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The COVID-19 pandemic in Ireland: An overview of the health service and economic policy response

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ABSTRACT

Objectives: To outline the situation in Ireland with regard to the COVID-19 pandemic.

Methods: Analyse the evolution of the COVID-19 pandemic in Ireland. Review the key public health and health system responses.

Results: Over 1700 people have died with COVID-19 by July 19th while almost 3000 people had been admitted to hospital with COVID-19. A high proportion of the deaths occurred in nursing homes and other residential centres who did not receive sufficient attention during the early phase of the pandemic.

Conclusions: Ireland's response to the COVID-19 crisis has been comprehensive and timely. Transparency, a commitment to a relatively open data policy, the use of traditional and social media to inform the population, and the frequency of updates from the Department of Health and the Health Services Executive are all commendable and have led to a high level of compliance among the general public with the various non-medical measures introduced by the government.

Introduction

This paper outlines the situation in Ireland with regard to the COVID-19 pandemic. We begin by outlining some key indicators of population health in Ireland and a brief description of the health system. We then discuss the key health policy and health technology aspects of the pandemic in Ireland. We analyse the available data on cases, hospitalisations and deaths, and outline the key public health initiatives undertaken by the government in Ireland. Our data analysis covers the period from February 29 when the first case was reported up to July 19. The response of the health system is explored in detail. We also discuss the economic impact of the virus to date and outline the very substantial financial measures that have been implemented by the government to ameliorate some of the effects of the pandemic, and the related lockdown, on individuals and businesses. The final section contains suggestions for how the country may cope with the continuing presence of the virus.

Country description

Sociodemographic profile of Ireland

According to the most recent census there were 4,689,921 people classified as usually resident in Ireland in 2016. The Central Statistics Office (CSO) estimates that the population increased by 3.8% since then [1]. The breakdown of the 2019 estimates by region and age group is contained in Table 1. There is a heavy concentration of the population in Dublin and the Mid-East region that surrounds Dublin, with over 43% of the population living in that area. Overall, the population density is 72 people per square kilometre. The proportion of the population aged 65 or older is a little over 14% while the proportion aged over 85 is just over 1.5%. Almost 400,000 people (8.5% of the total population) lived alone in 2016 and, of these, 39% were aged 65 or older. Just over 41% of the population aged 15+ were single while 47.7% of this age group were

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Table 1
Population estimates ('000 s) for regions by age group, 2019.

	Border	Midland	West	Dublin	Mid-East	Mid-West	South-East	South-West	Ireland
Male	202.5	153.0	230.2	683.3	359.8	242.3	216.6	350.3	2438.0
Female	204.2	151.9	233.5	712.4	363.7	242.7	219.3	355.9	2483.5
Total	406.7	304.9	463.7	1395.7	723.5	485.0	435.9	706.2	4921.5
Age-groups									
0–14	86.5	69.2	94.0	263.2	163.9	98.2	91.1	143.0	1008.9
15–24	51.0	38.9	57.2	175.2	92.6	60.9	54.9	87.4	618.0
25–34	43.7	34.9	52.2	223.7	81.3	53.6	48.1	83.0	620.0
35–44	58.2	46.8	69.2	240.3	117.0	71.3	64.5	109.2	776.9
45–54	54.9	41.0	62.7	176.3	103.5	66.7	60.2	96.2	661.6
55–64	47.4	33.5	54.6	139.2	76.4	57.1	50.7	80.8	539.7
65–74	37.5	24.4	42.3	100.4	53.8	45.0	38.5	62.2	404.1
75–84	19.8	12.2	22.6	56.5	26.2	23.8	20.8	32.9	214.9
85+	7.4	3.9	9.0	21.0	8.8	5.7	7.0	11.6	77.3

Source: Central Statistics Office [1].

married. There were almost 219,000 one-parent families in 2016, 86% of which were headed by a female [1].

There were 44,531 people with at least one disability living in a communal establishment in 2016. Almost 70% of these were aged 65 or older. There were approximately 10,000 homeless people in Ireland at the beginning of 2020, most of whom were living in temporary accommodation. Around 6000 people seeking asylum in Ireland were living in Direct Provision Centres at the end of 2019, with a further 1500 living in Emergency Accommodation Centres. There were almost 31,000 members of the Traveller community in Ireland in 2016. 11.4% of the population in 2016 were born outside of Ireland, mainly elsewhere in Europe [1].

Health profile of the country

Life expectancy at birth was 82.2 years for the whole population in 2017, 84.0 years for females and 80.4 years for males [2]. People aged 65 can expect to live for another 21.4 years on average for women, and 19.0 years for men. Just under 28% of the population report having a chronic illness or health problem. The percentage of the adult population that are smokers has declined steadily in recent years and now stands at 17%. Approximately 23% of the population in Ireland are obese. In 2016, 18.5% of the Irish population experienced some type of mental health disorder such as anxiety, schizophrenia, depression, alcohol abuse or drug abuse [2].

Overview of the health system

Health policy in Ireland is determined by the Department of Health, headed by a Minister of Health, and publicly funded healthcare is delivered by the Health Services Executive (HSE). There is also substantial private sector involvement in the delivery of healthcare, ranging from GPs to allied healthcare professionals to private hospitals.

The Irish health system incorporates public, voluntary and private elements in the production, delivery and financing of healthcare. People in Category I (which includes 36% of the population) are eligible for free healthcare in the public system (with significant co-payments for medicines). Most people who qualify for Category I entitlements do so on the basis of a means test while others do so depending on a diagnosis of a specified chronic illness. A further 10% of the population have a limited form of eligibility in Category 1 which entitles them to free GP visits [3].

The remainder of the population are in Category II, which entitles them to care in the public hospital system subject to a co-payment. They pay a full fee for visits to a GP. Many people in Category II as well as a minority of people in Category I buy private health insurance which gives them access to privately supplied care, some of which is provided in private hospitals but much of it is provided in public hospitals. Approximately 74% of healthcare expenditure is funded by taxation, 14% by private health insurance and the remaining 12% of expenditure by out-of-pocket payments. Further details about the Irish health system and proposals to reform it can be found in Connolly and Wren [3], Cullinan et al. [4] and Burke et al. [5]. The CSO recommends that modified Gross National Income be used as a measure of overall economic activity rather than Gross Domestic Product (GDP) because of the disproportionate effect of globalisation on Irish GDP. The proportion of modified Gross National Income that is spent on healthcare in Ireland was 12% in 2018 [6]. Per capita expenditure on health (adjusted for purchasing power parities) was estimated to be $4915 in 2018 [2].

The number of practicing doctors in Ireland is 3.1 per 1000, a relatively low figure by international standards. The number of nurses, 12.2 per 1000, is higher than the average in the OECD. There were a total of just over 10,000 hospital doctors in Ireland in September 2019, 32% of whom were consultants. There were 2.9 hospital beds per 1000 inhabitants in Ireland in 2018 [2]. A particular concern at the beginning of the pandemic was the low number of ICU beds in Ireland. The total number of ICU beds in the public health system was estimated to be 255 in February 2020 or 5.5 ICU beds per 100,000 people. Long-term residential care in Ireland is provided by publicly-owned, privately-owned and voluntary (not-for-profit) care homes. There are approximately 25,000 people living in nursing homes run by private and voluntary organisations and a further 5000 people living in public nursing homes. Pearce et al. [7] estimated that a significant proportion (between one half and two thirds) of nursing home residents have dementia.

Organizational structure of the public health policy response to COVID-19

The National Public Health Emergency Team (NPHET), a body of approximately 30 medical, science and health service professionals, was activated in January 2020 to deal with the COVID-19 virus. Its chairman is the State's Chief Medical Officer, Dr. Tony Holohan. NPHET is supported by an Expert Advisory Group as well as 11 sub-groups, including an expert modelling group. NPHET works closely with the HSE National Crisis Management Team which manages the HSE's response. Questions have been raised in Dáil Éireann (the Irish parliament) about the membership of NPHET and the delay in minutes of meetings being released. The Department of the Taoiseach (Prime Minster) has given regular press briefings since March 12th. These typically include details of financial supports for individuals and businesses. In May, a special parliamentary committee was established to consider the State's re-

sponse to the pandemic. The committee has been meeting weekly and its proceedings are streamed live.

COVID-19 data sources and trends

Overview of data availability

There are four publicly available official online data sources relating to Ireland's experience of the COVID-19 pandemic:

1 Health Protection Surveillance Centre (HPSC) website: www.hpsc.ie/
2 Department of Health (DoH) website: https://www.gov.ie/en/organisation/department-of-health/
3 Irish government's open data portal: https://data.gov.ie/
4 Health Service Executive (HSE) Daily Operations COVID-19 Update: https://www.hse.ie/eng/services/news/newsfeatures/covid19-updates/

The HPSC, an agency within the HSE, is Ireland's specialist agency for the surveillance of all communicable diseases. The HPSC data forms the foundation for the other three sources as it collates data relating to all confirmed and probable cases of COVID-19 in Ireland. The DoH updates, the governmental open data platform, and the HSE daily operations updates all have additional unique features that make them useful in the context of data collection and transparency. Since March 23rd, the HPSC has published daily update reports for NPHET on their website [8]. These reports provide the following data specifically related to COVID-19:

- number of new cases and cumulative number of cases.
- number of new deaths and cumulative number of deaths.
- number of hospitalisations and ICU admissions.
- number of clusters of infection, broken down by geographic region and the number of clusters in settings such as nursing homes.
- breakdown of number of cases by age, range, gender and county.
- breakdown of mode of transmission – community transmission, close contact with confirmed case or travel-related.

The daily briefings from NPHET, which are also posted on the DoH website, are subsets of the HPSC reports, but sometimes contain additional data such as the numbers of tests completed, the number of recovered cases and more detailed information on special groups, such as those in residential care settings or healthcare workers. However, these are not consistently reported. Data on recovered and active cases was very slow to emerge in the beginning but have been reported on a more regular basis since April 21st. The DoH also uses its website to update the general public about the findings of bi-weekly population surveys about public sentiment relating to the COVID-19 response and related restrictions in place. Finally, minutes of NPHET meetings are published on the DOH website with, at times, a considerable lag.

The Irish government's open data portal (https://data.gov.ie/) is designed to provide easy access to datasets held by public bodies in Ireland. These datasets are free to use, reuse, and redistribute. Since late March, the Health section of the open data portal has featured several datasets relating to the COVID-19 pandemic which can easily be used for analysis by researchers and the general public. Since mid-May, the Central Statistics Office have published a series of information bulletins containing an analysis of people who have died or contracted COVID-19 [9]. These bulletins contain data not previously available, such as a breakdown of deaths by county.

Since April 13th, the HSE has released daily updates [10] describing the acute hospital activity related to COVID-19. These updates offer a succinct summary of the situation in each of Ireland's public hospitals and critical care units in relation to COVID-19. Current COVID-19 admissions, occupancy due to COVID-19 and non-COVID disease, and available bed capacity in terms of regular beds and critical care beds are all included in these updates. Individual hospitals are listed by name and this offers some additional visibility on where in the country COVID-19 is most active.

How has the virus spread?

Our data analysis covers the period from February 29, when the first case was reported, up to July 19. From the outset, cases were defined as people who had tested positive for COVID-19. Despite initial ambitious plans by the HSE to test widely, it became clear quite quickly that laboratory capacity could not meet the demand created by the broad definition of criteria for testing. GPs quickly identified thousands of patients with respiratory symptoms as part of the first wave of the COVID-19 pandemic. These patients were referred for testing before the capacity existed to either conduct or to analyse this level of testing in a timely fashion, which meant there were considerable delays in the system. Testing criteria were changed on March 24th. The new criteria stated that individuals must be suffering from two symptoms, have a respiratory disease, and be a contact of a confirmed or suspected case, and also be in a priority group to be eligible for testing. Some testing was outsourced to German laboratories to clear the backlog. These outsourced test results were delayed coming back into the system which created a 10-day period in mid-April where these test results were returned in bulk and reported in the daily HPSC and DoH updates. This led to a spike in apparent virus activity which was, in fact, an artefact of the delays.

Initially, for a death to be classified as a COVID-19 death, it was contingent on the patient having a laboratory-confirmed diagnosis of COVID-19 before their death. Since April 24th, the HPSC have included 'probable' deaths (i.e. deaths where the cause was likely COVID-19 but where the patient was not tested before death) in the total deaths tally. Deaths include people who died in either private homes or long term residential institutions in the community as well as people who died in hospital. This complete tally of hospital patients, community patients and probable cases has remained the standard reporting format since April 24th.

The majority of cases in Ireland have been in the east of the country, with 48% of cases occurring in Dublin. More broadly, a block of ten counties in the east, north-east and midlands, account for almost 75% of the total number of cases (see Fig. 1). Initially, most cases had a history of foreign travel, most notably to Northern Italy, but by the end of April community transmission accounted for almost two-thirds of total cases. Fig. 2 shows the number of new cases each day. The peak of new cases occurred in mid-April. However, positive COVID-19 results returning in bulk from foreign laboratories around this time complicates this somewhat, as date of reporting lagged significantly behind date of sampling. While the large majority of cases recovered without needing to be hospitalised, 12.9% of cases did require hospitalisation while 1.6% of cases were admitted to ICU [8]. Reporting of cumulative COVID-19 deaths also rose sharply on April 22nd (see Fig. 3). This is due to the fact that at this point the HPSC and DOH began reporting "probable" deaths, where patients died of a COVID-19-like illness prior to testing positive for COVID-19.

As seen in Figs. 4 and 5, COVID-19 hospitalisations and ICU admissions both began to decrease in the second week of April. While the complications of infection of COVID-19 lag behind the emergence of first symptoms by 7 to 10 days, hospitalisations and ICU admissions are less prone to the nuances of the variations in COVID-19 testing strategies and reporting dates.

The initial focus in Ireland was on how the virus was spreading in the general community, but by the end of March it was clear

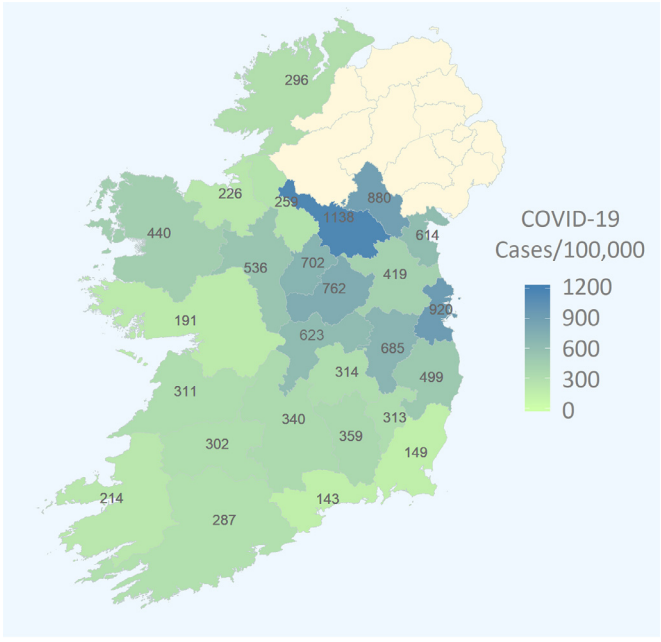

Fig. 1. Cases by county.

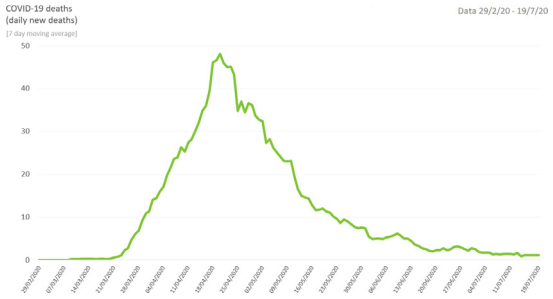

Fig. 3. Deaths per day.

that the virus has spread widely in a substantial number of long-term residential settings. There have been 257 clusters (defined as 5 or more cases) in nursing homes and 184 clusters in other residential settings. Nursing homes and residential settings in the east and north-east have been especially vulnerable, with 67% of the clusters in long-term residential settings occurring in these areas. Healthcare workers in Ireland have also been disproportionately affected by COVID-19, with 32% of cases being detected in healthcare staff [8].

The HSE daily operations update [10] offers the most granular breakdown of hospital activity related to COVID-19, particularly critical care activity. It includes the measure "Total Critical Care Beds Open & Staffed", which is arguably a more important measure than ventilator availability. No figures are available as to the number of people isolating at home. This may become a more relevant measure as society-wide restrictions are relaxed and more focused efforts are employed to control COVID-19 activity.

Initially, the number of new cases grew rapidly and increases exceeded 40% on some days. The public health restrictions imposed by the government and the high level of compliance with these restrictions and general public health advice slowed the spread of the virus very significantly. On April 24th, the daily increase in cases fell below 5%, and dropped sharply thereafter, falling below 1% growth consistently since mid-May. Similar trends can be seen in the "flattening of the curve" of new hospitalisations and new admissions to ICU. The growth in new cases fell to around 0.1% in the first two weeks of June and has remained very low since. An increase in the number of new cases in the first two weeks of July followed an easing of lockdown restrictions and led to a postponement of the final phase of a plan to re-open the economy (see Section 4 below).

Table 2 provides a breakdown by age range of cases and deaths. It is clear that older Irish patients are at a far higher risk of requiring hospital care and of dying from COVID-19. The mean and median ages of people who have died is 82 and 84 years respectively [8] (this only refers to deaths where a laboratory test confirmed the presence of COVID-19). Over 45% of people who died were aged 85 or older even though this group only accounted for 9.2% of cases. Males make up 43% of cases while they account for 49% of deaths. Fig. 6 shows the distribution of deaths by county as of July 3rd. The distribution of deaths closely matches the distribution of cases with a large proportion of deaths occurring in the north-east and east of the country. Information on the presence of co-morbidities is available for about 75% of cases and 82% of deaths. As of June 10th, 42% of patients who have died from COVID-19 had chronic heart disease, 31% suffered from a chronic neurological condition and 17% had a chronic respiratory disease. The CSO has analysed the spatial distribution of standard mortality rates according to the deprivation level of the area that the person who died was normally resident in [9]. The analysis was carried out using deprivation indexes for small areas. Nationally,

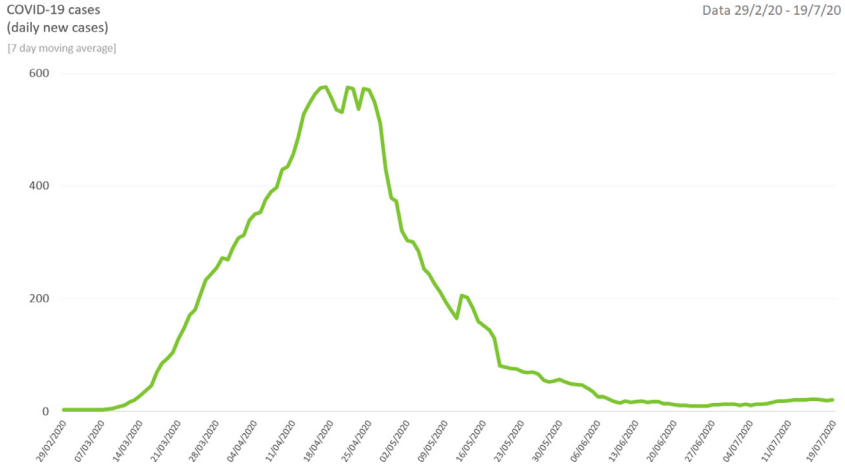

Fig. 2. Cases per day.

Fig. 4. Hospitalisations per day.

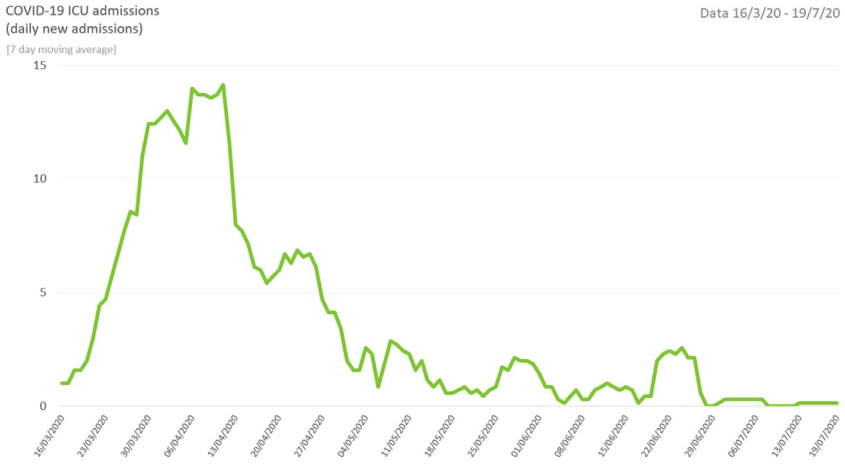

Fig. 5. ICU Admissions per day.

Table 2
Age breakdown of cases, hospitalisations and deaths (as of July 19th).

Age group (years)	Number of cases (n)	Number of Cases (%)	Cases hospitali-sed (n)	Cases hospitali-sed (%)	Cases admitted to ICU (n)	Cases admitted to ICU (%)	Number of cases who died (n)	Cases who died (%)
<5	183	0.7	23	0.7	0	0.0	0	0.0
5–14	338	1.3	17	0.5	2	0.5	0	0.0
15–24	1960	7.6	76	2.3	5	1.1	1	0.1
25–34	4353	16.9	198	5.9	15	3.4	5	0.3
35–44	4532	17.6	274	8.2	36	8.2	13	0.7
45–54	4607	17.9	448	13.4	91	20.8	26	1.5
55–64	3274	12.7	497	14.9	127	29.1	71	4.1
65–74	1824	7.1	586	17.5	109	30.0	246	14.0
75–84	2302	8.9	745	22.3	46	10.5	597	34.1
85+	2372	9.2	477	14.3	6	1.4	792	45.2
Unknown	21	0.08	1	0.03	0	0.0	2	0.1
Total	25,766	100.0	3342	100.0	437	100.0	1753	100.0

Source: Health Protection and Surveillance Centre [8].

standard mortality rates have been highest in the least deprived quintile and second highest in the most deprived quintile. So far, no individual-level analysis of the socio-economic background of people who have died has been possible as the data has not been released.

8144 of the 25,333 (32%) cases relate to healthcare workers. Of the 8018 healthcare workers infected up to May 30th, 88% got the virus in a healthcare setting, 4% got the virus from contact with a confirmed case, 3% got the virus from travel, 3% got the virus from community transmission and 1% got the virus from a health-care setting as a patient. Seven healthcare workers have died from the virus. Over a third of the healthcare workers infected by the end of April were nurses while almost a quarter were healthcare assistants [8].

Policy and technology road map

Ireland has followed a multi-faceted approach to the COVID-19 crisis involving measures to: 1) limit the spread of the virus in the community and specific institutional settings, 2) test and trace suspected contacts, 3) ensure that there were adequate healthcare services and equipment available for people who became seriously

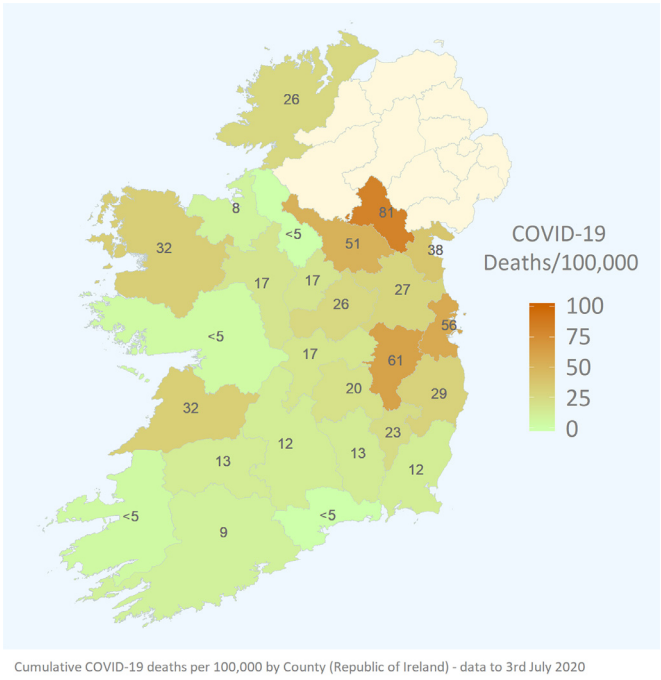

Fig. 6. Deaths by county.

ill with the virus, and 4) limit the financial burden on individuals and businesses due to the response to the virus. Extensive use of a large number of health and non-health technologies have been employed including diagnostic testing and the use of medical devices. In the period immediately after the first cases were reported in Ireland, the Government and the Public Health authorities tried to delay as much as possible the disease (this period is known as the 'delay phase'). Approximately one month after the first case, the Government and the Public Health authorities moved to the 'mitigation phase' where the main goal was to contain as much as possible the health and economic impact of the pandemic.

Health policy developments during the COVID-19 delay phase

From the outset, public health advice from the Government and the HSE to the community at large has emphasised frequent hand-washing, appropriate respiratory etiquette (recommending that people cover their mouth and nose with a tissue or sleeve when coughing or sneezing), the importance of maintaining a two metre distance between people, and the need to avoid touching one's eyes, nose and mouth [11]. More recently, the importance of wearing face coverings on public transport and in indoor settings has been emphasised. Traditional and social media have been extensively used to convey basic public health messages. Table 3 summarises the key health policy initiatives that have been implemented in Ireland since the beginning of March. The table follows the classification system developed by Moy et al. [12]. They classify measures based on their impact; minimal, medium, significant or very significant, and which category the measure falls into; containment, economic impact, prevention and care and health technology and finally whether the measure represents an escalation (increasing measures to respond to increases in active cases) or de-escalation (easement of measures). See Moy et al. [12] for a further explanation.

On March 9th, the annual St Patrick's Day parades were cancelled and an initial increase of €435 million in funding to deal with the impact of COVID-19 was announced for the HSE. On March 12th, Ireland entered the delay phase of dealing with the pandemic. The government ordered schools, colleges, childcare facilities and state-run cultural institutions to close. Indoor gatherings of more than 100 people and outdoor gatherings of more than 500 people were banned. Mandatory closure of pubs was announced on March 15th.

On March 24th the government introduced a second raft of mandatory measures. These included the closure of non-essential businesses such as retail outlets, gyms, hairdressers, outdoor markets and libraries while hotels were limited to cater for essential non-social and non-tourist guests. Cafés and restaurants were only permitted to supply take-away food and delivery. All indoor and outdoor sporting activities were cancelled. All playgrounds were closed and places of worship were required to restrict numbers and adhere to physical distancing. Essential services (such as supermarkets) were required to implement physical distancing. Individuals were not permitted to take unnecessary travel either within Ireland or overseas. Physical distancing was required when outside and social gatherings of more than four individuals were prohibited (except for members of the same household). Individuals were required to work from home unless they worked in essential services.

Policy developments during the COVID-19 mitigation phase

On March 27th Ireland moved to the mitigation phase and introduced a third range of additional measures [13]. People were asked to stay at home unless to undertake essential work or access essential services. Exercise and travel were restricted to 2 kilometres of an individual's home and individuals were not permitted to arrange gatherings with anyone outside their households. The government issued cocooning guidelines for anyone over 70 or medically vulnerable, asking them not to leave their houses. To ease the burden of cocooning, a community call initiative was introduced on April 2nd to mobilise volunteers to help cocooning citizens.

To enhance compliance with the measures, An Garda Síochána (the Irish Police Service) was given additional powers including arrest without warrant. Non-compliance with a direction of a Garda without a lawful excuse is considered a criminal offence and is punishable by a fine of up to €2500, up to six months imprisonment, or a combination of both. The Government also had the power to detain a person who refuses to remain in a specific place (such as a home or a hospital) if they are deemed by a medical professional to be a potential source of infection and/or a risk to public health, and detention is necessary to slow the spread of COVID-19. As of July 1st, 320 people had been arrested for breaching the restrictions [14].

On May 1st the Taoiseach announced a Roadmap to reopen the economy and society [15]. Initially, the roadmap contained a five phase reopening process with the first phase beginning on May 18th and the final phase on 10th August with three week periods between phases. On June 8th, the government announced an accelerated re-opening with a four phase process rather than five phases and with the final phase scheduled to begin on July 20th. An additional acceleration of the re-opening was announced on June 19th which meant that most commercial activity was able to resume in some form or other from June 29th. However, on July 15th, the government announced that the final (fourth) phase of re-opening would not in fact begin until August 10th. Details of what are included in the phases of the roadmap are included in Table 3.

Use of technology in disease detection and prevention

Technology has played a major role in Ireland's response to the pandemic. In the health sector, diagnostic testing, clinical trials, use of medical devices and eHealth systems have all been employed to

Table 3
List of key measures introduced in Ireland and categorised based on the classification system developed by Moy et al., (2020).

Month	Date	Key Public Measures	Classification	Categories	Type*
February	29th: 1st Case of COVID-19 confirmed in Ireland				
March	9th	Annual St. Patrick's day parade cancelled throughout Ireland.	Medium	Containment	+
	9th	Initial €3 billion financial support introduced including income support (€2.4 billion); business liquidity support (€200 million);	Significant	Economic Impact	+
	9th	HSE additional financial support (€435 million)	Medium	Prevention and Care	+
	12th	Mandatory closures of schools, colleges, childcare facilities and state run cultural institutions. Indoor gatherings of more than 100 people and outdoor gatherings of more than 500 people banned. People encouraged to work from home.	Medium	Containment	+
	15th	Pubs closed.	Significant	Containment	+
	17th	"Be on call for Ireland initiative launched" to recruit additional healthcare workers to HSE	Significant	Prevention and Care	+
	24th	Closure of non-essential businesses All indoor and outdoor sporting activities cancelled. All playgrounds/campgrounds closed and places of worship required to restrict numbers and adhere to physical distancing. Essential services required to implement physical distancing. Citizens not permitted to take unnecessary travel either within Ireland or overseas. Physical distancing required when outside and social gatherings of no more than four individuals allowed (except for members of the same household). Citizens required to work from home unless they worked in essential services.	Significant	Containment	+
	24th	Easier re-registration for former health care workers and former members of the defense force.	Medium	Prevention and Care	+
	24th	Announcement that private hospitals would become part of the public hospital system for the duration of the crisis, significantly increasing acute capacity	Very Significant	Prevention and Care	+
	24th	A raft of financial measures introduced included higher unemployment supports, covid-19 sick leave payments and introduction of wage subsidy scheme to co-fund 70% of cost of salaries up to a maximum of €38,000 per annum. Additional measures including rent freezes and eviction bans introduced	Significant	Economic Impact	+
	27th	Stay at home measures announced for all but essential workers exercise for everybody else confined to within 2 K of home. No gatherings with anyone outside household.	Very Significant	Containment	+
	27th	People aged 70+ or medically vulnerable advised not to leave home	Minimal	Containment	+
		1400 public service workers received training in contact tracing (various dates)	Medium	Prevention and Care	+
April	8th	An Garda Síochána (the Irish Police Service) given additional powers including arrest without warrant, under the Health Act 1947 (Section 31A-Temporary Restrictions) (Covid-19) Regulations). Any offence is punishable by a fine of up to €2500, up to six months imprisonment or a combination of both	Very Significant	Containment	+
May	18th	Phase 1 of reopening of economy and society: outdoor work is allowed to resume and shops that cater for mainly outdoor work is allowed to open. Groups of up to four people are allowed to meet outdoors within 5 km of home. Outdoor public amenities, sport and fitness activities are allowed to open.	Significant	Economic Impact	–
June	8th	Phase 2 of reopening of economy and society: travel within a county or up to 20 km from home if crossing county borders is allowed. Groups of up to six people are allowed to meet either outdoors or indoors. Organised sporting, cultural or social activities for up to 15 people are allowed. Other retail shows are allowed to open. Individuals who were cocooning or medically vulnerable individuals are allowed a small number of visitors. Funerals with up to 25 people in attendance are allowed.	Significant	Economic Impact	–
	15th	Retail facilities in shopping centres are allowed to open	Medium	Economic Impact	–
	29th	Phase 3 of reopening of economy and society: all domestic travel restrictions lifted. Cafes, restaurants, hotels, hostels, galleries, museums and pubs that serve food are allowed to open but social distancing must be maintained. Crèches will reopen for essential workers and those who need childcare facilities due to returning to work. Behind closed door sporting activities can resume. Higher risk retail outlets such as hairdressers are allowed to open. Hospitals will permit a small number of visitors. Indoor leisure facilities can reopen, festivals and cultural activities can reopen. Indoor gatherings of up to 50 people and outdoor gatherings of up to 200 people allowed as long as follow public health advice	Significant	Economic Impact	–
	30th	Deal with private hospitals allowed to lapse due to low need	Significant	Prevention and Care	–
July	7th	Mobile phone app launched to track and trace. 1.3 million downloads in first few days of apps launch.	Significant	Health Technology	
	15th	Face masks mandatory in shops for customers and staff. Maximum of 10 people from no more than 4 households allowed to visit other people's homes	Significant	Containment	+
	20th	"Green list" of countries published; travellers from these countries can visit Ireland without having to quarantine. Advice to people living in Ireland is to avoid all non-essential overseas travel	Significant	Containment	+
August	10th	**Phase 4 of reopening of economy and society**: Crèches can reopen for the remaining workers. Weddings are permitted with limited attendance. Pubs, nightclubs will be allowed to open.	Significant	Economic Impact	–

* Type: + is indicative of an escalating measure (increasing measures to respond to increasing numbers of active cases) and (-) is indicative of a de-escalating measures (easing of measures put in place). This is based on the definition provided by Moy et al., (2020).

combat the effects of the pandemic. As the pandemic progressed, the use of technology has evolved. A number of Irish organisations have provided rapid evidence reviews of health technology assessment and health queries about the coronavirus and COVID-19 disease including the National Health Library and Knowledge Service [16], the Health Information and Quality Authority (HIQA) [17], iHealthFacts [18] and Cochrane Ireland [19].

During the first month of the crisis, around 1400 public service workers received training in contact tracing. Many of these have been deployed along with existing HSE staff in a series of contact tracing centres that have been set up countrywide. A special mobile phone app to track and trace Covid-19 infections was developed by a collaboration between the private sector and health authorities and was launched on July 7th. Over 25% of the population downloaded the app in the week after it was launched [20]. A recurring concern in Ireland has been the availability of personal protective equipment (PPE), which is a particular issue in long-term residential care homes. The Health Research Board have funded local projects that avail of technology such as AI-enabled analysis and participation in international consortium clinical trials treating COVID-19 in ICU [21].

Healthcare system response

ICU beds

As noted earlier, the low number of ICU beds in the public health system (255 in total or 5.5 per 100,000) was a particularly pressing issue in Ireland at the beginning of the pandemic. On March 24th, the government announced that private hospitals had in effect been incorporated into the public hospital system for the duration of the crisis. In addition, many of the public hospitals increased the number of ICU beds in their own hospitals or identified additional beds that could be used as ICU beds if there was a surge in admissions. The number of ICU beds occupied by confirmed and suspected COVID-19 patients peaked in the second week of April and has steadily declined since then. The increase in the number of ICU beds meant that there were always at least 90 ICU beds available on any particular day [10]. As far as we know, no hospital ever exceeded its ICU capacity.

Recruiting additional healthcare workers

The Irish government took a number of steps to try to maintain and enhance the workforce capacity to deal with the COVID-19 pandemic. On March 17th, the Health Service Executive launched an international recruitment campaign, "Be on call for Ireland" to encourage healthcare professionals at home and abroad to come and work in the public health service [22]. The number of applicants for the Be on Call for Ireland initiative was approximately 73,000. However, the vast majority of these were not healthcare professionals. According to the Irish Medical Council, 397 doctors registered with the Council under this initiative. About one third of these were retired doctors returning to work. In addition to the Be on Call initiative, a number of other recruitment initiatives took place to maximise the current work force and increase capacity across both the public and private healthcare providers. These included increasing the hours of part time staff, maximising agency usage, rehiring of retired clinicians, redeployment of staff and encouraging those on career break to return early.

Changing requisites to practice medicine

The Government reached an agreement in March with the Private Hospitals Association to use its facilities for the treatment of both Covid-19 and non Covid-19 patients. Under the deal, 19 private hospitals essentially operated as public hospitals for a three month period. The arrangements between the State and private hospitals however did not cover 600 consultants who work exclusively in the private sector. By April 23rd about one quarter of these consultants had signed up to a contract offered to them. There have been ongoing discussions around the problem of how to ensure that formerly private consultants are able to continue their care relationship with their patients with many consultants strongly criticizing the arrangement between the State and the private hospitals. The deal has been criticised over its costs (€115 million cost per month) and the relatively few patients treated in these facilities [23]. The agreement lapsed at the end of June 2020.

Other actions pertaining to changing requisites in Ireland include:

- Bringing forward exams for final year medical students to enable them to join the workforce.
- All student nurses were hired as healthcare assistants.
- Reassignment of healthcare workers from private sector, and other external staffing supports on a needs basis.
- Cross training of healthcare workers where needed, for example where retraining has occurred e.g. theatre nurses to be ICU nurses.

GP / Specialists operational changes

Individuals who suspect that they have the virus are strongly encouraged to contact their GP as the first point of contact. Since mid-March, GPs have been providing the majority of their consultations over the phone or via video link. A number of Community Hubs were established around the country. In these hubs, patients can be seen by a GP who can refer them to an acute hospital. There has been ongoing concern over people delaying seeking medical help because of fear of contracting COVID-19 if they attended a hospital or other medical clinic [24].

Changes in utilisation of non COVID-19 healthcare

Systematic evidence for changes in the demand or need for other types of medical care or pharmaceuticals is limited. A large online survey with over 35,000 respondents conducted in the third week of April found that about 32% of respondents had postponed medical treatment or check-ups [20]. Most of the appointments that were postponed were routine medical examinations such as a consultation with a GP or a dentist or a post-operation follow-up. Parents reported that vaccinations had frequently been postponed as had some pre- and post-natal appointments. Almost 5% said that a medical examination in a hospital had been postponed and 2% had an operation postponed. The Irish Cancer Society has claimed that more than 450 cancers have remained undetected due to the suspension of cancer screening services [25].

Many mental health organizations have reported an increase in the use of their online and telephone services. SpunOut, which provides information on a broad range of issues to young people, said that there had been a 100% increase in people contacting them due to anxiety and depression. ALONE, an organization which supports older people, reported on April 27th that there had been a large increase in the number of older people contacting them about social isolation and loneliness. The number of calls they were receiving from people with suicidal ideation had also shown a large increase. The Samaritans have also reported an increase in calls to their helpline [26]. In April, the Government announced additional funding for online mental health services to support people, especially health services staff, during the pandemic. There has been a large fall in the proportion of adults reporting their satisfaction with life as 'high' with particularly large

Table 4
Summary of key economic activity and public finance variables.

	2019	2020	2021
Economic Activity (Per Cent Change)			
Real GDP	5.5	−10.5	6.0
Modified Domestic Demand	3.0	−15.1	8.2
Public Finances (Per Cent of GDP)			
General Government Balance	0.4	−7.4	−4.1
Debt Ratio	58.8	69.1	68.4

Source: Department of Finance [28].

falls among younger people [27]. Only 12% of adults reported a high level of overall life satisfaction compared to over 44% in 2018.

A survey of almost 200 psychiatrists published in the middle of June 2020 found that there had been a significant increase in the number of referrals and emergency presentations for psychiatric services in the third month of the pandemic. The main factors identified as influencing the increase in emergency referrals were increased social isolation and reduced access to community-based mental health services [28].

Economic and financial fluctuation

Economic impact

Ireland has experienced considerable economic disruption from the COVID-19 pandemic, with significant challenges for households, businesses, and policymakers. A report published on April 21st 2020 by the Department of Finance [29] set out a macroeconomic and fiscal scenario for the period 2020–2021, incorporating the potential impact of COVID-19. A significant contraction in modified domestic demand of 15.1% was projected for 2020 (see Table 4), resulting from domestic and international efforts to combat the virus. Notably, this 'baseline' projection assumed a transient shock to the Irish economy, whereby activity bottoms out in the second quarter of 2020 and is followed by recovery, both domestically and internationally, later in the year. Based on such a scenario, the Department forecasts economic growth of 6% in GDP in 2021 and a restoration of overall economic activity to pre-pandemic levels in 2022 [29]. However, it warns this is based on successful containment of the virus. In May, the Economic and Social Research Institute's forecast that real GDP would decline by over 12% in 2020 under a baseline scenario that reflects continued physical distancing and containment measures to the end of 2020 [30].

From a position of full-employment at the start of 2020, unemployment hit a record high of 28.2% in April and is set to average 17.4% for 2020, with young adults disproportionately affected [31]. At a sectoral level, non-food retail, entertainment and hospitality are among those sectors that have been hardest hit, both in terms of economic activity and employment.

Economic policy response

In terms of economic policy responses, there have been a number of measures introduced to reduce the impact on households, businesses, and the economy. Broadly speaking, the Government's response to the crisis at an economic level has involved attempting to reduce the impact of COVID-19-related restrictions on household incomes, and on helping businesses and firms survive until restrictions are relaxed [32]. This has included, for example, income supports in the form of a flat-rate *Pandemic Unemployment Payment* of €350 per week for individuals who lose their jobs due to the pandemic, as well as a *Temporary Wage Subsidy Scheme*, which enables employees, whose employers are affected by the pandemic, to receive significant supports directly from their employer through the payroll system. Other measures undertaken include payment breaks on mortgage, personal, and business loans, liquidity funding for businesses, guaranteed loan schemes and deferred tax payments, as well as moratoriums on evictions and rent increases.

Beirne et al. [33] found that the measures announced by the Government, and in particular the *Pandemic Unemployment Payment*, reduced the numbers exposed to extreme income losses by about a third. Nonetheless, more than 150,000 households lost between 20% and 40% of their incomes, with smaller numbers suffering even heavier losses. The Department of Finance [29] announced increased expenditure of €8 billion to account for measures taken in response to COVID-19, including income supports. It estimates that the general government deficit could increase to 7.4% of GDP this year (see Table 4), or possibly as much as 10% if the easing of restrictions is delayed and large parts of the economy remain closed. This large deficit is driven by both the expenditure measures implemented by the Government and decreases in taxation revenue arising from reduced economic activity, and will lead to an increase in the debt-to-GDP ratio to an estimated 69%.

Overall, the consensus amongst economic commentators, including the Irish Fiscal Advisory Council (IFAC) [34,35], appears to be that Ireland, given its recent strong economic performance and relatively healthy public finances, is reasonably well positioned to meet the economic challenges of COVID-19 and that it should be possible to avoid a return to severe fiscal adjustments. Nonetheless, this is predicated on the containment of the virus and a return to normal patterns of economic activity in the second half of 2020.

Conclusions and policy implications

Ireland has suffered substantial loss of life and health since the beginning of the COVID-19 pandemic. As of July 19th, 1753 people have died with either a confirmed or suspected infection of COVID-19 and 25,766 have tested positive with the virus. The effects on health and well-being from the effective lockdown of large parts of normal economic and social life are also very significant. Already, there is some evidence of an increase in mental health difficulties experienced by people during the crisis. There has been a large fall in the proportion of adults reporting their satisfaction with life as 'high' with particularly large falls among younger people. To date, there have not been any estimates of the total loss of a broad measure of health such as QALYs nor has anybody published a comparison of the loss of well-being due to the lockdown relative to a counterfactual where a different kind of a lockdown or no lockdown at all had been imposed.

In general, compliance with the various public health measures has been very high. At a policy level, there has been little disagreement about the various steps that have been implemented. Many of the limited disagreements have been more about the timing of particular measures than the merits of the measures themselves. There is a very high level of trust in NPHET and politicians from all parties were generally supportive of the caretaker Government's handling of the pandemic, with a strong sense of national solidarity during the crisis.

Ireland's response to the COVID-19 crisis has been comprehensive and timely in many respects. Transparency, a commitment to a relatively open data policy, the use of traditional and social media to inform the population, and the frequency of updates from the Department of Health and the HSE are all commendable. Other areas such as testing and contact tracing took some time to work effectively but have been operating efficiently in recent weeks.

A striking feature of how the health system has prepared for and responded to the COVID 19 situation is that essentially it has

been identical to what a tax-financed public health system would involve. People have not been charged for any aspect of care associated with the virus. The HSE took over the operation of private hospitals early in the crisis to increase capacity. While the universal, free-to-the-user nature of care for COVID-19 patients may bolster the case for a one-tier health system financed primarily by taxation, the difficulties of moving to such a system can be seen in the anomalous position that many patients in the private health system found themselves in.

Ireland's land border with Northern Ireland is another area which deserves close attention during this health emergency. Counties along the border with Northern Ireland are among those with the highest rate of cases and deaths per capita (see Figs. 1 and 6). Free movement across this border is an obvious cause for concern, particularly when two different public health and testing strategies are being pursued in the jurisdictions. Northern Ireland has thus far carried out less community testing. As of July 23rd, Northern Ireland had completed 170,000 tests (90 tests per 1000 inhabitants) [36] while the equivalent figure for the Republic was 580,000 tests (118 tests per 1000 inhabitants). There are also significant differences in death rates between Ireland and Northern Ireland and between Ireland and the UK mainland [37].

Much of the response by healthcare decision-makers in Ireland, particularly in the first month of the pandemic, focused on hospital-related issues. This was certainly understandable given the unfolding situation in some other countries. Nursing homes and other residential centres did not receive sufficient attention during that phase of the pandemic. The focus of attention on the hospital system can at times obscure the fact that the real battle needs to take place upstream in our communities, including long-term residencies. Further study of the individual components of public health advice that has clearly worked is required so we can be more focused in our response to further outbreaks of COVID-19. Improved information on symptoms reporting by the general public or likely diagnoses observed by GPs and other healthcare workers in our communities, along with better and more regular updates on testing and contact tracing will all contribute to better understanding of what is happening in our communities, the breeding ground for COVID-19. A further area of promise is the introduction of a contact tracing app which was downloaded by over a quarter of the population within a week of being launched. All of this additional data and research will be of utmost importance if we wish to be able to employ more focused yet effective measures rather than relying on a national lockdown.

To conclude, we offer some brief thoughts on what lessons we have learned that might help Ireland respond to a potential second or third wave of the pandemic. These observations, speculative as they might be, may also be useful to readers and policy makers in other countries.

1 The rapid fall in the number of new cases, hospitalisations and deaths per day, evident in Figs. 2–4, has been achieved in large part by the collective action of an overwhelming majority of people in Ireland. A powerful solidarity with family, neighbours and fellow citizens emerged quickly once the country's leaders and its public health officials explained clearly what the problem was and what was needed to mitigate the problem. We are hopeful that a similar sense of solidarity could be drawn on if a second or subsequent wave emerged.
2 Continuing to have regular clear updates on the public health situation is of vital importance in maintaining the high level of acceptance by the public of the various non-medical interventions that are required to keep the virus transmission at his currently low level. This will be particularly important as people get annoyed with the longevity of various restrictions and measures such as being required to wear masks. People will need to be reminded about why they are being asked to do what they are doing. Successes, such as instances where the COVID tracker App helps contact tracers, should be acknowledged and celebrated.
3 The hospital and long-term care system in Ireland has suffered from significant under-investment for many years. A second wave during the winter when the public hospital system has historically operated near or beyond capacity is likely to prove a much more serious challenge than that posed by the first wave. The pandemic may have strengthened the case for a universal health system but it has also underlined how difficult bringing that about will be given the current hybrid model of health care provision and financing. Short-term interventions, such as the raid development of Respiratory Hubs in the community, need to be prioritised and adequately resourced.
4 The public health system itself is another area that has suffered from many years of significant under-investment. One area of particular concern that the pandemic has highlighted is the lack of a comprehensive electronic health record system. The absence of such a system will make dealing with a second wave much more challenging.
5 As hope rise around the world that some vaccines may be available by early 2021 and as doctors learn more about possible treatments for people with the virus, we think that Ireland and other countries should remain on a very high state of alert and caution. It is not yet time to consider any kind of a return to normal business and social life. Money is cheap and states should continue to borrow large sums to protect individuals and businesses for what we tentatively hope may be a relatively short period.

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References

[1] Central Statistics Office Census 2016 Reports, Cork: Central Statistics Office; 2020 July 16. citedAvailable from: https://www.cso.ie/en/census/.
[2] Organization for Economic Cooperation and Development Health at a Glance: OECD Indicators, Paris: Organization for Economic Cooperation and Development; 2020 July 16. citedAvailable from http://www.oecd.org/health/health-systems/health-at-a-glance-19991312.htm.
[3] Connolly S., Wren M.-A. (2019) Universal Health Care in Ireland—What Are the Prospects for Reform? 2019 Health Systems & Reform 5 (2) 94–99.
[4] Cullinan J, Connolly S, Whyte R. The sustainability of the Irish health care system. *The sustainability of health care systems*. Contributions to economic analysis. Baltagi B, Moscone F, editors. London: Emerald Publishing; 2020.
[5] Burke S, Barry S, Siersback K, Johnston B, Ní Fhallúin M, Thomas S. Sláintecare – A ten year plan to achieve universal healthcare in Ireland. Health Policy 2018;122(12):1278–82.
[6] Department of Health, Ireland Health in Ireland: key trends 2019. Dublin: Department of Health; 2019.
[7] Pierce M., Keogh F., O'Shea E. The impact of COVID-19 on people who use and provide long-term care in Ireland and mitigating measures. 2020. [cited 2020 June 22] Available from: https://ltccovid.org/2020/04/29/update-on-the-covid-19-long-term-care-situation-in-ireland/.
[8] Health Protection Surveillance Centre (HPSC), Ireland. Epidemiology of COVID-19 in Ireland - daily reports. 2020 April [cited 2020 June 22]. Available from https://www.hpsc.ie/az/respiratory/coronavirus/novelcoronavirus/casesinireland/epidemiologyofcovid-19inireland/.

[9] Central Statistics Office COVID-19 deaths and cases series 2, Cork: Central Statistics Office; 2020 June 22. citedAvailable from https://www.cso.ie/en/releasesandpublications/ep/p-covid19/covid-19informationhub/health/covid-19deathsandcasesstatistics/.
[10] Health Service Executive. Performance management and improvement unit-daily operations update- COVID-19. 2020. [cited 2020 June 22]. Available from https://www.hse.ie/eng/services/news/newsfeatures/covid19-updates/.
[11] Department of Health, Ireland COVID-19 Coronavirus: stay safe guidelines, Dublin: Department of Health; 2020 July 18. citedAvailable from https://www.gov.ie/en/collection/428743-covid-19-coronavirus-physical-distancing-graphics/.
[12] Moy N, Antonini M, Kyhlstedt M, Paolucci F. Working paper; June 2020.
[13] Department of the Taoiseach [Prime Minister], Ireland. Government agrees next phase of Ireland's COVID-19 response. [cited 2020 July 17] Available from https://www.gov.ie/en/news/72ecf5-government-agrees-next-phase-of-irelands-covid-19-response/.
[14] Staines M. No arrests for COVID-19 breaches in last week of June. Newstalk; 2020 July 1. [Internet][cited 2020 July 17]. Available from https://www.newstalk.com/news/arrests-covid-19-breaches-1039254.
[15] Department of the Taoiseach [Prime Minister], Ireland. Roadmap for reopening society and business. [cited 2020 July 17]. Available from https://www.gov.ie/en/news/58bc8b-taoiseach-announces-roadmap-for-reopening-society-and-business-and-u/.
[16] National Health Library and Knowledge Service. COVID-19 Summaries of evidence. [cited 2020 July 20]. Available from https://www.lenus.ie/handle/10147/627286.
[17] Health Information and Quality Authority. COVID-19 [cited 2020 July 20]. Available from https://www.hiqa.ie/reports-and-publications/health-technology-assessments?tid_1=All&field_hta_topics_target_id=112.
[18] iHealthFacts. Health Claims – Tact Checked. [cited 2020 July 17]. Available from https://ihealthfacts.ie/.
[19] Cochrane Ireland. Living mapping and living systematic review of COVID-19 studies. [cited 2020 July 20]. Available from https://covid-nma.com/.
[20] Carroll R. Cheap, popular and it works: Ireland's contact-tracing app success. The Guardian; 2020 July 20. [Internet][cited 2020 July 2020]. Available from http s://www.theguardian.com/world/2020/jul/20/cheap-popular-and-it-works-irelands-contact-tracing-app-success.
[21] Health Research Board. Coronavirus. [cited 2020 July 20]. Available from https://www.hrb.ie/news/covid-19-coronavirus/.
[22] Health Services Executive. Be on call for Ireland. [cited 2020 July 20]. Available from https://www.hse.ie/eng/services/news/newsfeatures/covid19-updates/oncall/.
[23] Wall M. Private hospitals takeover agreed without 'luxury' of due diligence. The Irish Times; 2020 Jun 22. [Internet][cited 2020 July 20]. Available from https://www.irishtimes.com/news/ireland/irish-news/coronavirus-private-hospitals-takeover-agreed-without-luxury-of-due-diligence-1.4284944.
[24] Fletcher L. Survey suggests one third postponed medical treatment during pandemic. RTE; 2020 April 27. [The Internet][cited 2020 June 20]. Available from https://www.rte.ie/news/coronavirus/2020/0426/1134944-survey-coronavirus-ireland/.
[25] Wall M. Some 450 cancers missed due to pause in screenings, COVID-19 committee told. The Irish Times; 2020 July 17. [Internet][cited 2020 July 20]. Available from https://www.irishtimes.com/news/health/some-450-cancers-missed-due-to-pause-in-screenings-covid-19-committee-told-1.4306989.
[26] Boland R. Helplines during COVID-19: 'There is an awful lot more drinking going on at home'. The Irish Times; 2020 April 26. [Internet][cited 2020 July 20]. Available from https://www.irishtimes.com/life-and-style/people/helplines-during-covid-19-there-is-an-awful-lot-more-drinking-going-on-at-home-1.4235181.
[27] Central Statistics Office Social impact of COVID-19 survey, Cork: Central Statistics Office; 2020 July 16. citedAvailable from https://www.cso.ie/en/releasesandpublications/ep/p-covid19/covid-19informationhub/socialandwellbeing/socialimpactofcovid-19survey/.
[28] Gallagher C. Ireland facing a 'tsunami' of mental health problems. The Irish Times; 2020 June 11. [Internet][cited 2020 July 20]. Available from https://www.irishtimes.com/news/health/ireland-facing-a-tsunami-of-mental-health-problems-1.4273850.
[29] Department of Finance, Ireland Draft stability programme update. Dublin: Economics Division, Department of Finance; 2020.
[30] McQuinn K, O'Toole C, Allen-Coughlan M, Coffey C. Quarterly economic commentary. Dublin: Economic and Social Research Institute; 2020.
[31] Central Statistics Office CSO statistical release. Monthly Unemployment; June 22nd 2020. cited Available from https://www.cso.ie/en/releasesandpublications/er/mue/monthlyunemploymentapril2020/.
[32] Roantree B. Fiscal policy through the crisis: support for individuals. Ireland's COVID-19 crisis response: perspectives from social science. Geary Institute Conference; 2020. 24 April 2020.
[33] Beirne K, Doorley K, Regan M, Roantree B, Tuda D. The potential costs and distributional effect of COVID-19 related unemployment. Dublin: Economic and Social Research Institute; 2020.
[34] Barnes S. Fiscal advisory council: return to austerity can be avoided. The Irish Times; 2020 April 27. [Internet][cited 2020 Jun 20]. Available from: https://www.irishtimes.com/opinion/fiscal-advisory-council-return-to-austerity-can-be-avoided-1.4238372.
[35] IFAC Fiscal assessment report, May 2020. Dublin: Irish Fiscal Advisory Council; 2020.
[36] Northern Ireland Statistics and Research Agency. Coronavirus (Covid-19) statistics. 2020 June [cited 2020 June 22] Available from https://www.nisra.gov.uk/statistics/ni-summary-statistics/coronavirus-covid-19-statistics#toc-0.
[37] Office for National Statistics UK, Coronavirus (Covid-19) Statistics. 2020 June [cited 2020 June 16] Available from https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases.