Potential impacts of the COVID-19 public health and social measures (PHSM) on population health and health equity in Northern Ireland

A discussion paper developed by the Institute of Public Health for the Department of Health Northern Ireland

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1. Summary

The population health impact of the COVID-19 public health and social measures (PHSM)[1] is not known. This report presents potential impacts across the social determinants of health, health behaviours and selected disease outcomes. The report concludes with considerations for the Department of Health in terms of options for mitigating harms. Recent WHO guidance cautions that "*an assessment of the broader public health impact of PHSM for COVID-19 is not yet available*" and envisages a scenario of relapsing and recurring PHSM measures in response to epidemic waves interspersed with periods of low-level transmission[2] (1, 2). Potential impacts across the social determinant indicators used in Making Life Better (MLB) are presented. The key mechanisms influencing social determinants include 'economic shock', then recession, disrupted access to Government services and supports, disrupted family, caring and social support networks and disrupted access to goods and services. Mental health and chronic disease outcomes may be at the most immediate risk.

Potential impacts on the MLB health behaviour indicators are presented. A shift in alcohol-related harms into home environments is highly probable. Physical activity is likely to decrease, and risk of poor nutrition and obesity may increase, with food insecurity a priority concern. Non-household sexual contacts will likely decline, but there may be new challenges in sexual health including maintaining access to STI prevention and contraception, alongside increased vigilance in respect of online consent and exploitation. Smokers are at an increased risk of severe COVID-19 disease but there is no reliable evidence of increases in smoking cessation. The broader impact of PHSM on smoking behaviours is unclear. Increased second-hand smoke exposure in home settings is possible. Home safety behaviours as they relate to falls, fires and (child) poisoning may become increasingly significant.

The overall effect on MLB life expectancy indicators is assumed to be negative with increases in both direct and indirect COVID-19 deaths. Infant mortality may rise in parallel with increased child poverty. Mental health may decline, and people with mental illness may suffer most, with a potential for increases in suicide. PHSM will increase social isolation and loneliness. Those people shielding, people living alone, and lower socio-economic groups may be especially vulnerable. The prevalence of long-term illness may increase with potential for delayed presentation and diagnosis, disease exacerbations and suboptimal disease management. Health systems have historically underestimated the impact of pandemics/natural disasters on long-term illness.

[1] Public health and social measures have been defined by the WHO as personal protective behaviours (hand hygiene, respiratory etiquette), environmental measures, physical distancing measures, and travel-related measures. Physical distancing measures apply to individuals (e.g. isolation of cases and quarantine of contacts) or to communities, specific segments of the population, or to the population as whole. Additional large-scale public health and social measures (PHSM), including movement restrictions, closure of schools and businesses, geographical area quarantine, and international travel restrictions.

[2] Considerations in adjusting public health and social measures in the context of COVID-19.

PHSM are a necessary response to reduce the impact of the COVID-19 pandemic but they have the potential to impact other aspects of population health (2). Priority areas to consider in terms of mitigation of harms include:

1. Adopting a **health in all policies approach to Government decisions** on social protection, economic, employment and education policies.
2. Deploying **a strategic approach to mental health promotion and support**.
3. Building **information and management systems that allow for rapid identification and response to 'decompensation' and potential surge of usage issues (issues** of delayed presentation to services, disease exacerbations and incidence of preventable morbidity and mortality).
4. Rapidly enriching the **digital capability of both the health and social care system and service users.**
5. Delivering an **evidence-informed programme of action to mitigate the effects of PHSM on the highest impact health behaviours.**
6. Creating **a better understanding of human rights issues relating to the impact of PHSM in particular with regard to** health equity, child protection, reproductive rights, domestic abuse including elder abuse, disability and racial/ migrant issues and wider community tensions.

2. Social determinants

Making Life Better (MLB), the public health strategy for Northern Ireland (3) supplies direction on policy measures to improve the health of the population. MLB recognises the profound influence of social, economic, and environmental factors on population health. The reporting mechanism includes relevant 'social determinant' indicators. *Table 1* presents potential impacts of PHSM on MLB social determinant indicators. Four main mechanisms are hypothesised. These are, in order of importance: (a) 'economic shock', then recession (b) disrupted access to Government services and supports (c) disrupted social and family networks, especially caring and support roles (d) disrupted access to goods and services (4). There are no publicly available economic projections for Northern Ireland at this time, and assumptions below are based on tentative UK and European studies (4-8).

Table 1. Potential impacts of PHSM on the MLB social determinant indicators

MLB indicator	Change	Potential change	Vulnerability
Poverty (including child poverty)	Increase	Redundancies and fewer employment prospects. More than 1 in 4 NI workers earned less than real minimum wage at baseline.	Population level. Higher risk for children in affected families, lone parents, low income families, unemployed, people with disabilities (4).
Unemployment (Incl. Long term unemployment and NEETS)	Increase	Three in four of the new jobs created in the pre-COVID-19 years were in the services sector (9). Some sectors may buck the general trend (manufacturing and IT)	Population level. Higher risk in the retail, service, tourism, sport and private transport sectors.
Economic insecurity	Increase	Increased. Food insecurity a concern (10).	Population level.
Educational attainment (Key Stage 2 and GCSE Achievement)	Unclear	Widening inequality; Unknown impact on overall level of achievement (11, 12).	Existing low literacy/numeracy groups. Children without access to online resources or equipment (4).
Housing quality	Unclear	Unknown but homelessness a particular concern (13).	Release of new supply of housing to rental market
Social capital	Variable	Reduced number of family carers for vulnerable people and for children	Working mothers reliant on care of children by grandparents

		Increase in older people living alone Reduced opportunities of community connections/ support/networking.	Older carers Impact on community and voluntary services reliant on fundraising capital.
Air quality	Increase	Reduced air pollution from reduced industrial and transport emissions (4).	May benefit people with respiratory conditions, children and pregnant women in particular.
Water quality	Increase	Presumably enhanced if pandemic response is prioritising protection of the water supply and quality for washing purposes.	Population.

Northern Ireland has a health system that performs as well as the rest of the UK in many respects (14) but may have higher vulnerability than other UK regions in terms of social determinants of levels of population health. Vulnerability factors include a higher prevalence of low paid work, a reliance on service and tourism industries and higher economic inactivity levels (9). A high dependency on fiscal transfers from central UK government and the potential impact of a hard Brexit alongside ongoing trade and political tensions are likely to create additional vulnerabilities (15). UK analyses predict that the economic repercussions of the crisis will disproportionately affect young workers, low-income families and women (4-6). Modelling of economic shocks in the UK (based on the 2008 financial crisis) found that strong adverse effect on chronic health for five broad types of health conditions, with the strongest effects being for mental health conditions (5, 16). The imprint of this period on early-childhood health and development may be far-reaching. For people with pre-existing physical and mental health conditions, the combination of economic vulnerability, restricted access to services and enforced social distancing may be particularly difficult (4-6, 17).

Evidence suggests that traditional structured home-schooling can provide positive academic achievement outcomes, however the situation of COVID-19 is highly unusual and it is likely that the impact of school closures has caused interrupted learning (18). The gap in educational outcomes widens during school holiday breaks, especially being more detrimental for maths and literacy skills, and particularly between children from lower and higher socio-economic backgrounds (19).

People experiencing homelessness face particular challenges. People in already precarious housing situations may also become homeless due to lockdown-related economic and relationship pressures (13, 20, 21).

Digital connectedness may emerge as a key determinant of health in the context of PHSM. Many groups have been able to avail of services and connections by moving online. However, 5% of those aged 65+ have used the internet compared to 98.4% of those aged 16-24. Of those aged 65+, 100% of professional backgrounds use the internet compared with 71% of skilled manual and 24% of the unskilled. Furthermore people with disability and women are less likely to use the internet (22).

3. Health behaviours

Sustaining existing health behaviours and the adoption of new behaviours are both relevant concerns in the context of PHSM, but they require different approaches. The Capability, Opportunity, Motivation, Behaviour (COM-B) is proposed as a useful model for considering health behaviour change in the context of the COVID-19 PHSM measures. Policy levers available to governments are named as fiscal measures, guidelines, environmental and social planning, communications/marketing, legislation, service provision and regulation (Appendix) (23). *Table 2* and *Table 3* present implications for health behaviours. Mental health and suicide are addressed in a subsequent section. However, mental health and health behaviours are highly inter-dependent. Mental ill-health affects the ability of individuals to both sustain and adopt positive health behaviours. Similarly, harmful health behaviours, particularly in the domain of substance misuse, and physical inactivity can threaten mental health. Another relevant consideration is that certain health behaviours cast a wider 'net of harm' - for example the harms from alcohol consumption often extend to family and community level impacts.

Table 2. Potential impacts of PHSM on the MLB health behaviour indicators

Indicator	Potential change	Vulnerability
Smoking	Increased risk of severe disease and death for smokers (24). No reliable evidence on quitting or switching to vaping. Disruptions to illicit supply chains likely. Increased risk of second-hand smoke exposure in household environments.	Lower socio-economic groups People with mental health issues; Waterpipe users (tobacco and transmission risk) (25); Children at greater risk of SHS. Exposure (26).
Alcohol	Shift to off-sales likely to fuel an increase in family-based forms of alcohol-related harm (27). Home setting may lack modulatory factors (pub closing, social setting norms etc). Risks of drinking alone. Increased exposure to screen marketing. Stockpiling. Relapse for people who are alcohol dependent may be an issue (28). Access of	Children (child protection) Family (domestic violence, abuse, relationship issues) Drinker (home safety, particularly for older drinkers; mental ill-health and suicide risk).

	children to alcohol overall likely to be reduced, but home supply and online sales a concern. Reduced access to treatment and counselling.	
Teenage births	Likely decrease due to restricted contact opportunity between non-household couples and casual sexual encounters.	Girls at risk of sexual abuse by household/family member and/those with limited access to contraception.
Adult obesity	Unknown, but overall net increase likely. Increased exposure to HFSS foods screen marketing. Proximity to food source. Lower level of physical activity. Lack of social setting modulatory factors to eating. May be counteracted by increased home cooking, family meals, fewer impulse buys on grocery shop. Food insecurity likely to compound obesity due to affordability of HFSS options.	Men Older people/ cocooners Lower socio-economic groups lacking food storage and cooking facilities.
Childhood obesity	Unknown, but overall net increase likely (29). Factors as for adult obesity above. Other risks include substitution of school meals (nutritional standards) for HFSS meals. Potential decline in breastfeeding if there are less effective/reduced prenatal and postnatal supports.	Infants, children and teenagers (30, 31).

Table 3. Potential impacts of PHSM on other health behaviours

Indicator	Potential change	Vulnerability
Physical activity	Previously active children and adults may be less likely to maintain their usual levels of physical activity. Overall increase in proportion of population not meeting guidelines, with older people and shielding groups potentially most impacted (32, 33).	All ages. Gender and socio-economic inequalities may widen. Lower activity in older people may impact functional ability, cognition, chronic disease management and mental health.
Sexual health	Reduced opportunities for casual and non-household sexual contacts. Reduced rate of STI. No clear evidence on planned or unplanned pregnancies in co-habiting couples. Failure to	Sex workers. People with limited access to contraception and

	prevent and intervene early on STI may bring increase risk for later presentation, illness, later infertility. Children may miss out on school-based sex education (34).	preventive measures. (condoms, PreP etc) Underage and vulnerable adults - online sexual grooming/ non-consensual sharing of images Reproductive coercion.
Drug use (excl. alcohol)	Overall impact on drug-related deaths unknown. Access to opiate replacement medication may be disrupted. Disruptions in illicit drug supply may bring different and potentially more risky drugs and in some cases precipitate withdrawal states. Low threshold harm reduction services and support likely to be critical (35-37).	Vulnerabilities for opiate dependent, older users, those with co-existing physical and mental illness and those living alone/homeless.
Violence	Increased potential for domestic abuse created by a heightened situation through quarantine, isolation and associated social, emotional and economic stressors (38-40).	Women. Children. Older People. People in lower socio-economic position
Home safety	Potential increase in home and garden-based injuries (41).	Children (bleach poisoning) Older People Falls. Men. Farmers and their children.
Road safety	Work and travel restrictions mean traffic in the initial period will be reduced and may lead to improved road safety due to less collisions. However, there is also a danger that higher speeds could result in more fatalities where collisions occur (42).	Those who continue to travel to work/volunteer and provide front line support and services. Pedestrians and cyclists (including children) using road space in the context of social distancing.

4. Disease outcomes

Table 4 presents the potential impact of the PHSM on the MLB life expectancy indicators. Prior to the onset of the COVID-19 epidemic, improvements in life expectancy in Northern Ireland were slowing significantly, particularly for women. The lack of progress was attributed mainly to higher than expected deaths from cardiovascular disease and stroke, alongside increases in alcohol and drug-related deaths (43). Disability free life expectancy declined in pre-COVID-19 years, with inequalities widening (44). Although the causes of the stalling of life expectancy are debated, changes in the social welfare system and reduced public services may be contributory factors. This has been identified in the context of increased infant mortality in some regions of the UK (45). Unravelling the relative contribution of direct (Infection deaths) and indirect deaths (PHSM, economic recession related etc) in 2020 and subsequent years, and delineating pre-existing versus new trends, will be very challenging.

Table 4. Potential impacts of PHSM on MLB life expectancy indicators

Indicator	Potential change	Vulnerability
Life expectancy	Excluding COVID-19 deaths, a background trend of stalling of life expectancy trend is assumed Epidemiological research required.	Disadvantaged communities. People with existing long-term conditions, multimorbidity and mental ill-health. People with disabilities.
Healthy life expectancy	Unknown- requires research.	See above.
Disability free life expectancy	Unknown – requires research.	See above.
Infant mortality	Possible increases in light of UK trend pre-COVID-19, decreased engagement with health service, elevated risk for determinants of prenatal maternal and child health (45).	Disadvantaged communities. Substance misuse. High unemployment and food insecure communities.

Table 5. Potential impacts of PHSM on other MLB morbidity indicators

Morbidity indicators	Potential change	Vulnerability
Long term conditions	Increase onset, exacerbation, and suboptimal management. Increased CVD and stroke mortality and longer-term	People with multimorbidity especially those with physical and mental morbidities. Older people.

	disability. Diabetes complications may increase (46).	People in deprived areas.
Mental health	The conditions of anxiety and depression (47) are expected to rise (48, 49).	See loneliness and social isolation below.
Suicide	Increases in suicide are a potential outcome in the medium to long-term (49-53).	Health and social care providers. Men.
Hypertension	Increase onset, exacerbation, and suboptimal management (46).	Older people. People with existing cardiovascular disease, respiratory disease or LTC.

Long-term conditions

There is limited review level evidence on the indirect effects of pandemics on long term conditions. However, best available evidence shows that long term conditions are "at risk of neglect during pandemics" in terms of disease onset, exacerbation and management (46, 54, 55). Indirect threats to long-term conditions in the context of COVID-19 include:

- Suboptimal health and social care diversion of health care resources.
- Interruptions in medication and care supplies.
- Disruptions and/or over burdening of informal caring and social support networks.
- Exacerbations driven by changes in health behaviours (e.g. diet and physical activity, alcohol use).
- Direct and indirect consequences of fear, anxiety and/or mental ill-health.
- Socio-economic vulnerability especially regarding food insecurity.
- Disruptions in transport.

(46, 54-57)

Older people in deprived areas may be the highest risk group (46) and patients with multimorbidity and joint health and social care needs may also be especially vulnerable. Increases in deaths attributable to stroke and myocardial infarction were observed in the influenza pandemic of 2009 and in post-disaster communities (58). However, it is challenging to unravel the extent to which these additional deaths were attributable to direct (infection) and/or indirect consequences of the pandemic (46, 56). Cardiovascular events and diabetes complications are most often represented in the literature, but in the case of COVID-19, outcomes in relation to chronic respiratory disease may be a more prominent feature. The nature and potential impact of 'post-COVID-19' complications and clinical sequelae such as increases in patients living with post-viral /post-ventilation chronic respiratory disease, neurological syndromes and post-traumatic stress disorder is not yet apparent.

Mental health, suicide and loneliness

A recent evidence review concludes that social distancing measures and quarantine can increase negative psychological effects, and potential for suicide (59). In particular, an increase in suicides among older people was observed in the SARS epidemic in 2003 (60). A consensus statement on suicide risk and prevention during COVID-19 was recently published in the Lancet Psychiatry (49). These recommendations inform the strategic considerations section of this report.

Table 6. Potential impacts of PHSM on loneliness and social isolation

	Potential Change	Vulnerability
Loneliness	Increase in those who report feeling 'often lonely' and 'sometimes lonely' and decrease in those reporting 'never' feeling lonely.	Older people. Living alone. Poor Health. Lower socio-economic group.
Social Isolation	Increased social isolation due to a decrease in networks, clubs, churches and connections with family and friends.	Older people. Lower education levels. Living alone. Poor Health. Lower socio-economic group/areas. Minority groups.

PHSM may be particularly impactful on isolation and loneliness (59, 61). Social connections matter and loneliness and social isolation are associated with poor physical and mental health outcomes (62-64). Loneliness is a personal experience where one feels they lack meaningful connections and relationships. It is the difference between an individual's preferred and actual situation. Social isolation focuses on the number of relations, social interactions, social support structures and engagement in the community and activities in which we are involved. It is an 'objective measurement' (65). It is projected that older people and vulnerable groups are at risk of experiencing increased loneliness and or social isolation and subsequently the conditions of anxiety and depression, are expected to rise.

5. Policy considerations

(1) **Adopting a** health in all policies approach to Government decisions **on social protection, economic, employment and education policies.** **Options include:**
Application of rapid HIA methodology to proposed adaptations to income and benefit supports and universal social charge. Consider application of HIA to basic minimum income standard for duration of the pandemic.
Promoting the uptake of COVID-19 related and broader social protection benefits at population level and among traditional 'low uptake' groups.
Provision of whole population safety nets to mitigate financial stressors both short term (emergency loans) and longer term (active labour market programmes).
Maintaining educational opportunity and career prospects for across all ages to mitigate anxiety about future.
Reviewing the need for increases in core benefits relating to living alone, carer status, disability status, home heating, pregnancy and child-rearing.
Adapting utility allowances and benefits to better support access to the internet and training.
Providing additional resource to addressing inequities in education, building on the existing programmes and expertise, and with an enhanced focus on literacy and numeracy skills.
Enhanced integration of mental health supports into health and safety practice in workplaces, including in the circumstance of redundancy and job insecurity.
Maintaining ethical practice to limit inappropriate commercial interference in policy making on public health matters including alcohol and food policy, in line with WHO recommendations.

(2) **Deploying** a strategic approach to mental health promotion and support. **Options include:**
A blend of regulatory, policy, service and community level interventions.
Deploying population-wide public health approach to prevent and respond to higher levels of mental distress, loneliness and social isolation.
Deploying resources to meet compliance by Northern Ireland with the provisions of both the WHO and UK government guidance on mental health and wellbeing during COVID-19 .
Communication strategies that target key populations (health care workers, mental health service leads, carers, older people, people with long-term conditions and people in isolation) and address issues of stigma and racism/xenophobia.
Designing communication strategies mitigate the narrative that a rise in suicide is inevitable.
Reinforcing the role of media reporting in reducing risk of suicide: non-adherence to guidelines for reporting suicide and self -harm and repeated exposure can increase risk, fear and incidence of suicide.
Provision of evidence based online resources.
Considering the implications for privacy, and therefore engagement with, of remote assessment and interventions for individuals.
Considering supports to maintain community and voluntary services where capacity may be affected.
Monitoring the demands on service providers to ensure appropriate resourcing and co-ordination.
Reconfiguration and resourcing of mental health services to provide as much interface and service continuity as possible, in line with clinical guidance and within the boundaries of infection control advice.
Monitoring rates of anxiety, depression and self-harm in Northern Ireland at population level and within vulnerable groups, including front line workers.

Integrating learning from multiple sources but prioritise data from large scale representative and robust surveys, on the impact of COVID-19 on mental health in the UK and Ireland. (see CSO and parallel UK social COVID-19 survey)
Maintaining, and expanding if necessary, funding for helplines providing emotional support and suicide intervention.
Integrating mental health and emotional assessment, and signposting, into all post-COVID-19 discharge and follow up protocols. Higher risk groups include survivors post-ventilation and those with pre-existing mental or chronic illness. Making 'caring for the carers' - integral to all post-COVID-19 care models.
Investments in counselling and bereavement supports with a focus on older people, frontline workers (death of colleagues) and their families.
Consideration of additional measures to restrict access to commonly used and highly lethal suicide methods, bearing in mind that purchases may shift online.
Monitoring of both alcohol consumption and harms. Ensuring advice on consumption guidelines and self-management alongside signposting to supports features in all mental health messaging.
Reviewing the feasibility of introducing additional regulatory measures on gambling building on recent legislative developments in Northern Ireland.
Harnessing existing surveys and datasets to better understand longer term mental and emotional impacts of COVID-19 PHSM in the Northern Ireland context.
Inserting relevant modules into ongoing longitudinal studies, like NICOLA and the Millennium Cohort Study in Northern Ireland, Life and Times to examine longer term psychological impacts of PHSM.

(3) **Building** information and management systems that allow for rapid identification and response to 'decompensation' issues**. Monitoring and responding to issues of delayed presentation to services, disease exacerbations and incidence of preventable morbidity and mortality.** **Options include:**
Care management and commissioning that enhances collaboration and mobilises community-based partnerships.

Development of resources for people living with LTCs, including print and web-based educational materials and access to support telephone lines.
Proactive review of patients requiring care for LTCs and their possible needs if healthcare services are disrupted.
Investment in systems to improve identification and tracking mechanisms for people living with LTCs.
Providing clarity on points of contact for patient care should disasters/emergencies occur.
Designation of regionalised speciality centres to manage the most complex patients, particularly those with multimorbidity and functional impairment.
Analysis of the impact of delayed diagnosis of cancer and the relative contribution of delayed presentation by patient and delayed access to service. (eg. Screening)

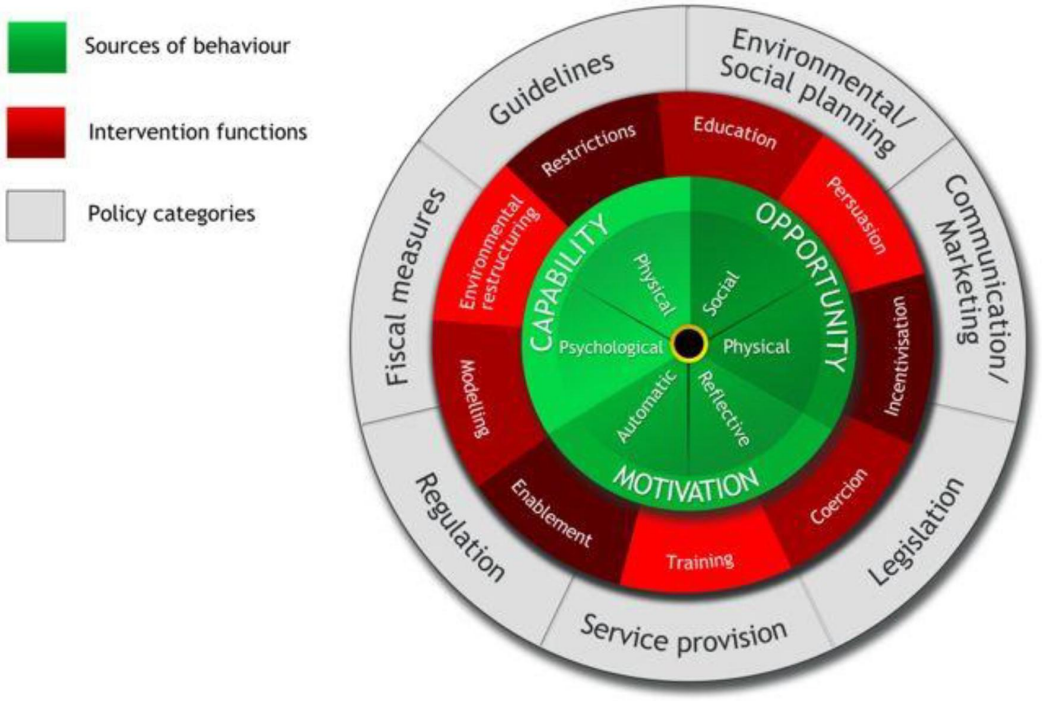
(4) **Rapidly enriching the** digital capability of both the health and social care system and service users. **Options include:**
Population wide, community driven interventions with the goal of inclusive and equitable online access. Strategic actions to address barriers of cost and confidence and deliver user friendly low literacy interfaces and IT support helplines.
Increasing the level of internet usage in older adults (65+) in Northern Ireland by 20% with a particular focus on carers, people with disabilities, women, people living alone.
Quality improvement towards best practice in telehealth for health and social care professionals through training and service development initiatives in primary care and specialist services.

(5) **Delivering an** evidence-informed programme of action to mitigate the effects of PHSM on the highest impact health behaviours**. This could encompass regulatory measures as well as guidance, communications and online interventions.** **Options include:**

Additional regulatory measures to curb consumption and harms from alcohol, and reduce health service demand. (e.g. quotas on purchases, minimum unit pricing, enhanced regulation of marketing, regulations on supermarket licensing hours)
Supporting older adults to implement an adapted physical activity programme in a safe home environment to maintain physical and mental health and decrease the negative physiological and psychological impact of sedentary behaviours for older adults.
Conducting an all-island assessment of the impact of PHSM on healthy eating, weight management and obesity with a focus on identifying drivers and appropriate messaging and supports.
Developing a health behaviours research programme aligned to surveys already in place to monitor population compliance and responses to the PHSM through the behavioural insights streams operationalised by UK and Irish governments.
Providing Government-led guidance and supports on regulating screen time and managing mental health in the context of anxiety and misinformation.

(6) **Creating** a better understanding of human rights issues relating to the impact of PHSM. **Options include:**
A child protection taskforce to agree actions for children made vulnerable through PHSM encompassing issues of child abuse, alcohol and drug-related harms, school exclusion/virtual absenteeism, children in care, online exploitation.
Agreeing actions to support reproductive rights, in line with current legislation.
Investment in social work and criminal justice system responses to intimate partner/ domestic violence and elder abuse issues.
Review of equality issues in terms of health inequalities and the section 65 equality legislation.

Appendix



Source: Susan Michie, Maartje M van Stralen & Robert West. The behaviour change wheel: A new method for characterising and designing behaviour change interventions.

References

1. World Health Organization. Considerations in adjusting public health and social measures in the context of COVID-19: interim guidance. World Health Organization,; 2020 16 April 2020.

2. European Centre For Disease Prevention And Control. Considerations relating to social distancing measures in response to COVID-19 – second update. European Centre For Disease Prevention And Control,; 2020 23 March 2020.

3. Department of Health. Making Life Better: A whole system strategic framework for public health 2013 - 2023. In: Department of Health, editor.: Northern Ireland Government; 2014.

4. Douglas M, Katikireddi SV, Taulbut M, McKee M, McCartney G. Mitigating the wider health effects of COVID-19 pandemic response. BMJ. 2020;369:m1557.

5. Banks J, Karjalainen, H. & Propper, C. Recessions and health: The long-term health consequences of responses to coronavirus. The Institute for Fiscal Studies: Economic and Social Research Council; 2020 April 2020.

6. Joyce R, Xiaowei X. Sector shutdowns during the coronavirus crisis: which workers are most exposed? : Economic and Social Research Council,; 2020 April 2020.

7. Layard R, Clark, A., De Neve, J., Krekel, C., Fancourt, D., Hey, N. and O'Donnell, G. When to release the lockdown: A wellbeing framework for analysing costs and benefits. Centre for Economic Performance; 2020.

8. OECD. OECD Economic Outlook, Interim Report March 2020. Paris: OECD Publishing; 2020.

9. AgendaNI. Northern Ireland Economy 2019 Northern Ireland: AgendaNI; 2019 [Available from: https://www.agendani.com/northern-ireland-economy-2019.

10. High-Level Panel of Experts on Food Security and nutrition. Impact of COVID-19 on Food Security and Nutrition (FSN). European Commission; 2020.

11. Cooper H, Nye B, Charlton K, Lindsay J, Greathouse S. The Effects of Summer Vacation on Achievement Test Scores: A Narrative and Meta-Analytic Review. Review of Educational Research. 1996;66(3):227-68.

12. Wright U. 2020. Available from: https://www.fsg.org/blog/quakes-and-tremors

13. Tsai J, Wilson M. COVID-19: a potential public health problem for homeless populations. The Lancet Public Health. 2020;5(4):e186-e7.

14. Gwyn Bevan G, Karanikolos, M., Exley, J., Nolte, E., Connolly, S., and Mays, N. The four health systems of the United Kingdom: how do they compare? United Kingdom: The Health Foundation and Nuffield Trust; 2014 April 2014.

15. Fitzgerald JD, Morgenroth ELW. The Northern Ireland Economy: Problems and Prospects. Dublin: Trinity College Dublin; 2019 July

16. Rothe C, Schunk M, Sothmann P, Bretzel G, Froeschl G, Wallrauch C, et al. Transmission of 2019-nCoV Infection from an Asymptomatic Contact in Germany. The New England journal of medicine. 2020.

17. Astell-Burt T, Feng X. Health and the 2008 Economic Recession: Evidence from the United Kingdom. PLOS ONE. 2013;8(2):e56674.

18. Ray BD. A systematic review of the empirical research on selected aspects of homeschooling as a school choice. Journal of School Choice. 2017;11(4):604-21.

19. Cooper H, Nye B, Charlton K, Lindsay J, Greathouse S. The Effects of Summer Vacation on Achievement Test Scores: A Narrative and Meta-Analytic Review. Review of Educational Research. 1996;66(3):227-68.

20. Mosites E, , Parker, E.M., Clarke, K.E., et al. . Assessment of SARS-CoV-2 Infection Prevalence in Homeless Shelters — Four U.S. Cities. MMWR Morb Mortal Wkly Rep,. 2020.

21. FEANTSA. COVID19: "Staying Home" Not an Option for People Experiencing Homelessness 2020 [Available from: https://www.feantsa.org/en/news/2020/03/18/covid19-staying-home-not-an-option-for-people-experiencing-homelessness?bcParent=26.

22. Northern Ireland Statistics and Research Agency (NISRA). Digital inclusion Module 2018 from Household Omnibus survey. In: Northern Ireland Statistics and Research Agency (NISRA), editor. Belfast, 2018.

23. Michie S, van Stralen MM, West R. The behaviour change wheel: A new method for characterising and designing behaviour change interventions. Implementation Science. 2011;6(1):42.

24. Guan WJ, Liang WH, Zhao Y, Liang HR, Chen ZS, Li YM, et al. Comorbidity and its impact on 1590 patients with COVID-19 in China: A Nationwide Analysis. Eur Respir J,. 2020.

25. WHO Regional Office for the Eastern Mediterranean. Tobacco and waterpipe use increases the risk of suffering from COVID-19. 2020.

26. McAvoy H, McDaid, O., Metcalfe, O., Kabir, Z., Clancy, L., Reulbach, U. A Tobacco-free Future - An All-Island Report on Tobacco, Inequalities and Childhood. Dublin: Institute of Public Health in Ireland, ; 2013.

27. Fox S, Galvani S. Substance Use and Associated Behaviours Research Centre. Manchester Metropolitan University; 2020.

28. Clay J, Parker M. Alcohol use and misuse during the COVID-19 pandemic: a potential public health crisis? The Lancet. 2020.

29. Brazendale K, Beets MW, Weaver RG, Pate RR, Turner-McGrievy GM, Kaczynski AT, et al. Understanding differences between summer vs. school obesogenic behaviors of children: the structured days hypothesis. Int J Behav Nutr Phys Act. 2017;14(1):100.

30. Safefood. What's on your child's plate? - Food portion sizes and the proportion of different food groups eaten by children on the island of Ireland. Dublin: Safefood; 2019.

31. Department of Education. Ministers take action in relation to Free School Meals payment. Deparrment of Education, ; 2020.

32. Cunningham C, O' Sullivan R. Physical activity and older adults: An overview of guidelines, trends, policies and frameworks. Dublin/Belfast: Institute of Public Health in Ireland; 2019.

33. Cunningham C, O' Sullivan R, Caserotti P, Tully MA. Consequences of physical inactivity in older adults: A systematic review of reviews and meta-analyses. Scandinavian Journal of Medicine & Science in Sports. 2020;30(5):816-27.

34. British Association for Sexual Health and HIV (BASHH). (Standing With You) COVID-19 Guidance: Provision of Sexual Services to the Community. London; 2020 20 March 2020.

35. European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). EMCDDA update on the implications of COVID-19 for people who use drugs and drug service providers. Lisbon; 2020 25 April 2020.

36. Green TC, Bratberg J, Finnell DS. Opioid use disorder and the COVID-19 pandemic: A call to sustain regulatory easements and further expand access to treatment. Substance Abuse,. 2020;41(2):147-9.

37. Health Service Executive (HSE). Guidance documents and resources - Addiction Dublin: Health Service Executive (HSE),; 2020 [Available from: https://www.hse.ie/eng/about/who/primarycare/socialinclusion/other-areas/health-inequalities/guidance-documents-and-resources-addiction.html.

38. World Health Organization. COVID-19 and violence against women What the health sector/system can do. World Health Organization; 2020 07 April 2020.

39. House of Commons Home Affairs Committee. Home Office preparedness for COVID-19 (Coronavirus) domestic abuse and risks of harm within the home. Second Report of Session 2019 - 21. London: House of Commons; 2020.

40. van Gelder N, Peterman A, Potts A, O'Donnell M, Thompson K, Shah N, et al. COVID-19: Reducing the risk of infection might increase the risk of intimate partner violence. EClinicalMedicine. 2020.

41. Le Roux G, Sinno-Tellier S, Descatha A. COVID-19: home poisoning throughout the containment period. The Lancet Public Health. 2020.

42. Road Safety Authority. Concern over speeding drivers as number of pedestrian deaths doubles in 2020 2020 [Available from: https://www.rsa.ie/en/Utility/News/2020/Concern-over-speeding-drivers-as-number-of-pedestrian-deaths-doubles-in-2020-/.

43. Carson P, Blakley H, Dunbar S, Laverty C. Health Inequalities Annual Report 2020.: Department of Health; 2020.

44. Sheehan A, O'Sullivan R. Ageing and Public Health – an overview of key statistics in Ireland and Northern Ireland. Dublin: Institute of Public Health; 2020.

45. Taylor-Robinson D, Lai ETC, Wickham S, Rose T, Norman P, Bambra C, et al. Assessing the impact of rising child poverty on the unprecedented rise in infant mortality in England, 2000–2017: time trend analysis BMJ Open,. 2019;9(10).

46. Hartmann-Boyce J, Mahtani KR. Supporting people with long-term conditions (LTCs) during national emergencies: Centre for Evidence-Based Medicine (CEBM); 2020 [Available from:

https://www.cebm.net/covid-19/supporting-people-with-long-term-conditions-ltcs-during-national-emergencies/

47. World Health Organization (WHO). Mental health and psychosocial considerations during the COVID-19 outbreak. 2020 18 March 2020.

48. Galea S, Merchant RM, Lurie N. The Mental Health Consequences of COVID-19 and Physical Distancing: The Need for Prevention and Early Intervention. JAMA Internal Medicine. 2020.

49. Gunnell D, Appleby L, Arensman E, Hawton K, John A, Kapur N, et al. Suicide risk and prevention during the COVID-19 pandemic. The Lancet Psychiatry. 2020.

50. Ammerman BA, Burke, T.A., Jacobucci, R. and McClure, K. . Preliminary Investigation of the Association Between COVID-19 and Suicidal Thoughts and Behaviors in the U.S. PsyArXiv. 2020.

51. Reger MA, Stanley IH, Joiner TE. Suicide Mortality and Coronavirus Disease 2019—A Perfect Storm? JAMA Psychiatry. 2020.

52. Inter-Agency Standing Committee (IASC). Briefing note on addressing mental health and psychosocial aspects of COVID-19 Outbreak- Version 1.1. IASC MHPSS Reference Group,; 2020 February 2020.

53. Jiang X, Deng L, Zhu Y, Ji H, Tao L, Liu L, et al. Psychological crisis intervention during the outbreak period of new coronavirus pneumonia from experience in Shanghai. Psychiatry Res. 2020;286:112903.

54. Saulnier DD, Brolin Ribacke K, von Schreeb J. No Calm After the Storm: A Systematic Review of Human Health Following Flood and Storm Disasters. Prehospital and Disaster Medicine. 2017;32(5):568-79.

55. Mokdad AH, Mensah GA, Posner SF, Reed E, Simoes EJ, Engelgau MM, et al. When chronic conditions become acute: prevention and control of chronic diseases and adverse health outcomes during natural disasters. Preventing chronic disease. 2005;2 A04-A.

56. Madhav N, Oppenheim, B., Gallivan, M., et al. Pandemics: Risks, Impacts, and Mitigation. In: Jamison DT, Gelband H, Horton S, et al., editors. Disease Control Priorities: Improving Health and Reducing Poverty. 3rd Edition ed. Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2017 27 November.

57. Dempsey TM, Lapinsky, S. C., Melnychuk, E., Lapinsky, S. E., Reed, M. J., & Niven, A. S. . Special Populations. Critical Care Clinics. 2019.

58. Del Giudice G, Stittelaar KJ, van Amerongen G, Simon J, Osterhaus AD, Stöhr K, et al. Seasonal influenza vaccine provides priming for A/H1N1 immunization. Sci Transl Med. 2009;1(12):12re1.

59. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. The Lancet. 2020;395(10227):912-20.

60. Cheung YT, Chau PH, Yip PSF. A revisit on older adults suicides and Severe Acute Respiratory Syndrome (SARS) epidemic in Hong Kong. International Journal of Geriatric Psychiatry. 2008;23(12):1231-8.

61. Usher K, Bhullar N, Jackson D. Life in the pandemic: Social isolation and mental health. Journal of Clinical Nursing. 2020;n/a(n/a).

62. Fried L, Prohaska T, Burholt V, Burns A, Golden J, Hawkley L, et al. A unified approach to loneliness. The Lancet. 2020;395(10218):114.

63. Armitage R, Nellums LB. COVID-19 and the consequences of isolating the elderly. The Lancet Public Health. 2020.

64. British Psychological Society. Sychological impact of the response to the coronavirus/COVID-19 on older people. Leicester: Faculty of the Psychology of Older People (FPOP), British Psychological Society (BPS),; 2020.

65. O'Sullivan R. The Age of Loneliness? Féila An Phobail, Annual Public Health Lecture Belfast, 2019.