable COVID-19 disinformation (link).
	European External Action Service, *Special Report Update: Short Assessment Of Narratives And Disinformation Around The COVID-19 Pandemic*, https://eeas.europa.eu/delegations/un-geneva_en/77996/EEAS%20SPECIAL%20REPORT%20UPDATE:%20Short%20Assessment%20of%20Narratives%20and%20Disinformation%20around%20the%20COVID-19/Coronavirus%20Pandemic%20(Updated%202%20–%2022%20April)	Flagship project of the European External Action Service's East StratCom Task Force, EUvsDISINFO carries out assessments of disinformation across Europe and beyond. This special report published in May 2020 looks at the interplay between statesponsored disinformation, terrorist groups, and the responses of Western nations.
	European Commission, *Tackling COVID-19 disinformation - Getting the facts right*, https://ec.europa.eu/info/sites/info/files/communicationtackling-covid-19-disinformation-getting-factsright_en.pdf	This document gives an overview of the key challenges of the COVID-19 "infodemic" and details the necessary next steps to address them. It lays out the need for a better cooperation and a coordinated EU-wide response.
10. Changes in the opportunity structure for crime and in the drivers of the tendency to criminal behaviour, whether social, innate or environmental	Arizona State University: Centre for Problem Oriented Policing, Guides and Toolkits, https://popcenter.asu.edu/	Guides and toolkits addressing crime-specific problems. They target a police readership most directly but policymakers, researchers and other agencies with crimerelated responsibilities.
	Farrell, G., Tilley, N. & Tseloni, A. (2014). Why the Crime Drop? *Crime and Justice*, 43 (1): 421-490.	Review essay summarising the science explaining the dramatic prolonged declines in many types of crime across western countries.
	Clarke, R.V. (2018). *The Theory and Practice of Situational Crime Prevention*, Oxford Research Encyclopaedia of Criminology.	Review essay of situational crime prevention (the term for crime-opportunity-reducing measures).

11. Relationship between extremism and integration, dynamics of friendship/ familial and community relationships, and links between hate crime, other crimes and extremism	Clemmow, C., Schumann, S., Salman, N. L. & Gill, P. (2020). The base rate study: developing base rates for risk factors and indicators for engagement in violent extremism. *Journal of forensic sciences, 65*(3): 865-881	On risk and protective factors including the role of family, local networks, community support for extremism.
	Emmelkamp, J., Asscher, J. J., Wissink, I. B. & Stams, G. J. (2020). Risk Factors for (Violent) Radicalization in Juveniles: A Multilevel Meta-Analysis. *Aggression and Violent Behavior*, doi: 10.1016/j.avb.2020.101489	
	Lösel, F., King, S., Bender, D. & Jugl, I. (2018). Protective factors against extremism and violent radicalization: A systematic review of research. *International journal of developmental science, 12*(1-2), 89-102.	
	Vergani, M., Iqbal, M., Ilbahar, E. & Barton, G. (2018). The three Ps of radicalization: Push, pull and personal. A systematic scoping review of the scientific evidence about radicalization into violent extremism. *Studies in Conflict & Terrorism* 1-32.	
	Peucker, M., Grossman, M., Smith, D. & Dellal, H. D. (2016). Stocktake Research Project*: A systematic literature and selected program review on social cohesion, community resilience and violent extremism 2011-2015*. Victoria University.	

12. Supporting integration of services around rehabilitation and prevention of reoffending	Dawson, P, and Stanko, B. (2013) 'Implementation, Implementation, Implementation: Insights from Offender Management Evaluations' Policing: A Journal of Policy and Practice, 7:3, 289–298, https://doi.org/10.1093/police/pat015 Prison education Davis, L. M., Bozick, R., Steele, J. L., Saunders, J. and Miles, J. N. V. (2013) 'Evaluating the Effectiveness of Correctional Education A Meta-Analysis of Programs That Provide Education to Incarcerated Adults', RAND corporation report, available at http://www.rand.org/pubs/research_reports/RR266.html Wilson, D. B., Gallagher, C. A. and MacKenzie, D. L. (2000) 'A meta-analysis of corrections-based education, vocation and work programs for adult offenders', Journal of Research in Crime and Delinquency, 37:4, 347-368	Joined up implementation of services essential for successful reduction of reoffending. Education and skills training programmes in correctional facilities aim to increase the education or skills levels of participants to improve their employment prospects on release. Meta-analysis showed overall, the evidence suggests that educational and skills training programmes in correctional facilities have reduced reoffending, but there is some evidence (from two studies) that they have increased reoffending.
	Prison visits M.M., Mitchell, K., Spooner, D., Jia, Y., Zhang. 2106. The effect of prison visitation on re-entry success: A meta-analysis. Journal of Criminal Justice, 47, pp. 74– 83.	Prison visits provide prisoners with an opportunity to preserve or develop connections with family, friends, community and social support networks. By encouraging, maintaining or strengthening such networks, these visits may provide protective mechanisms that function to prevent criminal relapse after release from prison. Meta-analysis showed overall, the evidence suggests that prison visits have reduced crime, but there is some evidence that they have increased crime.
13. Understanding the contribution of forensic techniques to the Criminal Justice System, within	Annual Report of the Government Chief Scientific Adviser 2015. *Forensic Science and Beyond: Authenticity, Provenance and Assurance, Report.* London: The Government Office for Science.	The value of forensic science undertaken by Mark Walport when he was in office.

investigations and in court, including issues such as attrition of cases in the system	Annual Report of the Government Chief Scientific Adviser. (2015). *Forensic Science and Beyond: Authenticity, Provenance and Assurance, Evidence and Case Studies*. London: The Government Office for Science.	
	The Judicial Primers Project. (2017). *Forensic DNA analysis: A Primer for Courts*. London: The Royal Society.	Two judicial primers in print with another 4 in the pipeline.
	The Judicial Primers Project. (2017). *Forensic gait analysis: A Primer for Courts*. London: The Royal Society.	
	Science and Technology Select Committee, 3rd Report of Session 2017–19. (2019). *Forensic science and the criminal justice system: a blueprint for change.* https://old.parliament.uk/forensic-science-lordsinquiry/	Advisory committee that is helping UKRI to find its 'funding place' for forensic science, it is in response to the House of Lords inquiry into forensic science.
	https://pubmed.ncbi.nlm.nih.gov/27125769/; https://authors.elsevier.com/a/1bbeQ_u7gL64vh; https://pubmed.ncbi.nlm.nih.gov/22950080/; https://pubmed.ncbi.nlm.nih.gov/26118853/; https://pubs.rsc.org/en/content/articlelanding/2015/an/c5an00112a#!divAbstract https://pubmed.ncbi.nlm.nih.gov/28387396/;	A proteomic approach for the rapid, multi-informative and reliable identification of blood Matrix Assisted Laser Desorption Ionisation Mass Spectrometry (MALDI MS) can detect and image a variety of endogenous and exogenous compounds from latent finger marks. Use of MALDI MS for criminal profiling and individualisation.
	Automated approaches that allows large dataset creation and datamining are being developed in many areas including the detection, analysis and interpretation of trace evidence – the EU funded Scientific High-throughput and Unified Toolkit for Trace analysis by forensic Laboratories in Europe (SHUTTLE) project - https://www.shuttle-pcp.eu/project-at-a-glance/visionand-concept/ https://www.sciencedirect.com/science/article/pii/S2665910720300712	The SHUTTLE project uses machine learning – deep learning approaches for evidence detection and analysis - this is an incredibly useful area for all aspects of forensic science and appears to be key in ARI's – supervised and unsupervised AI type studies and projects are starting to appear

	https://www.uknewsgroup.co.uk/a-ground-breaking-aifirm-helping-police-to-solve-serious-crimes-at-a-dramaticrate-with-unique-technology-is-celebrating-a-milestonewith-a-pioneering-revelation/	Using AI approaches for autodetection of people, cars etc is not new but significant developments have been made to improve detection in less than perfect situations including poor visibility
14. Decent and safe prisons: prisons are decent, safe and productive places to live and work	Moran, D. (2019) 'How the prison environment can support recovery'. *Prison Service Journal*, no. 242: 4449. Moran, D. (2019). 'Back to nature? Attention restoration theory and the restorative effects of nature contact in prison'. *Health & Place*, vol. 57: 35-43.	Improving the physical environment of prisons (regarding noise, light/dark and access to nature). Drawing on the work of Professor Dominique Moran: https://www.birmingham.ac.uk/staff/profiles/gees/moran-dominique.aspx Further articles on the topic are currently in press.
	Kincaid, S., Roberts, M. & Kane, E. (2019). *Children of Prisoners: Fixing a broken system.* London: CREST and Centre for Health and Justice, University of Nottingham. https://static.wixstatic.com/ugd/89643c_a905d6cf4f644ee5afb346e368bb9e0e.pdf	The effect of imprisonment on children.
	Auty, K.M. & Liebling, A. (2020). 'Exploring the relationship between prison social climate and reoffending' *Justice Quarterly* 37(2): 358-381.	Link between the quality of prison life and reoffending.
15. Understanding which individuals are at risk of becoming offenders (and/or victims), for what reason and at what stages of their lives	Ministry for Justice. (2020). The Data First Project: *An Introductory User Guide. "Harnessing the potential of linked administrative data for the justice system."* (Version 2.0). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/908466/datafirst-user-guide.pdf	Administrative data sources about offenders.
	Scottish Government, A National Statistics Publication for Scotland, Crime and Justice. (2019). *Reconviction Rates in Scotland: 2016-17, Offender Cohort.* https://www.gov.scot/publications/reconviction-ratesscotland-2016-17-offender-cohort/pages/4/	Administrative data sources about offenders.

	Scandinavian, and other European, register data. https://www.ssb.no/en/sok?sok=offender https://www.bra.se/bra-in-english/home/crime-andstatistics.html https://www.dst.dk/en/Statistik/emner/levevilkaar/kriminali tet	Administrative data sources about offenders. Provide exemplars in how data linkage to a wide range of databases can improve theory and policy.
	Jennings, W., Gray, E., Hay, C. & Farrall, S. (2015). Collating Longitudinal Data on Crime, Victimization and Social Attitudes in England and Wales: A New Resource for Exploring Long-term Trends in Crime. *The British Journal of Criminology*, Volume 55, Issue 5: 1005–1015.	Administrative data sources about victims. Crime Survey for England and Wales – new ways of using the data for longitudinal analysis.
	McVie, S., Norris, P. & Pillinger, R. (2019). Increasing Inequality in Experience of Victimization During the Crime Drop: Analysing Patterns of Victimization in Scotland from 1993 to 2014–15. *The British Journal of Criminology*, Volume 60, Issue 3: 782–802.	Administrative data sources about victims. Scottish Crime and Justice Survey – using advanced statistical methodologies to better understand increasing inequalities in crime and victimization.
	The Peterborough Adolescent and Young Adult Developmental Study (PADS+). https://www.cac.crim.cam.ac.uk/research/padspres	Survey sources/other studies of offenders & victims.
	The Edinburgh Study of Youth Transitions and Crime. https://www.edinstudy.law.ed.ac.uk	Survey sources/other studies of offenders & victims.
	The 'Growing Up' Studies. https://growingupinscotland.org.uk https://www.growingup.ie https://www.growingup.co.nz https://growingupinaustralia.gov.au	Survey sources/other studies of offenders & victims.
16. Public protection: the public are protected from harm caused by offenders	Restorative justice Strang, H., Sherman, L.W., Mayo-Wilson, E., Woods, D. and Ariel, B. (2013) 'Restorative Justice Conferencing (RJC) Using Face-to-Face Meetings of Offenders and Victims: Effects on Offender Recidivism and Victim	As a general overview - the very serious end is well dealt with and managed, because they are assessed as high-risk and receive regular probation visits, support etc. Various forces have brought in a risk assessment model focused on: Recency, Gravity and Frequency. There are gaps in our

	Satisfaction. A Systematic Review', Campbell Systematic Reviews, 2013:12 DOI: 10.4073/csr.2013.12 Livingstone, N., Macdonald, G. and Carr, N. (2013) 'Restorative justice conferencing for reducing recidivism in young offenders (aged 7 to 21)', Cochrane Database of Systematic Reviews, 2013, Issue 2. Art. No.: CD008898. DOI: 10.1002/14651858.CD008898.pub2	provision – given limited resources they are primarily targeted at the most serious offenders. Where the system is less able to cope is with slightly lower risk people who don't meet the criteria for the high-risk response. Restorative justice remains underused. Overall, the evidence suggests that RJC has reduced crime.
17. Lessons learned from investigations	Assessed to be a request for analysis of HSE investigations	
18. Reducing reoffending: the rate of reoffending is reduced and the life chances for offenders are improved	Hadfield, E., Sleath, E., Brown, S. & Holdsworth, E. (2020). A systematic review into the effectiveness of Integrated Offender Management, *Criminology & Criminal Justice,* 16 March 2020*,* DOI:10.1177/1748895820912295	Integrated Offender Management
	Evaluation of the Wales Integrated Serious and Dangerous Offender Management (WISDOM) programme (2019) Kane *et al.* Can be provided upon request.	Integrated Offender Management
	Hester, M., Eisenstadt, N., Ortega-Avila, A., Morgan, K., Walker, S.J. & Bell, J. (2019). *Evaluation of the Drive Project – A Three-year Pilot to Address High-risk, High-harm Perpetrators of Domestic Abuse*. Bristol: Centre for Gender & Violence Research, University of Bristol.	Approaches to reducing violent reoffending
	Kane, E., Bandyopadhyay, S. & Cronin, E. (2019). *Preventing Violence against Vulnerable People Evaluation Report*. Nottingham: Centre for Health and Justice.	Approaches to reducing violent reoffending
	Kane, E., Durcan, G. & Zawojska, D. (2019). *Greater Manchester Health and Justice Strategic Review*. Nottingham: Centre for Health and Justice.	Approaches to reducing violent reoffending

	Kane, E., Evans, E., Mitsch, J. & Jilani, T. (2020). Are Liaison and Diversion Interventions in Policing Delivering the Planned Impact: a longitudinal evaluation in two Constabularies? *Criminal Behaviour and Mental Health.* DOI: 10.1002/cbm.2166.	Diversion from the CJS
	Abramovaite, J., Bandyopadhyay, S., Stephenson, Z. & Woodhams, J. (2020). New *Chance: Process and Impact Evaluation.* Birmingham: University of Birmingham, Centre for Crime, Justice and Policing.	Diversion from the CJS
	Abramovaite, J. & Bandyopadhyay, S. (2019) *A quantitative evaluation of the effect of Community Resolution on reoffending among first time offenders.* Birmingham: Better Policing Collaborative.	Diversion from the CJS
	Weir, K., Routledge, G. & Kilili, S. (2019). Checkpoint: An Innovative Programme to Navigate People Away from the Cycle of Reoffending: Implementation Phase Evaluation. *Policing: A Journal of Policy and Practice.* https://doi.org/10.1093/police/paz015	Diversion from the CJS
19. How is the landscape of crime changing	The Dawes Centre for Future Crime at UCL, https://www.ucl.ac.uk/jill-dando-institute/research/dawes-centre-future-crime	Futurists consider a number of classic dimensions – encapsulated by the acronym PESTLE (Political, Economic, Social, Technological, Law, Environment) - when considering how change will affect a business or other organisation. [Government should] routinely engage in systems thinking. Changes in any PESTLE dimension can impact upon crime, so changes implemented by any department have the potential to impact upon crime. Such unanticipated consequences should become anticipated consequences, the effects of which are purposefully designed out.

	Johnson, S.D., Ekblom, P., Laycock, G., Frith, M.J., Sombatruang, N. & Valdez, E.R. (2018). Future Crime. In the Routledge *Handbook of Crime Science* (Edited by Wortley, R., Sidebottom, A., Tilley, N. & Laycock, G.) Abingdon: Routledge. https://www.routledgehandbooks.com/doi/10.4324/9780203431405-32	In many cases, crime opportunities emerge from the launch of new products and services. While products undergo health and safety risk assessments, little to no consideration is given to their crime and security implications. Government should consider what might be done to encourage businesses to do so, either through regulation, self-regulation or other incentive models, such as labelling schemes.
	Home Office. (2019). *Future Technology Trends in Security*. Home Office: London. https://www.gov.uk/government/publications/futuretechnology-trends-in-security	
	MOD. (2015). *Strategic Trends Programme: Future Operating Environment 2035*. https://www.gov.uk/government/publications/futureoperating-environment-2035	
20. Improved knowledge of the harms and impacts of serious organised crime, including economic impact	Dorn, N. and van de Bunt, H. (2010) *Bad Thoughts: Towards an Organised Crime Harm Assessment and Prioritisation System*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1574071 Mackenzie, S., & Hamilton-Smith, N. (2011). Measuring police impact on organised crime. *Policing: An International Journal of Police Strategies & Management*.	By contrast with the metaphorical impact of McMafia – which seriously overstated the coherence of transnational organised crime - it might be fruitful to examine the cumulative harms from criminal actors and acts that may not be 'organised' in a hierarchical or even obviously networked way, which do constitute a threat but not necessarily one from 'threat actors' in a quasi-military sense. Much can be learned from understanding better how Mafias or – more saliently to the UK – smaller networks fail to migrate or grow locally.
	Marquette, H. & Peiffer, C. (2018). Grappling with the 'real politics' of systemic corruption: Theoretical debates versus 'real-world' functions. *Governance*, 31(3): 499514.	Anti-corruption interventions often fail because they fail to take into account 'corruption functionality', or: *the ways in which corruption provides solutions to the everyday problems people face, particularly*

	Marquette, H. & Peiffer, C. (forthcoming). *Corruption Functionality Framework*. Birmingham: Institute for Global Innovation & Washington DC: Global Integrity.	*in resource-scarce environments, problems that often have deep social, structural, economic and political roots*. Developing multi-pronged interventions that tackle the underlying problems alongside strategies to detect and disrupt corrupt behaviours is necessary for effective, sustainable reductions in corruption. By identifying and investigating bribery 'positive outliers', or sectors where bribery reduced while in all other sectors it remained the same or increased, research shows that anti-corruption approaches that disrupt corruption patterns and networks can work up to a point. However, without also addressing the underlying causes (e.g., the functionality), interventions are unlikely to be sustained over time. In addition, depending on the nature of the underlying problems, even effective anti-corruption interventions can produce negative unintended consequences that have the potential to be more harmful than the bribery itself.
	Marquette, H. & Peiffer, C. (2018). 'Islands of integrity'? Reductions in bribery in Uganda and South Africa and lessons for anti-corruption policy and practice'. *DLP Research Paper 58*. Birmingham: Developmental Leadership Program.	
	Peiffer, C., Marquette, H., Armytage, R. & Budhram, T. (2019). The surprising case of police bribery in South Africa. *Crime, Law & Social Change*.72(5): 587-606.	
	Peiffer, C., Armytage, R., Marquette, H. & Gumisiriza, P. (forthcoming). Uganda's health sector as a complicated outlier in bribery reduction. *Development Policy Review*.	
21. Understanding how serious organized crime markets work, and how they interact with each other	Note – Four sets of responses. An overview including money laundering, and two focused specifically on fraud and human trafficking/modern slavery.	
	Ariel, B., Englefield, A., & Denley, J. (2019). I HEARD IT THROUGH THE GRAPEVINE. *The Journal of Criminal Law and Criminology (1973-)*, *109*(4), 819-867. (for specific deterrence measures v prolific offenders, using randomised controlled trials)	Serious organised crime is a term of art, and might include most economic crimes, including many committed by otherwise legitimate actors, both money laundering 'enablers' and mainstream firms that harm air quality (like Volkswagen 'dieselgate') or do not manage their supply chain carefully, from modern slavery to toxic waste. Therefore, to attain better serious organised crime reduction, we may need to widen the lens, no longer looking just at *full-time* illicit actors. Stigmatising entire sectors as 'enablers' can be
	Crocker, R., Webb, S., Skidmore, M. *et al.* Tackling local organised crime groups: lessons from research in two UK cities. *Trends Organ Crim* **22,** 433–449 (2019). https://doi.org/10.1007/s12117-018-9335-x	

Dorn, N. and van de Bunt, H. (2010) *Bad Thoughts: Towards an Organised Crime Harm Assessment and Prioritisation System*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=157 4071

Levi, M., Doig, A., Gundur, R. Wall, D. and Williams, M. (2017) 'Cyberfraud and the Implications for Effective Risk-Based Responses: Themes from UK Research', *Crime, Law and Social Change*, 67 (1): 77-96. First online. DOI: 10.1007/s10611-016-9648-0.

Mackenzie, S., & Hamilton-Smith, N. (2011). Measuring police impact on organised crime. *Policing: An International Journal of Police Strategies & Management*.

Maxwell, N. (2020) *Five years of growth in public–private financial information-sharing partnerships to tackle crime*

Levi, M. and Soudijn, M. (2020) 'Understanding the Laundering of Organized Crime Money'. In P. Reuter and M Tonry (eds) Organizing Crime: Mafias, Markets, and Networks, *Crime and Justice: an Annual Review of Research*. https://www.journals.uchicago.edu/doi/10.1086/708047

Campana, P. (2020). Human Smuggling: Structure and Mechanisms. *Crime and Justice*, *49*(1). https://doi.org/10.1086/708663

Leukfeldt, E. R., Kleemans, E. R., Kruisbergen, E. W., & Roks, R. A. (2019). Criminal networks in a digitised world: on the nexus of borderless opportunities and local

counter-productive, especially without good publishable evidence, but social media – e.g. Google (and to a lesser extent Facebook) advertising of fraud and money mule schemes without any due diligence -are clearly 'crime facilitators' and arguably this is laundering if they are paid from proceeds of fraud. So is Amazon marketplace's fake reviews and sales of counterfeit and harmful products.

The intersection of different forms of criminal market is little understood and tends to be satisfied by anecdotal real cases without sufficient self-critical analysis of the limits to our knowledge, e.g. via concern about the methodologies of intelligence and its gaps. In other words, if all or many intersections were like x, what would we expect to see and is there a plausible way of testing these hypotheses. Thus cases where criminals do get together and engage in mutual action (see Hobbs (2013) Lush Life) fit a vision of easy criminal mobility and aggrandisement, without looking hard enough for counter-examples or understanding the constraints on offenders.

The harms of money laundering need to be understood more subtly.

Interventions need to distinguish between organised crime with direct victims (like frauds, toxic waste and persons trafficked/exploited against their will) and those that are in sense consenting (like drugs taking and human smuggling); wildlife trafficking is a separate category. The National Economic Crime Centre has already been doing some serious thinking, but in the shift away from 'core nominal thinking' about organised crime, serious frauds

embeddedness. *Trends in Organized Crime*, 22(3), 324345

Whittle, J., & Antonopoulos, G. A. (2020). How Eritreans plan, fund and manage irregular migration, and the extent of involvement of 'organised crime'. *Crime Prevention and Community Safety*, 1-18; Madarie, R., & Kruisbergen, E. W. (2020). Traffickers in Transit: Analysing the Logistics and Involvement Mechanisms of Organised Crime at Logistical Nodes in the Netherlands: Empirical Results of the Dutch Organised Crime Monitor. In *Understanding Recruitment to Organized Crime and Terrorism* (pp. 277-308). Springer, Cham.

Levi, M. 2020. 'Evaluating the Control of Money Laundering and Its Underlying Offences: the Search for Meaningful Data', Asian Journal of Criminology¸ 1-20, DOI: 10.1007/s11417-020-09319-y

and others should be thought about in a more connected way between regulators, police/nonpolice investigators and prosecutors, instead of their historic bifurcation as organised/not organised crime. In addition to enhancing the evidence base, partly through more experimental 'mystery shopping' tests to examine susceptibility to launder, to act corruptly, etc. I would commend the following:

Having selected out for prevention efforts only scams where suspects are likely to be unreachable in unfriendly countries (plus impact of Brexit), a more systematically varied approach (HMRC-style) to the Pursue model for different types of economic crime, based not just on harm but also the need to send messages to offenders. This should be accompanied by serious research into the impact of messaging on (separately) public reassurance, victims and offenders. It is fashionable to have national action days on fraud types and by Europol, but I have not seen any good analysis of their impacts beyond making everyone feel better (which may motivate them and therefore is good in itself).

Serious social network analysis for detecting and preventing fraud in government lending schemes. Government currently appear not to be stopping firms from obtaining loans (including business interruption loans) to bank accounts other than those registered to HMRC, and do not inform firms that this is happening. There are widespread opportunities for crime networks in this context, whether they are labelled as organised crime or not.

		Systematic engagement of local & national safeguarding authorities and regulators in actions to make repeat victimisation of consumer/investment frauds harder. Following up the Law Commission Proceeds of Crime Report published today, alongside a self-critical analysis of data sharing in anti-money laundering and its prospects for upscaling. The reforms of the subject access requests process envisaged in the Economic Crime Plan are good in themselves, but a realistic analysis of what is likely to be achieved when following up (or not) data sharing is long overdue, despite the Maxwell report's enthusiasm.
	Button, M. and Cross, C. (2017) *Cyber Frauds, Scams and their Victims*. London: Routledge. Levi, M.et al. 2016. The implications of economic cybercrime for policing. Project Report. [Online]. London: City of London Corporation. Available at: https://www.cityoflondon.gov.uk/business/economicresearch-and-information/research-publications/Documents/Research-2015/EconomicCybercrime-FullReport.pdf Police Foundation/Perpetuity Research (2019). Improving the Police Response to Fraud. Available at http://www.police-foundation.org.uk/project/improvingthe-police-response-to-fraud-2/ Button, M., Lewis, C., Shepherd, D., Brooks, G., and Wakefield, A. (2012) *Fraud and Punishment: Enhancing Deterrence through More Effective Sanctions*. Portsmouth: Centre for Counter Fraud Studies.	The identification of tools which are effective in preventing fraud (and related crimes) should be identified and structures developed to promote such tools through standards, online resources, campaigns, training and education. This would require the use of experts as well as additional research. The Centre for Problem Orientated Policing provides an example for broader crime prevention. The priority and resources dedicated to the investigation of fraud are often low and precarious. The government should encourage a higher priority and minimum levels of investment in investigation in the police and other relevant public bodies. Underpinning the above two the government should consider investing in an Institute of Economic Crime. I think it should be broader than just fraud because other economic crimes such as cyber-crime, money laundering, corruption etc are often linked. This Institute should lead on the development of courses for leaders in the fight against economic crime to spread the knowledge and best practise.

	Available at https://researchportal.port.ac.uk/portal/en/publications/fra ud-and-punishment(75bb2919-4063-4a45-95bb687d2a34cfa3).html	
	Human trafficking/Modern Slavery Carole Murphy, 2020, Surviving Trafficking, Seeking Asylum: Status, Waiting and the State, International Journal of Sociology and Social Policy https://www.emerald.com/insight/content/doi/10.1108/IJSSP-12-2019-0255/full/html Sasha Jesperson and Anne-Marie Barry, 2019, both working at the Centre for the Study of Modern Slavery at the time worked on a pivotal piece of research funded by the Modern Slavery Innovation Fund, that later contributed to a publication: Human Trafficking: An Organised Crime?, available as a hardcover on Amazon: https://www.amazon.co.uk/Human-Trafficking-Organised-Sasha-Jesperson/dp/1787381285 Carole Murphy, 2018, Game of Chance report, available at: https://www.stmarys.ac.uk/research/centres/modernslavery/docs/2018-jun-a-game-of-chance.pdf	While important steps have been taken to address modern slavery and human trafficking in the UK, the response is still fragmented and to some extent uncoordinated. As various agencies and institutions with competing demands, strive to address such complex phenomenon/crime, the need for vigorous oversight and guidance is key, as is the necessity for a more focussed interagency cooperation. Furthermore, to make significant progress in addressing the phenomenon, survivor voice is also of paramount importance. Survivors' experience and expertise can inform more effective policies and interventions.
22. Analysis of how conflict and terrorist dynamics may change as a direct or indirect result of COVID-19.	Oral contributions.	
23. Analysis of what new conflicts may arise and where there might be new	Existing resources not identified	

opportunities to resolve conflict.		
24. Analysis of how COVID-19 interacts with other factors of instability in different countries.	Herbert, S. & Marquette, H. (forthcoming). *COVID-19 conflict & governance: Emerging impacts and future evidence needs.* K4D Emerging Issues Paper. Brighton Institute for Development Studies. Kleptocracy & 'egregious grand corruption' pose a significant threat, both to individual states/economies and to global stability. The dropping of anti-corruption standards as part of the urgent COVID-19 response is *directly* to blame for much of the exponential growth in corruption, fraud & serious organised crime that's being observed.	Already weak health systems are seeing increased corruption & this is likely to continue at the grand corruption level (as above) but also the petty corruption/frontline bribery level as demand for health services outstrips supplies; this could also see petty corruption (re)emerging in high income countries with under pressure health systems.

Annex 5. Resources identified by the Working Group on Supporting Lower-Carbon Local Economies

ARI	Resource	Key Messages
1. Capturing and maintaining sustainable changes to travel behaviour, including locking-in good practice	Calvillo, C.F. and Turner, K., 2020. Analysing the impacts of a large-scale EV rollout in the UK–How can we better inform environmental and climate policy? Energy Strategy Reviews, 30, p.100497	
2. How will public attitudes be affected? Are individuals, cities or communities motivated by the drop in emission levels resulting from reduced travel? Are they more/less fearful of ambitious decision making to protect the climate? What opportunities does this present in the UK?	Skeete, J.P., Wells, P., Dong, X., Heidrich, O. and Harper, G., 2020. Beyond the Event horizon: Battery waste, recycling, and sustainability in the United Kingdom electric vehicle transition. Energy Research & Social Science, 69, p.101581	
	Tang, Y., Zhang, Q., Li, Y., Li, H., Pan, X. and Mclellan, B., 2019. The social-economic-environmental impacts of recycling retired EV batteries under reward-penalty mechanism. Applied Energy, 251, p.113313	
3. Future of travel in terms of systems and choices, reflecting decarbonisation goals, reduced aviation opportunities	Zaporozhets, O., Volodymyr, V. and Synylo, K., 2020. Trends on current and forecasted aircraft hybrid electric architectures and their impact on environment. Energy, p.118814	

and changing working practices 4. Charging infrastructure – understand the requirements for Electric Vehicle charging, and how effective the policies are to support this, including the Electric Vehicle Homecharge Scheme, the Workplace Charge Scheme, and the On-street Residential Scheme.	Palomino, A. and Parvania, M., 2019. Advanced charging infrastructure for enabling electrified transportation. The Electricity Journal, 32(4), pp.21-26	
5. Scope for digital platforms to support commercial activity 6. What are the benefits of investment in innovative technologies such as AI, automation and decarbonisation, and how best can we unlock these benefits? What role does international collaboration have to play? 9. Supporting regional	Swyngedouw, E (2010) Apocalypse Forever?: Post-political Populism and the Spectre of Climate Change. Theory, Culture & Society 27: 213-232 Robins N, Brunsting V and Wood D (2018) Investing in a just transition: Why investors need to integrate a social dimension into their climate strategies and how they could take action, LSE. ttp://www.lse.ac.uk/GranthamInstitute/wpcontent/uploads/2018/06/Robins-et-al_Investing-in-a-Just-Transition.pdf	

diversity and industrial growth while contributing to net-zero	Robins N, Gouldson A, Irwin W and Sudmant A (2019) Investing in a just transition in the UK: How investors can integrate social impact and place-based financing into climate strategies, LSE. http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2019/02/ Investing-in-a-just-transition-in-the-UK_Full-policy-report_40pp-2.pdf	
10. How can we best stimulate/maximise the green jobs market to combine economic recovery with a green and just transition?		
11. Role of investment in emerging technologies to support ecnomic regeneration	Hajer, M and Versteeg, W. (2018). Imagining the post-fossil city: why is it so difficult to think of new possible worlds? *Territory, Politics, Governance*: 1-13.

Blowers, A. and Pain, K. (1999) *The unsustainable city?* In: Pile, S., Brook, C. and Mooney, G. (eds.) Understanding Cities: Unruly Cities? Order/Disorder. Routledge. ISBN 0415200733. See also Curran G. (2015) *Ecological Modernisation: Promises and Prospects. In: Sustainability and Energy Politics. Energy, Climate and the Environment.* Palgrave Macmillan, London.

Bulkeley, H.A., Edwards, Gareth. A.S & Fuller, S (2014). Contesting climate justice in the city: | |

	Examining politics and practice in urban climate change experiments. *Global Environmental Change.* 25: 31-40. Hall, P., Pain, K. and Green, N. (2006) Anatomy of the polycentric metropolis: eight mega-city regions in overview. In: Hall, P. and Pain, K. (eds.) The Polycentric Metropolis: Learning from Mega-City Regions in Europe. Earthscan, London, pp. 19-52. Nunes, R. (2020) Regional planning: the resilience of an imperative. In: The International Encyclopedia of Geography: People, the Earth, Environment, and Technology. Wiley. ISBN 9781118786352. Birmingham Policy Commission (2020). Energy from Waste and the Circular Economy. Energy Capital Policy Commission (2018). Powering West Midlands Growth: A Regional Approach to Clean Energy Innovation. Pain, K., Black, D., Blower, J., Grimmond, S., Hunt, A., Milcheva, S., Crawford, B., Dale, N., Doolin, S., Manna, S., Shi, S. and Pugh,	

R. (2018). Supporting smart urban growth: successful investing in density. Report. Urban Land Institute, p 36.

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North, P and Nurse, A. (2014). "'War Stories': morality, curiosity, enthusiasm and commitment as facilitators of SME owners' engagement in low carbon transitions" in *Geoforum*. 52/2: 32-41.

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MHCLG (2020). Planning for the Future: White Paper.

MHCLG (2020). Living with beauty: report of the Building Better, Building Beautiful Commission.

Place Alliance (n.d.). Available at http://placealliance.or

	g.uk/. Accessed 23 October 2020.	
	Krumholz, N. and Hexter, K.W. (Eds. 2019). Advancing equity planning now. Cornell University Press. 263.	
	Dornelles, A.Z., Boyd, E., Nunes, R.J., Asquith, M., Boonstra, W.J., Delabre, I., Denney, J.M., Grimm, V., Jentsch, A., Nicholas, K.A. and Schröter, M., 2020. Towards a bridging concept for undesirable resilience in social-ecological systems. Global Sustainability, 3.	
	Feola, G and Nunes, R (2014). Success and failure of grassroots innovations for addressing climate change: The case of the Transition Movement. *Global Environmental Change.* 24: 232-250.	
	Seyfang, G and Haxeltine, A (2012). Growing Grassroots Innovations: Exploring the Role of Community-Based Initiatives in Governing Sustainable Energy Transitions. *Environment and Planning C: Government and Policy.* 30: 381-400.	
8. Changes to housing stock to support	Holmes, G., Hay, R., Davies, E., Hill, J., Barrett, J., Style, D., & Vause, E. (2019). UK	Houses in the UK are not fit for the future and attempts at adapting UK housing stock to fit the challenges of climate change have not been very effective.

lower-carbon future	Housing: Fit for the Future? *Committee on Climate Change*.	The government needs to address this with several interventions (e.g. designing and building new homes, retrofitting existing ones and ensuring performance and compliance). House holders can effect changes too (e.g. by increasing insulation, installing shading and boiler upgrades). *The message here is that there is often much more UK government has to do to decarbonise its housing stock. While enforcing new measures for new builds, the real opportunity lies in decarbonising existing stocks that are neither fit for the present and the future. Strategies and policies must realise that the government cannot go it alone, efforts must be made to bring in all stakeholders, particularly homeowners using command and control instruments together with economic incentives*.
	Patterson, J. L. (2016). Evaluation of a regional retrofit programme to upgrade existing housing stock to reduce carbon emissions, fuel poverty and support the local supply chain. *Sustainability, 8(12), 1261.*	This study evaluated the Welsh Government's £9.6 million regional scale housing retrofit programme to reduce fuel poverty, carbon emissions and support energy efficiency and renewable energy supply chain. It reaffirmed government retrofitting strategy as affording huge opportunity reducing housing energy demand, cutting carbon emissions, and enhance energy efficiency. To achieve its goal, a suggestion that while legislation is necessary policy instrument to drive lower-carbon housing, it needs to be complimented with other policy instruments throughout the built environment sector. Measures to cut energy demands, enhance energy efficiency, reduce carbon emissions, facilitate employment and training are critical to the overall success of the strategy implemented. **The message here is that it will require a combination of strategies, policy instruments, and commitment to decarbonise UK housing stocks.**
	Rosenow, J., Guertler, P., Sorrell, S., & Eyre, N. (2018). The remaining potential for energy savings in UK households. *Energy Policy, 121, 542-552.*	*The message here is that upgrading or retrofitting existing housing stocks to sustainable standards presents the UK with huge opportunities to achieve significant reductions in building energy consumption, hence reductions in carbon emissions*.
	Jan Rosenow, Tina Fawcett, Nick Eyre & Vlasis Oikonomou (2016) Energy	Energy efficiency policy is expected to play a key role in helping to reduce energy demands and attended CO2 emissions. The experience of 14 European Union countries revealed this to be the

	efficiency and the policy mix*, Building Research & Information, 44:5-6, 562-574,* DOI:10.1080/0961321 8.2016.1138803	case. Energy consumption and CO2 emissions reductions are unlikely to effectively succeed using single policy instruments. *The message here is that effectiveness is likely to come through combinations of policy mixes targeted at different scenarios. In other words, success is unlikely with a one-fit-all policies. The challenge is finding how these policies combine and under which scenarios they are most effective. This is particularly the case with financial incentives under different under different scenarios.*
	Gillich, A, Sunikka-Blank, M., Ford, A. (2016), Lessons for the UK Green Deal from the US BBNP. *Journal of Building Research and Information. http://www.tandfonli ne.com/doi/abs/10.1 080/09613218.2016.1 159500?journalCode =rbri20*	The message here is that no matter how good a policy may be, poor implementation can lead to the ultimate failures of policies. In comparing the performance of the US Better Buildings Neighbourhood Program (BBNP) with the Green Deal in the UK, BBNP was found to be relatively more successful than the Green Deal in converting energy assessments to actual retrofits, and this was attributed to policy implementation. The UK Green Deal could have benefitted from proactive marketing and outreach, there was no sufficient engagement with the workforce and neither was there concerted effort to develop the technical and non-technical skills and competences necessary to actualise the programme and render the policies implementable. *The key message here is that it is not sufficient to formulate policies, what it will take in capacity to implement must also be ascertained.*
	Arif, M, Gillich, A, Ford, A and Wang, Y (2018). Overcoming Practical Challenges and Implementing Low-Carbon Heat in the UK: Lessons from the Balanced Energy Network (BEN) at LSBU. *CIBSE Technical Symposium.* **London 12 - 13 Apr 2018**.	The commitment to decarbonise UK heating energy by 2050, highlights the need for efficient electric heating and wider adoption of heat networks. While the possibility of low-carbon heat has always been conceptualised at a theoretical level, creating a gap in knowledge, understanding the challenges to implementation, particularly for existing stock is necessary prerequisite to effective decarbonisation of UK housing stock. Electrified heat can be integrated into existing building distribution systems and Balanced Energy Network BEN system demonstrates how the practical challenges to achieving retrofit low carbon heat to existing building distribution systems can be achieved. *The message here, once again, is that the requirements to implement policies must be articulated during the time of policy*

		implementation, this is seen as critical in driving a lower-carbon housing stock in the UK.
	Mirzania, P, Andrews, D, Ford, A and Maidment, G (2019). The Impact of Policy Changes: The Opportunities of Community Renewable Energy Projects in the UK and the Barriers they Face. *Energy Policy. 129, pp. 1282-1296*	UK's energy system is majorly centralised and reliant on fossil fuels. The dilemma of successfully delivering energy security, equity, and environmental sustainability, whilst dealing with an ageing energy infrastructure, demands an overhaul of the entire energy system in the UK. In recent years, Community Renewable Energy (CRE) projects have played a significant role in the transition of the UK's energy system, but since 2016 government support for them has been less robust. The message from this study is that certainty and policy stability, particularly government policies is critical to creating the enabling environment for support and successful implementation of policies such as the Community Renewable Energy project. In other words, longer term rather than shorter term policies are critical to driving initiatives such as CRE. The decision by majority of CRE organisations to focus on managing their existing assets rather than expand on their assets is a testament to the fall outs of government not following through with its policy. *For the future, lessons from past initiatives must be learnt and challenges likely to be faced by those venturing into projects such as CRE must be articulated.*
	Kaluarachchi, Y. and Jones, K (2013). Promoting low-carbon home adaptations and behavioural change in the older community. *Architectural Engineering and Design Management. 10 (1-2), pp. 131-145.*	Ambitious target to cut the UK's carbon emissions by 80% by year 2050 exist, to meet this target, action is needed in the residential sector with 27% of the UK's CO2 emissions coming from energy use in homes. While working towards zero carbon new homes, refurbishment of the existing housing stock to advanced, low-carbon standards is essential. The involvement of all stakeholders and behavioural change of occupants to low carbon lifestyles are necessary. Findings of an EPSRC Public Engagement project (2009-2010) carried out to promote low carbon home adaptations and behaviour change among the elderly. Findings show that promotion exercise of this nature can be very effective in the number of the elderly who have made changes in their lives since attending the events, and others planning to change, or have encouraged someone else they know to make a change in their lives to be more sustainable. *The key message here is the need to promote policies to groups or sectors that are the target of implemented policies.*

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	Urge-Vorsatz, D., Eyre, N., et. al. (2012). Towards Sustainable Energy End Use: Buildings, *in Global Energy Assessment. Chapter 10 in, Global Energy Assessment: Toward a Sustainable Future. Cambridge University Press, Cambridge. 1888 pp. ISBN: 9781107005198.*	Buildings and attendant activities account for about 31% of global final energy demand and about one-third of energy-related CO_2 emissions and other pollutants. Efficient energy and energy efficient materials are critical to environmental sustainability. Technological and process innovations coming through have demonstratively resulted in reduced building energy consumption and CO_2 emissions in existing housing stock and also new builds. Huge scope exists to further enhance efficiency in building energy use through on-site and community-scale renewable energy strategy hence zero-greenhouse gas emissions can be achieved. *The message here is that technological and process innovation affords huge opportunity to decouple the building industry and energy consumption intensity, hence green-house gas emissions. The key message here is that while several policy instruments may be available, they need to be tailored or adapted to specificities or socio-economic and political realities of the country.*
	Janda, K.B., Killip, G. and Fawcett, T. (2014) Reducing Carbon from the "Middle-Out": The Role of Builders in Domestic Refurbishment. *Buildings, 4(4): 911-936.*	This study explored how builders respond to low-carbon housing refurbishment in both UK and France with the focus on how building expertise in low-carbon housing refurbishment is manifesting. While the two countries were found to have comparable long-term CO_2 emissions reduction strategy on the one hand, and on the other, they both have decided to drive CO_2 emissions through retrofitting or refurbishment. The building trade is comprised of general to specialist builders, each with different capacity to effect change and bring about low-carbon housing stock. The significance of this is in showing that top-down and bottom-up intermediaries should not be the only change actors to be the focus of policy. Building professionals are categorised as "middle actors" while policy makers are seen as "top down" actors, and homeowners and clients are seen as bottom-up change actors. While policy drive often concentrate on "top down" and "bottom up" actors to effect desired policy outcome, professionals are seen as having the capacity not only to mediate or effect change upwards, downward, and sideways along low-carbon retrofit supply chain. While in the UK, low-carbon retrofits were targeted at housing associations and those on low-income or receiving income support, those on income transfers, attracting non-professional building trade, the was different in France hence the

		involvement of building professionals and technological and process innovations attracted to the sector. It was found that the retrofit housing supply chain experience change effects from all directions, and the middle actors had the most accelerating effects. Rather than displace other change actors, the recommendation is for a mediating platform to be created.
		The message is that all stakeholders have a role to play in the lower-carbon housing strategy drive. This is particularly the case with building professionals who has the capacity to effect both technological and process innovations and deliver quality at all levels output, including physical work, design, and communication into policy.
	NFB (2019). Transforming Construction for a Low Carbon Future. ***https://www.builders.org.uk/documents/transforming-construction-for-a-low-carbon-future/***	Construction, however, has a greater role than most other sectors of the economy to play in reducing building energy consumption and Carbon emissions. The industry accounts for 10% of total UK carbon emissions and directly impacts 47% of all national emissions. The sector critical to UK government carbon reduction efforts, which justifies the particular focus it is receiving from policy makers. This study focuses on 'main contractors' as essential gatekeepers to a low-carbon future. Main contractors are seen as change drivers and when in partnership with the supply chain and their forward-thinking clients, they are best placed to affect the transition to a lower-carbon future a reality. The UK government reportedly spend £15 billion yearly on domestic housing sector and £5 - £10 billion on industrial and commercial sectors annually. ***The message here is that the UK government has tremendous powers to leverage lower-carbon housing stock and must not hesitate to use existing measures such as the certification scheme to effects, and at the same time, take proactive action to develop tools for accurate measure of carbon use to enable companies understand their carbon footprints and adopt carbon reduction measures.***
	Currie & Brown (2018). Cost of carbon reduction in new buildings.***https://www.cse.org.uk/downloads/file/cost-of-carbon-reduction-in-new-buildings.pdf***	UK has a legal commitment to reduce carbon emissions by 80% by 2050. Different options explored in new housing and non-domestic buildings together with associated costs and other factors relevant to the development of local planning policies. However, emphasis was placed on policy options that are specific and reflective of local priorities, viable as well as other

		considerations such as capacity to implement and deliver projects to policy. Attention to cost information as well as other relevant policy considerations must are critical to policy effectiveness in delivering carbon savings whilst protecting housing supply and reducing costs to household.
		Costs of scenarios involving a variety of policy options were considered looking at minimum levels of energy efficiency, onsite carbon savings and then the achievement of net zero carbon standards considering regulated energy or both regulated and unregulated energy. Results suggests that for an additional capital costs of 5-7%, it is possible to achieve a net zero regulated carbon emissions from a combination of energy efficiency and on-site carbon reductions.
		Key message here is that it is feasible to reduce energy demands and cut carbon emissions by decarbonising existing housing stocks using strategies and policies specific and reflective of local priorities. Policies must be well costed under different scenarios and informed by local peculiarities.
9. How to encourage the uptake of smart construction and support the use of robotic, off-site, and modular construction	Woodhead, R., Stephenson, P., & Morrey, D. (2018). Digital construction: From point solutions to IoT ecosystem. Automation in Construction, 93, 35-46.	The construction industry is in a transformational stage brought about by the emergence of disruptive technology and innovation.UK construction companies are not engaging with the transition with the speed witnessed in other advanced and emerging economies.
		The UK construction industry must appreciate the current transformational process brought about by disruptive technologies and stand the risks of becoming uncompetitive nationally and internationally. A stronger drive for Research and Development is advocated but a collaborative research is needed to understand the combination of policy-mix that will incentivise and encourage the uptake of smart innovative technologies as well as processes for efficient delivery of quality and sustainable built assets.
		Key message here is that it is feasible to reduce energy demands and cut carbon emissions by decarbonising existing housing stocks using strategies and policies specific and reflective of local priorities. Policies must be well costed under different scenarios and informed by local peculiarities.
	Kivimaa, P., Hyysalo, S., Boon, W., Klerkx, L.,	Intermediary actors (e.g. innovation funders, energy agencies, NGOs, membership organisations, or internet discussion forums)

		Martiskainen, M., & Schot, J. (2019). Passing the baton: How intermediaries advance sustainability transitions in different phases. *Environmental Innovation and Societal Transitions, 31*, 110-125.	operate at many levels to advance transitions. Integrating existing conceptual models on transition dynamics and phases and a typology of transition intermediaries to examine how intermediaries advance transitions in different phases, intermediary actors were found to be critical from predevelopment to stabilisation stage of transition. This was found to be particularly relevant to encouraging transition to heat pumps and low-energy housing. Intermediary functions change at various levels of transitions from "supporting experimentation and articulation of needs in predevelopment, to the aggregation of knowledge, pooling resources, network building and stronger institutional support and capacity building in acceleration". ***The message here is that encouraging transition, as being expected of UK construction industry to transit to sustainability do involve many intermediary actors and several stages of the transition process. This requires a holistic support and structures in place for delivering the support.***
		Housing, Communities and Local Government Committee, (24 June 2019) Modern methods of construction, HC 1831 2017–19.	The UK lacks adequate homes and meeting the government target necessitates using Modern Methods of Construction (MMC) in addition to the traditional methods of housing delivery. This involves innovating smart technologies and processes such digitalising designs, 3D printing, IoT as well as onsite construction processes thereby delivering faster and smarter housing and other infrastructure and services. The role of the government in speeding uptake of new technological innovation is clearly articulated. While new strategies and policies are necessary, there is scope within existing measures in currently in place move house building firms to embrace MMC, and these include the Home Builders' Fund; partnering with lenders, valuers, and developers to ensure mortgages are available for MMC buildings. ***The message here is that what it will take to effective move housing building firms to adopting prevailing technological and process innovations transcends the conventional form of support. All construction stakeholders must play their roles, including professional bodies as well as financial institutions to facilitate the market for MMC homes.***
		Fifeld, L. J., (2018). Hospital wards and off-site modular construction:	Modula construction are off-site manufactured and assembled on site, affording opportunities for purposed design and built incorporating several energy demand reductions. A modular thermally

	Summertime overheating and energy efficiency. ***Building and Environment, 141, pp. 28-44.***	lightweight, well insulated, naturally ventilated hospital building was constructed and found to consume 31% less energy and 21% less CO2 emissions respectively. However, some risks were identified, and these relates to overheating risks in relatively cool summer months. The recommendation was that the overheating risks should be resolved before wider adoption in other hospital schemes. ***The message here is that modern methods of constructions can deliver reduced energy and CO2 emissions but there are other sustainability attributes that should be actively sort, including thermal comfort and wellbeing.***
	Piroozfar et al. (2012). Design for sustainability: A comparative study of a customized modern method of construction versus conventional methods of construction. ***Architectural Engineering and Design Management, Volume 8, Number 1, 2012, pp. 55-75(21)***	Investigation of an offsite construction method offering customization against its conventional counterpart in a fairly controlled context using two educational buildings with customization strategy. The data was collected, collated, and analysed, and the environmental impact of two buildings was measured using two different open-source applications. The result shows that despite the higher standards required by law, which in return increases the environmental impacts, the new school building performed significantly better with a slightly lower environmental impact compared to conventional buildings. ***The message here is that even with conventional methods of construction, buildings consciously designed to sustainability attributes, irrespective of standards will out-perform conventional buildings in terms of natural resource consumption intensity and wider environmental impacts. Sustainable construction is a necessity in delivering low-carbon housing.***
	Mantesi E, Hopfe C, Konstantinos M, Glass J, Cook M. (201). Empirical and Computational Evidence for Thermal Mass Assessment: The Example of Insulating Concrete Formwork. ***Energy and Buildings 188-189 DOI: 10.1016/j.enbuild.2019.02.021***	Insulated Concrete Formwork (ICF) is a site-based Modern Method of Construction (MMC). As an MMC, ICF has several advantages: increased speed of construction, cost and defect reduction, safety, among others. Moreover, the ICF wall construction method has similar benefits to any other heavyweight structure (such as strength, durability, noise attenuation). However, its thermal performance is not yet well-researched and understood. Using computational analysis and empirical evaluation, the thermal performance of an existing ICF building and develop evidence about its transient thermal behaviour. The results demonstrate that the ICF fabric showed a slow response to changes in

		boundary conditions, providing a stable internal environment. The concrete core of ICF was found to act as a buffer to the heat flow, reducing transmission losses by 37% in contrast to a lightweight wall of equivalent insulation. This demonstrates environmental attributes inherent in MMC regarding its energy saving and carbon emissions reduction. ***The message here is that innovative modern methods of construction delivers more than the inherent direct sustainability qualities, the product quality elements ensure minimum wastes as incidents of defects are reduced to avoid huge post-construction correctional expenditure.***
	Mosca L, Jones K, Davies AC, Whyte J, Glass J. (2020). Platform Thinking for Construction. ***Transforming Construction Network Plus Digests – Series 2. Publisher URL: http://bit.ly/Platform-Thinking-for-Construction***	This offers clarification on the ongoing conversation around platform thinking in construction and reveals the benefits of adopting a platform as a strategy for driving technological and process innovations in the construction industry. The need for a platform to host '***… a digital process where a designer seeks to provide an optimum functional and aesthetic solution whilst being cognizant of and […]adhering to the rule set of an appropriate construction platform***' – is considered a necessary prerequisite for driving innovation in the construction industry. However, creating an appropriate platform is critical, as variations of platforms exist between, organisations, product, ecosystems, and market intermediary platforms. Suggestion was that a 'Platform Approach to Design for Manufacture and Assembly (P-DfMA)' be created to promote and embed MMC in UK construction. ***The message is that a platform of some form where likeminded individuals and businesses can interact and exchange ideas is essential for incubating and sustaining transition of the kind we are suggesting here where all stakeholders in MMC can effectively interact and exchange good practice.***
	Oti-Sarpong, K., (2019). Offsite manufacturing, construction, and digitalisation in the UK construction industry – state of the nation report. ***Cambridge Centre for Housing & Planning Research.***	Digitally enabled construction industry affords huge opportunities for national and international growth, and this will enable market advantages. Despite the obvious benefits, the uptake of digital technologies and modern methods of construction such as offsite manufacturing (OSM), remains low. Several factors are held to account for this, including the state of the economy, market dynamics, lack of business case, unclear policies,

	https://pdfs.semanti cscholar.org/43b2/b b6b983a639fe43d5a0 1132b3951090c1dd8. pdf	lack of incentives, non-adaptive regulatory frameworks, poor demand, organisational inertia, lack of capabilities and socio-cultural interpretations of value explain low uptake of MMC. The conclusion is that for MMC or OSM to take off in UK construction, the identified factors must be addressed. *The message here is that it will take a concerted effort to encourage uptake of new and innovative technology by UK construction firms despite the obvious benefits of doing so. Market conditions and demands for MMC housing coupled with incentives and cultural shifts for this to happen*.

Annex 6. Resources Identified by the Working Group on Land Use

ARI	Evidence and Resources
How can UK land use change better deliver multiple outcomes for people's health and prosperity in an inclusive and equitable way, i.e. balancing trade-offs and synergies around flood protection, carbon sequestration, green jobs, recreation, thriving biodiversity, clean water and air?	**Ongoing work to be aware of:** • Strategic Priorities Fund on Food Systems • Royal Academy of Engineering: Net-zero policy work • Royal Academy of Engineering: Sustainable Living Spaces • Royal Society work on agriculture and food • Centre for Ageing Better interest in housing design, involvement in Home of 2030 competition and accessible housing options and Centre for Ageing Better work on social infrastructure **On Land Values and Concentrated Ownership:** • Scottish Land Commission 2019 investigation into Issues Associated with Large Scale and Concentrated Land Ownership in Scotland (Glenn et al., 2019) • Roberts, C., Blakeley, G., and Murphy, L. 2018. A Wealth of Difference: reforming the taxation of wealth. Institute for Public Policy Research, Discussion paper, 26. • Corlett A, 2018. Passing on: options for reforming inheritance taxation, Resolution Foundation **On aligning agriculture with sustainable food systems for better public health:** • Poux, X and Aubert, P. M. 2018 'An agroecological Europe in 2050: multifunctional agriculture for healthy eating. Institute for Sustainable Development and International Relations • Lang, T. 2009 'Reshaping the Food System for Ecological Public Health' J Hunger Environ Nutr. 4(3-4): 315–335. • Marsden, T. 2010. Food 2030: Towards a Redefinition of Food? A Commentary on the New United Kingdom Government Food Strategy. The Political Quarterly, 81, 443-446 • Tilzey, M. 2000. Natural areas, the whole countryside approach and sustainable agriculture. Land Use Policy, 17, 279-294. **On multifunctionality, productivism and post-productivism:** • Marsden, T. & Sonnino, R. 2008. Rural development and the regional state: Denying multifunctional agriculture in the UK. Journal of Rural Studies, 24, 422-431 • Tilzey, M. & Potter, C. 2008. Productivism Versus Post-productivism? Modes of Agri-Environmental Governance in Post-Fordist Agricultural Transitions. In: Robinson, G. (ed.) Sustainable Rural Systems: Sustainable Agriculture and Rural Communities. Aldershot: Ashgate. • Phillipson J, Gorton M, Turner R, Shucksmith M, Aitken-McDermott K, Areal F, Cowie P, Hubbard C, Maioli S, McAreavey R, Souza-Monteiro D, Newbery R, Panzone L, Rowe F, Shortall S. The COVID-19 Pandemic and Its Implications for Rural Economies. Sustainability 2020, 12(10), 3973. • UKRI Landscape Decisions Research Programme https://landscapedecisions.org/

- Royal Society Food, Farming & Countryside Commission 'Our future in the land' https://ffcc.co.uk/assets/downloads/FFCC-Our-Future-in-the-Land.pdf
- Defra Environmental Land Management Tests and Trials Quarterly Evidence Report, July 2020
- Countryside and Community Research Institute COVID-19 and sustainable food systems: a shared learning resource http://www.ccri.ac.uk/COVID-19-food-system/
- Reed MS, Kenter JO, Hansda R, Martin J, Curtis T, Prior S, Hay M, Saxby H, Mills L, Post J, Garrod G, Guy JA, Proctor A, Whittingham M, Collins O, Stewart G. Social barriers and opportunities to the implementation of the England Peat Strategy : Final report. Newcastle upon Tyne: Newcastle University, Natural England and Defra, 2020.
- Strategic Priorities Fund on Landscape Decisions: Towards a new framework for using land assets.
- NERC-led Programmes include: Future of UK Treescapes; Valuing Nature; Biodiversity and Ecosystem Service Sustainability; Sustainable Aquaculture; UK Droughts and Water Scarcity; Understanding Effective Natural Flood management; Security of Supply of Mineral Resources; LOCATE and UK-SCAPE NC Programmes.
- BBSRC and NERC joint programmes Soil Security programme, SARISA, ASSIST, SARIC, UK Aquaculture Initiative
- UK Centre For Ecology & Hydrology land cover maps, Drought and Water resource portals.
- Strategic Priorities Fund Food Systems Programme
- Circular Economy Centres programme (depending on project portfolio)
- Phillipson J, Gorton M, Turner R, Shucksmith M, Aitken-McDermott K, Areal F, Cowie P, Hubbard C, Maioli S, McAreavey R, Souza-Monteiro D, Newbery R, Panzone L, Rowe F, Shortall S. The COVID-19 Pandemic and Its Implications for Rural Economies. *Sustainability* 2020, 12(10), 3973 Rural economies face particular challenges arising from COVID-19 but have also demonstrated resilience and adaptability in previous crises. Includes list of key policy and research questions for consideration around changes in household, business and supply chain behaviours in rural areas brought on by crisis and future recovery.

On shaping the research system for competitiveness and sustainability:
- Chataway, J., et al. (2006). "The governance of agro- and pharmaceutical biotechnology innovation: Public policy and industrial strategy." Technology Analysis & Strategic Management 18(2): 169-185
- Gaëtan Vanloqueren, Philippe V. Baret (2009) How agricultural research systems shape a technological regime that develops genetic engineering but locks out agroecological innovations Research Policy 38 971–983, doi:10.1016/j.respol.2009.02.008
- Albie Miles, Marcia S. DeLonge & Liz Carlisle (2017) Triggering a positive research and policy feedback cycle to support a transition to agroecology and sustainable food systems, Agroecology and

	Sustainable Food Systems, 41:7, 855-879, DOI: 10.1080/21683565.2017.1331179
	On agritech innovation and systemic change: • El Bilali, H. (2019). "The Multi-Level Perspective in Research on Sustainability Transitions in Agriculture and Food Systems: A Systematic Review." Agriculture 9(4): 74 https://doi.org/10.3390/agriculture9040074 • Klerkx, L. and S. Begemann (2020) "Supporting food systems transformation: The what, why, who, where and how of mission-oriented agricultural innovation systems." Agricultural Systems 184: 102901, https://doi.org/10.1016/j.agsy.2020.102901 • Ingram, J. (2018). "Agricultural transition: Niche and regime knowledge systems' boundary dynamics." Environmental Innovation and Societal Transitions 26: 117-135 https://doi.org/10.1016/j.eist.2017.05.001 **On regulatory dynamics (post-Brexit):** • Lydgate, E. et al (2019) Brexit food safety legislation and potential implications for UK trade: The devil in the details. UK Trade Policy Observatory https://blogs.sussex.ac.uk/uktpo/files/2019/10/UKTPO-Briefing-Paper-37.pdf • Lydgate, E. et al (2020) Toxic trade: how trade deals threaten to weaken UK pesticide standards, https://issuu.com/pan-uk/docs/toxic_trade_report_2020?fr=sM2MwNTExOTMxNQ • GEAP3 (2020) Genome editing in agriculture: Regulation in the United Kingdom after Brexit, available with other briefings at https://www.geap3.com/policy-hub
What is the role for UK land in supplying healthy, safe, sustainable and affordable food, and how can innovation boost productivity to transform the UK food and farming system?	• Royal Society work on agriculture and food • Benton, TG and Bailey, R 'The Paradox of Productivity: Agricultural Productivity Promotes Food System Inefficiency' (2019) 2 Global Sustainability 1. The principal policy focus for food on increasing agricultural productivity and liberalizing markets allowing globalized trade has led to growth in the supply of agricultural produce, more calories becoming available, and price declining but drives food waste, underpins diets creating malnourishment through obesity, and global competition incentivizes producers who can produce the most, cheaply, typically with environmental damage. Proposes refocusing away from yields per unit input, to the food system's overall productivity and efficiency – the number of people that can be fed healthily and sustainably per unit input. • Poux, X and Aubert, P. M. 2018 'An agroecological Europe in 2050: multifunctional agriculture for healthy eating. Institute for Sustainable Development and International Relations. Modelling indicates that Europe could transition from a food importing region to a food sufficient region while simultaneously reducing its area under agricultural land use and using less productive methods if it were to orient its agriculture towards healthy diets aligning with public health recommendations. • Lang, T. 2009 'Reshaping the Food System for Ecological Public Health' J Hunger Environ Nutr. 4(3-4): 315–335. Proposes that while previous policies needed to address underconsumption, today's challenges are a combination of over- under- and mal-

consumption, alongside increasing inequalities. Introduces a new paradigm of 'ecological public health' in which food links human and planetary health. Suggests 7 priorities for policy.

- Marsden, T. 2010. Food 2030: Towards a Redefinition of Food? A Commentary on the New United Kingdom Government Food Strategy. The Political Quarterly, 81, 443-446. Critique of UK government food strategy
- Tilzey, M. 2000. Natural areas, the whole countryside approach and sustainable agriculture. Land Use Policy, 17, 279-294. Highlights the dichotomy between productivity and conservation and suggests possible ways for better integrating food production and the environment
- Marsden, T. & Sonnino, R. 2008. Rural development and the regional state: Denying multifunctional agriculture in the UK. Journal of Rural Studies, 24, 422-431. Discusses possibilities for multifunctional agriculture which enhances the environment while providing livelihoods and food.
- Tilzey, M. & Potter, C. 2008. Productivism Versus Post-productivism? Modes of Agri-Environmental Governance in Post-Fordist Agricultural Transitions. In: Robinson, G. (ed.) Sustainable Rural Systems: Sustainable Agriculture and Rural Communities. Aldershot: Ashgate. Critiques the perception that Europe has moved towards a post-productivist era and argues that the policies which support conservation and livelihoods for some types of agriculture serve to justify continued and increased productivism (at the cost to the environment and livelihoods) in other areas.
- Phillipson J, Gorton M, Turner R, Shucksmith M, Aitken-McDermott K, Areal F, Cowie P, Hubbard C, Maioli S, McAreavey R, Souza-Monteiro D, Newbery R, Panzone L, Rowe F, Shortall S. The COVID-19 Pandemic and Its Implications for Rural Economies. *Sustainability* 2020, 12(10), 3973. Rural economies face particular challenges arising from COVID-19 but have also demonstrated resilience and adaptability in previous crises. Includes list of key policy and research questions for consideration around changes in household, business and supply chain behaviours in rural areas brought on by crisis and future recovery.
- UKRI Landscape Decisions Research Programme https://landscapedecisions.org/. Over 50 ongoing research projects all exploring the challenge of delivering better, evidence-based decisions for UK landscapes. Includes projects with a focus on developing new mathematical and modelling approaches as well as projects using arts and the humanities to generate new thinking around people's interactions with the landscape
- Royal Society Food, Farming & Countryside Commission 'Our future in the land' https://ffcc.co.uk/assets/downloads/FFCC-Our-Future-in-the-Land.pdf. The report makes fifteen recommendations for policy around healthy food systems, farming as a force for change and rural communities as a powerhouse for a fair and green economy
- Defra Environmental Land Management (ELM) Tests and Trials (T&T) Quarterly Evidence Report, July 2020. Summary report on

interim findings on ELM T&T programme focusing on delivery of public good provision from agricultural land.

- Countryside and Community Research Institute COVID-19 and sustainable food systems: a shared learning resource http://www.ccri.ac.uk/COVID-19-food-system/ Excellent resource with links to blogs and papers highly relevant across number of ARIs including on theme of animal health and zoonoses
- Reed MS, Kenter JO, Hansda R, Martin J, Curtis T, Prior S, Hay M, Saxby H, Mills L, Post J, Garrod G, Guy JA, Proctor A, Whittingham M, Collins O, Stewart G. *Social barriers and opportunities to the implementation of the England Peat Strategy : Final report.* Newcastle upon Tyne: Newcastle University, Natural England and Defra, 2020. Explores upland land management and how land managers view the barriers and opportunities to engaging with England Peatland Strategy. While money is important, the research showed that land managers are also attracted to schemes for other personal and social reasons, for example if schemes enable them to collaborate with others, contribute to their local community or engage in activities that increase their sense of personal connection to the landscapes they manage
- Strategic Priorities Fund on Landscape Decisions: Towards a new framework for using land assets; Strategic Priorities Fund on Food Systems; Assist (UK Centre For Ecology & Hydrology & Rothamsted) NC programme; Soil Security Programme; Signals in the Soil Programme.
- Industrial Strategy Challenge Fund Transforming Food Production programme
- GFS Resilience of the UK Food System in a Global Context (GFS-FSR) programme.
- Global Food Security Policy Lab Report "Multifunctional landscapes in the UK: tools for policy and practice"
- BBSRC/Global Food Security internal report on "Building back better for increased resilience of the UK food system to future shocks" (To be published soon).
- Nature Food comment piece by GFS-FSR Bob Doherty "Vulnerability of the United Kingdom's food supply chains exposed by COVID-19"
- BBSRC/Global Food Security internal report on "Building back better for increased resilience of the UK food system to future shocks".
- BBSRC strategically funded institutes – Rothamsted Research (The North Wkye Farm Platform, ASSIST, soils to nutrition, Insect Survey), John Innes Centre (Designing Future Wheat, Germplasm Resource Unit), The Roslin Institute (Blueprints for healthy animals, control of infectious diseases and improving animal production and welfare), The Pirbright Institute (enhanced host responses for disease control), Quadrum Institute, Earlham Institute (From genomes to food security) and Institute of Biological, Environmental and Rural Sciences (Resilient Crops)
- Agri-tech centres
- BBSRC led programmes – Strategic Priorities Fund Bacterial Plant Diseases, horticulture quality and food loss network,

	veterinary vaccinology network, animal welfare network, networks in vector borne disease research and BBSRC veterinary vaccinology strategy
	• Defra funded Genetic Improvement Networks
	• STFC Food Network, STFC Facilities including the ISIS Neutron Source, Central Laser Facility, Diamond Light Source, Scientific Computing Department, Hartree Centre, and Rutherford Appleton Laboratory Space
	• Social, Technological and Environmental Pathways to Sustainability Centre biotechnology research archive
	• Genome Editing and Agricultural Policy, Practice and Public Perceptions (GEAP3) network
	• UKRI Landscape Decisions Research Programme https://landscapedecisions.org/ Over 50 ongoing research projects all exploring the challenge of delivering better, evidence-based decisions for UK landscapes. Includes projects with a focus on developing new mathematical and modelling approaches as well as projects using arts and the humanities to generate new thinking around people's interactions with the landscape
	• Royal Society Food, Farming & Countryside Commission 'Our future in the land' https://ffcc.co.uk/assets/downloads/FFCC-Our-Future-in-the-Land.pdf The report makes fifteen recommendations for policy around healthy food systems, farming as a force for change and rural communities as a powerhouse for a fair and green economy
	• The EAT-Lancet Commission on Food, Planet, Health https://eatforum.org/eat-lancet-commission/
	• City University, London Centre for Food Policy - https://www.city.ac.uk/about/schools/health-sciences/research/centre-for-food-policy
	Other ongoing work to be aware of:
	• Agrifood hub https://www.n8agrifood.ac.uk
	• Reduction of food waste across the supply chain and in primary production / on farms. See e.g. POSTBrief - Food Waste in the Food System (forthcoming) and e.g. Bojana Bajželj and others, 'The Role of Reducing Food Waste for Resilient Food Systems' (2020) 45 Ecosystem Services 101140. See also Benton and Bailey (above) on the relationship between agricultural productivity and food waste. For critique of government policy on food waste see Bradshaw, 'England's Fresh Approach to Food Waste: Problem Frames in the *Resources and Waste Strategy*' (2020) 40(2) Legal Studies 321; Bradshaw, 'Waste Law and the Value of Food' (2018) 30 Journal of Environmental Law 311, arguing that food waste has been problematically framed in waste law and policy as a waste problem rather than a resource problem, in turn obscuring food's agricultural origins and productive context.
How can management of the UK's land use footprint in other countries reduce	• NERC supported Urgency Grants and Highlight topic ideas. • NERC COVID-19 workshops • UKRI Awards under the COVID-19 Rapid Response scheme

likelihood of zoonotic disease emergence along with improved sustainability outcomes?	• BBSRC, ESRC, MRC, NERC, FCDO and Defence Science and Technology Laboratory funded: Zoonoses and emerging livestock systems (ZELS) • STFC Rutherford Appleton Laboratory Space Date Centre • Defra Environmental Land Management (ELM) Tests and Trials (T&T) Quarterly Evidence Report, July 2020 Summary report on interim findings on ELM T&T programme focusing on delivery of public good provision from agricultural land
How can we deliver early warning systems to monitor signals in the environment relevant to public health and other societal outcomes?	• Signals in the soil Programme, • UK Centre For Ecology & Hydrology land cover maps and Water resource portal • NERC digital Environment programme. • Awards under the COVID-19 Rapid Response scheme, including projects around COVDI-19 in wastewater. • UK Animal and Plant Health strategy has a focus on early rapid detection • BBSRC Transformative Research Technologies highlight – Animal and Plant Disease • Industrial Strategy Challenge Fund – Transforming Food Production • FeedUK • Countryside and Community Research Institute COVID-19 and sustainable food systems: a shared learning resource http://www.ccri.ac.uk/COVID-19-food-system/ Excellent resource with links to blogs and papers highly relevant across number of ARIs including on theme of animal health and zoonoses
How can we deliver a coherent spatial strategy that balances and optimises land use between different areas of the UK?	• Royal Academy of Engineering: Sustainable Living Spaces • Royal Society work on environment and human health • Centre for Ageing Better interest in housing design, involvement in Home of 2030 competition and accessible housing options and Centre for Ageing Better work on social infrastructure • Centre for Hydrology and Ecology Catharine Ward Thompson: These have excellent models relevant to modelling current and future land use – Stefan Reis is a good contact there • Natural England rapid review of health and wellbeing benefits for Framework of Green Infrastructure Standards • Greenspace Scotland work on using parks and greenspace as generators of green energy – ParkPower • BBSRC/Global Food Security internal report on "Building back better for increased resilience of the UK food system to future shocks". (no programme delivers both the breadth and specificity of this ARI. However, the SPF on Landscape Decisions: Towards a new framework for using land assets seeks to address the conceptual requirements of a framework to address such questions • No programme delivers both the breadth and specificity of this ARI. However, the Strategic Priorities Fund on Landscape Decisions: Towards a new framework for using land assets seeks to address the conceptual requirements of a framework to address such questions • Reed MS, Kenter JO, Hansda R, Martin J, Curtis T, Prior S, Hay M, Saxby H, Mills L, Post J, Garrod G, Guy JA, Proctor A, Whittingham M, Collins O, Stewart G. *Social barriers and*

	opportunities to the implementation of the England Peat Strategy : Final report. Newcastle upon Tyne: Newcastle University, Natural England and Defra, 2020 Explores upland land management and how land managers view the barriers and opportunities to engaging with England Peatland Strategy. While money is important, the research showed that land managers are also attracted to schemes for other personal and social reasons, for example if schemes enable them to collaborate with others, contribute to their local community or engage in activities that increase their sense of personal connection to the landscapes they manage
Land ownership, governance and finance	• Natural Capital Planning Standard? • Joseph Rowntree Foundation review on Climate Change and Social Justice • Scottish Land Commission recommendations from taskforce on Vacant and Derelict Land • Scottish Land Commission 2019 investigation into Issues Associated with Large Scale and Concentrated Land Ownership in Scotland (Glenn et al., 2019). Large scale ownership is linked to but separate from concentrated decision-making power over land use. Suggests possible ways to reduce concentration of power over land use • Roberts, C., Blakeley, G., and Murphy, L. 2018. A Wealth of Difference: reforming the taxation of wealth. Institute for Public Policy Research, Discussion paper, 26. Problematizes existing taxation, with reference to land value tax and suggests alternatives. • A. Corlett A, 2018. Passing on: options for reforming inheritance taxation, Resolution Foundation. Problematizes existing inheritance taxation and suggests alternatives which would better serve the public interest • On Land Values and Concentrated Ownership: • Scottish Land Commission 2019 investigation into Issues Associated with Large Scale and Concentrated Land Ownership in Scotland (Glenn et al., 2019) • Roberts, C., Blakeley, G., and Murphy, L. 2018. A Wealth of Difference: reforming the taxation of wealth. Institute for Public Policy Research, Discussion paper, 26. Problematizes existing taxation, with reference to land value tax and suggests alternatives • A. Corlett A, 2018. Passing on: options for reforming inheritance taxation, Resolution Foundation Problematizes existing inheritance taxation and suggests alternatives which would better serve the public interest • Other ongoing work to be aware of **Subtopics:** **1. Community led housing, role of community land trusts in regenerating land/assets** • http://www.communitylandtrusts.org.uk/_filecache/a34/126/197-final-ncltn-written-evidence-to-dclg-select-committee-enquiry-into-future-of-housing-associations-revised.pdf

- http://www.communitylandtrusts.org.uk/_filecache/f28/204/635-final-ucltp-report.pdf
- https://www.cafonline.org/docs/default-source/charity-finance-and-fundraising/2540aclt-report-090119.pdf
- Role of cohousing - https://cohousing.org.uk/wp-content/uploads/2017/03/Cohousing-shared-futures-2016.pdf
- Grassroots innovations in housing http://eprints.whiterose.ac.uk/151251/
- Hope for housing https://www.birmingham.ac.uk/Documents/college-social-sciences/social-policy/HCRN/hope-for-housing-conference/hrc-report-06-11-18.pdf
- Wealth of work by David Mullens Birmingham Uni (housing and communities research) https://www.birmingham.ac.uk/research/chasm/research/housing-communities/index.aspx

2. Land ownership
- Work of Guy Shrubsole https://whoownsengland.org/about/
- Shared assets https://sharedassets.org.uk
- Comprehensive land allocation plan in CAT's zero carbon Britain report https://www.cat.org.uk/info-resources/zero-carbon-britain/

3. Land and data
- Shared assets land explorer https://sharedassets.org.uk/innovation/land-explorer/
- Leeds Open Data Institute common ground mapper https://odileeds.org/blog/2018-06-08-common-ground

4. Municipal finance
- Mark Davis https://baumaninstitute.leeds.ac.uk/research/financing-for-society/
- Community shares http://communityshares.org.uk

5. Innovations in housing and placemaking – small scale disruptive digital innovators
- Wikihouse https://www.wikihouse.cc
- Demodev https://birmingham.impacthub.net/mission/demodev/
- Built in common and mass bespoke https://builtincommon.org
- We can make Bristol https://wecanmake.co.uk

6. Devolved issues
- Centre For Local Economic Strategies report Northern Ireland https://cles.org.uk/publications/from-coronavirus-to-community-wealth-building-back-better-in-northern-ireland/
- Wales one planet guidance https://gov.wales/one-planet-development-practice-guidance
- Scotland Community right to buy for sustainable development: https://www.cms-lawnow.com/ealerts/2020/05/the-community-right-to-buy-for-sustainable-development-key-points-for-landowners-and-tenants

Annex 7. Resources identified by the Working Group on The Future of Work

ARI 1: Preventing and reducing overcrowding on commutes and in the workplace and supporting active travel choices and reduced transport capacity.	
Resource	**Key Messages**
National Engineering Policy Centre (2020) rapid review of the engineering approaches to mitigate the risk of COVID-19 transmission on public transport.	Engineering solutions can help reduce the risk of transmission on public transport and at interchanges – there are specific challenges depending on the mode and design constraints of the carriages.

ARI 3: Health and safety of homeworking across age-groups.	
Resource	**Key Messages**
Pope, M.H., Lim Goh, K., & Magnusson, M.L. (2002). Spine Ergonomics. Annual Review of Biomedical Engineering. Vol. 4, p49. ONS (2020a). Coronavirus and homeworking in the UK labour market: 2019. https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/coronavirusandhomeworkingintheuklabourmarket/2019#ages-of-homeworkers (Accessed July 2020). Bevan S., Mason B. & Bajorek Z. & (2020). Institution of Employment Sciences Working at Home Wellbeing Survey: Interim findings. https://www.employment-studies.co.uk/resource/ies-working-home-wellbeing-survey (Accessed July 2020). ONS (2020b). Coronavirus and the social impacts on Great Britain: 17 July 2020, Opinions and Lifestyle Survey (COVID-19-19 module). https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandwellbeing/bulletins/coronavirusandthesoci	**Existing evidence** Recent surveys before and during the COVID-19 pandemic provide us with evidence on the prevalence of home working in Great Britain. For example, 1 in 20 workers reported working mainly from home prior to the COVID-19 pandemic in 2019, with older workers two and half times more likely to be working from home than younger workers (ONS, 2020a). COVID-19 has significantly increased the frequency of homeworking, and whilst homeworking numbers have fallen since the easing of the lockdown began, 27% of working adults were still working at home exclusively in the week to 12 July 2020 (ONS, 2020b). We also know that some of the features of home working, such as fixed postures and prolonged seating, are risk factors for musculoskeletal (MSK) conditions (Pope, Lim Goh & Magnusson, 2002). Emerging evidence also points to health difficulties home workers are currently experiencing, however it is difficult to separate out the potential contributions of home working from other aspects of the wider COVID-19 pandemic and associated lockdown restrictions to these experiences. The Institute for Employment Studies has carried out a survey of homeworkers during the pandemic. The sample for this survey was relatively small and self-selected, but interim findings can still provide an indication of some of the potential health issues that have been experienced. For example, more than half reported new aches and pains, such as neck pain (58%), shoulder pain (56%) and back pain (55%) compared to normal, with effects on health. Behaviours and sleep also reported. Three quarters of respondents also reported that their employer had not carried out a health and safety risk assessment of their

alimpactsongreatbritain/17july2020 (Accessed July 2020).	homeworking arrangements (Bevan, Mason & Bajorek, 2020). **Future evidence priorities** The evidence base in this area could be strengthened by research which explores: Longer term home working trends and employer intentions - are we now seeing a permanent step change in homeworking? Practical methods of minimising the risk of homeworking to health, including the role of occupational health advice and interventions for home workers, and to support employers to support the health of homeworking staff.
Falkingham et al; Centre for Population Change briefing (*2020*). *Older and home alone in lockdown: how has support from family, friends and neighbours changed?* *http://www.cpc.ac.uk/docs/2020_PB52_Older_and_home_alone_in_lockdown.pdf*	The majority of older people received support from the wider community. During the pandemic lockdown, a significant proportion of older people received an increased level of help from existing caregivers or received support from new caregivers. This was especially the case amongst those living alone or with a partner also aged 70 and over. However, there is also evidence that older people with difficulties in performing key activities of daily living faced a higher risk of receiving less care and support during the lockdown, raising the spectre that some older people are not receiving adequate social care.
Gayer-Anderson, C. et al (ESRC Centre for Society & Mental Health, King's College London, 2020). https://esrc.ukri.org/files/news-events-and-publications/evidence-briefings/impacts-of-social-isolation-among-disadvantaged-and-vulnerable-groups-during-public-health-crises/	Overall, there is a relatively small amount of research that has considered the impacts of social isolation on vulnerable, disadvantaged, and marginalised populations in the context of pandemics and other public health crises. Most of this research concerns health care workers and children and adolescents. For some groups, e.g. refugees, the homeless, and women in abusive relationships, we found no or few (e.g. minority ethnic groups) relevant studies.

ARI 4: Supporting flexible and home-working practices, including employer responsibilities, working regulations and required infrastructure.

Resource	Key Messages
Franche, R-L., Cullen, K., Clarke, J., Irvin, E., Sinclair, S., Frank, J., Institute for Work & Health (IWH) & Workplace-Based RTW Intervention Literature Review Research Team (2005). Workplace-based return-to-work interventions: a systematic review of the quantitative literature. Journal of Occupational Rehabilitation. Vol. 15, p607.	**Existing evidence** Evidence in this area generally relates to workplace accommodations for people with health conditions and disabilities. This evidence suggests that effective workplace accommodations can help shorten the length of workplace absences and/or increase the job security of ill or disabled employees with physical conditions. (Franche et al., 2005; Nevala et al., 2015; Padkapayeva, et al., 2017). Beyond work productivity and employment outcomes, working with accommodations also protects quality of life, and enhances attributes or factors which support

DWP (2014). Health and wellbeing at work: a survey of employees. https://www.gov.uk/government/publications/health-and-wellbeing-at-work-survey-of-employees. (Accessed July 2020). DWP (2015). Understanding the journeys from work to Employment and Support Allowance (ESA). https://www.gov.uk/government/publications/understanding-the-journeys-from-work-to-employment-and-support-allowance. (Accessed July 2020). Nevala, N., Pehkonen, I. Koskela, I., Ruusuvuori, J. & Anttila, H. (2015). Workplace accommodation among persons with disabilities: a systematic review of its effectiveness and barriers or facilitators. Journal for Occupational Rehabilitation. Vol 25, p432. Padkapayeva K., Posen A., Yazdani A., Buettgen, A. Mahood, Q., & Tompa, E. (2017). Workplace accommodations for persons with physical disabilities: evidence synthesis of the peer-reviewed literature. Disability and Rehabilitation. Vol. 30 (21), p 213 Lindsay, S., Cagliostro, E. & Carafa, G. (2018). A systematic review of workplace disclosure and accommodation requests among youth and young adults with disabilities. Disability and Rehabilitation. Vol. 40 p2971.4.	both physical health (improved symptom management, reduced fatigue) and psychological health (improved self-efficacy, social support, and reduced stress) (Lindsay, Cagliostro & Carafa, 2018). Systematic reviews have described the barriers and facilitators of using and implementing work accommodations provided to disabled people. Successful adjustments are bespoke, flexible, on-going, agreed collaboratively between employer and employee, and implemented as part of a package of support for the employee (Nevala et al., 2015). UK survey evidence shows that the vast majority of employees with disabilities or health conditions who had received accommodations report these had been helpful (DWP, 2014; DWP, 2015). Yet, employees report that just over half (52%) of adjustments actually helped them stay in work longer (DWP, 2015). While the Equality Act 2010 introduced an employer duty to make reasonable adjustments for disabled staff, access to and the implementation of work adjustments for employees appears to be inconsistent, especially for people with mental health conditions. Survey evidence indicates many disabled employees don't receive adjustments that could help them successfully stay in work. In a survey, 42% of employees with health conditions reported receiving any workplace accommodations (DWP, 2014). Likewise, 43% of Employment and Support Allowance claimants previously in work reported not having received any accommodations before leaving work (DWP, 2015). **Future evidence priorities** The evidence base in this area could be strengthened by research which: • Provides more in-depth descriptions of experiences of adjustments and accommodations among employees with disabilities and health conditions. • Undertakes more rigorous evaluations of the effectiveness and cost effectiveness of workplace accommodation practices, and interventions to help overcome barriers to implementation. • Examines the effectiveness of different work adjustments, accommodations and support for people with mental health conditions specifically.
Baert, S. et al The COVID-19 Crisis and Telework: A Research Survey on Experiences, Expectations and Hopes IZA (Discussion Paper 13229, 2020)	Flemish workers foresee the COVID-19 crisis as making teleworking (85%) and digital conferencing (81%) much more common in the future, at least in Belgium. However, those with resident children are less satisfied with the increased teleworking. Following the same trend, more than one in five experiencing

	increased time spent teleworking (during the COVID-19 crisis) report more conflicts with their housemates.
https://covid-19.iza.org/wp-content/uploads/2020/05/dp13229.pdf	
Benzeval, M. et al Understanding Society Working Paper Series 2020-11 *Briefing note COVID-19 survey: health and caring* https://www.iser.essex.ac.uk/research/publications/working-papers/understanding-society/2020-11	The health and caring section of the Wave 1 COVID-19 survey covered five broad topics: • Experience of COVID-19 symptoms, testing and hospitalisation. • Use of health services for long-term health conditions. • Mental health and loneliness, using the same scales as the *Understanding Society* main survey so change can be investigated. • Health behaviours, also using scales carried on the main survey. • Reciprocity – an adapted version of the 'caring' module from the family networks section in main survey asking about receipt and giving of care and how this has changed during pandemic. In this briefing we take a first look at the health data, where appropriate comparing with data from Wave 9 (2017/18) of the *Understanding Society* main survey.
Chung, H., & Van der Lippe, T (eds) (2018/forthcoming). Flexible working work life balance and gender equality. https://link.springer.com/article/10.1007%2Fs11205-018-2025-x	Flexible working/home working can potentially traditionalise gender roles, penalizing women further – increasing the gender pay gap. To reduce this, ensure fathers are also considered in their roles as a carer (including increasing ear-marked well paid paternity leave to change gender norms) – and ensure women who work flexibly do not get penalized when doing so. Change in organizational culture is necessary.
Chung, H. (2018/forthcoming). <u>Gender, flexibility stigma, and the perceived negative consequences of flexible working in the UK</u>. *Social Indicators Research*	Flexibility stigma prevalent in the UK stigmatizing mothers most. Highlights the need to ensure protection against such discrimination of flexible workers – possibly through labour law + campaigns on the productivity outcomes of flexible working.
Chung, H, Seo, H, Forbes, S and Birkett, H. (2020) <u>Working from home during the COVID-19 lockdown: Changing preferences and the future of work.</u> Canterbury, UK: University of Kent.	Survey of workers during mid lockdown (mid-May – mid June) show how working from home has expanded – workers were able to work effectively/prioritizing work during this period. Yet more support especially for equipment/tools are needed and workers miss social interaction with colleagues. Working from home during this time has also been experienced unequally – with women carrying out the triple tasks of work/care/schooling more than fathers – which emphases need of ensuring managers support fathers in their caring roles to ensure gender equality.
Sectoral variation and inequalities Grey resources – Timewise have produced several recent	Important to distinguish between employer- and employee-driven flexible work. Job quality an issue. Some sectoral work is relatively more constrained in time and place. Obstacles around job design and

reports focusing on sectors where shift-based work is common, and where remote working provides a challenge: • Social Care • Retail • Teaching • Nursing More academic studies which complement this work include Charlesworth et al. (2015) on social care; Smith and Elliott (2012) on retail.	adoption of flexible work in shift working and low-paid jobs, albeit not insurmountable ones. Lack of advice for employers: large policy-practice gap (more broadly verified by Budjanovcannin, 2018); suggestions that managers gatekeep access to flexible work (Atkinson, 2011; Michielsens et al., 2014), creating a marginalisation of flexible work for some employees. Significant in the context that studies have repeatedly identified lower-skilled workers as having reduced access to flexible working (Chung, 2017; Warren and Lyonette, 2018). Lott and Chung (2016) (using German data) found that flexible work had positive income gains only for men (partly due to men and women's different motivations in accessing flexible working), contributing to organisational gender inequalities.
Age and flexible working Grey resources: Chartered Institute of Personnel and Development (2015) *Managing an Age-Diverse Workforce: Employer and Employee Views*, https://www.cipd.co.uk/Images/managing-an-age-diverse-workforce_2014_tcm18-10838.PDF	Ageing is a relatively new human resource management issue for organisations, and flexible working a key component of this. Flexible working regarded as a key tool by employers to keeping older workers in post for longer. But lack of training of employers around managing age-diverse teams.
Smeaton, D. and Parry, J. (2018) *Becoming an Age-Friendly Employer: Evidence Report*, Centre for Ageing Better. https://www.ageing-better.org.uk/sites/default/files/2018-09/Being-age-friendly-employer-evidence-report.pdf Separate employer toolkit for employers developed, based on the same evidence.	Flexible work is one of the 3 key components of the report, which is written from the perspective of what employers can do, and what works. The emphasis is upon good quality flexible work that enables older workers to continue working for longer around diverse circumstances. Highlighted a large shortfall of flexible working opportunities in relation to demand; significant sectoral variations; and a lack of training for managers around flexible job design. Areas for development in employer practice highlighted as: flexible hiring, building the diversity of flexible working options available to employees, and supporting managers' capacities. Prior to COVID, age patterning among working from home – raised among the over 60s, and particularly amongst men (AgeUK, 2012).
Grey resources – Organisation for Economic Co-operation and Development (OECD) policy brief on **home-based entrepreneurship**: Reuschhke, M. & Domecka, M. (2018) *Policy Brief on Home-Based Businesses*, OECD SME	Self-employment is a significant but overlooked component of UK homeworking. Gender and socio-economic issues. Home-based businesses experience more challenges accessing business support infrastructure. Need to strengthen evidence base.

and Entrepreneurship Papers No.11.	
Academic paper, using Understanding Society dataset: Reuschke, D. (2019) 'The subjective well-being of homeworkers across life domains', *Environment and Planning A: Economy and Space*, 51 (6):1326-1349	Subjective well-being of homeworkers is differentiated around employment circumstances. Wellbeing of home-based entrepreneurs can be complicated by work-life balance challenges. Chung (2017) uses Workplace Employment Relations Study data to link flexible working to increased work-life tension.
Managerial issues around flexible working Grey literature – flexible working in the civil service: survey of 1,600 UK civil servants: Jones, L. and Jones, V. (2019) Flexible working: myth or reality? Research and recommendations from the FDA and the Global Institute for Women's Leadership at Kings College London.	UK's civil service has committed to becoming its most inclusive employer by 2020, but the report identifies key issues which are limiting progress around flexible work: part-time working flagged as impeding career progress and creating work-life balance conflict (see Tomlinson(2007) on the normative assumption of full-time workers in career structures); flexible working become more difficult for those working long hours. Need for: improved training for line managers to support flexible working; more engagement with team approaches to flexible working. Findings tie in with broader findings that managers regard flexible workers are more challenging to manage (Conley and Jenkins, 2011), and that flexible workers are regarded as less committed and difficult to place in 'long hours culture' organisations (Corby and Stanworth, 2009; Tomlinson et al, 2013).
Grey literature: Parry, J. (2017) Employers, the right to request flexible working and older workers, Research Briefing, University of Southampton https://www.southampton.ac.uk/ publicpolicy/support-for-policymakers/policy-projects/parry-flexible-working.page	Research conducted in the early years of the universalisation of the right to request flexible work legislation, looking specifically at its effect upon employers' experiences of managing older workers focusing on local government and third sector. Key challenges identified: - uneven work practices around flexible working. - pockets of managerial resistance. - employer support needs around job redesign. - and that a business rationale in decision making can disadvantage the very workers who stand to gain most from flexible working. In the contest of the broader national policy agendas around extending working lives and promoting active ageing, which flexible work complements, the research raises a number of unresolved policy issues.

ARI 5: What new and better approaches are there for delivering joined-up, tailored and personalised health and work support? How can we effectively engage employers, health professionals and other stakeholders to improve work and health outcomes?	
Resource	**Key Messages**
Bond, G.R., Drake, R.E. & Becker, D.R., 2008. An update on randomized controlled trials	**Existing evidence** One stream of studies is concerned with employment support or vocational support to help people with health

of evidence-based supported employment. Psychiatric rehabilitation journal, 31(4), p280.

Hillage J., Rick J., Pilgrim H., Jagger N., Carroll C. & Booth A. (2008) Review of the Effectiveness and Cost Effectiveness of Interventions, Strategies, Programmes and Policies to Reduce the Number of Employees who Move from Short-term to Long-term Sickness Absence and to Help Employees on Long-term Sickness Absence Return to Work. Brighton: Institute of Employment Studies, University of Sussex; 2008.

Bond, G. R., Drake, R. E. & Becker, D. R. 2012. Generalizability of the Individual Placement and Support (IPS) model of supported employment outside the US. World Psychiatry, 11, p32.

Coleman, N., Sykes, W. & Groom, C. (2013). What works for whom in helping disabled people into work? Published report by DWP. Working paper: 120. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/266512/wp120.pdf (Accessed July 2020).

Van Stolk, C., Hofman, J., Hafner, M. & Janta, B. (2014) Psychological wellbeing and work: improving service provision and outcomes. Published report for DWP. https://www.gov.uk/government/publications/psychological-wellbeing-and-work-improving-service-provision-and-outcomes (Accessed July 2020).

Kenning, C., Lovell, K., Hann, M., Agius, R., Bee P.E., Chew-Graham C, et al. (2018). Collaborative case management to aid return to

conditions or disabilities move into employment. Individual Placement and Support (IPS) is a key example of vocational support for people with health conditions or disabilities. Originally designed for people with severe mental illness, IPS is implemented to a fidelity model, and has been shown to have a positive effects on employment and health related outcomes, such as reduced incidences of hospitalisation (Bond, Drake & Becker, 2008; Bond, Drake & Becker, 2012). There is a good case for this intervention on the basis of therapeutic outcomes for people with severe mental health illness, but the intervention has not been tested widely for other cohorts. In addition, employment outcomes reported in existing studies are generally less stringent than those used for evaluations of UK government programmes, which limits the capacity to make a value for money case comparable to other employment programmes in the UK. New trials in England (for example in Sheffield City Region and the West Midlands Combined Authority) are underway to provide evidence on the effectiveness of IPS for wider cohorts in the UK.

Another stream of studies is concerned with interventions which help to support individuals on long-term sickness absence to return to work (Hillage et al., 2008). For example, Kenning et al. (2018) undertook a pilot study of a multi-component intervention for people on sickness absence that aimed to address multiple needs. It included a workplace component and was supported by medical intervention where needed. Features included patient-centred assessments and care plans, interaction between employee, case manager, employer and GP/occupational physician and signposting to other services and support. However, the pilot study struggled to engage employers in intervention and recruit enough participants. This is a general challenge for interventions which require some collaboration with employers.

Future evidence priorities
The evidence base in this area could be strengthened by research which focuses on:
- Novel approaches to vocational support for people with health conditions or disabilities, particularly approaches that involve a range of parties alongside individuals, such as employers, healthcare professionals and employment support providers.
- theoretically informed work to specify the components of interventions and study how they might be varied or combined.
- Whether and how interventions support health equity and equality across groups, including take

work after long-term sickness absence: a pilot randomised controlled trial. Public Health Research. Vol. 6 (2).	up, support received, experience of interventions and outcomes achieved. • Methods to improve the capability of actors in different roles that play a part in delivering vocational support in particularly in NHS, occupational health sector and welfare system.

ARI 6: What are the current and future trends in disabilities and health conditions that working-age people face that require targeted policy measures to improve employment, health and wellbeing outcomes?

Resource	Key Messages
Waddell G & Aylward M. (2010). *Models of sickness and disability applied to common health problems.* London: Royal Society of Medicine Press. Spiers, N., Bebbington, P., McManus, S., Brugha, T.S., Jenkins, R. & Meltzer, H. (2011) 'Age and birth cohort differences in the prevalence of common mental health disorder in England: National Psychiatric Morbidity Surveys 1993 – 2007' British Journal of Psychiatry 198; p479. Fylan B, Fylan G F and Caveney L. (2012). GPs' perceptions of potential services to help employees on sick leave return to work. DWP Research Report No 820. McManus S., Mowlam, A., Dorsett, R., Stansfeld, S., Clark, C., Victoria, B., Wollny, I., Rahim, N., Morrell, G., Graham, J., Whalley, R., Lee, L. & Meltzer, H. (2012). *Mental health in context: the national study of work-search and wellbeing.* DWP Research Report 810. NHS Digital (2014). Adult Psychiatric Morbidity Survey: Survey of Mental Health and Wellbeing, England, 2014. https://digital.nhs.uk/data-and-information/publications/statistical/adult-psychiatric-morbidity-survey/adult-psychiatric-morbidity-survey-survey-of-mental-health-	**Existing evidence** The most common types of health conditions affecting work participation include mental health conditions like anxiety and depressive disorders, musculoskeletal conditions, and cardio-respiratory conditions (Waddell and Aylward, 2010), also common reasons for years lived with disability in England (Newton et al., 2015). The prevalence of common mental health conditions in adults has been rising slightly in recent decades. According to the Adult Psychiatric Morbidity Survey series, the proportion of adults in England with a common mental disorder rose from 15.5% in 1993 to 18.9% in 2014 (NHS Digital, 2014). Furthermore, the proportion of incapacity benefits claimants with a mental health problem rose over considerably over the 1990s and by the end of the decade, mental and behavioural disorders surpassed musculoskeletal disorders as the most common primary health conditions among incapacity benefits claimants. There is indicative evidence that mental health problems are perceived to be more challenging to manage than other conditions even among GPs (Fylan et al., 2012). In addition, by their very nature, mental health problems mean that people will tend to have a more negative world view which erodes beliefs and can affect work outcomes (McManus et al., 2012). **Future evidence priorities** This would explore the social epidemiology of common health conditions among working age people, particularly with reference to work, for example: • Investigating obesity as a cause and sequelae of work disability. • The direct and indirect effects of the COVID-19 pandemic on rates of mental disorders, cardio-respiratory conditions and musculoskeletal conditions among working age people. • The relationship between morbidity and functional capability (for work and other

and-wellbeing-england-2014 (Accessed July 2020). Newton, J., Briggs, A.D.M., Murray, C.J.L., Dicker, D., Foreman, K.J., Wang, H. et al. (2015). Changes in health in England, with analysis by English regions and areas of deprivation, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013, The Lancet, 386: p2257.	activities) across the lifecourse, and any variation by cohort; The role of healthcare services in influencing trends in common health problems as they affect employment outcome, for example, considering access, experience and outcomes among working age patients.
Disability Focus Bandosz, P. et al OP45 (2019) 'The Potential Impact of Diabetes Prevention on the UK Burden of Dementia and Disability'. Journal of Epidemiology and Community Health, 73(1). (Oral Presentation reported in journal) https://jech.bmj.com/content/73/Suppl_1/A22.1.abstract	The authors used a Markov model to predict trends in Type 2 diabetes, cardiovascular disease and dementia to 2060 drawing on the English Longitudinal Study of Ageing data. The modelling showed a predicted 26% increase in type 2 diabetes by 2060. If this occurs, then this will lead to substantial increases in dementia and disability, and the authors recommend the enhancement of prevention policies.
Disability Focus Baumberg, B. (2015) 'From impairment to incapacity – educational inequalities in disabled people's ability to work'. Social Policy & Administration, 49 (2): 182-198	This qualitative study of disabled working people in England highlights the link between education and impairment; those with higher levels of education are more able to avoid incapacity through workplace flexibility, adjustments or changing jobs. Education is linked with job flexibility; those with lower levels of education find it harder to get suitable work and therefore became incapacitated. The author argues that some bodies such as the Organisation for Economic Co-operation and Development claim that there has been a policy failure which incentivises people to claim incapacity benefits reflective of an economic model of rational decision-making. Equally, the biopsychosocial model argues that people have been led to believe they are incapable of work and hence become dependent on benefits. Conversely, it has also been noted that weak labour demand constrains choice. In this study, the author focuses on the role of education. The interviews showed that some people with impairments were able to find non-disabling work environments through job flexibility, adjustments or moving to a more suitable job. However, there was a sizeable grey area where people were struggling with impairments that affected their work. Employers were generally sympathetic for temporary sickness but less so for chronic disability leaving many in the study 'struggling on' in a partly disabling environment. The study concludes that education plays a key role in creating choices and options.
Disability Focus Beatty, J. et al. (2019) 'On the treatment of persons with	This review of 88 empirical articles finds that the extant research base has a number of limitations, including missing differentiation between disability

disabilities in organizations: a review and research agenda'. Human Resource Management, 58 (20): 119-137.	populations, over-reliance on available datasets, predominance of single-source, cross-sectional data and neglect of individual differences and identities.
Disability Focus DWP (2020) The Employment of Disabled People. 24th March 2020. Annual overview. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/875199/employment-of-disabled-people-2019.pdf	In the UK, the number of disabled people in work is increasing and the gap between disabled and non-disabled is closing. 4.4m disabled people are in employment out of a total of 8.1m disabled people of working age, representing 54.1% of disabled people. Disabled people move out of work at twice the rate of non-disabled and workless disabled people move into work at around one-third of the rate of their non-disabled peers. 18% of working age people in the UK report a disability. The gap between employment rates increases with age. The most common main health conditions reported by disabled people of working age were (in descending order): depression or anxiety; musculoskeletal conditions; other health problems or disabilities; mental illness; chest or breathing problems, progressive illness; digestive problems; heart problems, diabetes; learning difficulties. Employment rates for those with musculoskeletal health conditions were higher than for those with a mental health condition. Over half of disabled people in employment have more than one health condition and employment rates declined with number of conditions. Regionally, the highest employment rates for those with disabilities are: South East; South West; East of England. Disabled people are more likely to work in human health and social work activities, wholesale and retail trade or education: 41.2% of disabled workers.
Disability Focus Guzman-Castillo, M. et al (2017) 'Forecasted trends in disability and life expectancy in England and Wales up to 2025: A modelling study', The Lancet, 2 (7): 307-313. (Journal article) https://www.sciencedirect.com/science/article/pii/S2468266717300919	The paper presents the first longitudinal empirical modelling of disability trends in the UK and examines a prediction of population trends in relation to life expectancy and disability focusing on individuals aged 35-100. The study shows increasing numbers of people aged 65+ (from 10.4m to 12.4m) with an increase in the number living with disability by 25%. The study focuses in particular on cardio-vascular disease, dementia and functional impairment. Although primarily relevant in the context of the health of older adults, there are implications of these predictions for those in employment, giving the rising retirement age. Cardio-vascular disease and dementia share risk factors (poor diet, smoking, high alcohol consumption, hypertension, diabetes and physical inactivity) and the authors recommend investment in prevention policies which would also be relevant for employers.
Disability Focus Hatton, C. (2018) 'Paid employment amongst adults with learning disabilities receiving social	The article draws on data from NHS Digital adult social care statistics to explore paid/self-employment for 18-64 years adults with learning disabilities known to social care. In 2016-17 5.7% were in

care in England: trend over time and geographical variation'. Tizard Learning Disability Review, 3 April, 23(2). https://www.emerald.com/insight/content/doi/10.1108/TLDR-01-2018-0003/full/html	employment/self-employed with most working fewer than 16 hours per week. Rates of employment do not appear to be growing over time.
Disability Focus Jones, M., Davies, R. and Drinkwater, S. (2018) 'The dynamics of disability and work in Britain'. The Manchester School, 86 (3): 279-307.	The authors study the link between work-limited disability and labour market outcomes using the extended panel element of the Local Labour Force Survey 2004-10. They find that disability onset has a significant negative impact on employment, and this widens cumulatively post-onset, but that the effect of disability exit (i.e. the end of the disability) is modest. The impact of disability is greater for men and older workers, and the impact is also greater for those with mental as opposed to physical health problems. Heterogeneity of disability was also important. The authors conclude that government policy should focus on reducing the risk of disability onset and/or supporting individuals to retain work at this time.
Disability Focus ONS (2020) https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/disability/articles/improvingdisabilitydataintheuk/2019	Disability is defined as when someone 'has a self-reported long-standing illness, condition or impairment that causes difficulty with day-to-day activities'. Between 2013-19 the disability employment gap has reduced, 53.2% of disabled people are in employment. Those with severe or specific learning difficulties are the least likely to have a degree (7%). Data on the educational experiences and outcomes for disabled children across the UK are lacking. The employment gap between disabled and non-disabled is greatest for those with learning difficulties and mental illness. More disabled people work part-time; women are most likely to experience a pay gap. The median pay for disabled people is consistently lower than for non-disabled. Older disabled adults experience an increasing employment gap. There is a need for better data, and a harmonized measure of disability. ONS are currently undertaking research to address some evidence gaps notably around the outcomes for disabled people.
Disability Focus Scope (undated) https://www.scope.org.uk/media/disability-facts-figures/	3.7m disabled people are in work (19% of working age adults are disabled); they are more than twice as likely as non-disabled to be unemployed.
Disability Focus Trades Union Congress (2019) Disability Employment and Pay Gaps 2019. Report. https://www.tuc.org.uk/sites/default/files/2019-11/Disability_gaps_2019.pdf	The study found that the disability employment gap is around 30% and the disability pay gap is around 15.5%. The pay gap is increasing and disabled women are most affected. Only around 52% of disabled people of working age are in employment. ONS data show that those groups with lowest employment rates are: 'learning difficulties' (15% in employment); 'speech impediments' (20% in employment); 'epilepsy' (34% in employment);

	'mental illness, phobias or panics' (34% in employment); 'impairments linked to arms or hands' (39% in employment).
Stress and Mental Health Focus The Advisory, Conciliation and Arbitration Service (ACAS) (2019) 'Stress and Anxiety at Work: Personal or Cultural?' 1 May 2019. ACAS policy document based on health at work survey by YouGov. https://www.acas.org.uk/stress-and-anxiety-at-work-personal-or-cultural	From a survey of 2000 working adults, 2/3 of employees have felt stressed and/or anxious about work in the past 12 months, including 76% of under-35s. Only 8% say their organization is 'very good' at preventing employee anxiety/stress. Most common causes of stress are workload (60%), management (42%) and balancing home/work life (35%). 33% say a reduced workload, 26% say better flexible working opportunities and 23% more role clarity would help with stress/anxiety.
Stress and Mental Health Focus Bhui, K. et al. (2016) 'Perceptions of work stress causes and effective interventions in employees working in public, private and non-governmental organisations: a qualitative study'. *British Journal of Psychology Bulletin,* 40(6): 318-325. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5353523/	A qualitative study of work stress involving 51 interviews in a range of organisations. The study highlights evidence that 440,000 people in the UK have work-related stress, depression or anxiety, with 9.9 million working days lost in 2014-15 and costs to the economy of £14.3 billion. The authors point to ongoing evidence gaps, especially concerning employer interventions. The study found adverse working conditions and management practices were common causes of work stress, e.g. unrealistic demands, lack of support, unfair treatment, low decision latitude, lack of appreciation, effort-reward imbalance, conflicting role, lack of transparency and poor communications. Interventions perceived as effective improved management styles, physical exercise, taking breaks, ensuring adequate time for planning work tasks. Personal interventions outside work were important to prevent and remedy stress.
Stress and Mental Health Focus Chartered Institute of Personnel and Development (CIPD) 2020b Health and well-being at work. Annual Survey. 31st March. https://www.cipd.co.uk/knowledge/culture/well-being/health-well-being-work	The report presents the findings of the 20th CIPD survey of health and wellbeing, involving 1000 people professionals. The study found the lowest ever average absence rate of 5.8 days, but also uncovered rising levels of stress, with one third of respondents stating that stress-related absence had increased in the past year, mainly due to heavy workloads, and an increase in presenteeism and 'leavism'. Heavy workloads coupled with management style were the top two causes of stress. The report found 37% of respondents reported an increase in stress-related absence. The authors recommend organisations carry out stress risk assessments along with focus groups to build a holistic picture and target action where it is most needed. Senior teams need to make a visible commitment to health and welling (currently, 61% believe senior leaders have this on their agenda). Manager training is key, along with having a clear wellbeing strategy (44% of organisations were found to have a strategy at present) and the use of tools such as AEPs. 45% of respondents believe their organization does not make enough use of the specialist knowledge of their occupational health

	provision to promote good work. 33% say their organisation is not taking steps to address stress-related absence.
Stress and Mental Health Focus Johnson, S. (2017) 'Emotion, stress and burnout – don't write off older workers'. Work and Equalities Institute Research Briefing, Manchester University. http://documents.manchester.ac.uk /display.aspx?DocID=45531	The briefing draws on peer-reviewed research and argues that the working population is getting older, but that older workers are subject to age discrimination. However, there is in fact very little evidence of any age-related deficits and, in the service sector, we improve with age. The paper draws in particular on a study of 444 workers in Germany's service sector and found that older workers are better at using emotion regulation strategies and are more engaged and less prone to burnout than younger colleagues. Their life experiences and ability to anticipate situations enable them to respond more authentically and with more empathy, reducing the need to fake emotion in challenging situations. This paper challenges the idea that older workers are more prone to stress than younger workers.
Stress and Mental Health Focus New Economics Foundation (2014) 'Wellbeing at work'. Report based on rapid review of the evidence. 26 March. New Economics Foundation. https://neweconomics.org/2014/03/ wellbeing-at-work	The report draws on a review conducted by Peter Warr and further research conducted by the authors. The report highlights inconsistencies in the measurement of wellbeing among economists and psychologists and differentiates between hedonic, eudaimonic and evaluative wellbeing. Repeated research shows that wellbeing is associated with performance and productivity. Low levels of wellbeing are linked with heart attacks, strokes, osteoarthritis and diabetes. Regular physical activity reduces the risk of anxiety and depression and raises mood, due to the increase in self-efficacy and distraction from daily life. Healthy eating, vitality and sleep are also associated with wellbeing. The authors recommend employers should support the achievement of good health, not simply protect employees from risks. The evidence on the link between hours worked and wellbeing is mixed but there is some evidence very long working hours are detrimental. Job design is relevant for wellbeing (see ARI 8). Management and organizational practices that impact on wellbeing include feedback, fair pay, job security, positive manager behaviour, the physical conditions of work. Functioning at work is also important including a sense of control, promotion and development opportunities, work relationships.
Evaluation of government programmes focus Britton, J. and French, E. (2020) 'Health and employment amongst older workers'. Fiscal Studies. https://doi.org/10.1111/1475-5890.12213	The paper reviews existing evidence from the UK and concludes that 5-10% of employment decline between ages 50-70 is due to declining health in England with the largest effects among low-educated men. The share of people who self-report work limitations rises from 19% to 33% between 50-70. Most of this is due to declining preferences for work and lower productivity when in bad health but

	some is due to government-provided incentives to not work when in bad health such as disability benefits (the authors estimate one-fifth of the employment gap between healthy and unhealthy people in England can be explained by the presence of disability benefits). Overall, those aged 50-60 who report health limits their ability to work have employment rates 44% lower than those who do not, thus health is a key driver of employment. This arises within a context where government is raising retirement age and tightening eligibility thresholds for disability benefits. The report highlights the difficulty in reaching consensus on an accurate measure of health and concludes that using a single objective measure understates the full impact of health on employment. Existing estimates vary by as much as a factor of 10. The authors highlight the point that health alone does not influence employment outcomes but also confounding factors such as childhood health and education.
Evaluation of government programmes focus Equality and Human Rights Commission (2017) 'Being Disabled in Britain: A Journey less Equal'. 3 April. Report. https://www.equalityhumanrights.com/en/publication-download/being-disabled-britain-journey-less-equal	Disabled people in Britain are less likely to be in employment than others. There are questions about the effectiveness of the Work Programme; non-disabled people are more likely (35%) to get a job than disabled people (18%). Very low numbers of disabled people are taking up apprenticeships; disabled women and young people are paid significantly less than others. Fewer than half of disabled adults were in employment in Britain in 2015-16 (47.6%) compared with almost 80% of non-disabled adults and the gap has widened since 2010-11. More disabled people are living in poverty than others. Disadvantages in work are mirrored in other areas of life as well such as health and care, participation and identity, justice and detention, standard of living and education.
Evaluation of government programmes focus Kessler, I. (2018) Rapid Review of Supported Internships in the NHS. July 2018. (unpublished)	The review highlights the success of the supported internships scheme in helping young people with disabilities into employment. However, ongoing support post-programme emerged as both important and challenging to achieve; programme graduates found it difficult to engage with typical NHS recruitment and selection processes; job scarcity meant some could not find employment.
Evaluation of government programmes focus Leonard Cheshire Foundation (2020) 'Reimagining the workplace: disability and inclusive employment'. Report. https://www.leonardcheshire.org/sites/default/files/2020-02/reimagining-the-workplace-disability-inclusive-employment.pdf	7.5m people of working age in the UK are disabled or have a long-term health condition; 51.3% are in employment, this has not changed over the past decade. The report is critical of the UK government's aim to address the disability employment gap by increasing the number employed by a mere 100,000 per annum. The report highlights problems with the Work Capability Assessments process and inconsistent application of benefit sanctions. The report also highlights the lower earnings of disabled people which exacerbates their poverty levels: 75%

	of households using foodbanks contain someone with a health condition or disability. The Foundation's research found 24% of employers said they were less likely to employ someone with a disability and 66% stated that the costs of workplace adjustments were a barrier. 40% of the working age population is predicted to have a long-term health condition by 2030; flexible working emerges from their research as vital to retaining disabled people. Leonard Cheshire has established the Change 100 programme with top employers to create opportunities for disabled students and graduates; their other schemes for disabled people have also helped young people into work. 73% of disabled adults in the UK said they have stopped working due to their health condition or disability.
Evaluation of government programmes focus Scholz, F. and Ingold, J. (2020) 'Activating the 'ideal jobseeker': Experiences of individuals with mental health conditions on the UK Work Programme'. Human Relations, online, doi.org/10.1177/0018726720934848	The authors analyse qualitative data from hard-to-access individuals with mental health conditions accessing the Work Programme (WP). The article shows ableist norms of the ideal jobseeker are embedded in the programme's design, prioritizing certain individuals and behaviours over others. There has been a steady increase of those with mental health conditions such as stress, depression and anxiety; in 2017-18 595,000 people of working age in the UK had experienced poor mental health, with 15.4 million days lost. Every year, 300,000 people with long-term mental health conditions lose their job in the UK according to Labour Force Survey data. The authors conclude that instead of altering patterns of inequality, the WP reproduced disability inequality and exacerbated workplace exclusion.
Workplace adjustment focus The Advisory, Conciliation and Arbitration Service (ACAS) (2020) 'Work Adjustments for Mental Health: A Review of the Evidence and Guidance'. 12 June 2020. Independent rapid review commissioned by ACAS. https://www.acas.org.uk/work-adjustments-for-mental-health-a-review-of-the-evidence-and-guidance-html	The report reviewed 21 peer-reviewed studies and 8 practitioner reports. The focus was on workplace adjustments. 1:6 employees in the UK report mental ill-health such as anxiety or depression each week. Mental ill-health is a growing concern for employers. The report found that the most common adjustments were flexible scheduling, reduced hours, modified training and supervision, and modified job duties/descriptions. However, employees struggle to access work adjustments and managers are ill-equipped to support employees to access them. 19 different pieces of guidance on work adjustments in the UK were found but there was little consistency in terms used or clarity in the pathways to access work adjustments. Guidance was limited by the absence of robust evidence to guide practice. However, adjustments are seen to be effective by employees and employers although evidence for effectiveness was less clear with no controlled studies examining the use of specific work adjustments.
Workplace adjustment focus Fenton, S.J. et al (2014) 'Workplace wellbeing programmes	The report focuses on the evidence base concerning the effects of workplace health and wellbeing programmes on employees and organisations in

and their impact on employees and their employing organisations: a scoping review of the evidence base'. Health Exchange & University of Birmingham, 27th November 2014. Scoping Literature Review Report. https://www.birmingham.ac.uk/Documents/research/ias/Wellbeing-at-work-review-Jan-31.pdf	relation to mental health and stress; nutrition, physical activity and smoking; musculoskeletal disorders and H&S. The report highlights the link between personal health practices and resources, the organization of work, employee health and productivity. The World Health Organisation has proposed three categories of health intervention: Primary, aimed at generally healthy populations and focusing on prevention e.g. encouraging exercise and fitness. Secondary, aimed at individuals at high risk due to lifestyle practices and focusing on addressing the severity of the illness e.g. screening, weight loss classes. Tertiary, aimed at the disease management of individuals with existing ailments focusing on return to work interventions and targeted services. Most workplace interventions focus on primary and secondary. The authors reviewed literature published between 2000-2014 and found 105 relevant studies focusing on workplace interventions. There are a large number of relevant findings. It is especially worth noting the problematic relationship between workplace wellbeing and stress. Mental health: Studies showed evidence that interventions in mental health aimed at health promotion appear more effective than those focusing directly on symptoms. Retail and construction sectors were identified as particularly susceptible to stress and workplace wellbeing issues and there are particular challenges within the construction sector that make intervention difficult. They conclude that a holistic approach is needed in developing workplace interventions around mental health and wellbeing and that more evaluation of workplace interventions is needed. Health promotion: the authors conclude the evidence around the effectiveness and cost-effectiveness of interventions to improve health is inconclusive since interventions are usually multi-component. There is an over-reliance on self-report data. Physical health and safety: the authors found a great deal of diversity in relation to types of intervention and conclude that interventions need to be tailored to the work environment and risks faced by employees. The benefits of interventions outweigh the costs. The authors conclude that wellbeing should be considered holistically to allow for interconnections between work-related and non-work-related factors. Multi-component interventions may be needed but there is insufficient evidence about how these might work. More research is needed in the UK specifically as intervention effectiveness is likely to vary across settings.

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Carers focus	One aspect of disability that needs to be considered in the context of work and employment is the rising number of people in work who are also carers. This ESRC-funded study showed that employer support can make a difference in terms of carers' ability to manage their caring responsibilities. Around 3.7million employees in England and Wales are working carers (more women than men), and for 72%, caring work is additional to full-time paid work. 32% of working carers provide 30 or more hours of care a week. 44% say that it is difficult to combine paid work and caring, and the report estimates 1.6 million carers are struggling; many find caring affects their work and 30% had reduced their working hours while 36% had refused a job offer or promotion. 25% of carers are unable to use the support offered by employers because of how their work was organized with many stating no support was available – 40% said their employer was carer-friendly. Working from home and flexitime are especially valuable. Formal recognition of carers is important and supporting carers has benefits for the carers as well as employers. The report recommends that policies should be flexible; carers should be given paid caring leave; supporting the mental wellbeing of carers is important along with publicizing available support.
Austin, A. and Heyes, J. (2020) Supporting working carers: how employers and employees can benefit. Chartered Institute of Personnel and Development (CIPD)/Sheffield University Report. June 2020. http://circle.group.shef.ac.uk/sustainable-care-publications/	
Impact of COVID-19 focus CIPD (2020a) Impact of COVID-19 on Working Lives, 4 June 2020. Report https://www.cipd.co.uk/knowledge/work/trends/goodwork/covid-impact	The CIPD run regular surveys of job quality and working lives. This most recent report shows, among other things, that there has been a steady decline in workplace mental and physical health since 2018 and has continued through the pandemic. 28% say work has a negative impact on their mental health; 31% said it did so on their physical health; 43% said their general mental health has deteriorated since the outbreak, rising to 52% of those with an existing issue; 35% said their physical health has become worse.

ARI 7: Effects and risks of social distancing on working patterns and practices, and how these will affect different groups and sectors.	
Resource	**Key Messages**
ONS (2020b). Coronavirus and the social impacts on Great Britain: 17 July 2020, Opinions and Lifestyle Survey (COVID-19-19 module). https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandwellbeing/bulletins/coronavirusandthesocialimpactsongreatbritain/17july2020 (Accessed July 2020)	**Existing evidence** Our main evidence sources in this area are emerging evidence from surveys conducted since the start of the COVID-19 pandemic. For example, in the week to 12 July 2020, over half of working adults (54%) reported that COVID-19 was having an impact on their work, 27% reported that they had worked exclusively at home in the last seven days and 60% who had a paid job, were self-employed or undertook casual work in the past seven days, reported that they have had to work in new ways (ONS, 2020b).

Resource	Key Messages
ONS (2020c). Coronavirus and the economic impacts on the UK: 16 July 2020, Opinions and Lifestyle Survey (COVID-19-19 module). https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandwellbeing/bulletins/coronavirusandthesocialimpactsongreatbritain/17july2020 (Accessed July 2020)	ONS surveys also tell us about the proportion and type of businesses that have stopped trading or have continued trading during the pandemic, that have a proportion of their workforce furloughed, and that have implemented safety measures. For example, inin the second half of June, a majority of businesses who have not permanently stopped trading indicated they were implementing, or were intending to implement, various safety measures in the workplace including social distancing (91%), hygiene measures (85%), and personal protective equipment (80%) (ONS, 2020c). **Future evidence priorities** The evidence base in this area could be strengthened by research which explores: • Longer term trends and impacts of continued social distancing on working patterns and practices for different groups, particularly those with health conditions or disabilities. • Health impacts of any changes to working patterns and practices. • How changing health and work needs correspond with protected characteristics and aspects of socioeconomic disadvantage. • Psychological factors that affect health and work outcomes, during and beyond the COVID-19 pandemic - including illness perceptions, health beliefs and work participation across different groups. • Experiences of work for different cohorts and how this could affect future health outcomes. • Experiences of young people with disabilities and health conditions on transition to the labour market during or in the aftermath of the pandemic.
IZA Institute of Labor Economics DP No. 13183, Inequality in the Impact of the Coronavirus Shock: Evidence from Real Time Surveys, Abi Adams-Prassl, Teodora Boneva, Marta Golin, Christopher Rauh, 2020 https://www.iza.org/publications/dp/13183/inequality-in-the-impact-of-the-coronavirus-shock-evidence-from-real-time-surveys	Key Finding: Within countries the impacts of COVID-19 are highly unequal and exacerbate existing inequalities. Less educated workers and women are more affected by the crisis. Informed: Understanding of general impacts of COVID-19 on work and inequality.

ARI 8: What are the different ways to define and measure labour market progression and sustainable work? How does this vary between groups and at different times in people's lives?	
Resource	**Key Messages**

Resolution Foundation's The Great Escape (2017) https://www.resolutionfoundation.org/app/uploads/2017/10/Great-Escape-final-report.pdf	Key Finding: A significant amount of those in low paid work were struggling to raise and sustain higher earnings. Informed: Policy development around in-work progression.
Kelly and Wishart / Joseph Rowntree Foundation 2018, Attitudes of people on a low income: work https://www.jrf.org.uk/report/attitudes-people-low-income-work	Key Finding: Those on low incomes are worried about automation and desire employers to increase pay, provide training, and provide flexible working. Informed: Policy development around in-work progression.
Clarke and Bangham 2018 (Resolution Foundation) Counting the Hours: Two decades of changes in earnings and hours worked https://www.resolutionfoundation.org/publications/counting-the-hours-two-decades-of-changes-in-earnings-and-hours-worked/	Key Finding: National Living Wage has improved earnings at bottom of the scale. Earnings in 2017 remained below 2009 levels in real terms. Gendered differences in pay changes can be seen. Informed: Policy development around in-work progression.
Income Dynamics: Income movements and the persistence of low incomes, DWP 2020 (and previous publications including Low Income Dynamics series) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/875641/income-dynamics-income-movements-and-persistence-of-low-incomes-2010-18.pdf	Key Finding: Explored proportions of working families in low-income, movements between income groups. Informed: Policy development around in-work progression.
Thompson, S. and Hatfield, I, (2015) Employee Progression in European Labour Markets, Institute for Public Policy Research. https://www.ippr.org/publications/employee-progression-in-european-labour-markets	Key Finding: Four measures of progression: • Earnings progression • Hours progression. • Occupational progression. • Contractual progression. UK performance varies across measures, low for some. Informed: Policy development around in-work progression.
Schnabel, C. (2016) Low-wage employment. Are low-paid jobs stepping stones to higher paid jobs, do they become persistent, or do they lead to recurring unemployment? IZA Institute of Labor Economics https://wol.iza.org/uploads/articles/276/pdfs/low-wage-employment.pdf	Key Finding: Supply-side, sectoral, and policy conditions all affect prospect of progression out of low pay. Informed: Policy development around in-work progression.
McKnight, A., S. Kitty, S. Mohun Himmelweit and M. Palillo (2016).	Key Finding: Typology of in-work progression policy levers.

'Low Pay and In-work Poverty: Preventative Measures and Preventative Approaches. Evidence Review.' Luxembourg: Centre for Analysis of Social Exclusion; London School of Economics	Informed: Policy development around in-work progression.
https://www.lse.ac.uk/business-and-consultancy/consulting/assets/documents/Low-Pay-and-In-Work-Poverty.pdf Organisation for Economic Co-operation and Development (2019) https://stats.oecd.org/Index.aspx?QueryId=64193	Key Finding: Occurrence of low pay in UK 4 percentage points higher than Organisation for Economic Co-operation and Development average. Informed: Policy development around in-work progression.
DWP In-work Progression Randomised Controlled Trial https://www.gov.uk/government/publications/universal-credit-in-work-progression-randomised-controlled-trial	Key Finding: Small increases in earnings found for claimants in frequent and moderate support groups compared to minimal support groups. Informed: Policy development around in-work progression.
Learning and Work Institute (2019) *Evidence review: Supporting progression from low pay* https://learningandwork.org.uk/resources/research-and-reports/evidence-review-what-works-to-support-progression-from-low-pay/	Key Finding: Evidence gaps remain around how best to enable in-work progression. Adviser support appears important, as does skills development, local strategy, and sector-specific strategies. Informed: Policy development around in-work progression.
Card, D. et al (IZA Institute of Labor Economics DP 9236, 2015) *What Works? A Meta Analysis of Recent Active Labor Market Program (ALMP) Evaluations* http://ftp.iza.org/dp9236.pdf	On average ALMP's have relatively small effects in the short run (less than a year after the end of the program), but larger positive effects in the medium run (1-2 years post program) and longer run (2+ years). Time profile of impacts in the post-program period varies with the type of ALMP. Job search assistance and sanction programs that emphasize "work first" have relatively large, short term impacts, on average. Training and private sector employment programs have smaller short-term impacts but larger effects in the medium and longer runs. Public sector employment subsidies tend to have negligible or even negative impacts at all horizons. The average impact of ALMP's vary across groups, with larger effects for females and participants drawn from the pool of long term unemployed, and smaller effects for older workers and youths. We also find suggestive evidence that certain types of programs work better for specific subgroups of participants. Job search assistance and sanction programs appear to be relatively more successful for disadvantaged

	participants, whereas training and private sector employment subsidies tend to work better for the long term unemployed.
Ussher, K. (2016) *Improving pay, progression and productivity in the retail sector*. York: Joseph Rowntree Foundation. Available at: https://www.jrf.org.uk/report/improving-pay-progression-and-productivity-retail-sector (Accessed: 3 August 2020).	**What**: research and policy report exploring structure of low paid retail workforce alongside attitudes of workers. Finds: • high level of self-reported 'underemployment' among low-paid retail workers, with more than half agreeing they feel overqualified • proposes that retail workers can be divided into two broad groups – those who want more hours to earn more money (around half), and those for whom the overriding priority is to have controlled hours • some workers believe that seeking promotion in the sector 'isn't worth it'. Also suggests strong link between motivation and age, with people starting out with ambitions to progress (within the sector) but later downgrading.
Devins, D., Bickerstaffe, T., Mitchell, B. and Halliday, S. (2014) *Improving progression in low-paid, low-skilled retail, catering and care jobs*. Joseph Rowntree Foundation. Available at: https://www.jrf.org.uk/report/improving-progression-low-paid-low-skilled-retail-catering-and-care-jobs	**What:** purposive sampling of four employers from the retail, care and catering sectors 'known to support progression of their low-paid employees' to identify relevant policies and practices. Particular focus on Internal Labour Market. **Finds:** • To understand firm-level behaviour it is essential to understand the economic context in which the firm operates • Progression generally discussed in terms of moving from entry level to management roles • Importance of clear progression pathways and transparent internal labour markets that are open to all staff, with champions also needed within organisations to establish and sustain progression opportunities for low-paid workers.
Wood, C. and Wybron, I. (2015) *Entry to, and progression in, work*. Demos. York: Joseph Rowntree Foundation (JRF). Available at: https://www.jrf.org.uk/report/entry-and-progression-work (Accessed: 3 August 2020).	**What**: a JRF solutions report on policy options to support entry and progression in work for ethnic minority groups based on evidence from their Poverty and Ethnicity programme (empirical papers not presented directly). **Key points**: • Experiences and barriers vary by ethnic group, gender, and region, as well as age, class, and migrant status and whether someone is first, second or third generation • Poor progression prospects may be due to concentration of some BAME groups in particular occupations – suggesting support to leave current employer and/or change occupation may

	be key – but even in sectors where progression is possible there are barriers relating to employer practices (lack of transparency, informal approach relying on social networks to allocate opportunities).
Green, A., Sissons, P., Broughton, K. and de Hoyos, M. (2015) *How cities can connect people in poverty with jobs*. York: Joseph Rowntree Foundation.	**What:** assesses UK and international evidence on local approaches linking people in poverty to jobs. **Finds:** • more evidence on pre-employment and employment entry than on staying in work and in-work progression; less evidence at city level than nationally • at the pre-employment stage holistic support packages encompassing advice and guidance, mentoring, and employer-designed training are valuable • for employment entry workplace-based training and help with transport and childcare can help; the quality of initial job entry is important for staying in work; there is scope for stimulating opportunities for in-work progression with employers in growth sectors or with recruitment and retention problems.
Bush, L., Templer, M. and Allen, K. (2019) *How can Universal Credit help parents move out of poverty?* York: Joseph Rowntree Foundation.	**What**: reports on research with working parents on Universal Credit (UC) and Work Coaches to explore how UC could be changed to address poverty among working parents. **Finds:** • Working parents prioritized changing UC to increase the amount of income they can derive from UC, more effective incentives to increase working hours, reducing the financial and administrative burden of childcare, and giving Work Coaches more time and training to support working parents. • Work Coaches did not feel they had the time available to offer necessary support due to large caseloads and the complex needs of some claimants.
Green, A., Sissons, P., Ray, K., Hughes, C. and Ferraria, J. (2016) *Improving progression from low-paid jobs at city-region level*. Joseph Rowntree Foundation. Available at: https://research.birmingham.ac.uk/portal/en/publications/improving-progression-from-lowpaid-jobs-at-cityregion-level(7864344e-e618-4274-9a3a-e13f59909983).html	**What**: describes a series of employment and skills policy proposals developed in consultation with stakeholders in the Leeds City Region and with reference to wider evidence on supporting job entry and progression. **Finds:** • A partnership approach is needed, to focus on skills and earnings progression for low-income individuals while also meeting employers' needs. • There is scope to improve the careers advice and guidance available to low-paid workers to

	support progression – a National Careers Service model is proposed. • An in-work progression service with a sectoral-based approach could be developed to work with both employers and low-wage workers. • Opportunities for part-time workers could be promoted via business support services.
Paskell, C., Rahim, N., Kazira, A. and Crowther, T. (2015) *Evaluating the In-Work Progression Advice Trial*. 912. London: DWP. Available at: https://www.gov.uk/government/publications/in-work-progression-advice-trial-evaluation (Accessed: 3 August 2020).	**What:** report on findings from 35 in-depth interviews with Tax Credit claimants who had received different types of communication about the support provided by the National Careers Service to help them 'get on in work'. The trial was undertaken to test ways in which Tax Credit claimants could be prompted to consider and take steps towards in-work progression.
DWP (2018) *Universal Credit: In-Work Progression Randomised Controlled Trial - Summary research findings*. London: Department for Work and Pensions. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/739766/summary-universal-credit-in-work-progression-randomised-controlled-trial.pdf (Accessed: 3 August 2020). NOTE: the report referenced here is a summary of an impact assessment report and evaluation report (by Ipsos Mori, qual and quant research). A further impact assessment was also published.	**What:** summarises research on the effectiveness of different types and frequency of contact with Work Coaches provided to current Universal Credit claimants in low-paid work or low-income households. Both DWP and independent research findings. **Finds**: • Some evidence for (modest) increase in weekly earnings at 52 weeks for those in 'moderate and 'frequent' support treatment groups vs minimal support (£4.43-£5.25 higher). Not replicated by independent evaluation of a sample of claimants. • Regardless of 'treatment' group, the majority (91%) of claimants undertook a progression related action. Frequently this involved looking for a new job and requesting more hours. • At both waves, participants saw the main barriers to progression as the lack of available full-time jobs, their own health issues and their lack of skills or qualifications • Higher sanction rate for frequent and moderate support group and main reason for sanctions across trial was for failing to attend a meeting. • Barriers to progression reported by employers were mainly structural, e.g. limited higher-level roles in large organisations with flat structures and smaller organisations. Also, low staff turnover, limited staffing budgets (restricting pay, training and number of positions) and dependence on external funding.
DWP (2017) *Evaluation of GOALS UK's step up and Timewise Foundation's earnings progression and flexible career pathways in retail*. Research summary 58. London: Department for Work and Pensions, p. 24.	**What:** summarises separate evaluations of three small proof of concept studies commissioned in 2014-16: 1. Timewise Foundation's Universal Credit (UC) earnings progression aimed to support and increase 102 low-income parents' incomes while maintaining flexible working.

	2. GOALS UK: Step Up model aimed to motivate and support 80 low-income, part-time workers towards progression in work and greater financial independence.
	3. The UK Futures Programme, run by Timewise in partnership with a national retailer. Aimed to tackle progression barriers and increase part-time, entry level, female workers' earnings.
	Key points:
	• Looked at progression in terms of earnings progression (pay rise, or more hours), or a new job.
	• Potential for job re-design to facilitate progression but Timewise also found client job change support and job brokerage for those most in need to be most effective for achieving progression particularly as many worked for SMEs.
DWP (2017) *Employer experiences of recruiting, retaining and retraining older workers: Qualitative research*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/584448/employer-experiences-of-recruiting-retaining-and-retraining-older-workers.pdf (Accessed: 3 August 2020).	**What:** 50 employer case studies oversampling those in low paid sectors to explore attitudes and behaviours of employers around recruitment, retention and retraining of older workers.
	Findings:
	• Existing flexible working policies and procedures are seen as effective to meet the needs of older workers. However, these policies are not always clearly articulated and are predominantly used by new parents.
	• Flexible working arrangements are more likely to be made for long-standing employees than for new entrants.
Ray, K., Bertram, C., Davidson, R. and Durante, L. (2010) *Can altering the structure of financial support payments aid work retention amongst lone parents? Qualitative evaluation of the In Work Retention Pilot*. Research Report by Policy Studies Institute 708. London: Department for Work and Pensions. Available at: https://www.gov.uk/government/publications/qualitative-evaluation-of-the-in-work-retention-pilot-rr708 (Accessed: 3 August 2020).	**What:** qualitative research on the In Work Retention Pilot (IWRP) for lone parents, introduced in two Jobcentre Plus districts 2008-2010. It was a variation on In Work Credit (IWC), with a different payment structure and additional advisory support.
	Finds:
	• The distinctive payment structure, in itself, was not felt to have any effect on work entry or work retention. It was suggested that this was because the lump sum payments, initiated at 39 weeks, were too distant to have any effect on initial decisions to enter work, and by the nine month stage lone parents were less likely to have financial problems that threatened work retention.
	• Lone parents reported mixed experiences of retention support from Jobcentre Plus once in work, and very little experience of any kind of advancement support.

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Hendra, R., Ray, K., Vegeris, S., Hevenstone, D. and Hudson, M. (2011). Employment Retention and Advancement (ERA) Demonstration: Delivery, Take-up, and Outcomes of In-work Training Support for Lone Parents, Department for Work and Pensions Research Report 727, London: Department for Work and Pensions	**What:** research on ERA which targeted lone parents and the long-term unemployed and offered participants access to a personal adviser, alongside financial incentives to complete training and work full-time. **Finds**: • Increased training for lone parents with lower qualifications but did not lead to increased earnings. This may be because training was insufficiently linked to available and realistic progression routes within local labour markets.
Hoggart, L., Campbell-Barr, V., Ray, K. and Vegeris, S. (2006) Staying in Work and Moving Up: Evidence from the UK Employment Retention and Advancement (ERA) Demonstration. DWP Research Report 381, Leeds: Corporate Document Services	**What:** qualitative research (170 in-depth interviews) with ERA customers 1. out-of-work lone parents entering the New Deal for Lone Parents (NDLP), 2. long-term unemployed (entering New Deal 25 plus programme), 3. lone parents working 16 to 29 hours a week and receiving a wage supplement through Working Tax Credit (WTC). **Finds:** • Advancement was understood to include better pay and working conditions, being promoted to a position with more responsibility, and achieving job satisfaction. • But customers differed in how they defined advancement for *themselves*. Many viewed it in terms of job satisfaction rather than moving up the 'career ladder'. People have different time scales for advancement. • Some customers' attitudes towards advancement were ambiguous or ambivalent, others rejected it as a priority for themselves. • Views of advancement also depended on overall orientations to work and care, their life stage and experience of work e.g. those in steady work with settled work-care arrangements often developed a more positive view of advancement.
DWP (2020) *The Work Aspirations and Support Needs of Claimants in the ESA Support Group and Universal Credit equivalent: final report of research findings.* Research Report 983, p. 204. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/867820/work-aspirations-and-support-needs-claimants-esa-support-group-and-universal-credit-equi.pdf.	**What:** research commissioned to understand how to engage and support people in the Employment and Support Allowance (ESA) Support Group and in the equivalent Universal Credit Limited Capability for Work and Work Related Activity (LCWRA) group to explore how to help them manage their health condition(s) and move towards work, where appropriate. **Finds:** • Some participants were concerned that if they expressed interest in paid work it would trigger a Work Capability Assessment and potential loss of benefit.

Hurrell, A. (2013) Starting out or getting stuck? An analysis of who gets trapped in low paid work - and who escapes. Resolution Foundation, November 2013. https://www.resolutionfoundation.org/publications/starting-getting-stuck-analysis-gets-trapped-low-paid-work-escapes/	First in a series of reports on progression from low pay. Transitions from low pay are measured over a ten year period from 2002 to 2012. • Workers are defined as having **progressed** if in each of the three final years of the period they were earning above the low pay threshold. • Workers are defined as being **stuck** if they only ever held low-paid jobs during the period. • Workers are defined as **'cyclers'** if they held a job above the low pay threshold at some point during the ten-year period but at the end of the period were not in higher-paid work. By 2012 18 per cent of the initially low-paid had progressed, 27 per cent remained stuck in low pay, and 46 per cent had cycled in between low pay and higher pay. Some factors associated with escaping low pay were: • Being male • Being younger Moving into a managerial, professional or technical occupation.
D'Arcy, C. and Hurrell, A. (2014) Escape Plan: Understanding who progresses from low pay and who gets stuck. Resolution Foundation, November 2014. (Also published on Social Mobility Commission webpages) https://www.resolutionfoundation.org/publications/escape-plan-understanding-who-progresses-from-low-pay-and-who-gets-stuck/	Second in the series. In contrast to 2013 report this focuses on low-paid workers who were in work for the majority of the period from 2002 to 2012. Of these workers, 25 per cent made a sustained transition to higher pay. This suggests that job retention can aid advancement but doesn't automatically lead to progression as the majority of workers did not achieve sustained progression. Both individual and household characteristics, and employment characteristics were important in shaping who progressed and who did not: • Single parents and workers with disabilities were less likely to progress. • Working for a larger employer had a positive association with progression. • Working part-time was negatively associated with progression. Qualitative focus groups revealed that: • in many workplaces moving to a higher-paid position was conditional on transitioning to full-time employment, • progression policies were often not implemented effectively, and • training tended to be given only to those who had already been selected for promotion.
D'Arcy, C, and Finch, D. (2017) The Great Escape? Low	Third in the series.

pay and progression in the UK's labour market. Social Mobility Commission, October 2017. (Report produced by Resolution Foundation for Social Mobility Commission) https://www.resolutionfoundation.org/publications/the-great-escape-low-pay-and-progression-in-the-uks-labour-market/	Uses the same approach as earlier reports, but focuses on the period 2006-2016. The proportions of 'escapers', 'stuck' and 'cyclers' over this period are very similar to the earlier period suggesting progression rates have not changed much in the short term. However, comparing to the 1980s, the analysis suggests: • an improvement in overall progression rates, but • an increase in the risk of remaining stuck in low pay for men, and • a fall in the risk of women remaining stuck in low pay. Nonetheless, women remain less likely to progress (even when controlling for occupation and sector). This is due in large part to them taking time out of the labour market after childbirth or switching to part time. Both reduce the likelihood of progression. • The report points to the importance of sector of employment, with workers in accommodation and food services particularly likely to remain in low pay for sustained periods.
D'Arcy, C, and Finch, D. (2016) Finding your routes: Non-graduate pathways in the UK's labour market. Resolution Foundation, May 2016. https://www.resolutionfoundation.org/publications/finding-your-routes-non-graduate-pathways-in-the-uks-labour-market/	Focuses on the employment routes and earnings of non-graduates, and the link between qualifications and earnings for this group. Focus of the analysis is those with Level 2 educational attainment who did not attend university. Among these workers, academic qualifications are associated with higher average earnings and faster earnings growth. However, the *match* between qualifications and occupation/sector of employment appears more important. For men particularly, vocational qualifications significantly boost earnings when working in sectors like construction or manufacturing. This points to the importance of developing clear non-graduate education and training tracks at Level 2 and Level 3 that lead to employment in relevant sectors. It also suggests a role for careers advice, both when in education and when in work, to help workers find appropriate employment and progression pathways that make the most of their skills. • The 2008/9 recession negatively impacted the earnings trajectories of young people entering the labour market at this time.
Gardiner, L. and Gregg, Paul (2017) Study, Work, Progress, Repeat? How and why pay	Much of this report is focused on a comparison of earnings within different cohorts of workers over the

and progression outcomes have differed across cohorts. Resolution Foundation, February 2017. https://www.resolutionfoundation.org/publications/study-work-progress-repeat-how-and-why-pay-and-progression-outcomes-have-differed-across-cohorts/	past four decades. In the latter half there is an analysis of labour market progression specifically. The main findings are that, compared to earlier cohorts, cohorts born in the mid- to late 1980s and the early 1990s: • started their labour market careers with lower earnings and • experienced lower rates of earnings growth over time. Several factors are likely to have contributed to this, including: • a shift in the occupations held by younger cohorts towards relatively lower-paid jobs, • a fall in worker mobility between firms, • a reduction in within-firm annual pay increases (from around 4 per cent per year for the cohort born in the 1970s to close to zero for the cohort born in the 1980s). This is a particularly important factor in the reduced wage progression seen in more recent cohorts.
Clarke, S. and D'Arcy, C. (2018) The Kids Aren't Alright: A new approach to tackle the challenges faced by young people in the UK labour market. Resolution Foundation, February 2018. https://www.resolutionfoundation.org/publications/the-kids-arent-alright-a-new-approach-to-tackle-the-challenges-faced-by-young-people-in-the-uk-labour-market/	This report aims to inform the development of labour market policies that promote secure and rewarding employment for younger workers, rather than the historical narrow focus on reducing youth unemployment. Drawing on previous work (e.g. the research summarized directly above), the report details the extent to which young workers have borne the brunt of the pay squeeze since the financial crisis, and highlights the growth of part-time work, self-employment, zero-hours contracts and agency work among young people. Young people are also more likely to work in lower-paid occupations and sectors compared to previous generations, with the proportion of younger workers employed in the accommodation and food services sector seeing a particularly stark increase compared to previous cohorts. There is a call for government to: • recognise the importance of low-paying sectors such as social care, hospitality and retail to the life chances of todays' younger generation, and • work with these sectors to raise productivity and opportunities for progression, including through changes to business models and increasing investment in staff.
Gardiner, L. and Gregg, Paul (2015) A Steady Job? The UK's record on labour market security	The report details how over the past two decades there has been: • a fall in the share of the workless, and

and stability since the millennium. Resolution Foundation, July 2015. https://www.resolutionfoundation.org/publications/a-steady-job-the-uks-record-on-labour-market-security-and-stability-since-the-millennium/	• a corresponding rise in the share of 'insecure' workers and in full-time, secure workers, at roughly equal proportions. • Men have become more likely to be in the 'insecure' group over time, as have young people. • Of the different forms of insecure employment, temporary employment, involuntary part-time employment, and zero-hours contracts have increased in particular. These are some of the most insecure forms of employment. In addition, the report identifies an increase in average job tenure for women over the past decades, whereas for men job tenure has seen a secular decline. Rising job tenure has both negative and positive implications, as one obverse side of increased tenure at the same employer has been a decline in between-firm mobility (which can play an important role in progression).
Tomlinson, D. (2018) Irregular Payments: Assessing the breadth and depth of month to month earnings volatility. Resolution Foundation, October 2018. https://www.resolutionfoundation.org/publications/irregular-payments/	Doesn't deal directly with progression or sustainable employment but contains important insights when it comes to measuring wage progression. Uses data on banking transfers to measure volatility in pay. Finds that even for workers remaining in the same job for at least a year, month-to-month fluctuations are very common, with: • the majority of workers having notable changes in monthly pay at least one month out of the year, • a substantial share of workers experiencing changes in pay several times during the year, • pay often fluctuating by substantial amounts (several hundreds of pounds). Pay volatility was more common among lower-paid workers and of greater magnitude relative to average earnings. These findings suggest a need to be cautious when measuring wage growth over the short-term since it appears that both upward and downward changes in earnings are common.
Papoutsaki, D., Buzzeo, J., Gray, H., Williams, M., Cockett, J., Akehurst, G., Alexander, K., Newton, B. and Pollard, E. (2020) Moving out to move on Understanding the link between migration, disadvantage and social mobility. Social Mobility Commission, July 2020.	This report is not primarily concerned with progression but does include analysis of the link between intra-national migration and employment outcomes. Results indicate that compared to people who stay in the local authority in which they grew up, those who moved to a different local authority tended to have higher wages and a higher likelihood of being

https://www.gov.uk/government/publications/internal-migration-and-social-mobility-moving-out-to-move-on	employed in a high-skilled occupation. This is the case even when controlling for individual characteristics, suggesting the possibility that moving could have an effect over and above what would be expected given differences in the characteristics of 'movers' versus 'stayers'. However, the analysis does not compare wages or occupations before and after a move, and no attempt is made to account for unobservable characteristics, meaning it is difficult to draw firm conclusions about the extent to which moving is beneficial for labour market progression.
Costa Dias, M., Joyce, R. and Parodi, F. (2018) The gender pay gap in the UK: children and experience in work. Institute for Fiscal Studies, February 2018. https://www.ifs.org.uk/publications/10356	Paper focuses on the gender pay gap through analysing earnings trajectories over the life course. The authors look at wage rates by gender from age 20 to 55. While women's and men's earnings are fairly similar during their early 20s, a large gap opens up around the mid to late 20s. Before the birth of the first child, the (age-adjusted) wage gap is around 7-12 per cent. This increases to around 30 per cent 12 years after the first of the first child. Regression analysis suggests that the gap in employment experience (either through a temporary withdrawal from employment altogether or a reduction in working hours) accounts for by far the largest proportion of the gender wage gap. While each year of additional full-time work tends to increase hourly wages in real terms, each additional year of part-time work does not appear to lead to any real wage growth. This suggests that progression opportunities for (female) part-time workers are poor.
Blundell, R., Costa Dias, M., Goll, D. and Meghir, C. (2019) Wages, Experience and Training of Women over the Lifecycle, Institute for Fiscal Studies, April 2019	The authors model wages over the lifecycle for women who take up work-related training, to estimate whether engaging in such training can compensate for the loss of employment experience that tends to affect women after childbirth, and thereby ameliorate the gender wage gap. The findings suggest that work-related training, while reducing earnings in the short term (during the period of training) tends to increase wages over the longer term and reduces the gender wage gap slightly. The greatest benefits are found for women with below-degree education. Nonetheless, training can only partly reduce the gender wage gap and even if it were more widely taken up (e.g. if a substantial subsidy were to be introduced to reduce the cost of training) the wage gap would remain relatively large.
Costa Dias, M, Joyce, R. and Norris Keiller, A. (2020) COVID-19	Mostly focuses on the impact of the COVID-19 crisis on young people (showing how young people are

and the career prospects of young people. Institute for Fiscal Studies, July 2020.https://www.ifs.org.uk/publications/14914	disproportionally likely to be working in sectors affected by lockdown, etc.), but contains a section specifically focused on progression among early-career workers. The current reduction in labour demand is likely to have particularly severe impact on young workers. Recent cohorts of labour market entrants have seen very little within-occupation wage growth during their early careers compared to earlier cohorts. Therefore, in recent times early-career wage growth has been particularly reliant on moving into higher-paying occupations (as opposed to securing higher pay through promotions within the same occupation). If the post-COVID-19 period ends up looking similar to the years immediately after the Great Recession, we can expect that wage progression for young people will be increasingly hard to achieve. Sharp falls in vacancies due to the lockdown and ongoing recession will make it harder to find better-paid opportunities, and for some there is a risk of falling off the career ladder altogether.
Blundell, R., Costa Dias, M, Joyce, R. and Norris Keiller, A. (2020) What has been happening to career progression? Institute for Fiscal Studies, July 2020. https://www.ifs.org.uk/publications/14967	The paper provides evidence on how pay and occupational progression during early career stages have changed over the last few decades. Shows that, over the past several decades: • young people have increasingly tended to **start their working careers in a low-paid occupation**. • more recent cohorts of young people have seen **less wage progression during their early career** compared to earlier cohorts. This is particularly the case for men. The reduction in wage progression is in part due to the slower wage growth during the years following the Great Recession. But rates of *occupational* progression have also fallen. This, again, has particularly affected men. These findings present a bleak picture for occupational progression even before the COVID-19 impact. And given that occupational progression is now the most important source of wage progression (in the absence of much within-occupation wage growth), there is a big danger that the lifetime wage trajectories of today's young workers will be severely affected by the current slowdown.
Avram, S. and Harkness, S. (2019) The National Minimum Wage/National Living Wage and progression out of minimum wage jobs in the UK – final report.	The report examines the wage progression of minimum wage job holders with the aim of: • examining whether the increases in the minimum wage rate over this period affected progression out of minimum wage jobs and

Prepared for the Low Pay Commission. December 2019.https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/852506/The_NMW__NLW_and_progression_out_of_minimum_wage_jobs_in_the_UK.pdf	• assessing which individual and job characteristics are associated with progression. The effect of the minimum wage on progression is estimated by comparing transition probabilities in Travel-To-Work-Areas with different shares of minimum wage workers. They find little evidence that areas with a greater share of minimum wage workers tend to have lower rates of progression. Some of the model specifications show a statistically significant effect, but the effect is not robust across specifications.
National Minimum Wage: Low Pay Commission Report Autumn 2016. Low Pay Commission, November 2016. https://www.gov.uk/government/publications/national-minimum-wage-low-pay-commission-autumn-2016-report	Presents findings from consultation with employee and employer organisations about the introduction of the National Living Wage (NLW) in 2016, as well as responses from an employer survey. Among concerns highlighted by employers, the effect of the planned increases in the NLW on the pay distribution were highlighted. Employers raised the possibility that pay distributions would be compressed which could impact on incentives for progression. Analysis of data from the Annual Survey of Hours and Earnings (ASHE) shows that there was an increase in the percentage of workers paid at the NLW rate from 2015 to 2016. But at the same time, the percentage of workers paid above the NLW also increased, suggesting at least some spillover effects on pay further up the wage distribution.
National Minimum Wage: Low Pay Commission Report Autumn 2017. Low Pay Commission, November 2017.https://www.gov.uk/government/publications/national-minimum-wage-low-pay-commission-report-2017	Following on from the introduction of the National Living Wage in 2016 and concerns expressed in earlier reports about the effect on pay differentials within firms, several of the surveyed or consulted employers reported having made changes to their pay structures, including compression of wage differentials. Employers worried that this would discourage progression and could have impacts on job satisfaction and retention. Some employers had also made changes to job structures, such as removing lower-level managerial positions. Unions and other employee representatives were more positive, however, and felt that employers had the capacity to absorb pay increases in other ways than through reducing differentials.
National Minimum Wage: Low Pay Commission Report Autumn 2018. Low Pay Commission, November 2018.	Two years from the introduction of the National Living Wage (and following increases in the rates since then), this report still finds employers reporting that pay differentials are being affected. In a case study visits, retail and hospitality workers felt that pay increases associated with more senior roles

https://www.gov.uk/government/publications/national-minimum-wage-low-pay-commission-2018-report	were virtually non-existent, making workers reluctant to take on additional responsibilities for no or very little additional pay. An employee survey by the British Retail Consortium found that workers reported fewer opportunities for promotion. Employers expressed concerns about the effects of these issues on staff morale, motivation to seek out progression, and ultimately their business models, but it seems few had come up with effective ways to mitigate these concerns. Employers in retail, hospitality and social care in particular cited limited scope for addressing the issue since pressures on staff costs were already high, though some had experimented with other forms of staff reward or enrichment of roles. These findings (together with those from previous Low Pay Commission Reports) suggest a need to be mindful of the sometimes-small increases in hourly pay that can accompany within-firm progression to more skilled or senior roles.
National Minimum Wage: Low Pay Commission Report Autumn 2019. Low Pay Commission, November 2019. https://www.gov.uk/government/publications/low-pay-commission-report-2019	Unlike in previous reports, this report includes data analysis on the effect of the National Living Wage (NLW). One of the areas examined is spillovers from the introduction (and subsequent increases) of the NLW on wage rates higher up the distribution. The estimates indicate that from 2015 to 2019, there were substantial spillovers ranging up to the 35th percentile of the hourly wage distribution. Nonetheless, there is evidence for wage compression in the lower third of the pay distribution. The largest increases in money terms were seen for wages up to the 5-6th percentile, while wages at the 10th to 30th percentile increased less strongly. This points to a reduction in pay differentials. This suggests that reported concerns by employers (and some workers) in previous reports are supported by the data.
Institute for Employment Studies (IES) Progression in Employment project https://www.employment-studies.co.uk/resource/progression-employment-employer-toolkit-case-study-collection (funded by JP Morgan Chase). Includes case studies and employer toolkit as well as Progression in Employment IES Briefing, April 2019.	The Progression in Employment project focuses on implementing upskilling pathways in four sectors: retail, hospitality, health and social care in Sweden, UK, France, Germany, Italy and Spain. Progression is defined as earnings progression, the move from insecure to secure employment and improved socioeconomic status. It can also encompass moving to a role with greater responsibility or skill requirements or improving job quality. The focus is on employer practices to support progression for low skilled workers. Findings show that the following employer interventions can help: job redesign;

	structured career development pathways; ensuring contracted minimum hours; multi-organisation collaborations; creation of specialist roles with appropriate training and pay; regular career conversations and development of line management capability. Success of such initiatives depends on: development of an evidence base and business case; senior leadership support; developing champions through the business; appropriate Human Resources systems and practices; a long-term perspective. Overall the research shows that workplaces should: critically evaluate promotion criteria for evidence of exclusion and bias; ensure all those involved in promotions are trained in unconscious bias; create a working environment where those involved feel comfortable about discussing bias; include all eligible people for promotion on a list, don't rely on assumptions; involve a wide range of perspectives; standardize the promotion process.
Green, A. Sisson, P. and Lee, N. (2017) Employment Entry in Growth Sectors: A Review of the International Evidence, Public Policy Institute for Wales http://ppiw.org.uk/files/2017/04/ESRC-Evidence-Review-Paper-Employment-Entry.pdf	ESRC international evidence on policies to encourage/ support entry into growing sectors and finds: • these can help underrepresented groups enter employment. • need to also focus on retention and career progression- particular problem in social care and hospitality. • public procurement for example in construction can be used to promote entry of disadvantaged groups. • in future policies need a place based as well as a sector focus.
Sisson, P, Green, A., and Lee, N (2017) Improving Job Quality in Growth Sectors: A Review of the International Evidence, Public Policy Institute for Wales http://ppiw.org.uk/files/2017/04/ESRC-Job-quality-paper.pdf	ESRC international evidence review on improving job quality in growth sectors finds: • little evidence of interventions to improve job quality in growth sectors. • available evidence is case studies and not systemic. • some interventions link improvements in job quality to improvements in service • some focus on using procurement as leverage, or on changing business model and on development of employer cooperatives.
Barnes, S-A, Green, A., Batty, E. and Pearson, S. (2017) *Key worker models: What key worker approaches, capacity and capabilities are important at different stages of the journey to employment?* Institute for Employment Research https://blogs.shu.ac.uk/talentmatch/	2 reports on Talent Match Lottery funded scheme in 21 Local Enterprise Partnerships with high youth unemployment (TM) National Evaluation 1. Evaluates how key worker support is being delivered and finds: • the key worker approach needs to /has evolved from 'building a working alliance' through to 'exiting the programme'

files/2015/03/tm-key-worker-report.pdf Crisp, R., Damm, C., Green, A., Pearson, S., Sanderson, E. and Wells, P, (2018). *Talent Match Evaluation: Progression to Employment*. Project Report. Sheffield, Sheffield Hallam University https://blogs.shu.ac.uk/talentmatch/files/2018/10/talent-match-eval-progression-employment.pdf	• key worker needs a wide range of skills for working with young people often with multiple and complex needs. 2. Evaluation of Talent Match programme found: • getting **the 'right job', as opposed to 'any job' is important for keeping people in work** – including how the person 'fits' the job in terms of skills, suitable hours and location. • Financial incentives for employers to take on and retain an individual in work for a pre-determined period can be important for stimulating employment entry and short-term retention. • role of the employer should not be overlooked. • Talent match could provide in-work support as well as support for entry- deemed important for progression. Suggests conceptualising individuals' journeys towards fulfilling employment as a 'climbing frame' – where moves might be forwards, backwards and across- and to recognise individuals also vary in their progression ambitions.
Chartered Institute of Personnel and Development (CIPD) Good Work Index https://www.cipd.co.uk/knowledge/work/trends/goodwork	CIPD Good Work Index has been developed in collaboration with academic partners and identifies seven dimensions of job quality: pay and benefits; employment contracts; work-life balance, job design and nature of work; relationships at work; employee voice; health and wellbeing. The CIPD argue that poor job quality is causing significant problems in the UK. They call for government to establish voluntary human capital reporting standards; ensure support for sector deals is contingent on coherent proposals by employers to boost job quality; provide small firms with Human Resources support; work with key stakeholders; improve labour market enforcement to protect employment rights. They recommend employers: design people strategies built on job quality and wellbeing; collect good quality data on the topic; use data-driven insights to target support; pay the Real Living Wage as a minimum; provide informal and formal flexible working practices; providing learning and career opportunities; promote inclusion and social cohesion; develop line managers; provide effective channels for voice.
CIPD Learning and Skills at Work Report, June 2020 https://www.cipd.co.uk/knowledge/strategy/development/learning-skills-work	This report was written in collaboration with Accenture and is based on a survey of organisations. The research found that although organisations increasingly recognize the need to improve capabilities and address skills gaps, there are gaps between the intent and reality of investment, resources and educational deployment involved. Organisations are failing to leverage technology. One-third of organisations state they are

	unable to address skills gaps in their organisations. Two-thirds have a vision for learning. Only 16% assess the behaviour change of participants by assessing the transfer of learning to the workplace.
CIPD (2019) Productivity and Place: The role of LEPs in raising the demand for, and use of, skills at work. Report, February 2019. https://www.cipd.co.uk/Images/productivity-and-place-the-role-of-leps-v2_tcm18-54430.pdf	The report explores the role of Local Enterprise Partnerships (LEPs) in skills development and utilization in the UK. It finds that LEPs emphasise skills supply with a limited focus on skills demand resulting in a low-skills equilibrium. The skills policy landscape is complex and fragmented creating the need for an overarching national skills policy. LEP capability and resource constraints meant adequate infrastructure was lacking and there was limited capacity to offer support outside priority sectors, excluding a large proportion of the local economy. Policy silos were evident even in local areas. In response to the Organisation for Economic Co-operation and Development drive for local skills approaches, the LEP focus on supply at the expense of demand meant capability to develop local skills ecosystems was limited. There was evidence of a tacit acceptance of a low skill/ low productivity equilibrium. Links between suppliers such as educational bodies and employers were weak. There was an uncritical assumption that simply improving skills supply would address the problem. Some pilot initiatives show promise e.g. two combined authorities are developing employment standards to encourage firms to offer stable, fairly paid work with training and in-work progression. Difficulty addressing skills demand was exacerbated by difficulty in influencing low-value large firms. In-work progression was limited in low skills equilibrium and the resulting overskilling was overlooked by LEPs. The UK offers a high proportion of jobs with few/no skill requirements.
CIPD (2018) Over-Skilled and Under-Underused. Investigating the untapped potential of UK skills. Report, October 2018. https://www.cipd.co.uk/Images/over-skilled-and-underused-investigating-the-untapped-potential-of-uk-skills_tcm18-48001.pdf	17% of respondents stated no qualifications were required for entry to their role and 27% said school-level qualifications only were needed. There is a concerning fall in the generic high-skills requirements of roles. 30% stated that while a degree would be required to get their job, only lower level qualifications would be required to do the job effectively. Over-qualification affects one-quarter of the workforce and affects how much an individual can earn, as well as increasing likelihood of future spells of unemployment. Over half stated their skill levels are not well matched with their roles. Young people are more likely to report being over and under-skilled, as well as those on part-time contracts and workers in low-skill industries e.g. retail and hospitality. Those who are over-qualified are less satisfied with their jobs, earn less, and are more likely to want to quit than their

	matched counterparts. They are also more likely to have poor career prospects and are less likely to be promoted. Just 12% of those earning less than £20k pa have been promoted compared with 45% of those earning £40k+. 24% of workers had had no training in the past 12 months. Those working in SMEs, on part-time contracts and working in manufacturing, retail, hospitality and construction had the lowest training rates.
Sisson. P. (2020) *Making progress? The challenges and opportunities for increasing wage and career progression* Work Foundation Centenary Provocation Papers https://www.lancaster.ac.uk/media /lancaster-university/content-assets/documents/lums/work-foundation/PaulSissonsFinalPape rforpublicationBH.pdf	Review of current state of knowledge: that supports: • a wider approach than monetary progression, • progression to be seen as a pathway starting pre entry with employability/ training through entry stability to progression, • trade-off between quality of initial match with need for in work support, • policy to target work entry and progression outcomes jointly, • a sector-focused approach (but insufficient evidence on the 'best' sectors to target), • raising employers' awareness of benefits of progression strategy • sharing good practice among employers (but notes in retail and hospitality activities disappeared with ending of funding).
Gunson, R., Hatfield I. and McGeoghegan, M. (2016) *Jobs and Skills in Scotland* Institute for Public Policy Research https://www.ippr.org/files/publicati ons/pdf/scotland-skills_June2016.pdf	Finds lower rate of progression from low to mid/high skilled in Scotland than for UK. Attributes this to a mismatch between demand and supply of skills in Scotland. Suggests needs a flexible/ modular skills system that can work with employees/ learners and employers throughout a lifetime of learning.
Thompson, S. and Hatfield, I. (2015) *Employee Progression in European Labour Markets* Institute for Public Policy Research https://www.ippr.org/publications/e mployee-progression-in-european-labour-markets	Review of labour market progression across European countries finds: • earning progression is stronger than occupational progression and associated with employer changes. • limited progression from part-time where part-time a common employment form, likewise with temporary contracts
Mion, G., Opromolla, L D, Ottaviano, G. (2020) *Dream Jobs* Centre for Economic Performance Discussion Paper No 1705 http://cep.lse.ac.uk/pubs/download/ dp1705.pdf	Compares internationally active and domestic firms and finds: • internationally active have much steeper wage profiles and more opportunities for progression, • these internal opportunities for progression mainly benefit managers, • blue collar workers mainly benefit from moves between firms, • this distinction between types of firms may help explain inequalities between workers and by region.
Jones L. (2019) *Women's Progression in the Workplace* Kings College London and	The report reviews 100+ papers on women's progression measured in 2 ways– wage growth, and movement up a vertical occupational scale:

Government Equalities Office https://www.kcl.ac.uk/giwl/assets/womens-progression-in-the-workplace.pdf	• in both cases minimal gender gap on labour market entry but widens significantly from the late 20s and early 30s/ women's progression plateaus. • part-time work is an important explanation. • other factors include social cloning, networks, hostile environments, and clash with external responsibilities (constant availability). • alternative working arrangements come at cost of lack of progression (senior part-timers often full-timers who negotiate a reduction).
Harkness, S., Borkowska, M. and Pelikh, A. (2019) *Employment pathways and occupational change after childbirth.* London: Department for Work and Pensions, p. 76. Government Equalities Office	**What**: research uses data from Understanding Society for 2009/10-2016/17 to explore how far women 'downgrade' their careers following childbirth. They compare the careers of new mothers and fathers over the 3-5 years following the birth. **Finds**: • Gendered patterns of occupational progression are reinforced after childbirth. 1 year after 6% of mothers and 13% of fathers move up occupational ladder, 5 years after childbirth 13% of mothers and 26% of fathers move up • Occupational change occurs gradually. Women tend to return to job in same occupation as the one they left but then have lower chance of promotion. • Women working with the same employer are more likely to remain in the same level of job (and less likely to progress or downgrade in the occupational ladder).
Morris, G. (2016) *Limits of exploitation? Consideration of the utility of progression pathways for workforce development* Centre for Skills, Knowledge and Organisational Performance Issues Paper 35 March 2016 https://files.eric.ed.gov/fulltext/ED593418.pdf	Paper makes argument that: • progression pathways currently too focused on moving between skills levels/job grades • employees may not all wish to progress by grade within the same job type an effective model of organisational skills development should additionally, provide greater opportunity to further develop employees within their grade. • an important driver for doing so is to better equip and focus employees on the issues of innovation and change.
Royal Society of Arts (RSA) (2020) 'A Blueprint for Good Work: Eight Ideas for a New Social Contract'. June 2020. Report. https://www.thersa.org/globalassets/reports/2020/a-new-blueprint-for-good-work.pdf	This report draws on ideas from the original 2017 Taylor Review, as well as a later 2019 RSA report 'The Four Futures of Work' and reflects changes since then, including the COVID-19 pandemic and the growth of employment insecurity. The report identifies five 'good work' principles: 'security; wellbeing; growth, freedom; subjective nurture. The report recommends interventions at the micro, meso and macro levels to secure good work based on the premise that it is not the responsibility of the individual but rather of other institutions to secure

	good work. This resource is largely an opinion-piece rather than being based on a clear evidence-base.
International Labour Organization (ILO) (2018) 'Digital labour platforms and the future of work: towards decent work in the online world' ILO, Geneva., September 2018. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_645337.pdf	The report is based on a survey of 3500 individuals in 75 countries engaged in work on microtask platforms. Such workers are self-employed, well-educated and many undertook this work to supplement their income; 10% undertook this work because health conditions precluded other types of paid work. For 32% it was their main source of income. Two-thirds of US based workers earned less than the federal minimum wage. On average, workers spent 20 minutes on unpaid activities for every hour of paid work; most wanted to do more crowd work. Only 6/10 were covered by health insurance, and 35% had a pension or retirement plan. Most had had work rejected or payment refused and many struggled to communicate with requesters and platforms.

There is a significant challenge in regulating platform working. The report recommends a suite of measures aimed at ensuring decent work, including allowing collective bargaining rights, applying minimum wage, ensuring pay transparency, covering cost of lost work, enforcing codes of conduct and enabling workers to continue a work relationship with a client off the platform without paying a large fee. |
ILO (2019) 'What works: Promoting pathways to decent work'. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_724049.pdf	The report focuses on how income support and active labour market policies can be combined to tackle temporal and structural barriers to decent work in emerging and developing countries. It is not directly relevant to the situation in the UK.
ILO (2019) 'Time to Act for SDG8: integrating decent work, sustained growth and environmental integrity'. ILO, Geneva. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_712685.pdf	The report focuses on progress towards Sustainable Development Goal 8 of the United Nations Agenda for Sustainable Development, concerned with decent work for all. The report finds that progress towards SDG8 is slowing down in many countries. Young people face major decent work deficits in all countries. The report urges countries to continue to strive for economic growth but to decouple it from environmental degradation by adopting technological innovations and changing consumption behaviour. However, it also calls into question the growth-based approach for wealthy countries such as the UK given the risks to the global ecosystem. Principles of social justice should encourage countries to seek a balance between sustained growth, social inclusion and decent work and environmental integrity. The report highlights the point that decent work is crucial to achieving inclusive economic growth.
ILO (2019) 'Working conditions in a global perspective'. ILO/Eurofound. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---	The report adopts the seven ILO measure of job quality comprising: physical environment; work intensity; working time quality; social environment; skills and discretion; prospects; earnings. Although

publl/documents/publication/wcms_696174.pdf	the UK is not analysed separately, the report includes an examination of the situation within the European Union which highlights continued exposure of workers to physical risks including posture-related risks such as lifting or repetitive movements in sectors such as construction. The report also highlights the continued prevalence of work intensity e.g. in terms of speed or emotional demands as well as long working hours for many. A minority reported negative social experiences such as bullying or harassment. Although many jobs required a high level of creativity and task variety, there were also signs of low levels of discretion and repetitive work. While 39% of workers across the European Union reported good career prospects, many did not. 78% of workers reported being in good health, and 82% reported a good work-life balance. 73% of under-55s reported they would be able to do their current job until the age of 60, with men being more optimistic than women, but this varied by sector and occupation. Exposure to such factors as work intensity, shift work, night work, unfair treatment or bullying and harassment reduced levels of optimism. Overall, the report highlights progress on many dimensions of job quality but continuing levels of concern around exposure to risk and low paid work.
Sadro F., and Clayton, N. (2019) Evidence review: Supporting progression from low pay. Learning and Work Institute. https://learningandwork.org.uk/resources/research-and-reports/evidence-review-what-works-to-support-progression-from-low-pay/	Evidence review drawing on impact evaluations of progression initiatives to assess the most effective types of interventions. Programmes reviewed include WorkAdvance, Carreras en Salud (US), Project Quest (US), Step Up London, the Timewise Progression Trial, West London Alliance Skills Escalator, Workforce1 Careers Centres (US), the DWP In-Work Progression trial, Year Up (US), and other, smaller programmes. Definitions of progression included increases in earnings or hours, better job security, and greater flexibility (though the review mostly focuses on earnings). **Key findings:** • It is difficult for labour market interventions to impact on in-work progression. Of the 30 programmes reviewed, 18 had positive impacts on employment and earnings while 12 did not. • Effects varied by group. Gains were often largest for those furthest from the labour market and on the lowest incomes. Young people also tended to benefit more. • Training tailored to a specific occupation or sector, combined with support to progress within that sector, tended to be more effective than general training.

Lupton, R., Hughes, C., Peake-Jones, S. and Cooper, K. (2018) *City-region devolution in England.* Social Policies and Distributional Outcomes Research Paper 2. London: London School of Economics.	**What:** research on the potential to take a more holistic approach to policymaking in the context of city-region devolution via a review of the policies emerging in Greater Manchester. **Finds:** • The simultaneous devolution of powers and responsibilities in different areas and the development of networks and partnerships presents an opportunity to take a more expansive view of 'employment policy' that cuts across government departments and policy areas. • Emerging evidence of this approach can be found in the Greater Manchester Work and Skills strategy, which encompasses commissioning practices, business support and 'soft' influencing of employers alongside more traditional supply-side elements of employment support. • While there is promise in this area, the paper finds the policies emerging in this context in Greater Manchester are part of a 'fragile settlement' which is by no means assured over the longer term
Pleace, N. and Bretherton, J. (2017) *Crisis Skylight: Final Report of the University of York Evaluation.* London: Crisis. Available at: https://www.crisis.org.uk/ending-homelessness/homelessness-knowledge-hub/services-and-interventions/crisis-skylight-final-report-of-the-university-of-york-evaluation-2017/ (Accessed: 4 August 2020). Bretherton, J. and Pleace, N. (2016) *Crisis Skylight: Journeys to Progression: Second Interim Report of the University of York Evaluation.* Monograph. London: Crisis. Available at: http://eprints.whiterose.ac.uk/139383/ (Accessed: 4 August 2020).	**What:** mixed methods evaluation of Crisis Skylight, an initiative aiming to promote social integration primarily for single homeless people, people at risk of homelessness and those with a recent history of homelessness. **Finds**: • Broad view of progression: the project aimed to support service users to progress to paid work, education, training, volunteering, housing stability and better health and social support. Not a work-first approach. • Progression for clients with complex needs is not a simple, linear process: e.g. they identified service users who made punctuated progress where people took positive steps but then lost ground; others 'regained progress' taking steps to regain the lives they had before (e.g. where they had interrupted studies) and others made progression for the first time. Positive outcomes were underpinned by a broader model of change, which centred on recognising and adapting to individual needs using arts-based activities, education and one-to-one support. Ongoing support was recognised as important to enable service users to maintain progress.
Velthuis, S., Sissons, P., and Berkeley, N. (2019) Do low-paid workers benefit from the urban	Examines whether workers are more likely to progress in (larger) cities. Finds that results vary

escalator? Evidence from British cities. Urban Studies, vol 56(8).	depending on the way wage progression is defined. Examining low pay transitions using a nationally defined threshold of two-thirds of median hourly pay, workers are significantly more likely to move out of low pay in London than in other areas. But this seems to be driven largely by the fact that overall wage levels are higher in London, such that the low pay threshold is positioned at a much lower point in London's wage distribution than the wage distribution of other local labour markets. When 'low-paid employment' is defined in terms of a set of occupations with low median rates of pay, instead of through a wage threshold, there is no evidence that low-paid workers in London experience faster wage growth than workers elsewhere. It is, however, possible that younger low-paid workers might derive a benefit from living in London in terms of progression, although the analysis could find no conclusive evidence for this.
Millar, J. (2019) Self-Responsibility and Activation for Lone Mothers in the United Kingdom *American Behavioral Scientist*, Vol. 63(1) 85–99	Longitudinal study of lone parents and finds: • staying in the "right" job for family commitments was often a priority, particularly when children were still at school. • Return interviews in 2016, to 15 families found most of the women interviewed had stayed in work, but most had not significantly increased their pay or incomes. In-work progression was possible for some, once childcare obligations had eased, and if they were willing to change jobs and work longer hours.
Butler, P. and Hammer, A. (2020) Pay progression in routinised service sector work: navigating the internal labour market in a fast food multinational company *Industrial Relations Journal* 51:4, 351–371	This paper explores the impact of internal labour markets on entry level workers undertaking routinized service sector work in a market leading, fast food multinational company. Despite having potential enabling features -on-the-job training, a transparent and integrated pay structure and a professed culture of progression, movements to positions above the low-pay threshold are relatively rare. This contradiction results from operating in a sector where price leadership strategies dominate.
Sisson, P, Green, A. (2017) More than a match? Assessing the Human Resource Management challenge of engaging employers to support retention and progression *Human Resource Management Journal*, Vol 27, no 4, pages 565–580	The paper argues that the shift in emphasis to retention and progression alters the logics of employer engagement and so also has potential implications for Human Resources practice at firm level. These include: • for some organisations, participation in active labour market policies may appear more demanding and/or intrusive, • employees may be asking for more wage progression (driven by the in-work conditionality element of UC),

	- if skills are lacking employers may focus on recruiting other groups not those on active labour market policies, - if progression is mainly through changing jobs/sectors it may be more difficult to engage employers. Also, difficult to identify sectors or types of employers to target that offer good jobs but comparably low barriers to entry.
Reichelt, M. (2015) Career Progression from Temporary Employment: How Bridge and Trap Functions Differ by Task Complexity *European Sociological Review*, Vol. 31, No. 5, 558–572	In the context of Germany, the paper explores if temporary contracts are a bridge into permanent employment and finds: - this is most likely for medium-skill work, - the risk of a transition to unemployment is generally equal, but increases for low- and medium-skill tasks if local labour demand falls, - only high-skill jobs seem unaffected by the employment environment, - the function and consequences of temporary work must consider occupational characteristics.
Lee, Neil, Green, Anne and Sissons, Paul (2018) *Low-pay sectors, earnings mobility and economic policy in the UK.* Politics & Policy, 46 (3). pp. 347-369	The paper focuses on sectoral variation in low pay: using Quarterly Labour Force Survey for a snapshot and 5 quarter longitudinal Labour Force Survey and finds: - Sectors with the highest share of low paid workers provide lowest chance of leaving low paid employment. - Sector of employment has a persistent effect on probabilities of low pay e.g. after controlling for their age, qualifications, migration status and disability, workers in Accommodation and Food are 17% more likely to be in low pay than an observationally identical worker in Manufacturing. - Sector matters for upwards earnings mobility: low paid workers in Human Health, Finance and Insurance, and Public Administration and Defence have a higher chance of not being low paid a year later than in manufacturing- others all below manufacturing. - Some sectors with low chances of escaping low pay e.g. accommodation and food services projected to expand.
Hudson,M., Netto,G., Noon, M., Sosenko, F., de Lima, P., Kamenou-Aigbekaen (2017) Ethnicity and low wage traps: favouritism, homosocial reproduction and economic marginalization *Work, Employment and Society* 31(6): 992–1009	Based on interview evidence from low-paid workers and managers in local government, the health service, facilities management and housing it reveals the double-edged nature of informality and the role of favouritism in particular in perpetuating ethnic advantage and privilege. Stronger forms of positive action, and even positive discrimination, are needed to address the low pay traps and restricted opportunities of ethnic minority workers.

Puttick, K. (2019). From Mini to Maxi Jobs? Low Pay, 'Progression', and the Duty to Work (Harder) *Industrial Law Journal,* Vol. 48, No. 2, pp. 143-179	Makes the case for the development of sectoral minimum wages on top of the National Living Wage to better align pay with what companies can afford and reduce costs of in work benefits as well. Also argues for right not to work more (progression in Universal Credit terms) due to family responsibilities-indicates need to match progression criteria with actual circumstances of the claimant.
Felstead, A., Gallie, D., Green, F., & Henseke, G. (2019). Conceiving, designing and trailing a short-form measure of job quality: a proof-of-concept study. *Industrial Relations Journal.* Doi:10.1111/irj.12241. Journal article.	Despite the interest in job quality, it is not always clear what is meant by 'fair' or 'good' work and there is no agreed upon short-form instrument available. The Taylor Review called for more effort to be made to produce a reliable metric for this purpose. The article proposes a new job quality measure drawing on prior research in the field. The measure is based on three principles: 1) job quality comprises a set of work features that have the capability of enhancing or diminishing worker well-being; 2) job quality needs to focus on the attributes of the job occupied by the worker and not the worker's personal circumstances; 3) several facets of job quality matter for wellbeing including pay, the organization of work, discretion, security, training, work effort, skill use and work-life balance. Other job quality measures such as that of the Organisation for Economic Co-operation and Development or Eurofound similarly include multiple dimensions. The measure covers 10 job quality domains: work intensity; learning; security; discretion; influence; control; work-life balance; social support; promotion; pay.
Bailey, N. (2016) 'Exclusionary Employment in Britain's Broken Labour Market', Critical Social Policy, 36(1): 82-103. (Journal article). https://journals.sagepub.com/doi/pdf/10.1177/0261018315601800	Using data from the UK Poverty and Social Exclusion Survey, the author found 1/3 of adults in paid work are in poverty, or in insecure and poor-quality employment. One-third of this group has not seen any progression in their labour market situation in the last five years. The dataset comprises interviews with c. 8,000 adults which took place in 2012, most of whom were originally interviewed in 2010/11. The measures used comprise low income poverty measure based on equivalized household income and a direct measure of poverty.
Rafferty, A., & Wiggan, J. (2015). The time-related underemployment of lone parents during welfare reform, recession and austerity: A challenge to in-work conditionality? Social Policy and Administration. https://doi.org/10.1111/spol.12190	This study explores the extent to which lone parents not only managed to enter paid work but obtain a sufficient number of employment hours. Activation policies have increased labour market exposure at a time of greater underemployment but high levels of economic hardship, in the context of stagnant real wage growth and benefit cuts could place additional pressures on lone parent time-related underemployment if there is a lack of availability of greater employment hours to improve household income. The findings showed disproportionately high growth in time-related underemployment among lone mothers with at peak around one in five employed

	lone mothers with a youngest dependent child above five years of age experiencing such underemployment.
Lain, D., Airey, L., Loretto, W. and Vickerstaff, S. (2020) 'Older workers and ontological precarity: between precarious employment, precarious welfare and precarious households'. In A. Grenier, C. Phillipson, and R. Settersten Jr (Eds) *Precarity and Ageing: Understanding insecurity and risk in later life*, pp.91-114. Lain, D., Airey, L., Loretto, W. & Vickerstaff, S. (2019) Understanding older worker precarity: the intersecting domains of jobs, households and the welfare state. *Ageing & Society*, 39: 2219–2241 doi:10.1017/S0144686X18001253	Policy-makers need to appreciate that, for older workers, 'sustainable work' is not simply about security of employment. Individuals' state of health and well-being, and the presence or absence of caring responsibilities, can also shape their perceptions of whether or not it is sustainable to remain in employment up to or beyond State Pension age
Loretto, W., Airey, L., Yarrow, E. (2017) Older people and employment in Scotland. Scottish Government Research report.	Older workers may miss out on opportunities for skills development & training. This is linked to employers retreating from the management of older workers in the wake of age-discrimination legislation, for fear of being accused of ageism by employees. Employers need guidance in how to communicate effectively with their older employees. Many older workers express the view that, for them, 'sustainable work' means good quality, **part-time** jobs. Part-time employment is perceived as desirable as it would enable older workers to combine paid work and caring responsibilities, manage their own energy levels and/or health conditions, and allow them time to pursue other interests whilst maintaining income from employment. However, awareness of flexible work opportunities is relatively low among older workers, and part-time jobs are generally perceived to be of low quality. Employers should therefore ensure that flexible work options are communicated effectively to older employees.
Richard Blundell, Monica Costa Dias, Robert Joyce and Agnes Norris Keiller 2020. What has been happening to career progression? https://www.ifs.org.uk/publications/14967	Men born in each decade since the 1950s, and women born since 1985, started their careers in occupations further down the wage ladder than earlier cohorts. Young people increasingly reliant on occupational mobility to progress. Young men born in 1980s increasingly struggling to move up occupational ladder even before COVID-19.

Monica Costa Dias, Robert Joyce and Francesca Parodi 2020. The gender pay gap in the UK: children and experience in work. https://www.ifs.org.uk/publications/10356	Mothers suffer big long-term pay penalty from part-time working. One important factor is that mothers spend less time in paid work, and more time working part-time, than do fathers. As a result, they miss out on earnings growth associated with more experience. The lack of earnings growth in part-time work has a particularly big impact for graduate women, because they are the women for whom continuing in full-time paid work would have led to the most wage progression.

ARI 9: Identifying populations at risk of joblessness and poverty and intervening and evaluating successfully to prevent poor outcomes.

Resource	Messages
Acemoglu, D. & Restrepo, P. (2018), 'Artificial Intelligence, Automation and Work', National Bureau of Economic Research Working Paper No. 24196 https://www.nber.org/papers/w24196	Key Finding: Automation may have complex effects on work, not simply reducing it, but also creating new forms of work and new demands for labour. Informed: Understanding of risks of automation and future of work.
https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/whichoccupationsareathigheristriskofbeingautomated/2019-03-25	Key Finding: Automation risks are worse for low-skilled, low-income jobs, and differ by certain protected characteristics. Informed: Understanding of risks of automation and future of work.
Households Below Average Income survey https://www.gov.uk/government/statistics/households-below-average-income-199495-to-201718	Key Finding: Gini coefficient broadly stable, before housing costs measures of low income rose in 2017/18; after housing costs measures of low income broadly stable in 2017/18. Households Below Average Income data has a significant time lag and COVID-19 effects will not become apparent in it for a long time. Informed: Understanding of household income dynamics and targeting of support.
IZA Institute of Labor Economics DP No. 9236, What Works? A Meta Analysis of Recent Active Labor Market Program Evaluations (ALMPs), Card, Kluve and Weber, 2015 https://www.iza.org/publications/dp/9236/what-works-a-meta-analysis-of-recent-active-labor-market-program-evaluations	Key Finding: ALMPs can take 2+ years to show positive impacts. Impacts vary across groups. Adviser support and activation important element of support. Informed: Labour market interventions development.
IZA Institute of Labor Economics DP No. 6880, Active Labor Market Programs: Employment Gain or	Key Finding: Activation is effective outside recession. Hiring subsidies can be effective for disadvantaged groups.

Fiscal Drain? Alessio J.G. Brown Johannes Koettl, 2012 https://www.iza.org/publications/dp/6880/active-labor-market-programs-employment-gain-or-fiscal-drain	Informed: Labour market interventions development.
Active Labour Market Programme (ALMP) Participation for Unemployment Insurance Recipients: A Systematic Review Filges, T. et al. 2015 https://doi.org/10.4073/csr.2015.2	Systematic review found overall, ALMP programmes display a limited potential to alter the employment prospects of the individuals they intend to help. The available evidence does suggest that there is an effect of participating in ALMP, but the effect is small and we found no effect of being assigned to ALMP participation at a particular moment. It was not possible to examine a number of other factors which we had reason to expect as impacting on the magnitude of the effect and which may be crucial to policy makers. The results of this review, however, merely suggest that across a number of different programmes there is an overall small effect of ALMP participation on job finding rates, and no evidence of differential effects for different programmes. While additional research is needed, the review does however suggest that there is a small increase in the probability of finding a job after participation in ALMP.
Lain, D., Airey, L., Loretto, W. and Vickerstaff, S. (2020) 'Older workers and ontological precarity: between precarious employment, precarious welfare and precarious households'. In A. Grenier, C. Phillipson, and R. Settersten Jr (Eds) *Precarity and Ageing: Understanding insecurity and risk in later life*, pp.91-114. Lain, D., Airey, L., Loretto, W. & Vickerstaff, S. (2019) Understanding older worker precarity: the intersecting domains of jobs, households and the welfare state. *Ageing & Society*, 39: 2219–2241. Loretto, W., Airey, L., Yarrow, E. (2017) Older people and employment in Scotland. Scottish Government Research report.	Older workers face multiple intersecting barriers to employment, such as: employers' ageist attitudes regarding recruitment; health problems, and unpaid caring responsibilities (which affect women more than men due to gendered social roles). Older women are particularly at risk of poverty in later life. This is linked to gendered patterns of paid employment and unpaid caring across the lifecourse. Women are more likely than men to have had time out of the labour market to care for children and other relatives. Women are also more likely to be employed part-time rather than full-time, in lower-paid jobs. This means that, compared to men, women accrue lower levels of occupational and personal pension savings by the time they reach pension age. Risks of poverty are even higher for divorced women, who may have lost access to a share of their ex-husband's pension & savings upon divorce.
Richard Blundell, Robert Joyce, Monica Costa Dias and Xiaowei Xu 2020. COVID-19: the impacts of the pandemic on inequality.	The specific nature of the economic shock associated with COVID-19 has interacted with many old and deep inequalities. Active policy is needed to avoid exacerbating inequalities in income, health and education, and by gender, ethnicity and age.

https://www.ifs.org.uk/publications/14879	
Robert Joyce and Xiaowei Xu 2020. Sector shutdowns during the coronavirus crisis: which workers are most exposed? https://www.ifs.org.uk/publications/14791	Sector shutdowns disproportionately affect low-paid, young and female workers. One mitigating factor is that the majority of the affected younger workers and lower earners live with parents or others whose earnings are likely to be less affected.
Monica Costa Dias, Robert Joyce and Agnes Norris Keiller 2020. COVID-19 and the career prospects of young people. https://www.ifs.org.uk/publications/14914	The COVID-19 pandemic has severely dented the career prospects of young people and threatens to have a prolonged negative economic impact on them as a result. Sharp contractions in shut-down sectors will make it harder for young people to take their first step onto the career ladder, while reduced job opportunities will make it harder for them to move into higher-paying occupations.
Jonathan Cribb, Andrew Hood and Robert Joyce 2017. Entering the labour market in a weak economy: scarring and insurance. ifs.org.uk/publications/10180	Leaving education when the economy is weak has a direct impact on employment and pay at least five years afterwards. Some of the impact is offset by lower taxes and higher benefits. Another important potential safety net is that most people live with their parents in the first few years after leaving education, irrespective of economic conditions.

Annex 8. Resources identified by the Working Group on Local and National Growth

Subgroup A

Research Centre	Relevance
Centre for Enterprise and Economic Development Research (CEEDR)	Our work has an established reputation for high quality, independence and meaningful impact in small business and local economic development policy and practice. Key research themes comprise: • SME growth, finance and development • Social and sustainable enterprise • Local/regional economic development and regeneration • Employment, skills and quality of work
University Alliance	We are universities with a common mission to make the difference to our cities and regions. We use our experience of providing high quality teaching and research with real world impact to shape higher education and research policy for the benefit of our students and business and civic partners. We innovate together, learn from each other and support every member to transform lives and deliver growth.
Universities UK	Opportunity - anyone with the will and potential to succeed, regardless of their background, has the opportunity to transform their lives through accessing an outstanding learning experience at a UK university. Impact - UK universities are world-leading in the production and application of knowledge and skills. Trust - through demonstrating positive impact on students' lives, economic growth, public services and civil society, UK universities benefit from widespread public trust and political support. Global - UK universities are global leaders in international education and research. Autonomous - UK universities are free to make autonomous decisions according to their diverse missions and the needs of their students and communities.
National Centre for Universities and Business	The National Centre's Council, drawn from senior business leaders and Vice-Chancellors from our member organisations, review and make recommendations on the UK's long-term skills, graduate talent and innovation needs, deliver collaborative thinking on the big issues of sustainable growth and industrial strategy, and strengthen understanding with government and policy-makers through high level networking. At the National Centre for Universities and Business, we deliver digital platforms for innovation brokerage and work experience, research and analysis feeding into every major review of business-university collaboration and change programmes mapping out clear and practical solutions for both sectors and regional economies.
Centre for Cities	The UK's economy is driven by the success of its largest cities and towns, which generate opportunities and prosperity for people in all parts of the country. Our mission is to help the UK's largest cities and towns realise their economic potential. We produce rigorous, data-driven research and policy ideas to help cities, large towns and Government address the challenges and opportunities they face – from boosting productivity and wages to preparing for Brexit and the changing world of work. We also work closely with urban leaders, Whitehall and business to ensure our work is relevant, accessible and of practical use to cities, large towns and policy makers.

City Region and Economic Development Institute (City REDI)	The Institute is at the forefront of academic debate on local and regional economic growth, as evidenced by high-quality research outputs. Utilising a systemic and interdisciplinary "Birmingham approach" to understanding and facilitating economic development in city regions. Attracting new, leading faculty in related fields to the University of Birmingham and providing a boost to the regions research capacity in areas such as data analytics and economic forecasting Developing international research partnerships to facilitate international comparative analysis and maximise economies of scale and scope for research funding and outputs. Translating high level academic reports into practical and useful policy recommendations for practitioners, alongside longer-term intelligence and research papers. Including paper on The Impact for Universities on regional economies paper
Centre for Economic Performance (CEP), London School of Economics	CEP studies the determinants of economic performance at the level of the company, the nation and the global economy by focusing on the major links between globalisation, technology, the educational system and the labour market and their impact on productivity, inequality, employment, stability and wellbeing.
Centre for Regional Economic and Enterprise Development (CREED)	The Centre for Regional Economic and Enterprise Development is an interdisciplinary research centre based within Sheffield University Management School. Its expertise is drawn from a number of disciplines including innovation, management and economic development. CREED is engaged in a variety of research project in the UK and across the world, examining the policy and practice of innovation, entrepreneurship and regional development. Much of our work has an institutional focus, examining how regulation, norms and cultures shape economic behaviours, landscapes and outcomes.
Centre for Regional Economic and Social Research (CRESR)	As a leading UK policy research centre, CRESR seeks to understand the impact of social and economic disadvantage on places and people and assess critically the policies and interventions targeted at these issues. Clients include government departments and agencies, local authorities, charities and foundations, international organisations, and the private sector. We offer research expertise covering a wide range of qualitative and quantitative methods, evaluation, policy advice and guidance, and consultancy.
Civic University Commission	Universities are facing a host of challenges. Politicians and commentators from all sides are asking fundamental questions about their purpose, whether they provide 'value for money', and whether they serve students and taxpayers. The Commission is an attempt to shift the debate on higher education, but it has a more fundamental and practical purpose. Universities will exist for centuries (indeed many already have) – far beyond any piece of government legislation or headline in the papers. The Commission will look at how, concretely, universities can serve their place as well as play a global role. To do this, the Commission wants to understand how civic universities operate today, how they operated in the past, and how they should operate in the future. We are looking at evidence from a wide range of sources including public opinion; expert witnesses and written evidence; and historical and current research.

UK Research and Innovation (UKRI)	UK Research and Innovation works in partnership with universities, research organisations, businesses, charities, and government to create the best possible environment for research and innovation to flourish. We aim to maximise the contribution of each of our component parts, working individually and collectively. We work with our many partners to benefit everyone through knowledge, talent and ideas. Operating across the whole of the UK with a combined budget of more than £7 billion, UK Research and Innovation brings together the seven research councils, Innovate UK and Research England.
Institute for Social Innovation and Impact (ISII)	The ISII aims to evaluate and measure the impact of social innovations in the UK and around the world, while also exploring the financing of, and policy support for, social innovation. The Institute defines social impact as 'the economic, social and environmental benefits delivered by an organisation to society' and views social innovation as any new structure or process that enhances society's resources and cohesion. The ISII supports social innovators through the delivery of academic research and consultancy services, including social impact measurement reporting. The Institute collaborates on multi-disciplinary research projects through internal partnerships with other research institutes and centres, as well through external partnerships with other universities and organisations.
The Research Centre for Social Sciences	The Research Centre for Social Sciences works to promote social science research at York. It fosters interdisciplinary research collaborations, provides training and skills development for our community of researchers, and promotes knowledge exchange and impact with our regional, national and international partners outside the academy.
Social Innovation Exchange (SIX)	SIX is a social innovation exchange built on mutual value, relationships and knowledge. We work globally to facilitate purposeful cross-sector conversations, that challenge and inspire people to use innovation to increase social impact. SIX was founded to help identify and connect isolated people and organisations within social innovation, fuelled by the belief that change is more effective when people work collectively. Ten years later, we have helped create a lively and impactful exchange between socially innovative thinkers and doers. This exchange is more than a network and more than just talk, it improves societal wellbeing. In the coming years, we are working to grow the social innovation movement and invite new people, sectors, and regions into this exchange.
European University Association (EUA)	The EUA represents more than 800 universities and national rectors' conferences in 48 European countries. EUA plays a crucial role in the Bologna Process and in influencing EU policies on higher education, research and innovation. Through continuous interaction with a range of other European and international organisations, EUA ensures that the independent voice of European universities is heard. EUA provides unrivalled opportunities for members to share best practices by participating in projects, events and other mutual-learning activities involving a wide range of universities. The Association also provides members with unique opportunities to shape European policies and initiatives affecting higher education and research.

ESRC Hub: Impact of HEIs on regional economies (2007-2011)	Some useful resources from a previous ESRC-funded large initiative based at Strathclyde University, led by Prof. Peter McGregor and Ursula Kelly. Although the consortium was finished in 2011, the insights and resources generated can still be useful esp. re the linkage between Higher Education Institutes (HEIs) and their contribution to regional economies. Many Co-Is associated with this initiative have gone on to further their work in areas re HEI-firm knowledge transfer and innovation network, academic entrepreneurship etc. (e.g., Markus Perkmann at Imperial, Richard Harris/John Moffat at Durham, Rob Huggins etc.). Here is a detailed list of the funded projects and the research outputs.
PrOPEL Productivity Hub (2020-2013)	The ESRC PrOPEL Hub (Productivity Outcomes of Workplace Practice, Engagement and Learning) was launched this year to support knowledge exchange and evidence coordination on productivity (2020-2022). This is a multi-disciplinary hub (led by Strathclyde Business School) to help boost productivity – and wellbeing – through supporting the growth of better workplaces in the UK. The specific focus of the Hub is on workplace, managerial practices and innovation adoption. It aims to provide practical lessons, ideas and toolkits for businesses to draw upon, all informed by the very latest research and evidence. The Hub will work with businesses, policymakers and support organisations to help improve the UK's productivity performance through improved management practices, employee engagement and adoption of digital technologies.
Productivity Institute (2020-2025)	The recently announced £32m Productivity Institute is the largest ever ESRC investment that aims to advance knowledge and inform significant decisions by policy makers and business leaders to increase productivity. "The Institute and programme will address low productivity identified by traditional measures, but will also go beyond these measures to explore wider issues, including variation across places and what can be done to improve productivity for the UK as a whole; the importance of delivering a low carbon economy; relationships between well-being, productivity and skills; and the need for new ways of measuring productivity in a changing economic, technological and environmental context." 'The aim is to ensure that advances in knowledge inform the significant decisions and interventions that policy makers, businesses and individuals must make to improve productivity, and to achieve the attendant improvements in wages and living conditions that doing so can drive.'

Subgroup B

ARI	Resource	Key Messages
What role does productivity play in the UK economy?	UK: Industrial Strategy Council https://industrialstrategycouncil.org/ UK Government Business Productivity Review (2019)	Established productivity key driver of local, regional and national growth Productivity debate has moved on from viewing productivity as a technical measure of output (Labour productivity and Total Factor Productivity) to its role in driving growth and wages and wider economic and societal benefits

	Made Smarter Review (2017) UKRI – Strategic Priorities Fund: https://www.ukri.org/research/themes-and-programmes/strategic-priorities-fund/ ESRC Productivity Strategic Investments: https://esrc.ukri.org/about-us/strategy-and-priorities/productivity/?_ga=2.48676128.721253446.1598969235-910505521.1555417717 Productivity Insights Network: https://productivityinsightsnetwork.co.uk/ International evidence: OECD (2019), OECD Compendium of Productivity Indicators 2019, OECD Publishing, Paris https://doi.org/10.1787/b2774f97-en Australian Productivity Commission: https://www.pc.gov.au New Zealand Productivity Commission: https://www.productivity.govt.nz/ Charities/Think tanks What Works Centre for Local Economic Growth (WWLEG) https://whatworksgrowth.org/policy-reviews/ Resolution Foundation Publications https://www.resolutionfoundation.org/publications/	The traditional 5 drivers (competition, enterprise, skills, investment and innovation) of productivity evidence shows remain important for increasing productivity. Most evidence and research has focused on these areas. Increasing focus on links between pay and productivity From the literature, focused mainly on advanced European economies and the US, the current thinking on the drivers of weak productivity are: • Mismeasurement (Coyle 2017,) - this is particularly identified as an issue for the UK due the relative size of the UK's service sector. The view being that services are not measured as effectively as tangible goods. • Weak investment - related to the financial crisis, and longer-term structural changes • Hysteresis - "a long-term effect of recession on output due to reduced capital accumulation, scarring effects on workers through job loss, and disruptions to economic processes underlying technological progress" (Bryson and Forth 2016: 167). • Long tail of low productivity firms. US literature refers to low productivity firms as 'zombie firms' i.e. firms that are surviving but under more competitive circumstances would have gone out of business due to their low productivity and lack of competitiveness. In the UK this divergence of productivity has clear sectoral and geographical dimensions • Technological and digital diffusion - the rate of adoption of new technologies across industries and within firms • Business concentration - in the US the rise of the 'superstar' firm and their monopsonistic power are viewed to be skewing the productivity distribution • Declining business dynamism (Furman 2017) - also linked to this is a less 'dynamic' and less mobile workforce, showing reluctance to change jobs post-recession • A shift towards less productive sectors - this requires further detailed analysis for the UK to identify the sectors in which the new jobs have been created (self-employment, distribution) versus the jobs

	Institute for Fiscal Studies https://www.ifs.org.uk/ Joseph Rowntree Foundation https://www.jrf.org.uk/ Economic Statistics Centre of Excellence https://www.escoe.ac.uk/	that were lost during the recession (financial services, construction, public sector) • Reduced productivity in a few key high-gross value-added sectors (McKinsey 2018) • Secular stagnation - a predominantly US phrase to explain stagnating economic growth and stagnating wages (Stansbury and Summers 2018).
What are the effects of the UK's approach to business regulation, and how can the system develop to meet the economy's needs in the future	PrOPEL Hub (Productivity Outcomes of Workplace Practice, Engagement and Learning) for knowledge exchange and evidence coordination on productivity (2020-2022) Report 'First do no Harm' by Independent Medicines & Medical Devices Safety Review Rebecca Riley & Ana Rincon-Aznar & Lea Samek, 2018. "Below the Aggregate: A Sectoral Account of the UK Productivity Puzzle," Economic Statistics Centre of Excellence (ESCoE) Discussion Papers ESCoE DP-2018-06, Economic Statistics Centre of Excellence (ESCoE).	The Hub will work with businesses, policymakers and support organisations to help improve the UK's productivity performance through improved management practices, employee engagement and adoption of digital technologies. It aims to provide practical lessons, ideas and toolkits for businesses to draw upon, all informed by the very latest research and evidence. Need to grow regulatory science expertise in the UK. There is a need to grow our regulatory science expertise to support the scientific underpinnings, mechanisms and provide an evidence base to better inform policy and legislation. Specific sectors are seeing large changes in the regulatory landscape both with the implementation at pace of innovation (such as AI in healthcare) but also changes in regulatory frameworks. The EU medical device regulation changes for instance are coming into force in the coming years for the Medical Device Regulation (MDR; 2021) and *In-Vitro* Diagnostic Regulation (IVDR; 2022). There are opportunities to improve reporting of adverse incidents involving medicines & medical devices and understand further how the UK regulates medical devices particularly with the pace of technological development to ensure patient safety and regulation policy alignments are supporting the UK in staying at the forefront of utilising cutting edge developments.
Unlocking the benefits of investment in skills and entrepreneurship	Rising to the UK's Skills Challenges Industrial Strategy Council (2020) https://industrialstrategyc ouncil.org/sites/default/fil es/attachments/Rising% 20to%20the%20UK%27s %20skills%20challenges. pdf	Industrial Strategy council report: "clear overarching vision for UK skills and a long-term commitment to delivering it in partnership with employees, employers, training providers and employer organisations. Improving UK management practices and enabling individuals to assume ongoing responsibility for developing their own skills will need to be key elements of that overarching vision.

	OECD (2019) Job polarisation and the work profile of the middle class http://www.oecd.org/els/emp/Job-polarisation-and-the-work-profile-of-the-middle-class-Policy-brief-2019.pdf	Policy stability and continuity emerges as important for employers to navigate the skills system and build relationships within it. Interviews conducted for the Council call for evolution of existing policy, not revolution. Improved use of information and data analysis will be required to better meet sectoral and local needs while contributing to the wider objective of raising productivity and competitiveness".
	OECD (2018) Decoupling of wages from productivity, Chapter 2, OECD Economic Outlook 2018. https://www.oecd.org/eco/outlook/Decoupling-of-wages-from-productivity-november-2018-OECD-economic-outlook-chapter.pdf	A main driver of productivity. Questions around weakening of return to investment in skills

Evidence of weakening of decoupling of wages from productivity. Significant variation across OECD countries |
	Stansbury, A and Summers, L.H. (2018) "On the link Between US Pay and Productivity". Vox, CEPR's Policy Portal. https://voxeu.org/article/link-between-us-pay-and-productivity	
	Ernst, Merola and Samaan (2018) The economics of artificial intelligence: Implications for the future of work, ILO Research https://www.researchgate.net/publication/328353684_The_economics_of_artificial_intelligence_Implications_for_the_future_of_work	
	ILO Global Commission on the Future of Work: Work for a Brighter Future https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_662410.pdf	

	OECD (2017) Better use of skills in the workplace: Why it matters for productivity and local jobs.	(Joint with International Labour Organisation) Offers a recent survey of relevant evidence in the literature and presents a number of international case studies on the impact of skills utilisation on productivity. Lessons from international case studies (incl. one UK-based intervention): targeted local interventions; leadership; employer and worker engagement; specialized/technical expertise; Initiatives should be strategically targeted to SMEs
	CERN Impact Report (2020): https://stfc.ukri.org/files/impact-publications/cern-impact-report/	Addressing shortage of STEM skills – CERN delivers training schemes and 'on the job' training across a variety of sectors
	https://stfc.ukri.org/files/stfc-impact-report-2018/	Eight Centres for Doctoral Training in data-intensive science established in 2017 to address identified skills gaps in four areas: instrumentation, software, mathematics and data.
	Science and Technology Facilities Council Delivery Plan & CBI Report Skills for the Future	STFC is developing a proposal called 'Skills Factory' to leverage its world-class facilities and expertise to manage them on behalf of the UK academic community to train the next generation. This could see 75 apprentices on 4-year courses, 100 graduates on 2-year courses and 125 industrial placements, returners and re-skills taken on 1-year courses taken on each year. Such programmes will be essential to ensure the UK can meet the demands of the technical industries for the future and can support scale up.
	Science and Technology Facilities Council Harwell Space Cluster Strategy	This is likely to support companies looking to scale-up as the larger contract will mean they can then move to large scale manufacture/delivery from bespoke solution. In addition, export opportunities will be enabled through the demonstration that UK Government is utilising services. A number of companies at Harwell Space Cluster find it easier to sell to international Governments than the UK. UKSA's Space for Smarter Government Programme has been designed to address this issue.
	Assessing the economic returns of engineering research and postgraduate training in	Sets out the aspects of the current UK environment which encourage or discourage engineering businesses to invest in R&D and innovation.

	the UK, Technolopolis (2015) Engineering for a successful nation, Royal Academy of Engineering (2015) Investing in Innovation, Royal Academy of Engineering (2015) Increasing R&D investment: business perspectives, Royal Academy of Engineering (2018)	
	Evidence synthesis on the conditions needed to translate research and drive innovation, RAND (2018) Evidence synthesis on measuring the distribution of benefits of research and innovation, RAND (2018) Engineering skills for the future, Education for Engineering and Royal Academy of Engineering (2019)	Teacher recruitment and retention has worsened, as well as continuing challenges with balance in uptake of certain subjects at A-level with a continued fall in students studying creative, technical subjects.
	Evaluation of the Royal Academy of Engineering's SME Leaders Programme, Technopolis (2020) Engineering Growth: an evaluation of the Enterprise Fellowship Programme, Steer Economic Development (2020) Stimulating R&D for a faster and better recovery, Royal Academy of Engineering (2020) Innovation after Lockdown, Nesta (2020) The Missing £4 Billion, Nesta (2020) From starting to scaling, Nesta (2020) Testing innovation in the real world, Nesta (2019)	

	The power of place, CaSE (2020)	
Mitigating the effects of business closures and redundancies	SEDA, (2007) Mid-term Evaluation of the Redundancy Support Service in the South East https://www.secouncils.gov.uk/wp-content/uploads/pdfs/_publications/RedundancySupportService_finalreport.pdf	Evaluations of redundancy support/re-employment policies can help workers overcome barriers to find work. However, lack of evidence of effectiveness during a recession/major economic downturn as this must be matched by job creation initiatives. As well as the risk of significant job losses business R&D is at immediate risk. Reducing or outright halting R&D activities is one of the first cost-saving measures businesses are taking amidst falling demand and cash flow difficulties. However, R&D is recognized by businesses as part of the solution for recovery. Jobcentre Plus previously offered a Rapid Response Service/Redundancy Support Service specifically for this circumstance. The only evaluation of it that we are aware of is a mid-term evaluation of the redundancy support service in the South – East, but this has not been reviewed by DWP analysts so we cannot couch for its robustness.
	Sector-based work academies and work experience trials for older claimants: combined quantitative and qualitative findings (DWP, 2017). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/584663/sector-based-work-academies-and-work-experience-trials-for-older-claimants.pdf	There was evidence that both programmes helped participants to overcome age-related and other barriers to work. The majority of participants considered that they had become more job-ready as a result of taking part and reported improved skills and qualifications as well as improved confidence. Reported benefits included being able to update and supplement curriculum vitaes and broaden the scope of job search. Participants experienced high levels of satisfaction with the programmes.
	COVID-19 immediate impact on R&D-intensive businesses, Royal Academy of Engineering (2020): Local Responses to Economic Shocks: https://whatworksgrowth.org/resources/local-	Business R&D is at immediate risk. Reducing or outright halting R&D activities is one of the first cost-saving measures businesses are taking amidst falling demand and cash flow difficulties. However, R&D is recognized by businesses as part of the solution for recovery.

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	responses-to-economic-shocks/	
Role of government in stimulating demand	Balance and effectiveness of research and innovation spending, House of Commons Science and Technology Select Committee (2019) Public Projects and Procurement in the UK, Royal Academy of Engineering (2014) Increasing R&D investment: business perspectives, Royal Academy of Engineering (2018) Leveraging public procurement to grow the innovation economy (2017)	
What are the future trends for demographics and working/saving behaviour and what is driving these trends? What further reforms to state and private pension provision might we require to ensure long-term sustainable financial security for older people and pensioners?	Lisenkova, K (2018) Demographic Ageing and Productivity https://productivityinsightsnetwork.co.uk/app/uploads/2018/07/Evidence-Review_Demographic-Ageing-and-Productivity-1.pdf Lisenkova, K. and Sanchez-Martinez, M. (2016) The Long-Term Macroeconomic Effects of Lower Migration to the UK, NIESR Discussion Paper No. 460. McCann, P. (2017) "Urban futures, population ageing and demographic decline", Cambridge Journal of Regions, Economy and Society, 10, pp. 543–557.	"Macroeconomic effects could also be used to look at the regional distribution of potential productivity risks associated with population ageing. In general, spatial differentiation of demographic change attracted relatively little attention but will have significant consequences for regional policy (McCann, 2017)" (Lisenkova 2018).

Subgroup C

ARI	Resource	Key Messages
What are the drivers of regional economic disparity? What drives differences in productivity at the firm and regional level, and what are the effects of these differences on enterprise and business growth?	Academic paper, meets level 2 or above on The Maryland Scientific Methods Scale Divergent cities in post-industrial Britain Ron Martin, Peter Sunley, Peter Tyler, Ben Gardiner	According to Moretti (2013), deindustrialisation has been responsible for a 'great divergence' between cities that have moved to become centres of innovation and ideas, and those that have continued to produce material goods. Other authors, however, place more emphasis on trends in specialisation and differences in productive bases as the driving forces behind urban divergence. Somewhat similarly, Storper (2013) argues that recent divergence been fundamentally been driven by the fact that some cities have become more specialised in knowledge intensive sectors. While most of this interest in urban divergence has been based on US cities, recent European research also reports divergent processes. The aim of this article is to examine the degree of divergence across UK cities and to analyse how far this has been driven by differences among cities in industrial structure and specialisation, tradable bases and productivity.
	Academic paper, meets level 2 or above on The Maryland Scientific Methods Scale The Economic Performance of Britain's Cities: Patterns, Processes and Policy Implications Ron Martin, David Bailey, Emil Evenhuis, Ben Gardiner, Andy Pike, Peter Sunley, Peter Tyler	The research has had several interrelated aims: • How have British cities differed in their growth paths since 1971, and what are the geographical patterns of these differences? • Given that the past five decades have witnessed major shifts in the structure of the national economy, how far do the growth paths of British cities reflect the uneven progress of these structural changes? Put another way, how have British city economies adapted over time? • What other factors have influenced the growth paths of British cities? • To what extent is the UK's 'productivity problem', of slow productivity advance, itself a problem that has a city dimension? How have cities differed in terms of productivity growth over recent decades, and what has caused these differences? • How have skills developed across British cities? Much has been made (especially in relation to US cities) about the importance of skills to city economic performance. How • far do patterns of city economic performance reflect differences in skill development? • How resilient are British cities to major economic shocks? Since 1971 there have been four major recessions. How have cities reacted to and recovered from these • disruptions? Does a lack of resilience have permanent negative consequences for long run city growth?

| | | For a selection of case-study cities, how have policy regimes and institutions differed over the study period, and is it possible to ascertain what effects these may have had
| | | on city economic performance? |

| | Academic paper, meets level 2 or above on The Maryland Scientific Methods Scale

Why does birthplace matter so much? Clement Bosquet, Henry G. Overman | We consider the link between birthplace and wages. Using a unique panel dataset, we estimate a raw elasticity of wages with respect to birthplace size of 4.2%, two thirds of the 6.8% raw elasticity with respect to city size. Part of this effect simply reflects intergenerational transmission and the spatial sorting of parents; part is explained by the role that birthplace size plays in determining current city size. Lifetime immobility explains a lot of the correlation between birthplace and current city size: we show that 43.7% of individuals only ever work while living in the place they were born. Our results highlight the importance of intergenerational and individual sorting in helping explain the persistence of spatial disparities. |

Subgroup D

ARI	Resource	Key Messages
1. Is COVID-19 accelerating trends in emerging technologies? 2. How might these trends affect global employment and immigration patterns? 3. How might COVID-19 affect migration trends? For example, as an amplifier or as a driver of migration in itself? If it impacts, which regions of the world are likely to be most affected?	BEIS -UKRI Commercialisation pipeline (work ongoing) https://sciencebusiness.net/covid-19/news/live-blog-rd-response-covid-19-pandemic https://www.ukri.org/research/coronavirus/covid-19-research-and-innovation-supported-by-ukri/ https://www.ukri.org/news/additional-projects-awarded-funding-to-tackle-the-impact-of-the-coronavirus/ https://www.euractiv.com/section/health-consumers/news/eu-goes-easy-on-gmos-in-race-for-covid-19-vaccine/ https://migrationdataportal.org/themes/migration-	 Identified Energy Generation, Omics, Disease Control, Medical imaging, AI& Machine learning as the top five. Example of the types of funding available publicly Lists of all research projects funded to date under the UKRI COVID-19 urgency grants scheme and InnovateUK awards to businesses. News item on changing EU policy approach for genetically modified organism usage. Migration data

	data-relevant-covid-19-pandemic	
	MoD IRIS - Covid-19: impact on technology	Internal government papers on COVID-19 emerging technology impacts
	MoD IRIS - Covid-19 vaccines: from lab to patient	
	Emerging Technology in a Post Covid world	
	https://www2.deloitte.com/global/en/pages/about-deloitte/articles/covid-19/understanding-covid-19-s-impact-on-the-technology-sector-.html	Deloitte article articulating covid-19 impacts on the technology sector itself
	An update to our 2020 Technology Vision trends Driving Value and Values During COVID-19	Accenture Technology Future Trends reassessed in light of COVID-19
	20200730 COVID 19 Research Project Tracker_Epidemics Group.pdf	The tracker contains nearly 2,000 funded research projects - the most comprehensive picture of the COVID-19 research landscape
	IOM UN Migration - Migration Factsheet No. 6 – The impact of COVID-19 on migrants	United Nations Migration Factsheet on COVID-19 Impact on Migrants, covers migrant health
	https://www.csis.org/analysis/five-ways-covid-19-changing-global-migration	US think tank article ways COVID-19 may change global migration
	http://www.oecd.org/coronavirus/policy-responses/managing-international-migration-under-covid-19-6e914d57/	OECD paper on short term policy responses impacting migration
	Ratha, Dilip K.; De, Supriyo; Kim, Eung Ju; Plaza, Sonia; Seshan, Ganesh Kumar; Yameogo, Nadege Desiree.2020.	Paper looking at International remittance flows how these have been impacted by COVID-19

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	COVID-19 Crisis Through a Migration Lens (English). Migration and Development Brief; no. 32 Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/989721587512418006/COVID-19-Crisis-Through-a-Migration-Lens	
	http://www.glimer.eu/wp-content/uploads/2020/06/Global-Migration-Policies-and-COVID-19.pdf	Working Paper that assess short term migration policy responses to COVID-19
	Interviews were conducted with: • Professor Laura Hammond UKRI Challenge Leader for Security Protracted Conflict, Refugee Crises and Forced Displacement • Jenny Phillimore, Professor of Migration and Superdiversity, Department of Social Policy, Sociology and Criminology University of Birmingham • NERC Conversations with the UK Carbon Trust and UKRI India were also drawn upon.	

Annex 9. Resources identified by the Working Group on Trade and Aid

ARI	Resource
1. Impact on global trade and supply chains, particularly around changes to our food supply chains and maintaining access to key goods, and monitoring and preventing panic buying of key goods	• Policy report: International Labour Organization (2020) 'Covid-19 and the World of Work, 5th ed' • Civil society policy report: European Center for Constitutional and Human Rights, International Lawyers Assisting Workers & Workers Rights Consortium (2020) *Farce Majeure: How Global Apparel Brands Are Using the COVID-19 Pandemic to Stiff Suppliers and Workers.* • Academic policy report: M. Anner (2020) *Abandoned? Impact of Covid-19 on Workers and Businesses at the Bottom of Global Garment Supply Chains.* • Civil society report: CCC (2020) *Un(der)paid in the Pandemic.* • P. Nilsson, 'Asia's Garment Workers Lose Out on $6bn after pandemic cuts,' *Financial Times.* • J. Fine, D. Galvin, J. Round, & H. Shepherd (2020) *Maintaining Effective US Labor Standards Enforcement Through the Coronavirus Recession.* • Interview with leading academic: J. Hacker (2020) 'Will COVID-19 Worsen Inequality in the United States?' Yale Insights. • Academic book. G. LeBaron (2020) *Combatting Modern Slavery: Why Labour Governance is Failing and What We Can Do About It.* • Academic report. G LeBaron (2018) *The Global Business of Forced Labour: Report of Findings.* • United Nations Committee on World Food Security High Level Panel of Experts on Food Security and Nutrition (HLPE) *Food Security and Nutrition: Building A Global Narrative Towards 2030.* • Economics Observatory, 'How is coronavirus affecting emerging markets and developing economies?' • Economics Observatory. 'Which firms and industries have been most affected by Covid-19?' • Academic journal article: D. Kolcava, L. Rudolph, & T. Bernauer (2020) 'Voluntary Business Initiatives Can Reduce Public Pressure for Regulating Firm Behaviour Abroad.' *Journal of European Public Policy.* • Consumer trackers – such as Food Standards Agency trackers COVID-19 and existing Public Attitudes offer data to better understand consumption trends. • Research in progress by Dr Anna Krzywoszynska (initial findings will be available shortly). • Economics observatory, 'How has coronavirus affected prices in the supermarket?' • Lang, T. (2020) Feeding Britain: Our food problems and how to fix them. Book published by Pelican Books. • United Nations Committee on World Food Security High Level Panel of Experts on Food Security and Nutrition

	(HLPE) *Food Security and Nutrition: Building A Global Narrative Towards 2030.*
	• T. Heron, 'COVID-19 is a reminder of how deeply the UK's food security is dependent on the EU', London School of Economics Brexit Blog, May 2020;
	• P. Garnet, B. Doherty & T. Heron, 'Vulnerability of the United Kingdom's food supply chains exposed by COVID-19', Nature: Food, 1, 315-18 (2020):
	• https://www.coronavirusandtheeconomy.com/question/how-has-coronavirus-affected-prices-supermarket
2. How will COVID-19 impact on forecasted global peak oil demand? What implications does this have for the transition to renewable resources?	• International Energy Agency (IEA), Global Energy Review 2020: The Impacts of the COVID-19 Crisis on Global Energy Demand and CO2 Emissions (2020) 3-4.
	• IEA, The Oil and Gas Industry in Energy Transitions (2020) 12.
	• IEA, Oil Market Report (2020).
	• Oxford Institute for Energy Studies, 'Decarbonization Pathways for Oil and Gas' (2020) 212 Forum 3-5; 9-13.
	• Reuters', Energy Transition Status Report: What next for Net-Zero? (August 2020) 6-7; 12-13. https://www.coronavirusandtheeconomy.com/question/how-will-coronavirus-affect-uks-oil-and-gas-industry
3. Exploring the opportunities to improve the way people and goods move in the UK including longer distance travel and last mile deliveries	https://www.coronavirusandtheeconomy.com/question/how-can-production-network-analysis-inform-policy-covid-19
6. What impact will COVID-19 have on global attitudes to traditional medicines derived from animal products?	• J. Margulies, R. Wong and R. Duffy (2019) Imaginary Asian Super Consumer: A Critique of Demand Reduction Campaigns for Illegal Wildlife Trade' Geoforum, 107, 216-219 https://www.sciencedirect.com/science/article/pii/S0016718519302945?via%3Dihub
	• https://www.theguardian.com/environment/2020/apr/15/mixed-with-prejudice-calls-for-ban-on-wet-markets-misguided-experts-argue-coronavirus
7. How will the health and economic impacts of COVID-19 affect the attitude of governments and publics to the illegal wildlife trade?	• Cochrane (2020) Animal Exploitation and COVID-19: Is the darkest hour just before the dawn?
	• Why Eat Wild Meat? International Institute for Environment and Development (IIED) Darwin Initiative Project 2018-2021 https://www.iied.org/why-eat-wild-meat
	• Literature review/initial findings of the IIED project https://www.cbd.int/doc/c/c7e8/3ab4/dbfb512d72dcb56952d8a0ea/sbstta-23-inf-21-en.pdf
	• Duffy, R. and F.A.V. St. John (2013). *Poverty, Poaching and Trafficking: What are the links?.* Consultancy Report for DFID, June 2013. Evidence on Demand Report HD059. https://xg6j3oqcgf397pv1122fduwp-wpengine.netdna-ssl.com/wp-content/uploads/EoD_HD059_Jun2013_Poverty_Poaching.pdf

	• Duffy, R., (2016) *EU Trade Policy and the Wildlife Trade* (Brussels, European Parliament) https://xg6j3oqcgf397pv1122fduwp-wpengine.netdna-ssl.com/wp-content/uploads/EU-Trade-Policy-and-the-Wildlife-Trade.pdf • Also see UKRI-Global Challenges Research Fund Trade Hub https://tradehub.earth/about-us/ • https://www.coronavirusandtheeconomy.com/question/does-environmental-damage-increase-risk-pandemics
8. How will the composition of sovereign debt change in countries post-COVID?	https://www.coronavirusandtheeconomy.com/question/how-coronavirus-affecting-emerging-market-and-developing-economies https://voxeu.org/article/post-pandemic-debt-sustainability-eueuro-area
9. What are the implications for stability of the euro area?	Given the paucity of hard accurate data, this was compiled from relevant expertise in the Sheffield Political Economy Research Institute, and their recent blogs: • Dr. Owen Parker- EU, European political economy, Eurozone southern 'periphery' • Prof. Simon Bulmer - EU, European political economy, Eurozone, Germany • Dr. Patrick Kaczmarczyk - EU, European political economy, Eurozone, Germany, France, Central and Eastern Europe • *Blog:* Kaczmarczyk, *'Coronavirus crisis: There is no way back to business as usual in the EU'* • Blog: Kaczmarczyk, *'Coronabonds are a pragmatic response to a crisis —and are not about cross-EU transfers or solidarity'* • Dr. Scott Lavery - EU, European political economy in global context, Central and Eastern Europe • Prof. Andrew Baker - Macro-prudential regulation; central banking
10. How will global patterns of consumption, saving and investment change post-COVID? How will productivity growth change?	https://www.coronavirusandtheeconomy.com/question/what-will-happen-if-international-trade-and-mobility-are-permanently-reduced https://www.coronavirusandtheeconomy.com/question/how-can-production-network-analysis-inform-policy-covid-19 https://www.coronavirusandtheeconomy.com/question/which-firms-and-industries-have-been-most-affected-covid-19
11. How are state and non-state actors are adjusting their approaches to geopolitical issues during the course of the pandemic?	Companies have reacted differently in relation to their supply chains as a response to COVID-19. This can depend on both the location of the main parts of the supply chain and the financial support being provided by governments. There have been a range of responses to the pandemic from international, regional, and national governments, companies and organisations. Some of these are summarised here: https://www.business-humanrights.org/en/from-us/covid-19-action-tracker/methodology/ As part of this response, the EU has begun the process to introduce requirements on all companies operating in the EU to have mandatory human rights and environmental due diligence: The commitment was made during a Webinar hosted by the Responsible Business Conduct Working Group

	of the European Union, 29 April 2020, available at: https://vimeo.com/413525229. The UK Modern Slavery Act and the Bribery Act are examples of these types of legislative actions in the UK. This is based on a study for the European Commission: https://op.europa.eu/en/publication-detail/-/publication/8ba0a8fd-4c83-11ea-b8b7-01aa75ed71a1/language-en
13. Analysis of the impacts of the pandemic on international cooperation and relationships between states	https://www.coronavirusandtheeconomy.com/question/does-world-economy-face-danger-rising-protectionism
15. Analysis of the impact of COVID-19 on key constituencies' approach to global governance and to particular institutions or groups of them within the multilateral system	https://www.coronavirusandtheeconomy.com/question/does-world-economy-face-danger-rising-protectionism
18. Supporting trade recovery	https://www.ons.gov.uk/businessindustryandtrade/business/businessservices/bulletins/coronavirusandtheeconomicimpactsontheuk/22october2020 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/905038/Company_Insolvencies_-_Commentary_-_Q2_2020_final.pdf The COVID-19 pandemic and the health measures implemented have severely affected the economy and led to a recession. The health crisis might be followed by an 'insolvency pandemic' (a 'flood' of bankruptcies). Amongst the most affected sectors are the accommodation and food services and the arts, entertainment, and recreation industry. Small businesses are especially vulnerable and are under the most intense pressure as they tend to have limited financial resources and reserves. National governments have formulated strategies to assist companies through the course of the pandemic in the hope of minimising both the numbers of insolvencies and the economic and social damage generated as a result. In the UK, in addition to various measures to support economic recovery and prevent insolvency (including the Coronavirus Job Retention Scheme; the Coronavirus Business Interruption Loan Scheme; the Small Business Grant Fund and the Retail, Hospitality and Leisure Grant Fund; the high street vouchers scheme), a new law entered into force– the Corporate Insolvency and Governance Act 2020. It includes temporary measures to avoid unnecessary insolvencies of companies, as well as permanent measures to enhance the rescue and recovery regime. For a critical appraisal of the earlier consultation on which the new Corporate Insolvency and Governance Act builds, see Frisby, 'Of Rights and Rescue: a Curious Confluence?' 20 Journal of Corporate Law Studies 2020

	https://www.tandfonline.com/doi/abs/10.1080/14735970.2019.1615165
	It has been shown that SMEs are the backbone of any economy, representing 99pc of businesses; insolvency and recovery measures should focus on ensuring easy access to procedures and cheap processes with limited court involvement, giving debtors and creditors a set of alternative tools to choose from to fit different business circumstances (see Davis et al, Micro, Small, and Medium Enterprise Insolvency: A modular Approach (Oxford University Press 2018). See also: forthcoming international standard on Micro, Small, and Medium Enterprise (MSME) insolvency, developed by the United Nations Commission on International Trade Law (UNCITRAL) (see Draft Text on a Simplified Insolvency Regime, https://undocs.org/en/A/CN.9/WG.V/WP.170); Report on the treatment of MSME insolvency (English). Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/973331494264489956/Report-on-the-treatment-of-MSME-insolvency. UNCITRAL has also developed two new model laws in 2018-19 to enhance the regime for cross-border insolvency (on enterprise groups insolvency and on the recognition and enforcement of insolvency-related judgments) (https://uncitral.un.org/en/texts/insolvency; see also Mevorach, The future of Cross-Border Insolvency: Overcoming Biases and Closing Gaps (Oxford University Press 2018); Mevorach, 'Overlapping international instruments for enforcement of insolvency judgments: undermining or strengthening universalism?' European Business Organisation Law Review (forthcoming) https://nottingham-repository.worktribe.com/output/4758905). https://www.coronavirusandtheeconomy.com/question/does-world-economy-face-danger-rising-protectionism
19. Market access and non-tariff measure	https://www.coronavirusandtheeconomy.com/question/does-world-economy-face-danger-rising-protectionism
20. What methods enable evaluation of a country's sectors and regions of dynamic comparative advantage?	https://www.coronavirusandtheeconomy.com/question/how-will-economic-effects-coronavirus-vary-across-areas-uk
21. What is the role of trade and investment in national economic performance indicators, for example, national and regional growth, employment and macroeconomic stability?	https://www.coronavirusandtheeconomy.com/question/how-will-economic-effects-coronavirus-vary-across-areas-uk
23. The compatibility of COVID-19 related restrictions with human rights law obligations or with other obligations under international law	There are an increasing number of claims being made in court and elsewhere about the compatibility with human rights, such as the right to work, the right to food, the right to freedom of movement and the right to freedom of expression, of COVID restrictions. https://www.business-humanrights.org/en/big-

	issues/covid-19-coronavirus-outbreak/covid-19-human-rights-defenders-and-civic-freedoms/

26. What are the public and state attitudes in China and the US towards the provision of 'global goods', particularly health provision in developing nations (for example hospital building or support for NGOs and the World Health Organisation)? How is the 'global good' narrative promoted at home and overseas?	The state attitude in China towards the provision of global goods can be summarized as follow:
	1. The general background is that the state has been keen to become a leader in the norms-making in the changing global landscape.
	2. Research has been done systematically to understand the western conceptualization of global goods and especially impure public goods.
	3. China's approach aims to
	    a. enhance input to the development of public goods,
	    b. broaden the sphere of public goods and be innovative.
	    c. focus on the strategic benefits obtained through the provision of public goods but not the pure public benefits. To this end, China aims to focus on the development of marketing and supply of public goods to achieve effective intervention.
	4. The COVID pandemic provides the window for China to apply such approach.
	
	See China Institute of International Affairs Report on China and World Part II available here http://www.gcms.org.cn/download/%E2%80%9C%E4%B8%AD%E5%9B%BD%E4%B8%8E%E4%B8%96%E7%95%8C%E2%80%9D%E7%B3%BB%E5%88%97%E6%8A%A5%E5%91%8A%E4%B9%8B%E4%BA%8CEN.pdf
	
	For China's conceptualization of public good see Journal Articles:
	• Yi Liu, 2016, Global Public Goods and the Role of Emerging Power: Considering the Concept of Impure Public Goods, Vol.2 2016, China and International Relations 84 -95. (In Chinese)
	• Cao De jun, 2019, China's Supply Model of Public Goods, International Relations Theory. (In Chinese)
	• See also Newspaper piece: Join hands to win the battle against the epidemic in the spirit of a community with shared future, People's Daily, Feb. 6, 2020, Page 3.

27. How will COVID affect the rate of technological adoption around the world and what will that mean for the structure of the global economy in the future, and the balance of trade?	https://www.coronavirusandtheeconomy.com/question/what-will-coronavirus-mean-innovation-firms
28. How can UK trade policy best support recovery from COVID-19	https://www.coronavirusandtheeconomy.com/question/what-happens-trade-global-downturn

and wider international development. How can policy levers such as trade agreements, unilateral trade preferences and tariffs be used to support economic development and poverty reduction in developing countries?	
29. How can we better understand the impact of COVID-19 on trade in services and support developing countries trade in services given the lack of reliable data?	https://www.coronavirusandtheeconomy.com/question/what-will-happen-if-international-trade-and-mobility-are-permanently-reduced
30. Which global economic sectors (e.g. agriculture, aerospace, financial services) are most likely to grow and shrink in a post-COVID world?	https://www.coronavirusandtheeconomy.com/question/which-firms-and-industries-have-been-most-affected-covid-19

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