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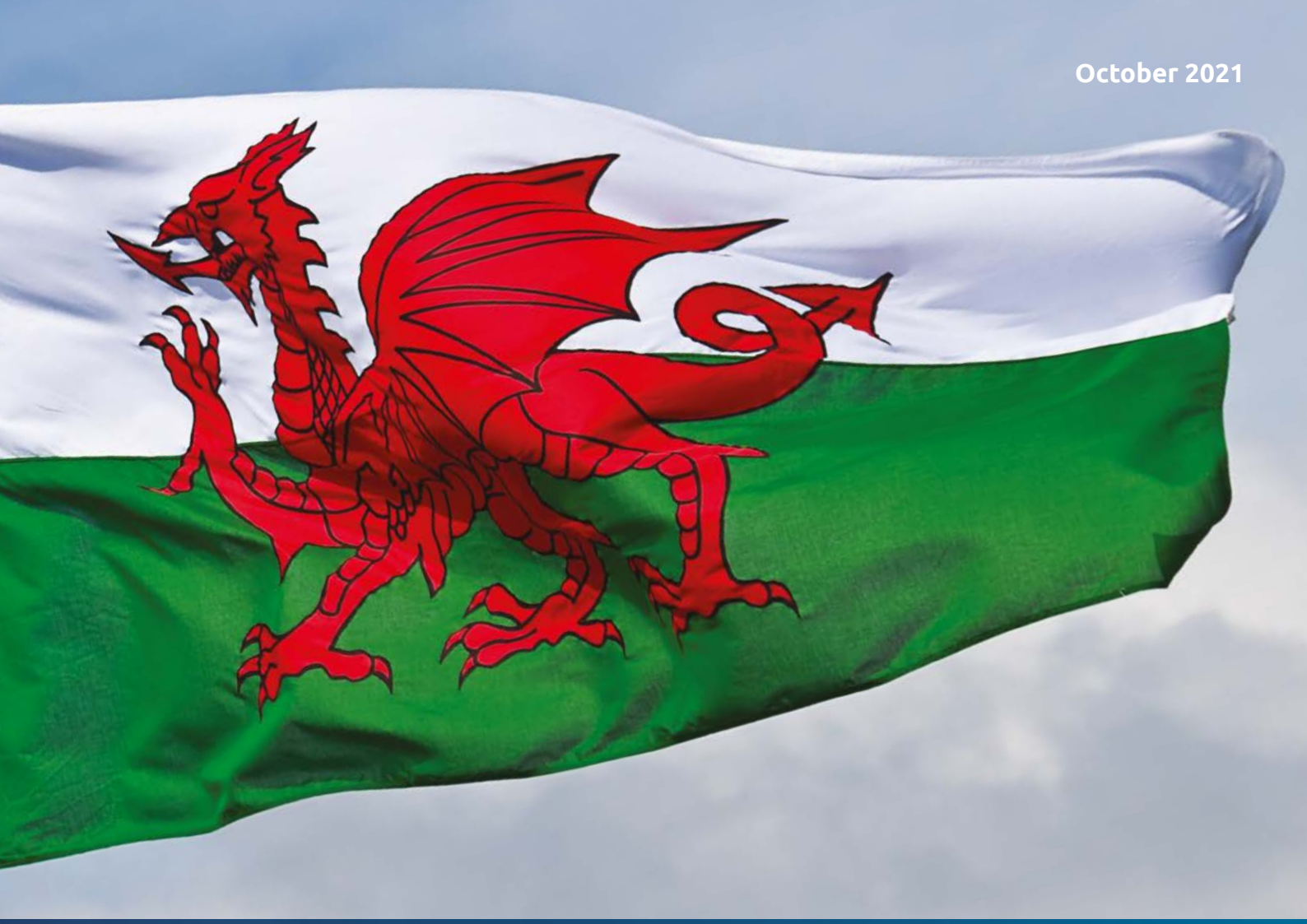

Rising to the Triple Challenge of Brexit, COVID-19 and Climate Change for health, well-being and equity in Wales

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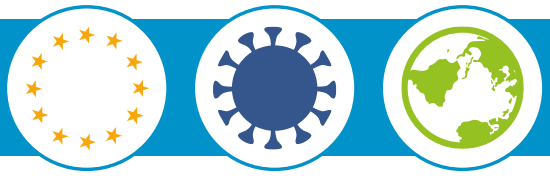


Executive Summary

The **Triple Challenge** describes the cumulative and individual impacts of **Brexit, COVID-19 and climate change** on health, well-being and equity in Wales. These impacts are **multifaceted, are not static and are likely to affect Wales in the immediate and long term.** This report provides a strategic overview of the impact, and interconnectedness, of the enormous events of Brexit, COVID-19 pandemic and climate change. It identifies the key determinants and population groups affected by the Triple Challenge and provides a key example against a determinant.

This work demonstrates the need to track interactions across such seismic events proactively, to enable mitigation against any identified negative impacts but also in order to maximise any opportunities which may arise. This report is aimed at a wide range of audiences including public bodies, but will also have huge relevance to the Third Sector and wider civil society. This is the first output in relation to the Triple Challenge and underpins future work to explore the interconnections using a multi-focal lens.

Summary of Findings:

- The Triple Challenge will have a wide range of compounding impacts across multiple determinants of health. These will need to be viewed in synergy, cumulatively and not through a singular lens.
- Key determinants affected include for example, mental well-being, food insecurity, health behaviours, environmental policy and regulations, employment and working conditions.
- Population groups potentially affected include for example, those in rural communities, fishers and farmers, those on low incomes and children and young people.
- There is a gap in the research and published evidence which link the three challenges together. However, there is evidence that links combinations of two of the challenges to health and well-being and equity, for example; Brexit and COVID-19; or COVID-19 and climate change; or Brexit and climate change.
- Climate change is a common theme in COVID-19 and Brexit literature. Both challenges present ways to tackle climate change directly and indirectly, for example improving air quality in Wales.

- The current point in time presents a 'window of opportunity' for policy change which will have co-benefits for health and well-being, the economy and a sustainable environment in Wales. Some of the policy areas are devolved to Wales and some of these areas are non-devolved and therefore nations will need to work together to maximise this.

- The Well-being of Future Generations (Wales) Act 2015 provides an enabling environment for Wales to utilise the application of a Triple Challenge lens to policies and strategies. This can be transferable to other similar devolved nations across the UK and Europe.

- There is an opportunity to strengthen public health messaging around health behaviours with the increased profile of public health and environmental issues related to Brexit, COVID-19 and climate change for example, diet and nutrition; food insecurity and waste.

- Trade and Free Trade Agreements (FTAs) are an important driver for the three challenges and their impact on health and wider determinants should be considered both now and in the future. For some determinants, for example, environmental regulation and standards or the economy, this is more explicit than for others and is most often referred to in relation to Brexit. However, trade is also important for COVID-19 for example, supply of vaccines and climate change as FTAs can limit the ability to tackle climate change and local policies and targets. A more holistic and integrated way of policymaking is required for trade with leadership needed to bring all those affected together to consider the health impact of these.

- Brexit and the pandemic can present opportunities for the future, for example to support a 'green industrial revolution', 'green jobs' and more employment to create a fairer, more sustainable Welsh economy and 'Economy of wellbeing'.

Population Groups affected:

A number of the impacts of the Triple Challenge can have negative or positive effects on the whole population of Wales. However, certain impacts disproportionately affect individual vulnerable population groups, including:

Babies, children and young people	**Farmers, Fishers and agricultural sector workers**
Older people	**Critical workers, including health and social care workers, and delivery and HGV drivers**
Those on low incomes / unemployed	**Minority ethnic groups**
Geographical areas, including those in rural or coastal areas, tourist areas or port towns	**Migrants and their families**
Those with existing health conditions and needs	**Single parent families**

Potential Actions

- Collaboration should take place at a strategic level (both nationally and locally through for example, Public Services Boards) to co-ordinate action and responses to the Triple Challenge - this will maximise resources and concentrate efforts on those determinants and groups who will be triply affected.
- Policies and action to address the challenges should be considered together so that co-benefits to health, the environment and society can be maximised and unintended impacts for other sectors and settings can be mitigated or avoided.
- Developing or utilising an action orientated 'health in all policies' conceptual framework in order to consider the impact of the Triple Challenge in Wales at a local or national level.
- Utilising Health Impact Assessment (HIA) methodology can support the early identification of emerging impacts of events such as Brexit, COVID-19 and climate change and act as focal points for further discussion. They can identify the potential or actual impacts of policies and plans in relation to the Triple Challenge in entirety; or when considering the impact of a singular challenge to broaden its scope to consider dual challenges for example, Brexit and climate change and COVID-19 impact. This multi-focal process could be implemented by public bodies and local communities that face specific multiple related challenges. Any HIAs can lead to the mitigation of negative impacts for health and well-being and maximise present or future opportunities.
- Developing more data, evidence and research (and utilising existing available data and health intelligence) for the three challenges as a whole will assist in further identifying those who are most vulnerable in the population and be disproportionately negatively affected by them.
- Local communities strongly perceive the impacts of Brexit, COVID-19 and climate change and some communities will be affected to a greater extent than others. Public bodies, local teams and the population will need to work collaboratively to address this. Building resilience at a population level is a key mitigator along with adaptation policies and more sustainable practices.
- Trade and future Future Trade Agreements (FTAs) will have a major impact on health and implications for public health activities. Public health practitioners and policy makers should work together in a co-ordinated manner to advocate and increase awareness of the impact trade will have.
- Brexit, COVID-19 and climate change can have direct and indirect impacts on health behaviours for example, diet, nutrition, active travel and alcohol. Health promotion messages should highlight the co-benefits of behaviour change to target audiences for example, adopting a planetary friendly diet.
- Policy makers can develop alternative scenarios for a range of issues for example, supply chains, employment and alternate land use and management in order to identify and reduce vulnerabilities.
- Policy makers and civil society can engage the public to foster an intergenerational debate about the impact of the challenges in relation to the environment and Wales' long-term security. This will promote participation, a core protective factor for mental well-being, about future policy and actions.

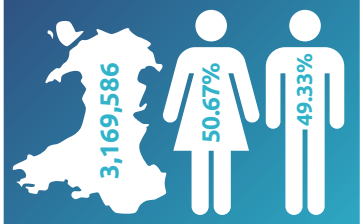
Rising to the Triple Challenge of Brexit, COVID-19 and Climate Change for health, well-being and equity in Wales

What is the Triple Challenge?

The cumulative and individual impacts of Brexit, COVID-19 and Climate Change on health, well-being and equity in Wales. These impacts are multifaceted, are not static and will affect Wales in the immediate and long term.

Key Statistics - Wales:

Total population at mid-2020



(StatsWales, 2021a).

Between 2017-18 and 2019-20,

23%

were living in relative income poverty *(Welsh Government, 2021a).*

0.9°C increase in average annual temperature from mid-1970s to mid-2010s.

By the 2050s annual temperatures are projected to rise by 1.2°C *(Netherwood, 2021).*

2.0% increase in annual mean rainfall from mid-1970s to mid-2010s.

By the 2050s, there is an approximate 15% decrease in summer rainfall projected *(Netherwood, 2021).*

Pre-pandemic –

3 IN 10

children living in poverty *(Matejic, 2020).*

As of June 2021, unemployment rate was 4.3%,

UP 1.2

percentage points on the previous year. *(Welsh Government, 2021d).*

Around 2.4 excess heat-related deaths per 100,000 population *(Committee on Climate Change, 2016).*

EU subsidies made up 80% of farm income in Wales *(House of Lords, 2017).*

£0.529bn

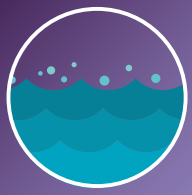
food exports in Wales in 2017, up 21% from 2016 *(Food and Drink Wales, 2019).*

Welsh ports handle 11% of total UK trade by volume each year. *(National Assembly for Wales, 2017).*

Covid-19: At 29th August, 278,262 cumulative confirmed and 5,672 cumulative suspected deaths *(Public Health Wales, 2021).*

United Kingdom:

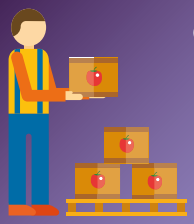
Around 900,000 citizens were long-term residents in other EU countries in 2010 and 2011 *(Welsh Government, 2017).*



Between 1.2 and 1.6mm per year rise in sea level since 1901. *(Netherwood, 2021).*

26%

of food consumed in 2020 was imported from the EU *(Chatham House, 2020)*

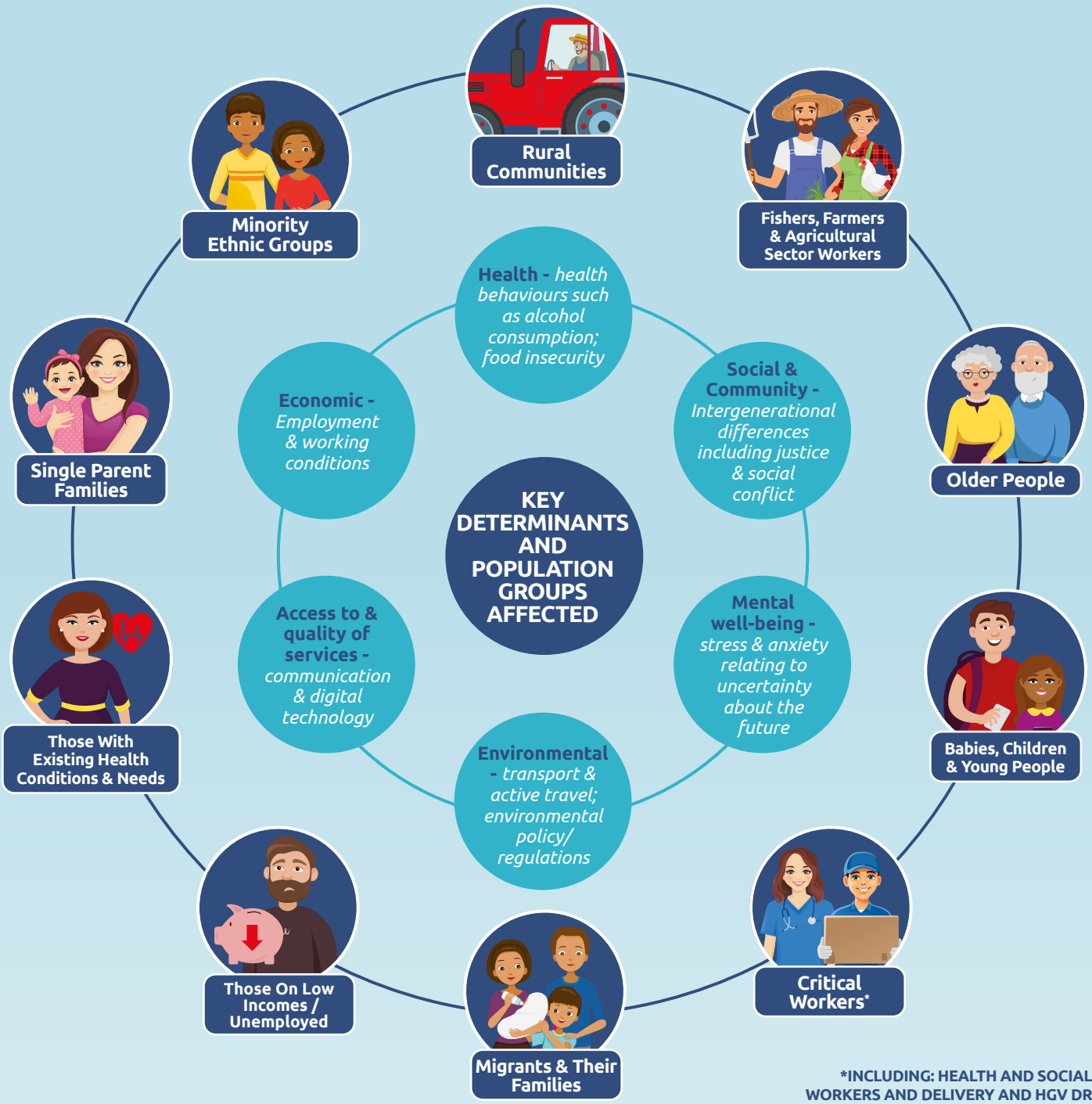


Over 4 million direct and indirect jobs depended on exports to the EU *(Centre for Economics and Business Research, 2014)*

26,903

asylum applications made in the last 12 months as of the year ending March 2021 *(Home Office, 2021).*

Between 2008 and 2013, the UK received €8.8 billion of EU science funding *(Welsh NHS Confederation, 2018).*



*INCLUDING: HEALTH AND SOCIAL CARE WORKERS AND DELIVERY AND HGV DRIVERS

Opportunities

- The Well-being of Future Generations (Wales) Act 2015 provides an enabling environment for Wales to utilise the application of a Triple Challenge lens to policies and strategies.
- Current 'window of opportunity' for policy change.
- Strengthening public health messaging around health behaviours with the increased profile of public health and environmental issues.
- To support a 'green industrial revolution' and 'green jobs' to create a fairer, more sustainable Welsh economy.

Potential actions for policy and decision-makers

- Collaborate at a strategic level and co-ordinate action and responses to the Triple Challenge.
- Use health promotion messages to highlight the co-benefits of behaviour change to target audiences.
- Develop an action orientated 'health in all policies' conceptual framework to support policy development.
- Use impact assessment methodology to support early identification of impacts.
- Develop more data, evidence and research for the three challenges as a whole.
- Support building resilience at a population level.
- Engage with the public.

Overview of the **Triple Challenge**

The global Coronavirus SARS-CoV-2 (COVID-19) pandemic has revealed the complex, interwoven relationships between health, well-being, equity, the economy, the environment, and society as a whole. In doing so, it has created new inequalities, but also exacerbated existing social and health inequalities and inequities (Marmot et al., 2020; Dyakova et al., 2021). Threats such as the United Kingdom's (UK) withdrawal from the European Union (EU) ('Brexit') and climate change are also having a cumulative impact on the Welsh population's health and well-being (Green et al., 2020a).

The Welsh and UK recovery from the pandemic needs to consider, and interact seamlessly, with the UK's exit from the EU. It must also consider how to develop national and local resilience and provide support to many vulnerable industries and communities which are also facing the increasing challenge of climate change and more frequent extreme weather events. Wales must grapple with the multifaceted and evolutionary nature of Brexit, COVID-19 and climate change not only in isolation, but as a cumulative whole. This is further complicated by the fact that these are not static events and will ebb and flow over the short, medium and long term. Wales and the UK are facing an unprecedented 'Triple Challenge' that must be addressed in a coordinated way – one which considers the future of the planet and its population and identifies solutions to the well-being and economic challenges which Brexit and COVID-19 have brought sharply into focus.

In 2019, the Wales Health Impact Assessment Support Unit (WHIASU), World Health Organization Collaborating Centre (WHO CC) on Investment for Health and Well-being at Public Health Wales carried out a Health Impact Assessment (HIA) on the public health implications of Brexit. This was to better understand the health and equity implications of these separate challenges (Green et al., 2019; Green et al., 2020b). HIA is a systematic and flexible evidence-based process which identifies the positive and negative impacts of policies, plans and events such as Brexit on the health and well-being of a population over the short, medium and long term. It also identifies opportunities for health gain and unintended negative impacts which require mitigation. It is equity-focused and as part of the process highlights the distinct impacts for particularly affected vulnerable population groups for example, children or those on low incomes (WHIASU, 2012).

Using the same multi-focal lens, the HIA approach was also applied to direct aspects of the COVID-19 pandemic for example, the 'Staying at Home and Social Distancing Policy' (commonly referred to as 'lockdown') and home and agile working (Green et al., 2020c; Green et al., 2020b). Furthermore, a HIA is currently being finalised which assesses the health and well-being impacts of climate change in Wales (Green et al., 2021, forthcoming). The work to date has already demonstrated many commonalities and synergies for these three challenges, their impact on health equity, and the wider determinants of health.

Triple Challenge Spotlight Papers:

This paper is the first in a series of short reports which aim to provide a strategic overview of the complex interactions between Brexit, COVID-19 and climate change (hereafter referred to as the 'Triple Challenge') and key determinants of health, well-being and equity. Using a range of evidence, each paper focuses on the determinants of health and population groups affected and aims to support strategic and organisational stakeholders to better understand the Triple Challenge facing Wales both now, and in the future.

Aim:

- Enable a better understanding of the potential positive health, well-being and equity impacts or opportunities and negative impacts of the Triple Challenge in Wales.
- Provide an overview of the population groups in Wales who will be primarily affected by the Triple Challenge.
- Analyse the current and future Welsh, UK and international policy context, including a consideration of policy levers.
- Articulate potential actions for the future for a wide range of stakeholders to consider and implement including mitigation for any negative or unintended negative impacts and how to maximise opportunities.
- Promote discussion and action.

Methodology:

Building on evidence and findings from the previous HIAs (Green et al., 2019; Green et al., 2020c; Green et al., 2021, forthcoming), rapid evidence searches of both the academic and grey literature were undertaken to identify literature which focussed on the Triple Challenge and its impacts. This process identified key determinants of health, well-being and equity which have been impacted by the Triple Challenge.

Audience:

This paper aims to support policy and decision makers across a wide range of sectors and settings including public health and health care services and systems, the economy and environment and sustainable development, and strategic organisational stakeholders including public bodies and the third sector.

1 WHAT IS THE TRIPLE CHALLENGE AND WHAT IS THE RELATIONSHIP TO HEALTH, WELL-BEING AND EQUITY IN WALES

The Triple Challenge describes the cumulative and individual impacts of Brexit, COVID-19 and climate change (Figure 1). These impacts are multifaceted, are not static and will affect Wales in the immediate, short, medium and long term (Figure 2, Box 1).

Figure 1: The interrelated nature of the Triple Challenge

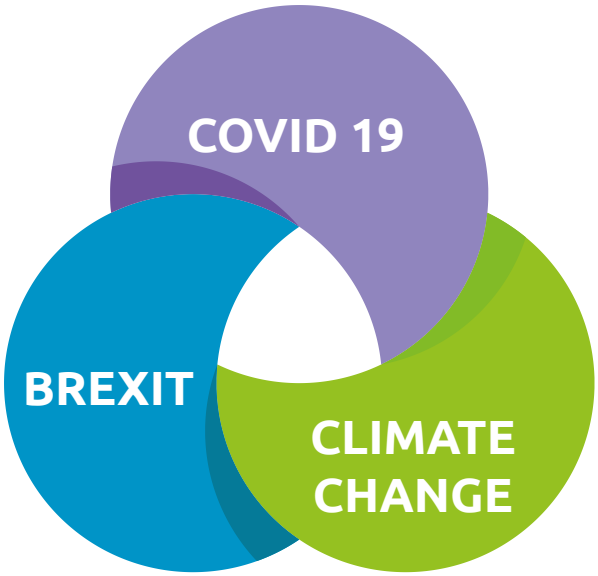
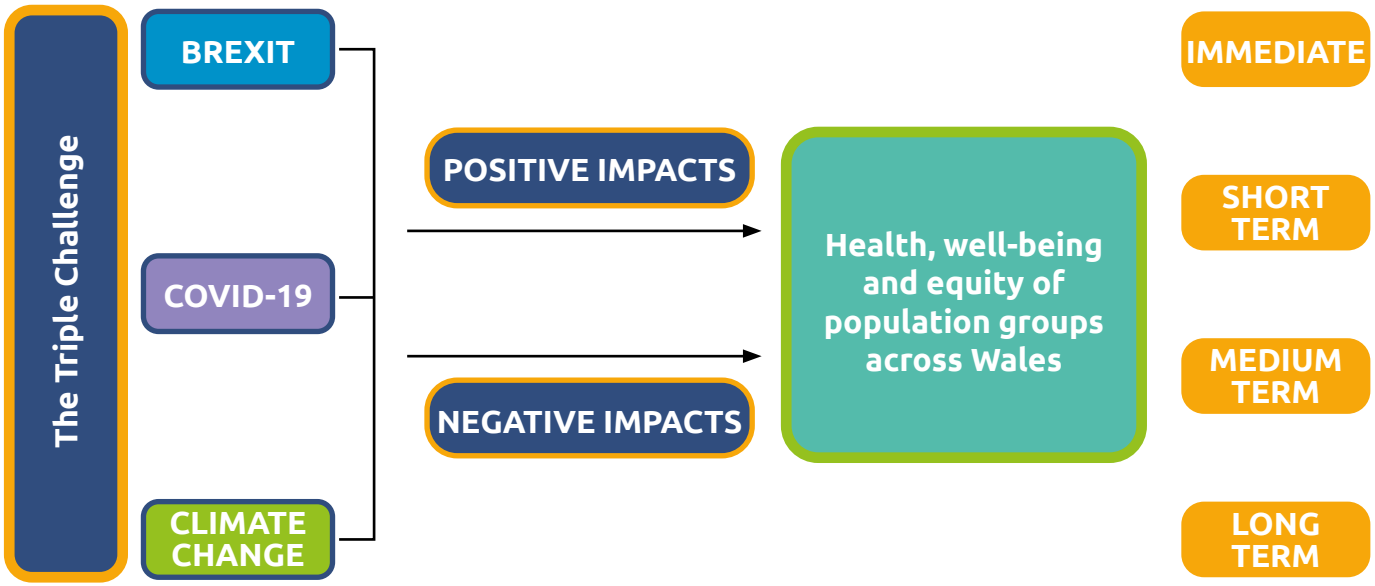


Figure 2: Overview of the Triple Challenge on health, well-being and equity



Box 1: Examples of the impact of Brexit, COVID-19 and climate change on health, well-being and equity

The COVID-19 pandemic has resulted in high levels of mortality and morbidity in some populations in Wales, for example older people and those from ethnic minority groups (Public Health England, 2020). However, it has also resulted in high levels of exposure to the virus for others, for example, health and social care and other critical workforces such as retail workers and emergency and utility services workers. Other direct and indirect health impacts include the impact on mental well-being, social isolation and air quality across the population (Ricardo Energy and Environment, 2020; Welsh Government, 2019a; Fore, 2020; Mental Health Foundation, 2021). Groups affected include babies, children and young people, women, those on low incomes and those with existing health conditions (Joyce and Xu, 2020; Green et al., 2021).

Climate change can affect health and well-being directly or indirectly through for example, facilitating the amount of physical activity someone takes, their employment and the local environment (Watts et al., 2018; Watts et al., 2021). It can impact whole communities such as Fairbourne in North Wales and residents in entirely or dispersed populations across Wales, dependent on the nature of extreme weather events such as flooding (Buser, 2020; CCRA, 2021). Children and young people may be affected, as well as those on low incomes and those in specific settings or employment, for example, agriculture workers.

Brexit can affect health and social care services and their workforces, the economy and lead to loss of access to funding to improve social and environmental infrastructure in communities (Fahy et al., 2018, Fahy et al., 2020; UK Parliament, n.d.). It will affect a wide range of population groups including non-UK EU residents, older people, those who work in industries highly exposed to trade and tariff barriers and men (Green et al., 2019, NHS Wales Confederation, 2019; NHS Wales Confederation, 2021).

1.1 POLICY CONTEXT – KEY POLICIES AND STRATEGIC DRIVERS

Governmental and organisational policies and strategies are important in relation to the Triple Challenge, both as **pathways of impact and as strategic drivers for change in the future.** A complex set of interactions take place to produce and implement policies - some of which align with those of other international governments and agencies, and some of which diverge. Integrated and aligned policies can have **co-benefits to health and well-being.** However, they **can also have unintended negative impacts** if not carefully developed in a holistic way for example, some actions to address one challenge and maximise policy could also have an unintended negative impact on other policy areas or create or exacerbate health inequities (Paavola, 2017). The sections below outline the policies, legislation and strategies that are relevant to the Triple Challenge and Wales.

International

A central underpinning policy framework on a global scale can be found in the United Nation's Sustainable Development Goals (UN SDGs) (United Nations, 2015). Launched in 2015, the UN SDGs comprises 17 goals and 169 targets for countries worldwide to work towards in an effort at creating and embedding a more sustainable future. The Goals include policy drivers such as No Poverty (Goal 1), Good Health and Well-being (Goal 3) and Climate Action (Goal 13). The UN highlights that the Goals 'recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests' (United Nations, 2015). Whilst the UN SDGs do not have a direct link to Brexit itself, they do identify sustainable development ambitions around some of the key, Brexit-related concerns such as Goal 12 on Sustainable Consumption and Production with its indicators linked to procurement, tourism and chemicals management (United Nations Department of Economic and Social Affairs 2021a). This is alongside the need for established international partnerships to achieve the goals (United Nations Department of Economic and Social Affairs 2021b).

UN annual analysis of progress against the UN SDGs has been viewed through a COVID-19 lens since the emergence of the pandemic, for instance Goal 12 considers the pandemic as 'a window of opportunity to explore more inclusive and equitable development models underpinned by sustainable consumption and production' (United Nations Department of Economic and Social Affairs 2021a).

United Kingdom (UK)

Brexit is a reserved legislative matter for the UK Government. However, it affects a range of devolved matters in Wales including the environment, economy, health and health services (Welsh Parliament, 2020). Legislation and policy papers surrounding the United Kingdom's exit from the European Union (EU) and future relationships with the EU and other countries have a major focus on economic drivers such as trade and Free Trade Agreements (FTAs). They also include some acknowledgement of climate change ambitions as part of the negotiating stance for future trading relationships. For instance, the UK's approach to negotiating a free trade agreement with New Zealand aims for both countries to work together to promote 'clean growth through trade' that supports both countries Net Zero Climate Commitments and to build on 'high environmental protections' (Department for International Trade, 2020, p.7). Climate change is devolved to Wales, Scotland and Northern Ireland. However, the UK government negotiates agreements, such as the signing of the Paris Accord in 2015, or hosts meetings such as the Congress of Parties 26 (COP26), which have a distinct focus on climate change. These are implemented at a UK national level with input from the devolved nations (Griffiths, 2019).

Wales

Wales has the ability to make its own policy and regulations in respect to devolved matters (UK Government, 2018 and UK Government, 2017) which include climate change, Environment, Business and Economy and Health. Other matters such as Policing, Trade and Investment are not devolved and are reserved by the UK Government.

During the COVID-19 pandemic, Welsh Government enacted and implemented legislation and regulations to address the transmission of the virus. These included requiring people to stay at home at all times except for specific circumstances for example, to attend a medical appointment or to obtain food supplies and to work from home if possible (UK Government, 2020; Welsh Government, 2020a). Response and recovery planning is ongoing. The four nations have at times aligned their policies, legislation and actions for example, Job Retention Schemes, grants for small businesses and support for those who are homeless (Business Wales, n.d.).

Welsh Government continue to respond and plan around Brexit and it has set out its priorities in respect to the withdrawal and importance and impact on Wales across a range of topic areas for example, trade, agriculture and health and social care (Welsh Government, 2021p).

The Welsh Government's Programme for Government (Welsh Government, 2021j) outlines its priorities for the duration of the current Welsh Parliament. It features a strong focus on climate change and the environment, reflected in the creation of a dedicated 'super-Ministry' (Welsh Government, 2021j) that brings together the policy areas of transport, housing, planning, energy and environmental policy. The Programme commits to embedding the response to 'the climate and nature emergency in everything we do'. This includes actions such as the introduction of a Clean Air Act amongst these obligations.

The Well-being of Future Generations Act (Wales) 2015 (Welsh Government, 2021q; Well-being of Future Generations (Wales) Act, 2015) commits all devolved public bodies, including the Welsh Government, to develop and shape their work with a commitment to the sustainable development principle and five ways of working. Crucially in the context of the Triple Challenge, it commits bodies to form an integrated approach in their activities alongside a focus on prevention, collaboration, long-term thinking and public involvement. Published alongside the 'Programme for Government', the Welsh Government's Well-being Statement (2021k) outlines how Welsh Government proposals have been 'designed to support an integrated approach to delivery' and will ensure that 'opportunities to deliver more through the integration of policies and programmes are identified early and acted upon.' This creates an opportunity for greater focus on sustainable and equitable policy action related to the Triple Challenges in combination, not isolation.

In direct relation to health, the Welsh Chief Medical Officer's Special Report (Welsh Government, 2021c) promotes a 'One Health' approach that views the health and well-being of the population, animals and ecosystems as being linked, thereby necessitating collaboration across sectors and disciplines to address issues or risks that occur at the animal-human-ecosystems interface.

Wales is also the first nation in the UK to introduce a Public Health Act. The Public Health (Wales) Act 2017 (Welsh Government, 2017b) contains a number of provisions aimed at improving population health, but of particular relevance to this work is the requirement for public bodies to conduct health impact assessments. The legislation and associated guidance require a public body to undertake a HIA prior to commencing major new programmes of work, to assess the likely short, medium, and long-term impacts of the project on the physical and mental health of the Welsh populace.

It can be anticipated that there will be initiatives to mitigate the impacts of climate change, COVID-19 or Brexit on health and well-being which will require a HIA to be undertaken.

1.2 PATHWAYS OF IMPACT

The manner in which the impacts could affect the health and well-being of specific population groups will arise due to **several pathways that emerge from Brexit, COVID-19 or climate change.** These conditions will be created by the content of Free Trade Agreements, economic and environmental circumstances and public policies to adapt to the context and situation. Some of these factors are devolved for example, health and social care but others are not, for example, international trade.

Box 2 below lists the pathways of impact that flow from the three Challenges.

Box 2

Brexit – pathways of impact:

- Changing regulatory standards and legal frameworks (devolved and non-devolved).
- Displacement of people, end of freedom of movement and changes to immigration policies (non-devolved).
- Economic recession, inflation and linked reduction in funding for public sector, infrastructure and key community assets (devolved and non-devolved).
- Leaving the single market and / or customs union (non-devolved).
- Mental well-being factors including resilience, control and participation including increased stress and anxiety; uncertainty over the future i.e. settled status (devolved and non-devolved).
- Reduced access to data, intelligence and evidence sharing mechanisms (devolved and non-devolved).
- Reduced access to key coordinating public health systems (devolved and non-devolved).
- Regulatory divergence increasing customs requirements at borders (non-devolved).
- Rights of EU Nationals to live and work in the UK (non-devolved).
- Terms of future trade policy and trade agreements (devolved and non-devolved).
- UK Citizens no longer EU citizens (non-devolved).

COVID-19 – pathways of impact:

- COVID-19 containment policies for example, staying at home, social distancing, home working, closure of some sectors, disruption to education and childcare (devolved) .
- Economic recession, inflation and linked reduction in funding for public sector, infrastructure and key community assets (devolved and non-devolved).
- Displacement of people, end of freedom of movement and changes to immigration policies (non-devolved) .
- Risk of mortality and morbidity from the COVID-19 virus / non presentation and delays in health and social care (devolved).
- Mental well-being factors including resilience, control and participation, social isolation; stress and anxiety; uncertainty about the future, fear of the virus (devolved and non-devolved).
- Reduced access to key coordinating public health systems (devolved and non-devolved).
- Terms of future trade policy and trade agreements (devolved and non-devolved).

Climate change – pathways of impact:

- Changing regulatory standards and legal frameworks (devolved and non-devolved).
- Changes to funding mechanisms (devolved and non-devolved).
- Displacement of population, end of freedom of movement and changes to immigration policies (non-devolved).
- Economic recession, inflation and linked reduction in funding for public sector, infrastructure and key community assets (devolved and non-devolved).
- Increased risk of exposure to extreme weather events for settings, workforces and infrastructure for example, agriculture, transport, health and social care settings (devolved and non-devolved).
- Mental well-being factors including resilience, control and participation, social isolation; stress and anxiety; uncertainty about the future i.e. preserving the planet for future generations (devolved and non-devolved).
- Terms of future trade policy and trade agreements (devolved and non-devolved).

1.3 THE IMPORTANCE OF TRADE AND FREE TRADE AGREEMENTS (FTAS)

Trade is an important factor in relation to the Triple Challenge and is a key employment and economic determinant of health. Brexit has meant that for the first time in over 40 years the UK will need to have a trade policy in relation to the EU and other nations and international trading blocs. Brexit has enabled the UK to autonomously negotiate new FTAs (Johnson et al., 2021). These can be a driver for enhanced or reduced economic growth and development dependent on the inclusions / exclusions and trade tariffs and Technical Barriers to Trade (TBT) which may be implemented across all parties.

Therefore they could have a major impact on health and well-being by reducing economic activity and employment (Johnson et al., 2021) with a potential impact on health services, food regulations, supply and standards and employment (Labonté et al., 2020; Gleeson et al., 2019; Hirono et al., 2016 and van Schalkwyk et al., 2021). Withdrawal from the EU has led to an impact on the level of imports / exports into the UK and Wales and the Office for National Statistics reported in March 2021 that imports and exports to the EU dropped sharply in January 2021 (Office for National Statistics, 2021d). At the start of 2021, levels had dropped with goods exported to the EU falling from £13.6 billion to £7.88 billion, while the value of imports fell from £22.7 billion to £15.8 billion pre Brexit (Statista, 2021a; Office for National Statistics, 2021d) the previous year. However, some of this could be due to COVID-19 restrictions and regulations rather than Brexit, or due to excessive supply pre the Withdrawal date and conclusion of the EU-UK Trade and Cooperation Agreement (TCA). FTAs can also directly or indirectly impact upon governmental abilities to make legislation to promote or protect health, for example, environmental health policies for food standards and labelling, but also pricing policies such as Minimum Unit Pricing (MUP) which can be challenged by major corporations as barriers to free trade.

The COVID-19 pandemic has had a major impact on Gross Domestic Product (GDP) in Wales and the UK (Office for National Statistics, 2021b). Negotiated trade and FTAs can be beneficial to the UK, but also favourable to the other nation state, blocs and their populations (Department of International Trade, 2020) as part of the recovery and renewal. They can do this by promoting economic growth for the future across the world. However, FTAs can have negative impacts, and unintended consequences, for health and the economy in

respect to COVID-19. For example, they can complicate supply chains further due to changes in legislation and regulation, for example labelling, and have implications for the speed of obtaining goods, services, workforces and medicines from the EU and other trading blocs (McNamara, 2017; McNamara and Labonté, 2016; Labonté et al., 2020; Hur and Park, 2012).

Trade is a major driver of airfreight, lorry and naval journeys from across the world delivering goods, people and products to nations. These journeys are not without cost to the environment and are widely acknowledged as drivers of climate change through the release of carbon emissions (Olivier et al., 2011; McNamara et al., 2021). Trade policies linked to economic development, increased urbanisation and consumption are also key factors to consider (Blanco et al., 2014).

Extreme weather events can disrupt trade routes, and policies to promote good climate health can have negative impacts on trade (Tamiotti et al., 2009). Some commentators suggest that climate and trade policy makers have 'worked in silos for too long' and need to become more integrated and sophisticated in their policymaking (Birkbeck and Denton, 2020). The table below (Table 1) depicts who could potentially be affected by trade and FTAs and the pathways of impact for these groups. This is based on the literature and the evidence contained in the HIAs that have previously been carried out.

Table 1

Key Theme	Pathways of Impact	Population Groups affected:
Trade and Free Trade Agreements (FTAs)	• Changes to employment status due to: economic recession; increased cost of imports / exports and tariffs; and Technical Barriers to Trade (TBT) • Changes to the movement of people and immigration regulations • Changes to environmental regulations and standards • Changes to regulatory and legal frameworks • Transportation and travel networks	• Whole population • Critical workers • Older people • Children and Young People • Those with existing health conditions • Those on low incomes • Those in employment related to imports and exports of goods

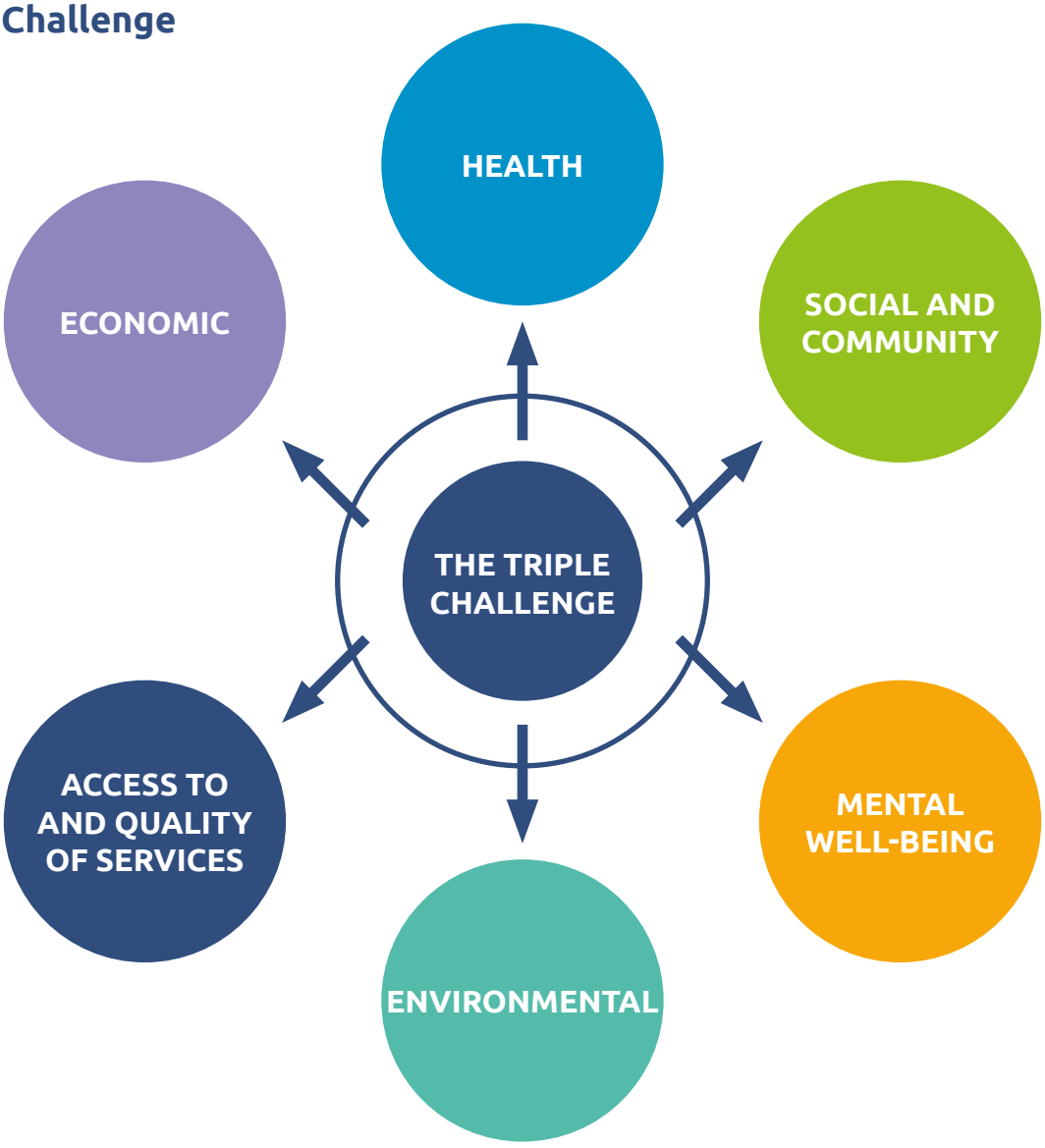
2 THE HEALTH, WELL-BEING AND EQUITY IMPACT OF THE TRIPLE CHALLENGE

Evidence identified in the Brexit, COVID-19 and climate change HIAs identified that the people of Wales have been majorly impacted by the Triple Challenge. These impacts occur through multiple pathways and determinants of health, for example, the way the challenges impact employment, trade and free trade agreements, factors which affect health behaviours such as alcohol consumption, food security and mental well-being (Figure 3).

This section of the report outlines the potential (and where observed actual) direct, major, cumulative impacts (positive and negative) of the Triple Challenge across a range of determinants and vulnerable population groups.

The initial table in each section maps all those determinants which are impacted in relation to a policy area and the pathways of impact. One key spotlight example is examined in more depth.[1]

Figure 3: Key determinants of health, well-being and equity affected by the Triple Challenge



[1] This report highlights determinants and population groups affected by all three elements of the Triple Challenge in the section table. It is acknowledged that Brexit, COVID-19 and Climate Change may also affect different determinants and population groups as individual standalone challenges, but these are not included in this report.

2.1 KEY DETERMINANT – HEALTH

Key Theme Impacted by the Triple Challenge	Pathways of Impact	Population Groups affected:
Health Care and Service Delivery, including new models of working	• Changes to movement of people and immigration regulations. • Rights of EU Nationals to live and work in the UK. • Terms of future trade policy and trade agreements. • COVID-19 containment policies for example, staying at home, social distancing, home working, closure of some sectors, disruption to education and childcare. • Risk of mortality and morbidity from the COVID-19 virus / non presentation and delays in care. • Mental well-being factors including resilience, control and participation, social isolation; stress and anxiety; uncertainty about the future; fear of the virus. • Increased risk of exposure to extreme weather events for settings, workforces and infrastructure for example, agriculture, transport, health and social care settings.	• Whole population • Those on low incomes • Critical workers • Older people • Geographical areas • Those with existing health conditions and needs
Health Protection – intelligence, evidence, research and development	• Reduced access to data, intelligence and evidence sharing mechanisms. • Reduced access to key co-ordinating public health systems. • Rights of EU Nationals to live and work in the UK. • Terms of future trade policy and trade agreements.	• Whole population • Those on low incomes • Critical workers • Older people • Geographical areas • Those with existing health conditions and needs

Health Behaviours including diet, alcohol, smoking and physical activity	• Terms of future trade policy and trade agreements. • Economic recession / loss of employment, inflation and linked reduction in funding for public sector, infrastructure and key community assets. • Mental well-being factors including resilience, control and participation, social isolation; stress and anxiety; uncertainty about the future. • Risk of exposure to extreme weather events for settings, workforces and infrastructure for example, agriculture, transport, health and social care settings	• Whole population • Those on low incomes • Those with existing health conditions and needs • Men

Spotlight Example on:
Health Behaviours – Alcohol

Prior to leaving the EU, the UK Government stated it would maintain the same high standards in respect to EU Directives and legislation already in force (Department for Exiting the European Union, 2018). However, this did not account for future potential changes in governmental policy, which could have positive or negative potential impacts on health behaviours. With Brexit, FTAs could positively or negatively affect a nation's ability to legislate or regulate for stronger alcohol, food or tobacco labelling standards and content (Zeigler, 2008). Increased regulation can also lead to increased pricing (McNamara et al., 2021). FTAs could lead to challenges by manufacturers in respect to public health laws for labelling and pricing for example, Minimum Unit Pricing. Supra National companies will be able to challenge these by stating that they will constrain their ability to trade freely (Zeigler, 2009).

Alongside these impacts, the World Health Organization (WHO) predicted that lockdowns during the COVID-19 pandemic, would potentially increase alcohol consumption and therefore exacerbate health vulnerability, risk-taking behaviours, mental health issues and violence, leading to alcoholism and addiction (World Health Organization, 2020). This increase in levels of alcohol consumption has been identified and reported in Wales through the Public Health Wales Engagement Survey. In week 3 of the first lockdown in April 2020, there was a 27% reported increase in alcohol consumption compared to the week before. One year later, 18% of respondents reported consuming more alcohol than they did prior to the pandemic, which equates to approximately 445,000 adults (Public Health Wales, 2021a). Those in less affluent communities and those aged 35-54 were more likely to report consuming more than previously (Public Health Wales, 2021a). Furthermore, there was an increase of 21% in alcoholic liver deaths in England during the year of the pandemic, accelerated by increased alcohol consumption during lockdowns (Public Health England, 2021). In England, there was a reported increase of 24.4% in alcohol sales in 2020-21 compared to 2019-20 (Public Health England, 2021).

In terms of climate change and alcohol, evidence highlights an increase in temperature and heat-related extreme weather events can lead to increased alcohol consumption and poorer health outcomes (Cusack et al., 2011; Thompson, 2018). A relationship has been observed between changing climatic conditions and increased use of drugs or alcohol as a coping mechanism (Kabir, 2018), whilst another study has identified a negative correlation between average global temperature and alcohol consumption with colder temperatures leading to higher alcohol intake and liver cirrhosis (Ventura-Cots et al., 2018). This is an area which requires further research.

Production of alcohol products such as beer have an energy, health and environmental impact (Garnett, 2007; Amienyo and Azapagic, 2016) but so does labelling, transportation and consumption. A Swedish paper (Hallstrom et al., 2018) looked at the greenhouse gases (GHG) produced via the population's consumption of alcohol. It notes increased alcohol intake will lead to an increase in alcohol-related GHG emissions due to factors such as the method of production for example, distillation, type of product and the packaging that it comes in. Men generated 90% higher GHG emissions than women due to the alcohol products they drank (mainly wine and strong beer) and their methods of production and packaging. The results indicated that alcohol consumption generated an average of 3% of total diet-related GHG emissions, and in sub-populations with the highest consumption this was up to between 6–11%.

2.2 KEY DETERMINANT - SOCIAL AND COMMUNITY FACTORS

Key Theme Affected by the Triple Challenge	Pathways of Impact	Population Groups affected:
Social mobilisation and citizen participation	• Changes to movement of people and immigration regulations. • Rights of EU Nationals to live and work in the UK (non-devolved). • COVID-19 containment policies for example, staying at home, social distancing, home working, closure of some sectors, disruption to education and childcare. • Increased risk of mortality and morbidity from the COVID-19 virus / non presentation and delays in care. • Mental well-being factors including resilience, control and participation, social isolation; stress and anxiety; uncertainty about the future; fear of the virus. • Terms of future trade policy and trade agreements (devolved and non-devolved). • Risk of exposure to extreme weather events for settings, workforces and infrastructure for example, agriculture, transport, health and social care settings.	• Whole population • Geographical areas • Children and young people • Older people • Those on low incomes • Those who are unemployed • Farmers and fishers • Those with existing health conditions and needs.

Intergenerational justice and social conflict	• Economic recession / loss of employment, inflation and linked reduction in funding for public sector, infrastructure and key community assets. • Mental well-being factors including resilience, control and participation, social isolation; stress and anxiety; uncertainty about the future. • Rights of EU Nationals to live and work in the UK (non-devolved). • Terms of future trade policy and trade agreements (devolved and non-devolved). • UK Citizens no longer EU citizens (non-devolved). • COVID-19 containment policies for example, staying at home, social distancing, home working, closure of some sectors, disruption to education and childcare. • Risk of mortality and morbidity from the COVID-19 virus / non presentation and delays in care. • Risk of exposure to extreme weather events for settings, workforces and infrastructure for example, agriculture, transport, health and social care settings.	• Whole population • Children and young people • Older people

Spotlight example on:
Intergenerational differences including justice and social conflict

The COVID-19 pandemic revealed intergenerational differences in patterns of morbidity and mortality, but also the ways in which generations reacted to the pandemic across Wales and the UK. The virus affected mainly older people in the first waves prior to vaccinations and led to higher levels of morbidity and mortality in these older age groups (Office for National Statistics, 2020a). Those aged over 70 are more likely to be hospitalised if they acquire COVID-19 and the majority of those dying as a result of the virus come from this age group (Office for National Statistics, 2020b).

Although children and young people were seemingly physically unaffected by the virus, by mid-2021 the age ranges infected by the virus were becoming increasingly younger as older adults were vaccinated (Office for National Statistics, 2020b). Although the number of deaths in the younger age groups remains extremely low, COVID-19 has had a wider effect on these age groups outside of their physical health, for example through educational disruption and the loss of social contact (Public Health Wales, 2021b). Young people were also affected economically in large tranches as the sectors in which they were most employed in Wales for

example, non-essential retail and hospitality, were temporarily closed down (Joyce and Xu, 2020; Gould and Kassa, 2020; Winding et al., 2021). At the end of 2020, youth unemployment in Wales was 10.9% compared to 4.4% unemployment reported for Wales as a whole (Welsh Government, 2021i). For many families and communities, the impacts of the virus spanned across generations. However, some commentators have noted the younger generation have sacrificed their freedom to protect older people (Kornwitz, 2021).

There were also differences in generational reactions to Brexit. Statistics demonstrate that there were consistent differences in voting patterns across the population in relation to remaining in the EU or exiting it (Moore, 2016). Older voters tended to vote to leave the EU whilst the younger demographic groups tended to vote to remain. Political participation and sense of control (or not) are all determinants of health and well-being and communities and familiar voting differences can lead to conflict (Eriksson, 2011). There were also differences between the voting patterns of social classes (Finlay et al., 2020). In the future, younger people could also be affected by Brexit, for example due to access to educational opportunities in the EU such as the ERASMUS study programme, to changes in employment, and a decrease in opportunities in the future caused by any Brexit influenced economic downturns. Older people could be affected by the challenges posed in recruiting and retaining health and social care workers to provide support and care for them which may be caused by immigration rule changes (AgeUK, 2020; Dayan et al., 2020; NHS Confederation, 2019). However, there could also be opportunities to remain in the workforce for longer (should they choose to do so) through a gap in some workforces created by non-UK EU residents moving away from Wales (Centre for Ageing Better, 2020).

The impact of climate change and extreme weather events will have a major impact on future generations being able to access the natural resources that they will need and have climate stability that will enable long-term survival. These are being represented as an issue of intergenerational justice by some commentators (Skillington, 2021; Sanson and Burke, 2020). It is a common assumption that there are divergent views between young and older people on climate change due to different experiences leading to differing drivers and frames of reference (Swim et al., 2011). However, the National Survey for Wales for 2018-19 suggested only small differences in the levels of concern across age ranges in relation to climate change (United Nations General Assembly, 2013; Statistics for Wales, 2019a; Sanson and Burke, 2020). Young people in Wales have mobilised to protest at climate change and the impact that this will have on them and future generations to highlight the need for action now (Wales Trades Union Congress, 2019). There is a growing number of young climate campaigners, some of whom are using the law to hold states legally accountable for loss of the right to health and 'Rights of the Child' (Skillington 2021; Sanson and Burke, 2020).

There is also increasing interest in planetary friendly diets which can also have co-benefits to health (Willett et al., 2019), and there is an increase in those stating that they are vegan in younger age groups (Chiorando, 2021; The Vegan Society, 2020). A survey in 2019 highlighted that younger age ranges are more likely to state that they are vegan than older people (Wunsch, 2020) with the 18-34 year old age range having the highest levels. Similar results were found in a Food Standards Agency 'Food and You' report from the same year (Food Standards Agency, 2019) with many reporting that they were vegan or vegetarian for health, environmental or animal welfare reasons (Vegan Food and Living, 2019).

2.3 KEY DETERMINANT - MENTAL WELL-BEING

Key Theme Affected by the Triple Challenge	Pathways of Impact	Population Groups affected:
Stress and anxiety relating to uncertainty about the future	• Changes to movement of people and immigration regulations. • Rights of EU Nationals to live and work in the UK. • Mental well-being factors including resilience, control and participation, social isolation; stress and anxiety; uncertainty about the future, fear of the virus. • UK Citizens no longer EU citizens. • Risk of mortality and morbidity from the COVID-19 virus / non presentation and delays in care. • COVID-19 containment policies for example, staying at home, social distancing, home working, closure of some sectors, disruption to education and childcare. • Risk of exposure to extreme weather events for settings, workforces and infrastructure for example, agriculture, transport, health and social care settings.	• Whole population • Those with existing health conditions and needs • Children and young people • Older people • Critical workers • Those who are unemployed • Those on low incomes • Migrants and their families • Single parent families

Spotlight example on:
Stress and anxiety relating to uncertainty about the future

There are both indirect and direct impacts on mental well-being in relation to the Triple Challenge. This is attributed to increased anxiety, stress and uncertainty not only about health and well-being but about the future. The three protective characteristics of mental well-being are a sense of control, participation and resilience (Coggins et al., 2011). Control (or lack of it) is a key factor regarding unusual events such as Brexit or in emergencies such as climate change related unexpected weather events or pandemics such as COVID-19.

The COVID-19 pandemic has been all-encompassing in its scale and scope, and continues to play out in ways which have not made the future recovery path smooth or certain. This is especially true of the virus itself - with the emergence of Variants of Concern or

Mutation (VOCM) such as the Delta variant of 2021 (World Health Organization, 2021; Welsh Government, 2021b) - but also in terms of the economic, educational and social recovery of the nation, and the impacts that this could have on for example, employment, levels of income and inequities. A recent literature review published in Wales highlighted the mental well-being impacts of the pandemic on babies, children and young people and the differential impact on groups within this cohort for example, those from low-income families compared to more affluent families and between older and younger age ranges (Public Health Wales, 2021b; Public Health Wales, 2021a). It identified that whilst there were some positives derived from the pandemic period for example, spending time with family and release of social pressure and from bullying, the impact was overwhelmingly negative including increased stress and worry about their education, their future and the impact of contracting COVID-19.

Research indicates that women with children (particularly less educated females) and younger adults were most at risk of the mental health and psychological impact of quarantine or self-isolation (Brooks et al., 2020). In addition, young people aged 18 to 24 years have been found to be most anxious about being separated from friends and family if they had to self-isolate (Mental Health Foundation, 2020b). A Public Health Wales' Public Engagement Survey reported that during Week 3 of the first COVID-19 lockdown, 56% were 'moderately' or 'very worried' about getting COVID-19, with subsequent survey findings remaining largely unchanged until the start of March 2021 (Public Health Wales, 2020). In January 2021 (week 40), 42% of participants reported their mental health and well-being was worse than prior to the pandemic, which equates to approximately 1,055,000 adults, with women and younger adults more likely to report worse mental health (Public Health Wales, 2021c).

Brexit has an equally uncertain future pathway in respect to its impact on the economy, jobs, movement of people and associated workforce issues, and the content and nature of future FTAs. The Trade Cooperation Agreement (TCA) has been signed but there are many more to be negotiated including a FTA with the United States - who have differing standpoints and standards about animal welfare and food regulations. Brexit uncertainty has also caused anxiety and stress amongst farming and fishing communities in Wales that will negatively impact on mental health and well-being (Homolova et al., 2020).

Climate change can lead to a wide range of mental health and well-being impacts including depression, anxiety and suicide (Palinkas and Wong, 2020) and post-traumatic stress disorder (Hrabok et al., 2020). Climate change and the uncertainty caused by the potential risk of exposure to extreme weather events for example, flooding, can provoke anxiety and stress in the population (IPCC, 2012; Cianconi et al., 2020). For some population groups such as young people, there is evidence to suggest that this uncertainty about the future and how climate change will impact them and the world (Sanson et al., 2018) can lead to worry, uncertainty and distress, increased aggression and violence, or increased suicide rates (Sanson et al., 2019).

This can be heightened by the fact that climate change projections vary. There are various models which suggest an increase in temperatures, however there is uncertainty regarding the scale of change depending on how climate change is addressed (Met Office, 2021; Brown, 2020) and past behaviours and emissions tackled. Flooding will become an increasing phenomena in Wales as will heat events (CCRA, 2021). Local communities can strongly perceive the negative impacts of climate change on them which can impact mental health at a population level (Cianconi et al., 2020). Some communities will be affected more than others and public bodies, local teams and the population will have to address this. Building resilience is a key mitigator for this along with adaptation policies and more sustainable practices which are positive to both the environment and well-being (The World Bank, 2020; Stevens et al., 2020).

2.4 KEY DETERMINANT – ENVIRONMENT

Key Theme Affected by the Triple Challenge	Pathways of Impact	Population Groups affected:
Environmental policies and regulations	• Terms of future trade policy and trade agreements. • Changing regulatory standards and legal frameworks. • Economic recession / loss of employment, inflation and linked reduction in funding for public sector, infrastructure and key community assets. • Leaving single market and / or customs union. • Regulatory divergence increasing customs requirements at borders. • Rights of EU Nationals to live and work in the UK i.e. many abattoir Veterinary Certificating Officers are non-UK EU nationals. • COVID-19 containment policies for example, staying at home, social distancing, home working, closure of some sectors, disruption to education and childcare. • Increased risk of exposure to extreme weather events for settings, workforces and infrastructure for example, agriculture, transport, health and social care settings.	• Whole population • Children and young people • Those on low incomes • Those with existing health conditions and needs

Transport and Active Travel	• COVID-19 containment policies for example, staying at home, social distancing, home working, closure of some sectors, disruption to education and childcare. • Economic recession / loss of employment, inflation and linked reduction in funding for public sector, infrastructure and key community assets. • Changing regulatory standards and legal frameworks. • Regulatory divergence increasing customs requirements at borders. • Leaving single market and / or customs union. • Increased risk of exposure to extreme weather events for settings, workforces and infrastructure for example, agriculture, transport, health and social care settings. • Increased risk of mortality and morbidity from the COVID-19 virus / non presentation and delays in care.	• Whole population • Critical workers including delivery and HGV drivers. • Geographical areas including tourist areas and port towns • Farmers • Those on low incomes • Those in employment which are highly exposed to Brexit, climate change and COVID-19
Population movement	• Terms of future trade policy and trade agreements. • Rights of EU Nationals to live and work in the UK. • Displacement of population, end of freedom of movement and changes to immigration policies. • Economic recession / loss of employment, inflation and linked reduction in funding for public sector, infrastructure and key community assets. • Increased risk of exposure to extreme weather events for settings, workforces and infrastructure for example, agriculture, transport, health and social care settings. • COVID-19 containment policies for example, staying at home, social distancing, home working, closure of some sectors, disruption to education and childcare. • Mental well-being factors including resilience, control and participation, social isolation; stress and anxiety; uncertainty about the future.	• Whole population • Migrants and their families • Those with existing health conditions and needs • Those on low incomes • Young people • Older people • Minority Ethnic Groups

Food security, including availability, accessibility and utilisation	• Terms of future trade policy and trade agreements. • Rights of EU Nationals to live and work in the UK. • Displacement of population, end of freedom of movement and changes to immigration policies (non-devolved). • Economic recession / loss of employment, inflation and linked reduction in funding for public sector, infrastructure and key community assets. • Increased risk of exposure to extreme weather events for settings, workforces and infrastructure for example, agriculture, transport, health and social care settings. • COVID-19 containment policies for example, staying at home, social distancing, home working, closure of some sectors, disruption to education and childcare. • Mental well-being factors including resilience, control and participation, social isolation; stress and anxiety; uncertainty about the future. • Changing regulatory standards and legal frameworks. • Leaving single market and / or customs union.	• Whole Population • Those on low incomes • Older population • Children and young people • Farmers and fishers • Agricultural workers

Spotlight example on:
Transport and Active Travel

During the first wave of the COVID-19 pandemic there was little to no travelling permitted in Wales as the population was required to stay at home unless it was for an 'essential journey' (Welsh Government, 2020b). The radical implementation of the lockdown measures across the world demonstrated that decarbonisation could be applied extremely quickly and thus result in improved air quality, reduced levels of vehicle traffic and air travel, reduced noise and pollution levels, which all contribute to climate and planetary health renewal (NASA, 2020; Brunt, 2020). The reduction in travelling during the pandemic contributed to reduced emissions and improved air quality in some areas of Wales and the UK (Brunt, 2020; Ricardo Energy and Environment, 2020; Air Quality in Wales, 2021; Jephcote et al., 2021; Jones, 2021; Department of Transport, 2021).

The pandemic provides an opportunity to reflect and refocus on reducing people's carbon footprints and have co-benefits to health and the economy – for example by driving economic development by encouraging 'staycations' across Wales. However, this could have an unintended negative impact in terms of increasing the number of cars and motorhomes on Welsh roads as people travel to their destination by car as they feel safer from COVID-19 transmission within them (RAC, 2021). At the same time, the accelerated move to, or increase in, online shopping has also contributed to increased numbers of delivery drivers using roads in Wales, as did the suspension of measures to restrict vehicles in town centres in Wales to enable social distancing (Cardiff City Council, 2021). Evidence suggests that by June 2021, road vehicle movements are returning to pre-pandemic levels, meaning that any benefits to health and the environment will be transient and temporary (Neill, 2021; RAC Foundation, 2021).

Active travel was, and is, encouraged for everyone during (and before) the pandemic - particularly those who worked as critical workers who needed to commute to work. Cities and towns in Wales and the UK enabled this with more visible cycle paths and walkways with space to socially distance (Teuton et al., 2020a). However, for more rural communities this can be more challenging. Active travel can improve physical and mental well-being (Sustrans, 2017; Mouratidis, 2019) and lead to reduced emissions from travelling by alternative modes of transport. Welsh Government have positively promoted active travel through the Active Travel (Wales) Act and in 2021 announced £38 million of funding to support active travel schemes in Wales. Public transport services remained in operation during COVID-19, however there were reduced passenger numbers which could have implications for the long term sustainability of services (Sung and Monschauer, 2021). This is not unique to Wales and has been observed in other nations in the UK (Teuton et al., 2020b). Welsh Government took over the operations of Transport for Wales in February 2021 as a way to maintain services for critical workers and those who needed to use these to access services and other designated essential journeys (Green et al., 2019; Jones, 2021).

Increased active travel and more physical activity could also be facilitated for positive health gain as a result of climate change and increased temperatures in the UK and it could also be an important mitigation measure to reduce global warming in itself (Brand et al., 2021). This could have co-benefits to health, society, and the environment whilst also helping to address inequalities (Rissel, 2009; Brand et al., 2021; Hoegh-Guldberg et al., 2018).

The impact of climate change has been also felt during the period of the pandemic and pre and post EU withdrawal. Flooding, increased precipitation, extreme heat and other extreme

weather events are risks to transport services, including road, rail, underground, air, marine and pipeline transportation (WHO, 2018; IPCC, 2018). A study highlighted that a 4'C warming scenario would lead to 2,400 km of the UK rail network being vulnerable to flooding, rising by 120% by 2080 (CCRA, 2021).

Many major Welsh transport routes have been majorly affected including road and rail links and infrastructure. Adverse weather events such as floods in 2019, 2020 and 2021 and extreme heat melting some rail lines in 2019 contributed to transport networks disruption and the people's daily lives including being able to access services and commute to work. Heatwaves pose a risk to transport infrastructure, and may cause buckling of railway tracks, damage to roads and failure of traffic lights (Zuo et al., 2015). Railways are particularly vulnerable to extreme heat and the frequency of rail buckling is expected to be four times higher under a low climate change scenario and five times higher in a high climate change scenario (CCRA, 2021). High temperatures also affect what maintenance can be performed, for example, tensioning rail track is difficult due to thermal expansion, and road tarmac dries too fast in high temperatures (CCRA, 2021). Additionally, overheating on UK public transport is likely to increase, having adverse impacts on passenger health and well-being (CCRA, 2021). Urban areas are most at risk of experiencing adverse impacts on commuter comfort and health, due to elevated temperatures on public transport (CCRA, 2021). Coastal areas are particularly at risk of damage and disruption to transport infrastructure due to flooding and storms (Veenema, 2017; CCRA, 2021). Wales has long stretches of road and railway located next to the shoreline, especially in the north and west, which is at risk of flooding from sea level rise (CCRA, 2021).

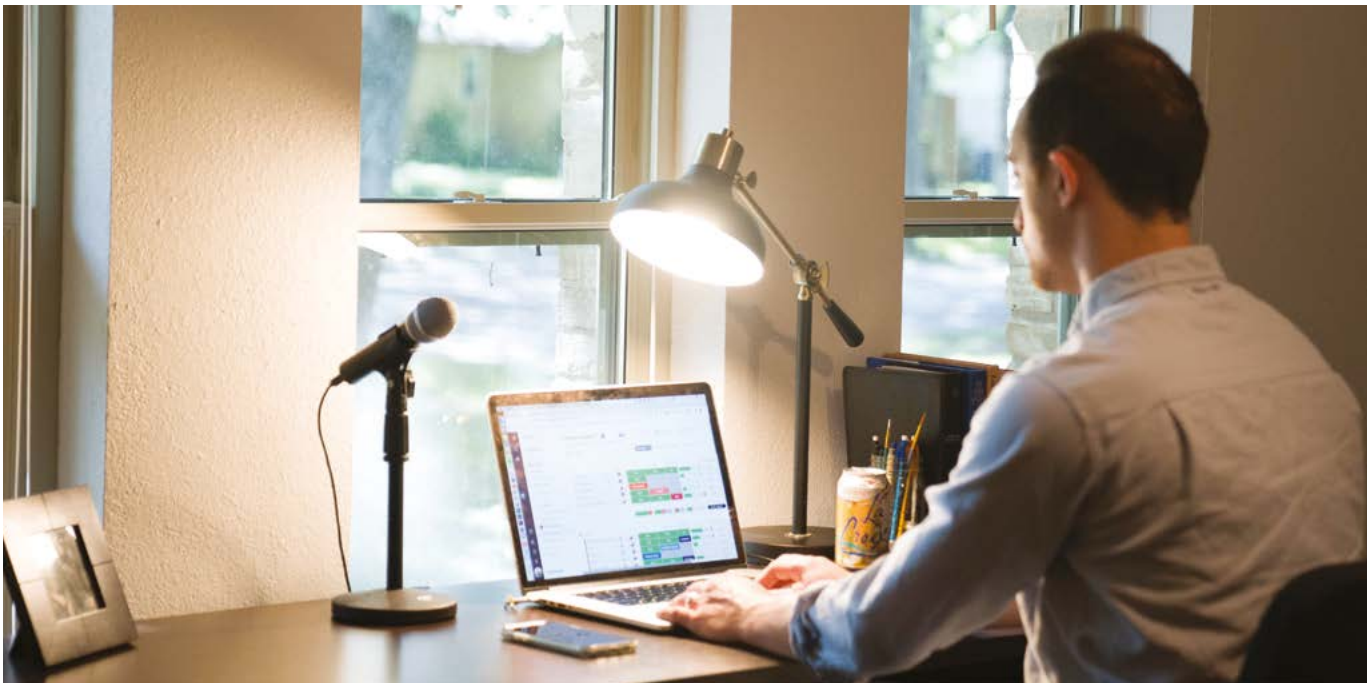
Reduction in flights and the movement in people due to the COVID-19 pandemic has affected the environment, the aviation industry and its workforce in a range of ways (International Finance Corporation, 2020; Statista, 2021b). However, this workforce is small in number in Wales. More affected has been ports in Wales with key links to Ireland and the UK and as a through path to mainland Europe.

Brexit has led to a reduction in the movement of people and transport has been affected. For example, there have been reported delays at ports and airports for HGVs due to the increase in paperwork that has accompanied the withdrawal from the EU (Johnson et al., 2021). In Wales, those ports which are essential links to Ireland have been disrupted and immediately prior to Brexit withdrawal they saw a significant surge in traffic followed by a significant reduction post Withdrawal – although this is slowly levelling out (Potter, 2021). Channel and Welsh ports are important, for example, they form a significant transport route for animal feed and food products into the UK (Carter, 2019). Additionally, rising sea levels are a risk to ports, which receive 95% of the UK's imports and exports (Welsh Government, 2019b). Positively, Welsh Government has implemented a five-point plan to support Welsh ports (Welsh Government, 2021o).

It must be noted that this issue is complex. There could be compounding or confounding effects from both COVID-19 regulations and Brexit changes to rules around importing and exporting goods and services to the EU. There are examples of product delays, for example, construction materials. This could be partly due to increased demand as people concentrated on upgrading or refreshing their homes and garden during lockdowns or the additional paperwork associated with Brexit and / or increased health and safety regulations as part of controlling the COVID-19 pandemic.

2.5 KEY DETERMINANT - ACCESS AND QUALITY OF SERVICES

Key Theme Affected by the Triple Challenge	Pathways of Impact	Population Groups affected:
Communication and digital technology	• COVID-19 containment policies for example, staying at home, social distancing, home working, closure of some sectors, disruption to education and childcare. • Changing regulatory standards and legal frameworks. • Leaving single market and / or customs union. • Mental well-being factors including resilience, control and participation including increased stress and anxiety; uncertainty over the future. • Reduced access to data, intelligence and evidence sharing mechanisms. • UK Citizens no longer EU citizens. • Increased risk of exposure to extreme weather events for settings, workforces and infrastructure for example, agriculture, transport, health and social care settings.	• Whole population • Those on low incomes • Older people • Children and young people • Migrants and their families • Geographical areas



Key Theme Affected by the Triple Challenge	Pathways of Impact	Population Groups affected:
Health and Social Care workforce, including recruitment and retention	• COVID-19 containment policies for example, staying at home, social distancing, home working, closure of some sectors, disruption to education and childcare. • Mental well-being factors including resilience, control and participation including increased stress and anxiety; uncertainty over the future for example, EU Nationals and their families right to carry on living / working in UK. • Changing regulatory standards and legal frameworks. • Leaving single market and / or customs union. • Rights of EU Nationals to live and work in the UK. • Increased risk of exposure to extreme weather events for settings, workforces and infrastructure for example, agriculture, transport, health and social care settings. • Increased risk of mortality and morbidity from the COVID-19 virus / non presentation and delays in care. • Reduced access to key coordinating public health systems. • Terms of future trade policy and trade agreements. • Displacement of population, end of freedom of movement and changes to immigration policies.	• Whole population • Critical workers including delivery and HGV drivers. • Geographical areas including tourist areas and port towns • Those on low incomes • Those in employment which are highly exposed to Brexit, climate change and COVID-19

Spotlight example on:
Communication and Digital Technology

The COVID-19 pandemic has accelerated the use of digital communication and technology in a myriad of ways. This includes to positively enable home working, to provide services, information and advice and to facilitate personal and social interaction between individuals and communities (Green et al., 2020a, Douglas et al., 2020; NHS Digital, 2020). It has also been used effectively during lockdowns to enable online retailing with record levels being recorded in January 2021 (Office for National Statistics, 2021c). However, digital forms of communication are not suitable for everyone. Some children, young people, older people and those on low incomes experience digital exclusion in Wales (Davies et al., 2019). They could be missing some important forms of support, information, key health messages and guidance as many agencies and organisations use social media to disseminate quickly information to a wide range of people. Staying at home / social distancing measures are more likely to affect those who do not have access to the internet, resulting in issues such as children not being able to access remote schooling, as well as issues with accessing health information and services (United Nations, 2020a). The United Nations has advocated for the expansion of internet access to those who are poor or at greatest risk as well as for there to be safeguards when using surveillance, artificial intelligence and big data (United Nations, 2020b). Levels of digital and health literacy also need to be considered as many members of society were exposed to increasing online fraud and 'scams' during the pandemic (Financial Conduct Authority, 2020; National Fraud and Cyber Crime Reporting Centre, 2020; Experian, 2020; UK Finance, 2020).

The accelerated use, and shift, to more digital methods of communication and working can also enable the population to reduce the impact on climate change. For example, home working and digital technology can enable services to be delivered remotely and thus mean that some workforces do not need to commute or travel as much as in the pre-pandemic period (WSP 2020; CET, 2021). However, one US study identified that associated home energy consumption and behaviours could negate this (Cruickshank, 2020).

Brexit has been an unanticipated change in respect to digital technology and communication. This can be viewed through the lens of FTAs for example, the Trade Co-Operation Agreement (TCA) concluded with the EU. A UK parliamentary committee report on digital trade and data has highlighted that FTAs will have implications in relation to goods and services traded via digital methods for example, information and statistical data including health intelligence. As a result of the COVID-19 pandemic more trade is taking place online (Department for International Trade, 2021). A House of Commons report highlights that FTAs are hugely important in relation to this concept and future trading patterns in which digital trade will become ever more important (House of Commons, 2021). The report also acknowledges that UK policy around digital trade is still in development and that this provides an opportunity to consider how future patterns could have an impact on public health, research and development collaborations and health services data.

Mobile phones and digital networks are an enabler for social and work connectedness for many individuals and can facilitate good health and well-being through this and they can promote equity for groups such as refugees and asylum seekers (Wajcman, 2008; Walker et al., 2014). The TCA encourages cooperation on the promotion of fair and transparent rates for international mobile roaming, but it does not prevent operators from charging for calls and roaming. This is because it does not include any specific provisions or exclusions in respect to mobile phone roaming charges, with the Mobile Roaming (EU Exit) Regulations

2019 coming into force at the end of the transition period (Hutton, 2020; Gallardo, 2021). This has led to some UK suppliers introducing charges. In June 2021, the mobile phone communications company EE announced that it was increasing its roaming changes to UK customers who are visiting the EU and Vodafone followed this lead in August 2021 (Wired, 2021). The introduction of roaming charges will have an impact on UK citizens or those with UK registered mobile phones on holiday, living and / or working in Europe and the cost of connecting with their employer, families and friends. Increased charges could also affect those on low incomes who travel outside of the UK. The recent trade agreement concluded between the UK and Norway, Iceland and Liechtenstein has included caps on the charges that mobile operators are allowed to charge each other for international mobile roaming which is a world-first in a free-trade deal (Boffey, 2021).

The European Union Commission announced on the 28th June 2021 that they have approved two adequacy decisions[2] for the UK. The first of these was in relation to General Data Protection Regulation (GDPR), which allows personal data to move freely between the EU and the UK, where it benefits from an equivalent level of protection to that guaranteed under EU law. The second decision refers to the correct implementation of the TCA, which allows for the exchange of personal information, for example as part of cooperation on judicial matters. Both of these adequacy decisions will last for four years until 2025. (European Union Commission, 2021).

[2] The European Commission has the power to determine, on the basis of article 45 of Regulation (EU) 2016/679 whether a country outside the EU offers an adequate level of data protection.

2.6 KEY DETERMINANT – ECONOMY

Key Theme Affected by the Triple Challenge	Pathways of Impact	Population Groups affected:
Employment, including types of employment and working conditions	• Economic recession / loss of employment, inflation and linked reduction in funding for public sector, infrastructure and key community assets. • Mental well-being factors including resilience, control and participation including increased stress and anxiety; uncertainty over the future for example, EU Nationals right to carry on living /working in UK. • Terms of future trade policy and trade agreements. • Changing regulatory standards and legal frameworks. • Changes to funding mechanisms. • Displacement of people, end of freedom of movement and changes to immigration policies. • Leaving single market and / or customs union. • Regulatory divergence increasing customs requirements at borders. • Rights of EU Nationals to live and work in the UK. • UK Citizens no longer EU citizens (non-devolved). • Containment policies for example, staying at home, social distancing, home working, closure of some sectors, disruption to education and childcare. • Increased risk of mortality and morbidity from the COVID-19 virus / non presentation and delays in care. • Increased risk of exposure to extreme weather events for settings, workforces and infrastructure for example, agriculture, transport, health and social care settings.	• Whole population • Older people • Critical workers • Those with chronic conditions / in need of care • Those on low incomes • Geographical groups • Farmers • Fishers • Young people • Migrants and their families

Spotlight example on:
Employment

Employment or unemployment are major health determinants and unemployment is an indicator of longstanding illness (LSI) and poorer health outcomes (Gray et al., 2021; Public Health Wales, 2019; Kadel et al., 2020). In 2020, Public Health Wales published a paper that highlighted that with increased unemployment, LSI would be expected to increase gradually following the COVID-19 pandemic, with an estimated increase of around, or exceeding, 4% over three years depending on the LSI measure. There would be a higher increment in the percentage of adults with limiting LSI compared with adults with any LSI, suggesting implications for wider health and social care services (Kadel et al., 2020).

The COVID-19 pandemic and response had been predicted to cause the global economy to decline by 4% (more than $6 trillion), assuming that recovery started in the second half of 2020 (Bosley, 2020). GDP in the UK in the first quarter of 2021 fell by 1.5% from the previous quarter due to lockdowns and closures of many businesses such as non-essential retail. The level of GDP is now 8.7% below where it was in Quarter 4 (Oct to Dec) 2019 and prior to the pandemic (Office for National Statistics, 2021f). Despite economic support interventions, the UK unemployment rate increased sharply from 3.8% in 2019 to approximately 5.1% at the end of 2020 following COVID-19 (Office for National Statistics, 2021g) and it is expected to gradually increase over the next few years. In Wales, the unemployment rate increased to 4.4% (up 1.5% on the previous year) despite many workers being supported by government schemes such as the Coronavirus Job Retention Scheme (otherwise known as 'Furlough') (Office for National Statistics, 2021g; Welsh Government, 2021d; Welsh Government, 2021h). Inflation can also affect employment, health, and well-being. Inflation has risen sharply which contributes to increased prices and therefore affect sales, exports and employment. In June 2021, inflation had increased by 2.5% from June 2020 (Office for National Statistics, 2021e) and increased cost of goods can affect businesses and individuals – particularly those on low incomes who may not have the elasticity in their incomes to be able to cope with any changes.

Positively in Wales, the Coronavirus Job Retention Scheme enabled many workers to retain their jobs and income during the pandemic measures if they were employed in a sector which was temporarily closed down due to being classed as 'non-essential' (HMRC, 2021; Welsh Government, 2021d). This included hospitality, leisure and 'non-essential' retail such as clothing stores (Office for National Statistics, 2021c). In January 2021, 178,000 employees were furloughed in Wales which was a take up rate of approximately 14%. This was similar to England (Welsh Government, 2021d). By June 2021, this had reduced to 68,800 (Welsh Government, 2021d). Grants in Wales were provided to small businesses and there was support for those who were self-employed (Welsh Government, 2021d). Wales also has high levels of micro-businesses and these were also enabled to remain viable as much as possible (Statistics for Wales, 2019b). Approximately 88,000 people had made a successful claim in Wales by January 2021, which was 63% of those eligible (Welsh Government, 2021d).

The COVID-19 pandemic could lead to increased employment through increased internal tourism and 'staycations' in Wales. It can also lead to a potential reduction in carbon emissions which occur from flying to overseas destinations due to restrictions placed on the population's ability to take 'non-essential' international travel and / or uncertainty about the timing for example, which international 'green' corridors to other holiday destinations would remain open or closed to travellers (Welsh Government, 2021n; Lock, 2021; Forgrave, 2021). Changes in the climate in Wales and rising temperatures could also lead to further opportunities to promote internal tourism with a focus on ecological and sustainable tourism and the enjoyment of the vast coastline, mountains and beaches (Marine Management Organisation, 2016).

During the pandemic, there was growth for some retail sectors for example, supermarket and online retailers (Financial Times, 2021) and increased support for local foundational economies as the population was encouraged to shop locally (Jones, 2020; Brewer and Patrick, 2021; Welsh Government, 2020; Monmouthshire County Council, 2020; Green et al., 2020b). Linking with climate change and building on Welsh Government and other policies (Welsh Government, 2019c; Welsh Government, 2021a; Bevan Foundation, 2020), using local services and enabling the concept of '20 minute neighbourhoods' (TCPA, 2021; Douglas and Beautyman, 2020) could lead to local regeneration, growth and more jobs. In addition, they can also facilitate better health by using active travel to access (Teuton et al., 2020a; Douglas and Beautyman, 2020) and can lead to improved environmental outcomes due to shorter distance travelled to access services and facilities (Green et al., 2020b). However, disruption due to changes in weather patterns and /or rapid decarbonisation could contribute to economic downturns which could affect employment or specific sectors including those who are locally based (DEFRA, 2010). In addition, the increased shift to more online based retailing has led to an increase in delivery drivers which will have an impact on the environment due to increased traffic movements – a major contributor to climate change (Teuton et al., 2020b; European Commission, 2016; Office for National Statistics, 2019; Douglas and Beautyman, 2020).

There is also evidence that wildfires, flooding, landslides and other climate-related events can lead to economic and employment losses (Zuo et al., 2015; Froude et al., 2018; Adger et al., 2014; Hoegh-Guldberg et al., 2018; UK Parliament, 2018). In England and Wales, projected changes in flood risk could lead to economic damage of up to 20 times compared to now, by the 2080s (Adger et al., 2014). Decreasing food production, an increase in health issues associated with climate change, and more extreme weather events will slow economic growth and affect employment and income, making it increasingly difficult to reduce poverty (Mbow and Rosenzweig, 2019). Reduced outdoor work activities and lost work days due to climate factors may also result in economic losses (Zuo et al., 2015; Welsh Government, 2019b) and the agricultural industry could experience reduced economic activity through the impact of climate change on crops and livestock (Zuo et al., 2015; Heogh-Guldberg et al., 2018; Castells-Quintana et al., 2015).

Whilst there were many early concerns about Brexit's impact on employment, employment levels continued to grow from 2016 until the pandemic was declared (CIPD, n.d.). However, the impact of COVID-19 and loss of employment due to the pandemic and associated measures has hidden any unemployment which could be due to EU withdrawal. Positively, new FTAs post-Brexit could create new job opportunities, for example, for fisheries and farming in Wales as new markets are created for imports and exports (Welsh Government, 2021o; Welsh Government, 2014). However, FTAs can also have a negative impact on employment as Welsh producers prices are undercut for reasons including increased supply of similar, cheaper imported products and trade barriers and tariffs which would drive up the cost of exporting to the EU. There could also be an impact on employment due to changes in patterns of migration and immigration brought about by Brexit and immigration regulations. This could majorly affect workforce staffing levels across a range of sectors including health, social care and agriculture (Welsh Government, 2021f, Welsh NHS Confederation, 2021). Brexit and the pandemic has also affected employment across coastal areas and tourist towns as they have been affected by a reduced supply of workers from the EU (and other nation states) to work in the hospitality sector, for example, hotels and restaurants due to the changes in immigration rules but also the restrictions on population movement (KPMG, 2017; The Independent, 2021).

It has been reported that a major medium-term impact of both Brexit and COVID-19 and any economic downturn could be that employers invest less in secure employment and skills development. Any recession will negatively impact a wide range of population groups including young people, those with disabilities / learning difficulties, low achievers and those with mental health conditions (Keep, 2020). However as the economic situation evolves, the present point in time provides an opportunity to move away from measuring the progress of a nation state by GDP. Wales, along with Scotland, Finland, Iceland and New Zealand are members of the Well-being Economy Governments partnership which adopts a 'shared ambition of building well-being economies' in which 'Policy is framed in terms of human and ecological well-being, not simply economic growth' (EuroHealthNet, 2021).

Types of employment

Brexit has implications for a range of workforces and particularly for those employed in industries which are highly exposed to FTAs and technical barriers to trade for example, tariffs and those in receipt of EU grants and subsidies for example, fishers and farmers. It also affects those occupations and sectors that are more exposed to immigration regulations such as agricultural, health and social care and hospitality workers where recruitment and retention issues have been exacerbated. Prior to Brexit Welsh Government noted that the veterinary, food and drink manufacturing and NHS sectors are all particularly dependent on skills from the European Economic Area (Welsh Government, 2017p).

The COVID-19 pandemic has majorly affected the workforce in Wales, across all disciplines, sectors and geographical locations and those who use their services (Joyce and Xu, 2020; Green et al., 2020a). This includes critical workers for example, health and social care, essential retail, police, education, HGV and delivery drivers and those in sectors that were closed down for example, leisure, non-essential retail and hospitality (Joyce and Xu, 2020). The pandemic has an impact on working practices for example, home working and social distancing in occupations and settings where home working is not possible. A report in 2020 highlighted that sectors most affected by lockdown (retail, leisure, transport) employ 15% of the workforce. These are more likely to be young people (nearly a third of under 25 year olds are employed in these sectors); have a low income (a third of employees have the lowest 10% of earnings); and women (17% of women are employed in these sectors compared to 13% of men) (Joyce and Xu, 2020).

Climate change will affect a range of sectors and their working conditions. Primarily these will be outdoor workers, including farmers and agricultural workers, construction, forestry and utilities workers – but it will also affect those who work inside buildings which are not adapted to cope with a variety of temperatures and weather conditions (Binazzi et al., 2019; Bonafede et al., 2016; Castells-Quintana et al., 2018; Flouris et al., 2018; Levi et al., 2018). A recent UK Government publication from the Independent Green Jobs Taskforce, promotes the idea that every type of job in the UK has the potential to be a 'green job'. It notes that the UK could enable a 'green industrial revolution' through the business, education and industry sectors working together with UK Governments in order to ensure that skills for, and pathways into, good green jobs are supported and promoted (UK Government, 2021). Wales has a similar integrated focus within its 2021 'Programme for Government' and it has been reported that Wales has untapped economic growth potential, particularly to generate energy, including from renewable sources and there has been growth in the community level low carbon energy sector in Wales for several years (Welsh Government, 2017b)

3 KEY FINDINGS

- The Triple Challenge will have a wide range of compounding impacts across multiple determinants of health. These will need to be viewed in synergy, cumulatively and not through a singular lens.
- Key determinants affected include for example, mental well-being, food insecurity, health behaviours, environmental policy / regulations, employment and working conditions.
- Population groups potentially affected include for example, those in rural communities, fishers and farmers, those on low incomes and babies, children and young people.
- There is a gap in the research and published evidence which link the three challenges together. However, there is evidence that links combinations of two of the challenges to health and well-being and equity, for example; Brexit and COVID-19; or COVID-19 and climate change; or Brexit and climate change.
- Climate change is a common theme in COVID-19 and Brexit literature. Both challenges present ways to tackle climate change directly and indirectly, for example improving air quality in Wales.
- The current point in time presents a 'window of opportunity' for policy change which will have co-benefits for health and well-being, the economy and a sustainable environment in Wales. Some of the policy areas are devolved to Wales and some of these areas are non-devolved and therefore nations will need to work together to maximise this.
- The Well-being of the Future Generations (Wales) Act 2015 provides an enabling environment for Wales to utilise the application of a Triple Challenge lens to policies and strategies. This can be transferable to other similar devolved nations across the UK and Europe.
- There is an opportunity to strengthen public health messaging around health behaviours with the increased profile of public health and environmental issues related to Brexit, COVID-19 and climate change for example, diet and nutrition, food insecurity and waste.
- Trade and Free Trade Agreements (FTAs) are an important driver for the three challenges and their impact on health and wider determinants should be considered both now and in the future. For some determinants, for example, environmental regulation and standards or the economy, this is more explicit than for others and is most often referred to in relation to Brexit. However, trade is also important for COVID-19, for example, supply of vaccines and climate change as FTAs can limit the ability to tackle climate change and local policies and targets. A more holistic and integrated way of policymaking is required for trade with leadership needed to bring all those affected together to consider the health impact of these.
- Brexit and the pandemic can present opportunities for the future, for example to support a 'green industrial revolution', 'green jobs' and more employment to create a fairer, more sustainable Welsh economy and 'Economy of wellbeing'.

Population Groups affected

A number of the impacts of the Triple Challenge can have negative or positive effects on the whole population of Wales. However, certain impacts disproportionately affect individual vulnerable population groups, including:

Babies, children and young people

Farmers, Fishers and agricultural sector workers

Older people

Critical workers, including health and social care workers, and delivery and HGV drivers

Those on low incomes / unemployed

Minority ethnic groups

Geographical areas, including those in rural or coastal areas, tourist areas or port towns

Migrants and their families

Those with existing health conditions and needs

Single parent families

4 POTENTIAL ACTIONS TO PROMOTE HEALTH, WELL-BEING AND EQUITY IN WALES IN THE CONTEXT OF THE TRIPLE CHALLENGE:

There are actions which policy and decision makers can take to enable positive health, well-being and equity for the population of Wales in respect to the Triple Challenge:

- Collaboration should take place at a strategic level (both nationally and locally through for example, Public Services Boards) to co-ordinate action and responses to the Triple Challenge - this will maximise resources and concentrate efforts on those determinants and groups who will be triply affected.

- Policies and action to address the challenges should be considered together so that co-benefits to health, the environment and society can be maximised and unintended impacts for other sectors and settings can be mitigated or avoided.

- Developing or utilising an action-orientated 'health in all policies' conceptual framework to consider the impact of the Triple Challenge in Wales at a local or national level.

- Utilising health impact assessment methodology can support the early identification of emerging impacts of events such as Brexit, COVID-19 and climate change and act as focal points for further discussion. They can identify the potential or actual impacts of policies and plans in relation to the Triple Challenge in entirety; or when considering the impact of a singular challenge to broaden its scope to consider dual challenges for example, Brexit and climate change and COVID-19 impact. This multi-focal process could be implemented by public bodies and local communities that face specific multiple related challenges. Any HIAs can lead to the mitigation of negative impacts for health and well-being and maximise present or future opportunities.

- Developing more data, evidence and research (and utilising existing available data and health intelligence) for the three challenges as a whole will assist in further identifying those who are most vulnerable in the population and be disproportionately negatively affected by them.

- Local communities strongly perceive the impacts of Brexit, COVID-19 and climate change and some communities will be affected to a greater extent than others. Public bodies, local teams and the population will need to work collaboratively to address this. Building resilience at a population level is a key mitigator along with adaptation policies and more sustainable practices.

- Trade and future Free Trade Agreements will have a major impact on health and implications for public health activities. Public health practitioners and policy makers should work together in a co-ordinated manner to advocate and increase awareness of the impact trade will have.

- Brexit, COVID-19 and climate change can have direct and indirect impacts on health behaviours for example, diet, nutrition, active travel and alcohol. Health promotion messages should highlight the co-benefits of behaviour change to target audiences for example, adopting a planetary friendly diet.

- Policy makers can develop alternative scenarios for a range of issues for example, supply chains, employment and alternate land use and management in order to identify and reduce vulnerabilities.

- Policy makers and civil society can engage the public to foster an intergenerational debate about the impact of the challenges in relation to the environment and Wales' long-term security. This will promote participation, a core protective factor for mental well-being, about future policy and actions.

5 CONCLUSION

This paper has highlighted some key examples of determinants of health and well-being and population groups impacted by policies, strategies, and legislation related to the Triple Challenge of Brexit, COVID-19 and climate change in Wales. There are also many examples where only one of the three challenges has been addressed, occasionally two. However, there is very little in the literature that links the three challenges and this paper aims to start discussions around the interlinkages.

This work has highlighted the significant interconnectedness of the three issues, and developing an overarching policy approach for these multifactoral policy areas could help to promote rapid, effective, and lasting change, and address the issues in combination rather than in isolation and viewed through a singular lens.

Having the Triple Challenge concept as the underpinning focal point for new policies and strategies will enable a wide range of organisations, public bodies and wider society to think through the cumulative impact going forward. This report is the first in a series of reports by Public Health Wales to continue to use this multi-issue platform and approach to better understand the health impacts of seismic events in order to maximise positive health impacts and opportunities when addressing common concerns in relation to post-Brexit policy and actions, COVID-19 recovery and renewal and climate change adaptation and mitigation.

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Our Priorities 2018-2030
Building and mobilising knowledge and skills to improve health and well-being across Wales
Influencing the wider determinants of health
Improving mental well-being and resilience
Working to Achieve a Healthier Future for Wales
Supporting the development of a sustainable health and care system focused on prevention and early intervention
Promoting healthy behaviours
Protecting the public from infection and environmental threats to health
Securing a healthy future for the next generation
Our Values:
Working together with trust and respect to make a difference
GIG CYMRU NHS WALES
Iechyd Cyhoeddus Cymru
Public Health Wales

October 2021

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