

# Impact of COVID 19 on the older persons in NI

## **Demographics of the Northern Ireland population**

Northern Ireland has an estimated population of 1,901,900, 98% of which are Caucasian and 15% currently aged 65 and over ((NISRA), 2020a). In line with global ageing population projections, in just 8 years' time we estimate there to be more people aged over 65 living in Northern Ireland than children. Around 80,000 older people aged 65 and over currently live on their own and for the period December 2019 – February 2020 10% of the population currently in employment were 65 and over ((NISRA), 2020b). Over a quarter of a million hours of domiciliary care is provided each year, 68% of which is provided by the independent and voluntary sector and over 80% of care packages in residential or nursing homes are provided to people aged 65 and over ((COPNI), 2015, DOH, 2019).

The health and wellbeing of older persons in Northern Ireland must remain a priority for commissioners and even prior to the Coronavirus pandemic and future economic uncertainty planning for healthcare provisions and promoting healthy ageing presented a significant global challenge.

## DIRECT CONSEQUENCES OF CORONAVIRUS INFECTION IN OLDER PERSONS

### **Disease Epidemiology**

Age has been clearly identified as a risk factor for severe disease COVID19 infection and death. Guan et al's report from the initial outbreak in Wuhan (Guan et al., 2020) indicated that patients over the age of 65 represented 15% of those admitted to hospital with COVID19, but comprised 49% of those who died, or required intensive care admission or mechanical ventilation. As well as demonstrating the vulnerability of an older population, in underrepresenting over 65s, who in Ireland comprise 53% of all COVID19 hospital admissions (HPSC, 2020), this also highlights the limited generalisability of the clinical information provided by the first tranche of (mostly Chinese) studies to our older population.

This limited generalisability may be further demonstrated by the emergence of case reports (Tay and Harwood, 2020), and clinical guidelines released by the British Geriatric Society (BGS, 2020a) encouraging vigilance in older patients presenting with non-specific features. A recent cross-sectional survey reported that 8% of COVID19 positive patients in a nursing home demonstrated atypical symptoms alone (Kimball, 2020). The disease may therefore have a different symptom profile in older adults, and the prevalence of the disease in such populations may be grossly underestimated.

### **Neurological symptoms & delirium**

Although fever and respiratory symptoms appear to be most prevalent manifestations (Guan et al., 2020), neurological symptoms and illnesses have been reported in 36% of patients hospitalised with COVID19 (Mao et al., 2020). These include dizziness, stroke and delirium (an acute confusional state). Figures from a French cohort report indicate that agitation (69%) and cognitive symptoms (36%) are observed in individuals with COVID19 (Helms et al., 2020). These figures are again likely to be an underestimate of the real prevalence given both the low average age of the study cohorts, and the recognition that presentations such as delirium go undetected in around two thirds of cases (Collins et al., 2010).

Delirium in particular is important because it is strongly associated with falls, depression (O'Sullivan et al., 2014), medical complications, institutionalisation (Witlox et al., 2010) and mortality (Kiely et al., 2009), as well as significant patient and carer distress. Delirium is also a strong risk factor for the development of dementia (Davis et al., 2012). However, it is reversible once detected and delirium often resolves following treatment of the underlying medical disorder with use of conservative, non-pharmacological, management strategies. It is also preventable, as demonstrated through exposure to a 33% reduction in incident delirium compared to usual care with use of a multimodal intervention tool (Inouye et al., 1999).

### **Dementia and neurodegenerative disease**

Evidence on the direct effects of COVID19 on brain structure and function is extremely limited. Neuropathological research may shed more light on this, but typically such studies involve smaller sample sizes, require specialised expertise and longer follow up periods than most clinical studies. This may be further inhibited by concerns that the use of oscillating saws, a tool commonly used during brain procurement, have been suspected to promote aerosolization (Cevik et al., 2020).

However, there is pathological evidence of the presence other coronaviruses in brain tissue. SARS-CoV, the pathogen responsible for the 2002-3 SARS outbreak, demonstrates a similar biochemical and genomic footprint to that of the SARS-CoV-2 pathogen (Andersen et al., 2020), and has been identified in the cerebrum of affected patients (Ding et al., 2004). Coronaviruses have also demonstrated the capability to invade the central nervous system from respiratory system foci (Desforges et al., 2014).

The direct long-term consequences of COVID19 on brain health may take decades to become apparent. Neuroinflammation is heavily implicated in the aetiologies of dementias and other neurodegenerative diseases preceding the development of clinical features by several years (Guzman-Martinez et al., 2019). Such inflammation has also been proposed as a mechanism of the neurological manifestations of COVID19 (Mao et al., 2020) and acute and severe cases of COVID19 nervous system inflammation have been reported (Liu et al., 2020). The olfactory bulb is a particularly vulnerable sentinel site for the development of neurodegenerative pathology (Outeiro et al., 2019) and inflammation of the bulb has been proposed as a likely mechanism of the hyposmia commonly observed in COVID19 infection (Mao et al., 2020). Long term neurological sequelae of systemic infection is not without precedent; Spanish influenza was hypothesised as contributing to the encephalitis lethargica epidemic which affected as many as one million people worldwide in the early twentieth century (Hoffman and Vilensky, 2017).

## **INDIRECT CONSEQUENCES OF CORONAVIRUS PANDEMIC ON OLDER PERSONS**

### **Impact on Mental Health**

Despite its small population size, Northern Ireland has consistently demonstrated higher rates of Post-Traumatic Stress Disorder, mental health burden and suicide rates felt in part due to the legacy of “the Troubles” (O’Neill et al., 2015, Bunting et al., 2013, McLafferty et al., 2018). This raises concerns of the impact of the COVID19 pandemic not only in known vulnerable groups but the mental wellbeing of the entire Northern Irish population.

There will be mental health ramifications as a result of COVID19 beyond that of the population with pre-existing mental health conditions (Holmes et al., 2020). Following the SARS outbreak in 2003 Liu et al., examined the mental health impact on 549 hospital employees and found that with other relevant factors controlled for, being single, having been quarantined during the outbreak, having been exposed to other traumatic events before SARS, and perceived SARS-related risk level during the outbreak were found to increase the odds of having a high level of depressive symptoms up to 3 years later (Liu et al., 2012). Age has been found to impact the emotional response to epidemics. In a study at the peak of the SARS outbreak older adults responded with less anger to the necessary restrictions and were better able to alter their coping strategies in response to the changing environment than younger adults (Yeung and Fung, 2007).

COVID19 has resulted in a parallel epidemic of fear and anxiety, further compounded by overwhelming media coverage with often weakly supported, over exaggerated or sensationalised news reports (Shigemura et al., 2020). Concerns about individual or loved ones health, bereavement as well as uncertainty about the future economic impact may increase the risk of serious mental health conditions including anxiety or trauma related disorders and alcohol or substance misuse (Fiorillo and Gorwood, 2020, Girdhar et al., 2020).

People with pre-existing mental health conditions are more likely than the general population to develop respiratory infections and may also be more susceptible to the increased emotional stress in response to the current crisis (Yao et al., 2020). This may increase the risk of relapse or deterioration in their mental health. Combine this with the closure of community care facilities, outpatient clinics and normal mechanisms for support and mental state monitoring and it could result in a delay in presenting to services or reduced access to interventions (Holmes et al., 2020).

Chan et al., highlighted a 31.7% increase in suicide rates in older adults during the Severe Adult Respiratory Syndrome (SARS) epidemic in Hong Kong 2003 compared to the previous year with peak deaths correlating with the peak of the epidemic (Cheung et al., 2008, Chan et al., 2006). There was also some evidence that suicide rates increased in the United States following the 1918-19 Spanish flu epidemic (Wasserman, 1992). As with any research into death by suicide, we must remain sensitive to the complexity of the factors involved but these highlight the need for an immediate and multidisciplinary response both in research and in the adaptation of clinical and crisis services (Holmes et al., 2020).

## **Isolation**

In order to reduce the risk of COVID19 in vulnerable proportions of the population that would have increased mortality, those over the age of 70 or with certain medical comorbidities were advised to remain isolated for a period of 12 weeks "shielding" (Sparrow, 2020). Self-isolation will disproportionately affect those that live alone, have reduced access to adapted community services or reduced ability to utilise the growth of technology enabled communication either via lack of access, cognitive impairment or sensory impairment (Armitage and Nellums, 2020, Steinman et al., 2020). Being socially connected can improve emotional well-being but has also been associated with improved physical well-being and uptake of health screening programmes (Van Jaarsveld et al., 2006) Conversely, chronic loneliness has been found to contribute to increased morbidity, mortality and healthcare utilisation (Gerst-Emerson and Jayawardhana, 2015).

However, social isolation and loneliness related outcomes are two related but distinct concepts and in a meta-analysis conducted by Holt-Lunstad et al.(2015), middle aged adults were at greater risk of mortality when lonely or living alone than when older adults experienced the same circumstances (Holt-Lunstad et al., 2015).

Prolonged isolation, disruption in food distribution or reduced opportunities to exercise may also result in physical deconditioning or nutritional deficits that could have longer term health impact for older persons (Steinman et al., 2020).

### **Disruption to health service**

In order to respond to the demand on the health service, plan for expected surge in COVID19 cases and accommodate staff shortages, there required a significant change in healthcare provision in a very short timeframe. This has resulted in a large number of elective procedures, investigations and treatments being suspended or cancelled and the older person is more likely to be directly affected.

There is also concern about the reduced attendances to general practitioners and emergency departments for non COVID19 related serious health conditions such as symptoms of cancer, heart attacks or strokes due to fear of the disease (Thornton, 2020, Steinman et al., 2020). This may result in increased morbidity and mortality as well as increased waiting lists when services return.

### **Immunosenescence**

One of the initial discussions presented by the UK government in response to the COVID19 pandemic was herd immunity. Herd immunity arises when a significant proportion of the population provides a measure of protection for a vulnerable portion of the population reducing the likelihood that the susceptible proportion will be infected (Lang, 2011). In the absence of a vaccine against COVID19 however and limited evidence to date to suggest that recovery from the infection results in immunity this strategy has come under some criticism (Pawelec and Weng, 2020). Accumulation of deficits in immune response most typically seen with advancing age is given the term immunosenescence and also may result in reduced efficacy of any vaccination programme in older persons (Lang and Aspinall, 2012).

### **Perceived Ageism**

Whilst older people do seem more susceptible to develop severe or life threatening symptoms in response to COVID19 infection there has been felt to be an ageist discourse in the public's perception and media reports about the disease (Brooke and Jackson, 2020). This may increase perception in the older person that they are a burden or less valued by their community increasing the negative emotional effects of the pandemic. It is important that the older person in our population are not seen as a homogenous group or that increased age felt to directly correlate with level of disability or chance of survival (Ayalon et al., 2020). The British Geriatric Society have also advocated for the increased inclusion of older people in COVID19 related research (BGS, 2020b).

The COVID19 global pandemic will present significant challenges in planning for healthcare services particularly the mental health impact beyond the initial response to the disease. The older persons in our population and those with pre-existing mental health conditions may be especially vulnerable and so consideration, adaptive services, assertive outreach and inclusion in research will be required to deliver evidence-based interventions.

## REFERENCES

- (COPNI), C. F. O. P. F. N. I. 2015. *Domiciliary care in Northern Ireland 2015 report* [Online]. Available: <https://www.copni.org/media/1119/domiciliary-care-in-northern-ireland.pdf> [Accessed 26/04/2020].
- (NISRA), N. I. S. A. R. A. 2020a. *NI Summary Statistics* [Online]. Available: <https://www.nisra.gov.uk/publications/ni-profile-february-2020> [Accessed 26/04/2020].
- (NISRA), N. I. S. A. R. A. 2020b. *Northern Ireland Labour Force Survey tables April 2020 [online document]* [Online]. Northern Ireland Statistics and Research Agency (NISRA). Available: <https://www.nisra.gov.uk/publications/labour-force-survey-tables-april-2020> [Accessed 26/04/2020].
- ANDERSEN, K. G., RAMBAUT, A., LIPKIN, W. I., HOLMES, E. C. & GARRY, R. F. 2020. The proximal origin of SARS-CoV-2. *Nature medicine*, 26, 450-452.
- ARMITAGE, R. & NELLUMS, L. B. 2020. COVID-19 and the consequences of isolating the elderly. *The Lancet. Public health*.
- AYALON, L., CHASTEEN, A., DIEHL, M., LEVY, B., NEUPERT, S. D., ROTHERMUND, K., TESCH-RÖMER, C. & WAHL, H.-W. 2020. Aging in Times of the COVID-19 Pandemic: Avoiding Ageism and Fostering Intergenerational Solidarity. *The Journals of Gerontology: Series B*.
- BGS. 2020a. *British Geriatric Society: Managing the COVID-19 pandemic in care homes for older people*. [Online]. Available: <https://www.bgs.org.uk/sites/default/files/content/attachment/2020-04-14/BGS%20Managing%20the%20COVID-19%20pandemic%20in%20care%20homes%20V2.pdf> [Accessed 25/04/2020].
- BGS. 2020b. *COVID-19: British Geriatric Society statement on research for older people during the COVID-19 pandemic* [Online]. Available: <https://www.bgs.org.uk/resources/covid-19-bgs-statement-on-research-for-older-people-during-the-covid-19-pandemic> [Accessed 27/04/2020].
- BROOKE, J. & JACKSON, D. 2020. Older people and COVID-19: Isolation, risk and ageism. *Journal of clinical nursing*.
- BUNTING, B. P., FERRY, F. R., MURPHY, S. D., O'NEILL, S. M. & BOLTON, D. 2013. Trauma Associated With Civil Conflict and Posttraumatic Stress Disorder: Evidence From the Northern Ireland Study of Health and Stress. *Journal of Traumatic Stress*, 26, 134-141.
- CEVIK, L., ALVES, M. J. & OTERO, J. J. 2020. Neuropathologists play a key role in establishing the extent of COVID-19 in human patients. *Free Neuropathology*, 1, 11-11.
- CHAN, S. M., CHIU, F. K., LAM, C. W., LEUNG, P. Y. & CONWELL, Y. 2006. Elderly suicide and the 2003 SARS epidemic in Hong Kong. *Int J Geriatr Psychiatry*, 21, 113-8.
- CHEUNG, Y., CHAU, P. H. & YIP, P. S. 2008. A revisit on older adults suicides and Severe Acute Respiratory Syndrome (SARS) epidemic in Hong Kong. *International Journal of Geriatric Psychiatry: A journal of the psychiatry of late life and allied sciences*, 23, 1231-1238.
- COLLINS, N., BLANCHARD, M. R., TOOKMAN, A. & SAMPSON, E. L. 2010. Detection of delirium in the acute hospital. *Age and ageing*, 39, 131-135.
- DAVIS, D. H., MUNIZ TERRERA, G., KEAGE, H., RAHKONEN, T., OINAS, M., MATTHEWS, F. E., CUNNINGHAM, C., POLVIKOSKI, T., SULKAVA, R. & MACLULLICH, A. M. 2012. Delirium is a strong risk factor for dementia in the oldest-old: a population-based cohort study. *Brain*, 135, 2809-2816.
- DESFORGES, M., LE COUPANEC, A., BRISON, É., MEESEN-PINARD, M. & TALBOT, P. J. 2014. Neuroinvasive and neurotropic human respiratory coronaviruses: potential neurovirulent agents in humans. *Infectious Diseases and Nanomedicine I*. Springer.
- DING, Y., HE, L., ZHANG, Q., HUANG, Z., CHE, X., HOU, J., WANG, H., SHEN, H., QIU, L. & LI, Z. 2004. Organ distribution of severe acute respiratory syndrome (SARS) associated coronavirus (SARS-CoV) in SARS patients: implications for pathogenesis and virus transmission pathways.

- The Journal of Pathology: A Journal of the Pathological Society of Great Britain and Ireland*, 203, 622-630.
- DOH. 2019. *Department of Health - Statistics on Community Care for Adults in Northern Ireland 2018/2019* [Online]. Available: <https://www.health-ni.gov.uk/sites/default/files/publications/health/cc-adults-ni-18-19.pdf> [Accessed 26/04/2020].
- FIORILLO, A. & GORWOOD, P. 2020. The consequences of the COVID-19 pandemic on mental health and implications for clinical practice. *European Psychiatry*, 1-4.
- GERST-EMERSON, K. & JAYAWARDHANA, J. 2015. Loneliness as a public health issue: the impact of loneliness on health care utilization among older adults. *American journal of public health*, 105, 1013-1019.
- GIRDHAR, R., SRIVASTAVA, V. & SETHI, S. 2020. Managing mental health issues among elderly during COVID-19 pandemic. *Journal of Geriatric Care and Research*, 7.
- GUAN, W.-J., NI, Z.-Y., HU, Y., LIANG, W.-H., OU, C.-Q., HE, J.-X., LIU, L., SHAN, H., LEI, C.-L. & HUI, D. S. 2020. Clinical characteristics of coronavirus disease 2019 in China. *New England Journal of Medicine*.
- GUZMAN-MARTINEZ, L., MACCIONI, R. B., ANDRADE, V., NAVARRETE, L. P., PASTOR, M. G. & RAMOS-ESCOBAR, N. 2019. Neuroinflammation as a common feature of neurodegenerative disorders. *Frontiers in Pharmacology*, 10, 1008.
- HELMS, J., KREMER, S., MERDJI, H., CLERE-JEHL, R., SCHENCK, M., KUMMERLEN, C., COLLANGE, O., BOULAY, C., FAFI-KREMER, S. & OHANA, M. 2020. Neurologic Features in Severe SARS-CoV-2 Infection. *New England Journal of Medicine*.
- HOFFMAN, L. A. & VILENSKY, J. A. 2017. Encephalitis lethargica: 100 years after the epidemic. *Brain*, 140, 2246-2251.
- HOLMES, E. A., O'CONNOR, R. C., PERRY, V. H., TRACEY, I., WESSELY, S., ARSENEAULT, L., BALLARD, C., CHRISTENSEN, H., COHEN SILVER, R., EVERALL, I., FORD, T., JOHN, A., KABIR, T., KING, K., MADAN, I., MICHIE, S., PRZYBYLSKI, A. K., SHAFRAN, R., SWEENEY, A., WORTHMAN, C. M., YARDLEY, L., COWAN, K., COPE, C., HOTOPF, M. & BULLMORE, E. 2020. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *The Lancet Psychiatry*.
- HOLT-LUNSTAD, J., SMITH, T. B., BAKER, M., HARRIS, T. & STEPHENSON, D. 2015. Loneliness and social isolation as risk factors for mortality: a meta-analytic review. *Perspectives on psychological science*, 10, 227-237.
- HPSC. 2020. *Epidemiology of COVID-19 in Ireland Report prepared by HPSC on 23/04/2020 for NPHE* [Online]. Available: [https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/casesinireland/epidemiologyofcovid-19inireland/COVID-19%20Epidemiology%20report%20for%20NPHE%2020200423\\_website.pdf](https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/casesinireland/epidemiologyofcovid-19inireland/COVID-19%20Epidemiology%20report%20for%20NPHE%2020200423_website.pdf). [Accessed 25/04/2020].
- INOUE, S. K., BOGARDUS JR, S. T., CHARPENTIER, P. A., LEO-SUMMERS, L., ACAMPORA, D., HOLFORD, T. R. & COONEY JR, L. M. 1999. A multicomponent intervention to prevent delirium in hospitalized older patients. *New England journal of medicine*, 340, 669-676.
- KIELY, D. K., MARCANTONIO, E. R., INOUE, S. K., SHAFFER, M. L., BERGMANN, M. A., YANG, F. M., FEARING, M. A. & JONES, R. N. 2009. Persistent delirium predicts greater mortality. *Journal of the American Geriatrics Society*, 57, 55-61.
- KIMBALL, A. 2020. Asymptomatic and presymptomatic SARS-CoV-2 infections in residents of a long-term care skilled nursing facility—King County, Washington, March 2020. *MMWR. Morbidity and mortality weekly report*, 69.
- LANG, P.-O. 2011. Adverse effects of the herd immunity or when childhood vaccination becomes deleterious for the epidemiology of infectious diseases in adults. *Geriatric et psychologie neuropsychiatrie du vieillissement*, 9, 11-19.

- LANG, P. O. & ASPINALL, R. 2012. Immunosenescence and herd immunity: with an ever-increasing aging population do we need to rethink vaccine schedules? *Expert Review of Vaccines*, 11, 167-176.
- LIU, K., PAN, M., XIAO, Z. & XU, X. 2020. Neurological manifestations of the coronavirus (SARS-CoV-2) pandemic 2019–2020. *Journal of Neurology, Neurosurgery & Psychiatry*.
- LIU, X., KAKADE, M., FULLER, C. J., FAN, B., FANG, Y., KONG, J., GUAN, Z. & WU, P. 2012. Depression after exposure to stressful events: lessons learned from the severe acute respiratory syndrome epidemic. *Comprehensive psychiatry*, 53, 15-23.
- MAO, L., WANG, M., CHEN, S., HE, Q., CHANG, J., HONG, C., ZHOU, Y., WANG, D., MIAO, X. & HU, Y. 2020. Neurological manifestations of hospitalized patients with COVID-19 in Wuhan, China: a retrospective case series study.
- MCLAFFERTY, M., O'NEILL, S., MURPHY, S., ARMOUR, C. & BUNTING, B. 2018. Population attributable fractions of psychopathology and suicidal behaviour associated with childhood adversities in Northern Ireland. *Child Abuse & Neglect*, 77, 35-45.
- O'SULLIVAN, R., INOUE, S. K. & MEAGHER, D. 2014. Delirium and depression: inter-relationship and clinical overlap in elderly people. *The Lancet Psychiatry*, 1, 303-311.
- O'NEILL, S., ARMOUR, C., BOLTON, D., BUNTING, B., CORRY, C., DEVINE, B. & MURPHY, S. 2015. Towards a better future: the trans-generational impact of the Troubles on mental health. *Commission of Victims and Survivors, Belfast*.
- OUTEIRO, T. F., KOSS, D. J., ERSKINE, D., WALKER, L., KURZAWA-AKANBI, M., BURN, D., DONAGHY, P., MORRIS, C., TAYLOR, J.-P. & THOMAS, A. 2019. Dementia with Lewy bodies: an update and outlook. *Molecular neurodegeneration*, 14, 1-18.
- PAWELEC, G. & WENG, N.-P. 2020. Can an effective SARS-CoV-2 vaccine be developed for the older population? *Immunity & Ageing*.
- SHIGEMURA, J., URSANO, R. J., MORGANSTEIN, J. C., KUROSAWA, M. & BENEDEK, D. M. 2020. Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: mental health consequences and target populations. *Psychiatry and clinical neurosciences*, 74, 281.
- SPARROW. 2020. Coronavirus: UK over-70s to be asked to stay home 'within weeks', Hancock says. *The Guardian*.
- STEINMAN, M. A., PERRY, L. & PERISSINOTTO, C. M. 2020. Meeting the Care Needs of Older Adults Isolated at Home During the COVID-19 Pandemic. *JAMA Internal Medicine*.
- TAY, H. S. & HARWOOD, R. 2020. Atypical presentation of COVID-19 in a frail older person. *Age and Ageing*.
- THORNTON, J. 2020. Covid-19: A&E visits in England fall by 25% in week after lockdown. British Medical Journal Publishing Group.
- VAN JAARSVELD, C. H., MILES, A., EDWARDS, R. & WARDLE, J. 2006. Marriage and cancer prevention: does marital status and inviting both spouses together influence colorectal cancer screening participation? *Journal of Medical Screening*, 13, 172-176.
- WASSERMAN, I. M. 1992. The impact of epidemic, war, prohibition and media on suicide: United States, 1910–1920. *Suicide and Life-Threatening Behavior*, 22, 240-254.
- WITLOX, J., EURELINGS, L. S., DE JONGHE, J. F., KALISVAART, K. J., EIKELENBOOM, P. & VAN GOOL, W. A. 2010. Delirium in elderly patients and the risk of postdischarge mortality, institutionalization, and dementia: a meta-analysis. *Jama*, 304, 443-451.
- YAO, H., CHEN, J.-H. & XU, Y.-F. 2020. Patients with mental health disorders in the COVID-19 epidemic. *The Lancet Psychiatry*, 7.
- YEUNG, D. Y. & FUNG, H. H. 2007. Age differences in coping and emotional responses toward SARS: a longitudinal study of Hong Kong Chinese. *Aging Ment Health*, 11, 579-87.