



COVID-19: Resource

Ireland, like other countries, is going through a huge challenge in combatting the coronavirus. AIGNA, as the voice of gerontological nurses in Ireland, will provide information to enhance safe practice in caring for older people in any setting.

General Information

What is COVID-19?

The Coronavirus-19 (COVID-19) is an infection from the new corona virus Severe Acute Respiratory Syndrome CoVid-2 (SARS CoV-2). COVID-19 is from a family of viruses that cause diseases in animals. To date, we know of at least seven that have transferred to human beings. Most of these infections have caused mild symptoms. However, two, the MERS (Middle Eastern Respiratory Syndrome) and SARS (Severe Acute Respiratory Syndrome), have been more serious and caused deaths.

COVID-19 is a threat to all age groups, but as age rises and particularly for people who have existing health challenges (including younger adults), risk increases, with 80 percent of current COVID-19 related deaths (so far) in the United States being in the over 65 years age group. However, a report from the US Centre of Disease Control (US CDC 2020) also shows millennials are vulnerable with those aged 20-44 years representing one fifth of the United States hospital admissions and 2-4 percent of ICU admissions.

Why is this different?

Studies from China suggests that one individual can infect about 2-2.5 people. This is higher than the flu (which infects about 1.2 other people on average). Data from the United States indicates about 5-20 percent of people are infected with influenza each year and the US Centre for Disease Control (2020) advises that, for influenza, the potential to infect people starts much later than COVID-19, approximately only one day before symptoms manifest.

The potential for rapid transmission of COVID-19 is high, leading to the World Health Organisation calling this a pandemic. A pandemic is a disease epidemic that has spread across multiple continents and affects an exceptional amount of people

Why don't we have a vaccine?

Vaccines contain weakened or attenuated micro-organisms/toxins/anti-bodies or lymphocytes. A vaccine mimics the specific virus so that individuals develop an

active (where anti-body produce cells called B-lymphocytes) or passive immunity (antibodies given already produced by animals or other humans), that allows them to subsequently ward off the specific virus if exposed. There are currently over 25 vaccines for diseases such as: measles, polio, tetanus, diphtheria, meningitis, influenza, tetanus, typhoid and cervical cancer. Because vaccines are virus specific, there is a huge amount of testing before they can be used publicly. For COVID-19, the World Health Organisation is working on over 20 different vaccine projects globally, and some clinical trials have commenced, but a safe vaccine may be up to 18 months away.

What are the signs and symptoms of COVID 19?

The coronavirus can be asymptomatic for up to 14 days, however symptoms could appear after 3 days, with an average incubation of 5 days (Moriarty et al. 2020).

Signs and symptoms are available on the HSE webpage:

<https://www2.hse.ie/conditions/coronavirus/symptoms-causes-treatment.html>

The signs and symptoms are similar to colds and flu. The European Centre for Disease Control prepared the graph below, which also provides fundamental information.

<https://www.ecdc.europa.eu/sites/default/files/documents/COVID-19-infographic.pdf.pdf>

COVID-19
Disease caused by the SARS-CoV-2 virus

Novel coronavirus
Coronaviruses are viruses that circulate among animals but some of them are also known to affect humans.
The 2019 novel coronavirus was identified in China at the end of 2019 and is a new strain that has not previously been seen in humans.

Symptoms

- FEVER
- COUGH
- DIFFICULTY BREATHING
- MUSCLE PAIN
- TIREDFNESS

Prevention

When visiting affected areas:

- Avoid contact with sick people
- Wash your hands with soap and water
- If you develop cough, use a medical face mask

Wherever you travel apply general hygiene rules

Transmission
VIA RESPIRATORY DROPLETS
2-14 days
estimated incubation period

ecdc.europa.eu/en/novel-coronavirus-china

More serious cases develop severe pneumonia, acute respiratory distress syndrome, sepsis and septic shock that can lead to death.

Mode of transmission

The principal mode of transmission appears to be through respiratory droplets when people, exhale, sneeze or cough. For cross infection, the virus must travel from the infected person's nose or mouth to another person's eyes, nose or mouth. However, in a recent study published in the *New England Journal of Medicine*, (van Doremalen et al., 2020), the COVID-19 was detected in aerosols for up to three hours, up to four hours on copper, up to 24 hours on cardboard and 2-3 days on hard plastic or stainless steel, albeit under laboratory conditions.

Risk of infection and risk groups

Approximately 80 percent of people who contract COVID-19 will generally have symptoms such as a fever, cough, tiredness and low grade pneumonia ranging from mild to moderate. A further twenty percent may need hospitalisation, with intensive care support for about five percent of people. Rates of population based infection differ in recent studies. Researchers from the University of Hong Kong and Harvard University (2020) suggest that one quarter to one half of a population will be infected, although on March 16th, Imperial College (see: <https://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/news--wuhan-coronavirus/>) in London estimated worst case scenario potential of an 81 percent infection rate in the United States.

The risk of death with the pandemic COVID-19 (commonly estimated at 3% to 4%) is less than it was for SARS (approximately 11%) and MERS (about 35%), but may be higher than the risk from seasonal flu (which averages about 0.1%). The risk of death very much depends on your age and your overall health. Children appear to be at very low risk of severe disease and death. Harvard Health (2020) identify that several underlying medical conditions may increase the risk of serious COVID-19 for individuals of any age. These include:

- blood disorders, such as sickle cell disease, or taking blood thinners
- chronic kidney disease
- chronic liver disease, including cirrhosis and chronic hepatitis
- any condition or treatment that weakens the immune response (cancer, cancer treatment, organ or bone marrow transplant, immunosuppressant medications, HIV or AIDS)
- current or recent pregnancy in the last two weeks
- diabetes
- inherited metabolic disorders and mitochondrial disorders
- heart disease, including coronary artery disease, congenital heart disease, and heart failure
- lung disease, including asthma, COPD (chronic bronchitis or emphysema)
- neurological and neurologic and neurodevelopment conditions such as cerebral palsy, epilepsy (seizure disorders), stroke, intellectual disability, moderate to severe developmental delay, muscular dystrophy, or spinal cord injury.

<https://www.health.harvard.edu/diseases-and-conditions/coronavirus-resource-center#general>).

Older people with underlying health conditions (Hypertension, cardiovascular disease, hypertension, chronic respiratory disease, diabetes) are more at risk of developing more severe symptoms.

For older people living in the community, the US Centre for Disease Control has provided some advice (adapt for Ireland):

<https://www.cdc.gov/coronavirus/2019-ncov/community/retirement/checklist.html>

For older people living in residential care, preliminary guidance is given by the Health Service Executive (HSE) and the Health Protection Surveillance Centre (HPSC) in:

<https://www.hpsc.ie/a-z/respiratory/influenza/seasonalinfluenza/guidance/residentialcarefacilitiesguidance/Management%20ILI%20and%20influenza%20in%20residential%20care%20facilities.pdf>

Also, guidance is available via the US Centre for Disease Control (adapt for Ireland):

<https://www.cdc.gov/coronavirus/2019-ncov/healthcare-facilities/prevent-spread-in-long-term-care-facilities.html>

The HPSC has published guidance for practitioners in the community setting:

The HPSC:

<https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/guidance/primarycareguidance/>

Another good source of information is the British Gerontological Society who have developed a number of COVID-19 related reference documents

<https://www.bgs.org.uk/resources/coronavirus-current-information-and-advice>

These include:

- General information
- Infection control
- Hospital, residential care and community care
- Coronavirus and older people
- BGS statement on COVID-19
- COVID-19 and medicines advice for older people
- Managing delirium in older people with confirmed or suspected cases
- Blog on Facing a new reality-challenges for acute care of older people

***Please pay particular attention to any small changes in health and cognitive status. Older people do not always 'fit' into typical presentations. Also, important to keep a good diet, hydration and mobility. A lack of mobility leads to many negative effects in older people, such as accelerating sarcopenia, increase falls risks, health decline, increased healthcare utilisation and increased adverse events (See Musich et al, 2018)**

Flattening the curve

As the COVID-19 is transmitted relatively easily, it is important to flatten the curve of infection rates. This involves an aggressive collective action, public health measure to limit the acceleration of cases, try to reduce the number of overall cases of the disease and to reduce demand on the healthcare system.

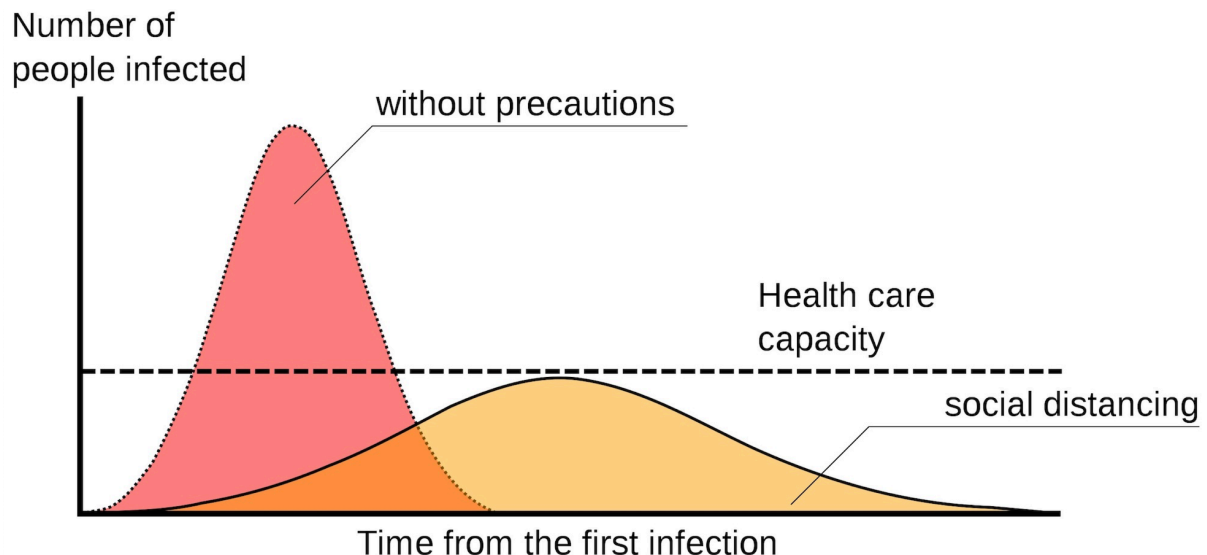


Figure 1: Flattening the curve-No precautions vs spacial distancing (Johannes Kalliauer/ CC BY-SA 4.0)

The 'flattening the curve graph' is a representation of what could happen if precautionary measures are taken and are not taken. In figure 1, the first 'curve' demonstrates a steeper increase in infections as the cases rise exponentially and a steep drop as the population recovers over a period of a few weeks. This places an exceptional burden on the healthcare system which is unable to cope with the demand. One response to flatten the curve is the use of physical distancing (formally termed social distancing) to reduce the infection rate. To use a simple metaphor, when tickets are released for a popular music groups, the concurrent on line demand can mean long waits or the website can very occasionally crash because the demand at a single point of time is overwhelming. The long waits represent people needing hospital care and intensive care, while the crash is the system crisis, where medical professionals can be forced to choose who to ventilate. While, flattening the curve has worked in other countries, we can also see its impact in 1918, in the Spanish flu. In Philadelphia, city officials ignored public health advice and progressed with a major public parade-within six months there were 16,000 deaths. In contrast, in St Louis, physical distancing and other public health strategies were used, resulting in one eighth of the deaths, stemming the catastrophic outcome of the Spanish flu.

Physical distancing, means we lessen the chance of passing the virus to one another.

Keeping in mind the mode of transmission, the HSE recommends:

- keep a space of 2 metres (6.5 feet) between you and other people

- reduce physical interactions with people
- reduce the number of people you meet every day
- avoid communal sleeping areas
- avoid crowded places
- work from home unless it is essential that you go to your workplace
- do not shake hands
- Avoid touching face (eyes, nose, mouth) if hands are not clean
- Do not share objects that touch your mouth like bottles, cups (unless thoroughly cleaned)

Handwashing

Frequent hand-washing is important. This needs to be vigorous for a minimum of 20 seconds. Ordinary soap is fine, as viruses are comprised of a coating of fat. The soap removes the fat, thus degrading the virus. Hand sanitizers also work but need to be 60-80 percent alcohol. Guidance is given in the HSE webpage:

<https://www2.hse.ie/wellbeing/how-to-wash-your-hands.html>

OR <http://www.stjames.ie/images/Coronavirus-Hygiene-v4.mp4>

Another *You tube* link is useful to demonstrate common areas which can be neglected in handwashing: <https://www.youtube.com/watch?v=TLMGoGlaSJM>

Other guidance from the HSE includes:

- Cover your mouth and nose with a tissue or your sleeve when you cough and sneeze.
- Put used tissues into a bin and wash your hands.
- Clean and disinfect frequently touched objects and surfaces.
- Avoid close contact with people - keep a distance of 2 metres (6.5 feet) between you and others.
- Avoid crowded places, especially indoors.
- Avoid non-essential travel overseas and follow the DFA's travel advice.
- Stay at home if you are sick to stop the spread of whatever infection you may have
- Although, not thought to be a major mode of transmission, keeping objects clean is also very important (see above-modes of transmission).

Wash hands:

- after coughing or sneezing
- before and after eating
- before and after preparing food
- if you were in contact with someone who has a fever or respiratory symptoms (cough, shortness of breath, difficulty breathing)
- before and after being on public transport if you must use it
- before and after being in a crowd (especially an indoor crowd)
- when you arrive and leave buildings including your home or anyone else's home

- if you have handled animals or animal waste
- before having a cigarette or vaping
- if your hands are dirty
- after toilet use

To avoid skin problems, the British Association of Dermatologists provide some advice (<https://www.skinhealthinfo.org.uk/statement-on-coronavirus-and-skin-disease-affecting-the-hands/>)

- Moisturizers, or emollients, are vital for treating hand dermatitis. They help repair damaged outer skin and lock moisture inside. People should apply them repeatedly throughout the day, and whenever the skin feels dry.
- Applying an emollient after washing the hands can help. They advise that some individuals might benefit from applying emollient to their hands overnight while wearing cotton gloves.
- When washing the dishes, using cleaning products, or shampooing a child's hair, a person can protect their hands by wearing latex or rubber gloves.

Wearing a face mask

In terms of the public, the HSE indicates that wearing a face mask is unlikely to be of benefit if you are not sick. The WHO provides the following advice which includes guidance on use and disposal:

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/when-and-how-to-use-masks>

Disposable gloves

Not generally advised for public use as may give false sense of security and:

- sneeze or cough into the gloves - this creates a new surface for the virus to live on
- contaminate yourself when taking off the gloves or touching surfaces
- not wash your hands as often as you need to and touch your face with contaminated gloves.

<https://www2.hse.ie/conditions/coronavirus/protect-yourself.html>

Infection Control

The HPSC have developed specific guidelines on infection prevention and infection control and the use of personal and protective equipment. Please see:

<https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/guidance/infectionpreventionandcontrolguidance/>

Testing

HSE guidelines were updated on 25th March 2020

People are to contact GP:

if they have a fever (38 degrees Celsius or above) or chills and one of the following symptoms:

- A cough- this can be any kind of cough, not just dry
- shortness of breath
- breathing difficulties

If demonstrating symptoms, self-isolate for 14 days (unless test is negative) and people in the house (ie relatives/housemates) should restrict their movement. For further guidance, see: <https://www2.hse.ie/conditions/coronavirus/self-isolation-and-limited-social-interaction.html#self-quarantine>

Assessment will be over the phone and a test will be arranged by the GP if he/she is concerned. Prioritisation is given to close contacts of a confirmed case, healthcare professionals and risk groups (see <https://www2.hse.ie/conditions/coronavirus/at-risk-groups.html>). Appointments will be confirmed by texts.

Within 5 days, community based people will receive a text if the test is negative and a phone call if positive (Hospital based-12-14 hours). If positive, the person needs to self-isolate for 14 days. See Health Protection Surveillance Centre:

<https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/guidance/primarycareguidance/adviceriskassessmentandmanagementofpatients/>

Contact tracing

Contact tracing is a common public health activity for diseases that can cause epidemics. Examples include TB and meningitis. The idea is that people who have been in close contact with a person who has COVID-19 would be contacted because of their heightened risk of infection due to exposure to the virus. This is a major secondary prevention and early intervention strategy to limit further spread of the disease. Current guidelines can be found on the Health Surveillance and

<https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/guidance/contacttracingguidance/>

The HPSC also has a National Result Notification and Contact Management Programme (CMP)

https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/guidance/primarycareguidance/nationalresultnotificationandcontactmanagementprogramme/CMP%20Overview_Model%20V4.pdf

Mental Health

All people who engage in physical distancing may experience consequences with regard to their mental health. There can be increased anxiety due to fear of catching COVID-19, physical isolation, depression, a worsening of pre-existing mental health issues and an exacerbation of substance abuse. In addition, when a person is infected, they may feel guilty on potentially infecting others, and there may be a stigma associated with being infected.

The HSE has provided the following guidance to assist people. Keeping routines and keeping connected are key activities.

<https://www2.hse.ie/wellbeing/mental-health/minding-your-mental-health-during-the-coronavirus-outbreak.html>

Self-isolation can disproportionately impact on older people. Also, please see the following commentary from the Lancet related to older people and social connection: <https://www.thelancet.com/action/showPdf?pii=S2468-2667%2820%2930061-X>

Helping Agencies

There are national and local organisations that are providing assistance.

An Post: Post will be collected free from older people and newspapers are planned to be delivered from the end of this week.

An Garda Siochana: Are providing assistance to vulnerable adults. See: <https://www.garda.ie/en/about-us/our-departments/office-of-corporate-communications/news-media/coronavirus-covid-19-an-garda-siochana-announces-measures-in-relation-to-delay-phase-of-covid-19-13-3-20.html>

ALONE: Call 0818 222 024. Support helpline (also arrange groceries, prescription collection, fuel and general helpline): <https://alone.ie/alone-launch-a-covid-19-support-line-for-older-people-working-in-collaboration-with-the-department-of-health-and-the-hse/>

Third Age Senior Helpline: Call 1800 804591 <http://www.thirdageireland.ie/seniorline>

National Support Helpline: Call 086 1800256/021 2377809

Age Action information Service: 01 4756989

Alzheimer's Society of Ireland: <https://alzheimer.ie>. Helpline: 1850 341341

Department of Social Protection: See <https://www.anpost.com/Media-Centre/News/Special-arrangements-in-place-for-DEASP-customers>

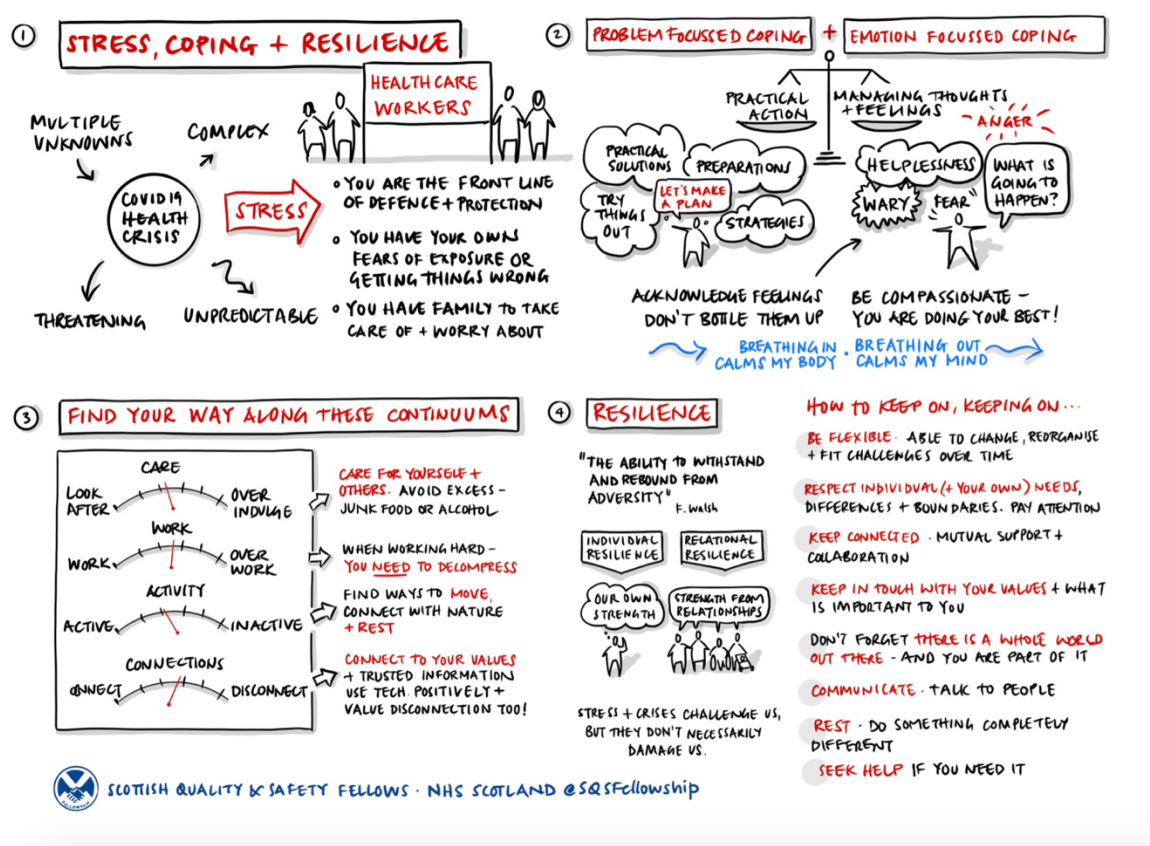
Lots of local support groups have been mobilised in communities-ask locally or see <https://www.volunteer.ie/about-us/covid-19/>

Older people can nominate a temporary agent to collect payments- that person must have a Public Services Card. See:
<https://www.anpost.com/AnPost/media/PDFs/Appointment-of-Temporary-Agent.pdf>

Citizens' Information for older people:
https://www.citizensinformation.ie/en/health/covid19/covid19_and_older_people.html
 Citizens' information phone line: 0761 07 4000.

Staff Mental Health

The Scottish Quality and Safety Fellowship, NHS Scotland (2020) recognises the stressful situation for healthcare professionals who are delivering care during COVID-19. The infographic below gives some guidance on coping and resilience.



Safeguarding

We know from research on natural and man-made disasters and on statistics around time where family direct contact increases, that the safeguarding risk increases. For example, domestic violence calls increase during Christmas as the pressure of 'cabin fever' and 'family time' can cause interpersonal conflict and create the potential for first time abuse or exacerbation of abuse.

It is important to support caregivers who may not be able to avail of usual supports (ie day care). Any concerns regarding safeguarding should initiate an early response with HSE Safeguarding Services and follow local protocols.

For older people in the community, it is important to keep connected to stay safe, so ensuring they have contacts and sources of support during physical distancing are important.

For intimate partner violence, a good source of support and advice is *Women's Aid*: 1800341900

There is also a scam risk. Specific scams have also been noted by the British Trading Standards related to the provision of COVID-19 tests and the offer to do grocery shopping, but the scammer goes off with the money.

The Gardai Siochana have a scam alert related to COVID-19:

<https://www.garda.ie/en/about-us/our-departments/office-of-corporate-communications/press-releases/2020/march/coronavirus-scam-warning.html>

Pastoral Care/ Spiritual Care

The European Association for Palliative Care have provided resources on palliative care (See: <https://www.eapcnet.eu/publications/coronavirus-and-the-palliative-care-response>)

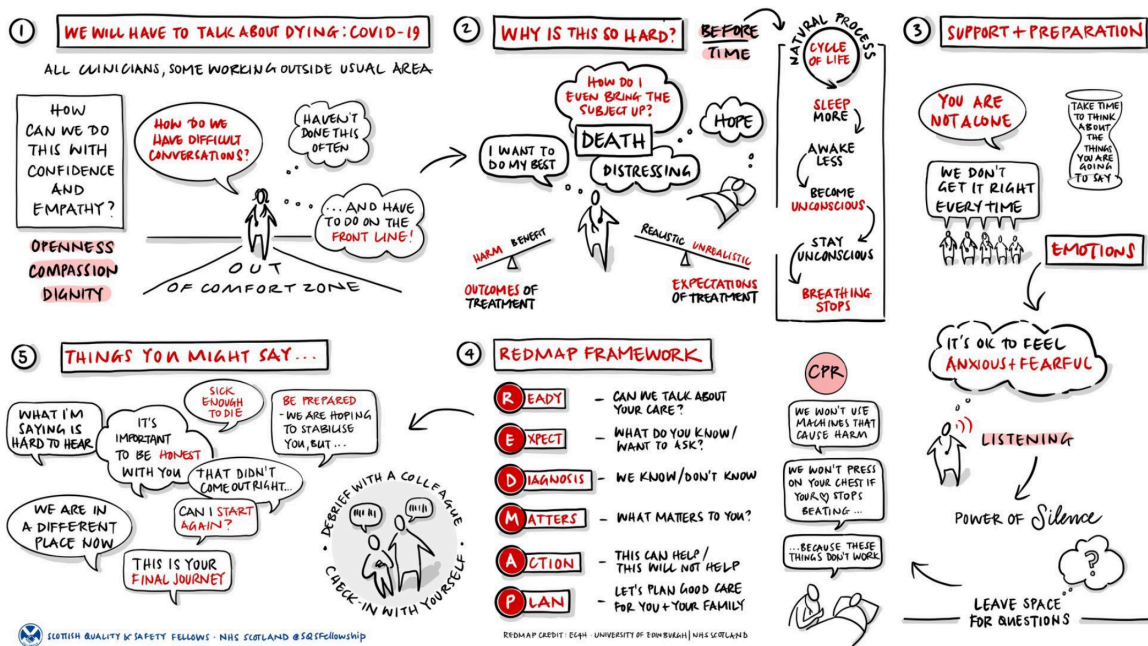
These resources have been kindly shared on the EAPC webpage by Italian colleagues- Società Italiana di Cure Palliative, Dott.ssa Danila Valenti, and Dott. Simone Veronese and focus on COVID-19 areas of communication, clinical and care pathways, referral forms and operational guidelines resources.

(<https://www.eapcnet.eu/publications/coronavirus-and-the-palliative-care-response/key-documents-for-italy>)

Conversations are important in relation to advanced care planning. See:

<https://hospicefoundation.ie/programmes/advance-care/>

The Scottish Quality and Safety Fellowship, NHS Scotland (2020) has prepared this infographic to help staff engage in difficult conversations around end of life during the COVID-19 pandemic.



If a person dies with a confirmed corona-virus diagnosis

The Health Protection and Surveillance Centre updated their guidance to funeral directors' management of infection risk in COVID 19 cases:

Please see: <https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/guidance/funeraldirectorguidance/Guidance%20Funeral%20Directors%20v1.3.pdf>

Bereavement due to Coronavirus

There are several webpages which can assist both staff and families during the time of bereavement. Please see:

<https://www.cruse.org.uk/get-help/coronavirus-dealing-bereavement-and-grief>

Coroner's Service Guidance:

<http://www.coroners.ie/en/COR/Coroners%20Service%20COVID-19%20110320.pdf/Files/Coroners%20Service%20COVID-19%20110320.pdf>

Scope of practice for nurses and midwives

Recognising the unprecedented times and the concern of nurses and midwives related to scope of practice, the Nursing and Midwifery Board of Ireland have issued the following guidance (<https://www.nmbi.ie/News/News/Information-for-nurses-and-midwives-on-scope-of-pr>)

March 20, 2020
Statement

'In response to concerns that nurses and midwives may have about extending their scope of practice during the current COVID-19 emergency situation, the Scope of Nursing and Midwifery Practice Framework (NMBI, 31 October 2015) has a specific section dealing with emergency situations.

Section 4.9 states that "The guidance presented in this document supports a nurse or midwife taking appropriate action in emergency and/or life threatening situations. At all times, the overall benefit to the patient must be served in these situations."

At any time when concerns are raised about the practice of a nurse or midwife, the context and circumstances that prevailed at the time will always be taken into consideration. This would be particularly so in the context of the current public health emergency.'

See NMBI statement to Nurses and Midwives on COVID 19:

<https://www.nmbi.ie/News/News/NMBI-Statement-to-registered-nurses-and-midwives-o>

Use of Ibuprofen

The French Minister for Health had expressed concerns on the use of ibuprofen. There is currently no scientific link between ibuprofen and COVID 19 worsening symptoms. The WHO has indicated it is: "aware of concerns on the use of non-steroidal anti-inflammatory drugs (i.e., ibuprofen) for the treatment of fever for people with COVID-19." "not aware of published clinical or population-based data" on the use of ibuprofen in coronavirus patients. "Based on currently available information, WHO does not recommend against the use of ibuprofen." However, paracetamol is generally advocated as the first line of treatment. The HSE state:

Ibuprofen and other anti-inflammatory medication

It is okay to take anti-inflammatories (NSAID) if you have coronavirus. There is no evidence that they are unsafe.

Only take one anti-inflammatory medication at a time. It is okay to take paracetamol and an anti-inflammatory like ibuprofen at the same time.

Anti-inflammatory medicines include:

- ibuprofen - brand names: Nurofen, Actiprofen, Advil, Brufen, Brupro, Buplex, Easofen, and Fenopine. Ibuprofen gel can be called Nurofen, Melfen, Phorpain, Ibugel and Ibuleve
- naproxen – brand name: Naprosyn
- diclofenac – brand names: Voltarol, Diclo, Diclac, Cataflam, Difene and Flector

<https://www2.hse.ie/conditions/coronavirus/coronavirus-treatment.html>)

There is also information on blood pressure medications, immunosuppressive medicines and treatments and steroids. The most recent commentaries (25 Mch) from other reputable organisations are listed below.

<https://www.gov.uk/government/news/ibuprofen-use-and-covid19coronavirus>
https://www.fda.gov/drugs/drug-safety-and-availability/fda-advises-patients-use-non-steroidal-anti-inflammatory-drugs-nsaids-covid-19?utm_campaign=FDA%20advises%20patients%20on%20use%20of%20NSAIDs%20for%20COVID-19&utm_medium=email&utm_source=Eloqua
<https://www.ema.europa.eu/en/news/ema-gives-advice-use-non-steroidal-anti-inflammatories-covid-19>

Resources

European Nurses Association: <https://www.ena.org/practice-resources/covid-19>

Department of Health Analysis: <https://www.gov.ie/en/publication/8eadd0-an-analysis-of-the-438-cases-of-covid-19-in-ireland-as-of-wednesday-18-m/>

Department of Health: General Guidance: <https://www.gov.ie/en/publication/472f64-covid-19-coronavirus-guidance-and-advice/>

For further breakdown of symptoms in 99 cases in China, see Chen et al. (2020): [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)30211-7/fulltext?from=Qikan Academic Index](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30211-7/fulltext?from=Qikan Academic Index)

For an analysis of cases related to older people as compared to middle aged and young patients, see Liu et al. (2020), see: [https://www.journalofinfection.com/article/S0163-4453\(20\)30116-X/abstract](https://www.journalofinfection.com/article/S0163-4453(20)30116-X/abstract)

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Musich S., Wang S.S., Ruiz J., Hawkins K. & Wicker E. (2018) The impact of mobility limitations on health outcomes among older adults, *Geriatric Nursing*, 39(2), 162-169.

University of Harvard and University of Hong Kong (2020) *Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19)*. Access: <https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf>

US CDC (2020) *Severe outcomes among patients with coronavirus 2019 (COVID-19)*. Access: [http://dx.doi.org/10.15585/mmwr.mm6912e2external icon](http://dx.doi.org/10.15585/mmwr.mm6912e2external%20icon).

van Doremalen, N., Bushmaker, T., Morris, D.H., Holbrook, M.G., Gamble, A., Williamson, B.N., Tamin, A., Harcourt, J.L., Thornburg, N.J., Gerber, S.I., Lloyd-Smith, J.O., de Wit, E., Munster, V.J. (2020) Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-New *England Journal of Medicine*, DOI: [10.1056/NEJMc2004973](https://doi.org/10.1056/NEJMc2004973)

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