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Intervention Strategies for Stages 2 and 3 of the Barbados COVID-19 Response: An evidence base

This evidence brief specifically addresses the epidemic suppression strategies of:

A. Information, Education, Communication (IEC) in particular, continued sensitization and communication with the public
B. Mass gatherings
C. Social Distancing in the general population
D. Social Distancing in the >70 population
E. Community-wide Quarantine as a Pandemic Containment Strategy

A. Continued sensitization and communication to the general public

Definition: Information, Education and Communication[1] strategies seek to provide persons with factual information about a topic so that they can make informed decisions about the prevention and treatment of disease and the promotion of health. The World Health Organization recommends as a high priority, "to sensitize the public to their active role in response" as part of a comprehensive package of measures to address COVID-19 (1). The evidence points to the importance of continued communication from a core group of experts over time (to build trust), with the caveat that communication strategies will most likely change over the course of a pandemic based on changing public concerns and risk perceptions, as well as factors such as cultural values and life circumstances (2,3). The term social distancing does not seem to be well understood and physical distancing may better reflect what individuals are being asked to do. Specifically, regarding communication related to behavior change outcomes, past pandemics have found that communicating recommendations related to distancing interventions have the most compliance issues due to underlying beliefs on the negative social and economic consequences of such behavior change (3). Early reports on public behavior in the UK during the COVID-19 pandemic confirms this: Overall, social distancing such as 'avoiding going out' was not perceived as a very effective measure to prevent COVID-19 (69%). In addition, while 71% of the general population reported changing behaviour in response to government guidance, it was notably lower for young adults ages 18-24 years (53%) (4). This indicates a need for targeted communication to this group, (even though they are not considered vulnerable, but can spread the virus,) using alternative media resources (e.g. NGOs, social media, social influencers). In the event of Stage 3 implementation which would include community-wide containment, social media is considered an effective tool for communicating reasoning, reassurance, advice and dispelling of rumours (5). Getting the population to employ self-protective actions may need to be targeted at the family unit, and messaging focused on protecting loved ones versus the individual (3). In addition, monitoring and evaluation systems must be developed and implemented to understand public perceptions and opinions of the outbreak response in order to tailor communications moving forward (6).

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[1]Management for integrated NDTPs- Community sensitization and Social Mobilization- https://www.who.int/neglected_diseases/training/Session_4.4.pdf [Accessed March 22, 2020]

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B. Allowing mass gatherings and appropriate numbers for mass gatherings

Definition: Mass gatherings are not defined by a specific numerical value but rather if the number of people congregating is large enough to be a potential strain on the planning and response resources of the health system in the community where it takes place. The decision to alter or postpone gatherings is dependent on whether this level of stress is acceptable in the current situation. At our current stage of the contagion, stage 2, the aim is to contain or at least retard local spread (1).

Evidence from influenza outbreaks and transmission found that they are influenced by the type of event, the degree of crowdedness, the event duration and, possibly, whether the event is held indoors or outdoors (2), therefore things to consider include:

- The overall number of persons
- The number of people attending who are at greater risk of more serious illness
- The density of attendees within a confined area
- The level of transmission in your local community (and the level of transmission in the areas from which your attendees will travel – moot point now we are closing our borders)
- If there are ways to significantly reduce the number of attendees

There is little evidence related to COVID-19 and mass gatherings, but evidence from past pandemics have shown that acute respiratory infections appear to be the most common infectious disease transmitted at mass gatherings, specifically, for large religious gatherings (2). Models on influenza showed that gatherings occurring 10 days before the epidemic peak could result in a 10% relative increase in peak influenza prevalence and total rate. On the other hand, mass traveling or gatherings may have little effect when occurring much earlier (e.g. more than 40 days earlier) or later (more than 20 days later) than the epidemic peak (initial R0 = 1.5), with the potential recommendation that "monitoring, postponing, or cancelling large public gatherings may be warranted close to the epidemic peak but not earlier or later during the epidemic," for influenza. (3).

Specific recommendations for mass gatherings e.g. schools, workplaces and faith-based organisations include: in minimal spread – preventative measures e.g. stay at home if ill and hand hygiene, minimal – moderate spread – social distancing, staggered work hours, small groups <10 for high risk populations; substantial spread – it is recommended to cancel mass gatherings of any size and instead institute distance learning, telework, online services (4). A detailed risk assessment framework should be used in decision-making (5).

C. Social distancing

Definition: Maintaining a distance of 1-2m (3-6 feet) from the all individuals in the population.

Description
To achieve high compliance with recommendation to maintain a distance of 1-2m a range of measures can be taken in the workplace, school or home. The table below describes various measures used to achieve social distancing in these areas and the outcomes of studies assessing their effectiveness. Some of these studies were conducted when studying Influenza virus and others are specific to the COVID-19 currently spreading worldwide.

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Description SD	Where study done/Country which adopted this measure	Effectiveness
Social distancing interventions in non-healthcare workplaces: These included segregation of persons into small sub-groups (skeleton staff) and working from home Teleworking at home, staggered shifts, and extended holidays (1,2,3)	USA (2009H1N1); Singapore(2009H1N1)	Reduces transmission by 20-40%. Is much more effective when used in combination with other NPIs.
Thirteen studies investigated preemptive school closures (4,5)	USA (1918FLU) Hong Kong 2008 France 1986-2006 Israel 2000	Early and sustained school interventions reduced mortality rates by <25% school closures, followed by planned school holidays, reduced influenza transmission.
All households reduce contact outside household by 75%.	UK (modelling) 2020	In combination with case isolation and household quarantine this reduces need for critical care beds by 30-50% and reduces the risk of death by 13-20%.

Table 1: Social Distancing Evidence

Place	Stage 2	Stage 3
Schools	• » Alter schedules to reduce mixing (e.g., stagger recess, entry/dismissal times) » Limit inter-school interactions » Consider distance or e-learning in some settings • Consider regular health checks (e.g., temperature and respiratory symptom screening) of students, staff, and visitors (if feasible). • Short-term dismissals for school and extracurricular activities as needed (e.g., if cases in staff/students) for cleaning and contact tracing. • Students at increased risk of severe illness should consider implementing individual plans for distance learning, e-learning. number of attendees per gathering	• Broader and/or longer-term school dismissals, either as a preventive measure or because of staff and/or student absenteeism. • Cancellation of school-associated congregations, particularly those with participation of high-risk individuals. • Implement distance learning if feasible. Implement social distancing measures: » Reduce the frequency of large gatherings (e.g., assemblies), and limit the

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Workplace	Encourage staff to telework (when feasible), particularly individuals at increased risk of severe illness. • Implement social distancing measures: Increasing physical space between workers at the worksite » Staggering work schedules » Decreasing social contacts in the workplace (e.g., limit in-person meetings, meeting for lunch in a break room, etc.) • Limit large work-related gatherings (e.g., staff meetings, after-work functions). • Limit non-essential work travel. • Consider regular health checks (e.g., temperature and respiratory symptom screening) of staff and visitors entering buildings (if feasible).	Implement extended telework arrangements (when feasible). • Ensure flexible leave policies for staff who need to stay home due to school/childcare dismissals. • Cancel non-essential work travel. • Cancel work-sponsored conferences, tradeshows, etc.
Church	• Implement social distancing measures: » Reduce activities (e.g., group congregation, religious services), especially for organizations with individuals at increased risk of severe illness. » Consider offering video/audio of events. • Determine ways to continue providing support services to individuals at increased risk of severe disease (services, meals, checking in) while limiting group settings and exposures. • Cancel large gatherings (e.g., >250 people, though threshold is at the discretion of the community) or move to smaller groupings. • For organizations that serve high-risk populations, cancel gatherings of more than 10 people.	Cancel community and faith-based gatherings of any size.

Table 2: CDC mitigation strategies

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D. Social distancing in the >70 age group

Definition: Social distancing measures decrease interaction between people with the aim of reducing transmission of COVID-19. Public Health England (PHE) defines social distancing as avoiding: symptomatic individuals; non-essential use of public transport; large and small gatherings in public places; and gatherings with friends and family (1). If possible, PHE also recommends working from home and, if essential services are required, contact should be made via telephone.

People aged 70 or older (regardless of medical conditions) are at increased risk of severe illness from COVID-19: Current international data on the severity of COVID-19 disease demonstrate that older people have a higher infection fatality rate (4.3% in 70-79 years and 7.8% in 80+, compared with 0.15% in under 60s), and are more likely to require hospitalization (17-18% in 70+, compared with 4% of those in their 40s) (2). We are unable to predict whether these figures will apply to the Barbadian population, but it is likely that the older population will experience worse outcomes.

Effectiveness of social distancing in >70 age group: Previous experience with containing influenza outbreaks demonstrates that social distancing is ineffective on its own, but does enhance the effectiveness of mixed strategies (3). To our knowledge, no data exist on the impact of social distancing in older age groups on COVID-19 transmission. However, because the infection fatality rate increases sharply with age, targeted social distancing for over 70s has been proposed as an effective way to reduce morbidity and concomitant mortality (4).

Recent estimates for the UK and US predict that, if implemented for 3 months, the most effective combination of interventions is likely to be a combination of case isolation, home quarantine, and social distancing of the over 70s (5). The >70 age group has relatively less impact on transmission than other age groups, but reducing morbidity and mortality in the highest risk groups reduces both demand on critical care and overall mortality. They predict that this combination of interventions successfully achieves mitigation of COVID-19 transmission, reducing peak critical care demand by two-thirds and the number of deaths by half. However, mitigation may be insufficient to prevent healthcare services from being overwhelmed, and suppression is the preferred option for countries able to implement the intensive controls required. In order to achieve suppression, social distancing for the entire population over an extended period of time (≥5 months) is necessary, rather than focusing on high-risk groups (5).

E. Community-wide Quarantine as a Pandemic Containment Strategy

Definition: Community containment is the application of a physical or legal barrier to prevent movement of people in geographical (cordon sanitaire) (1).
Rationale: part of the suite of Non-Pharmaceutical Interventions (NPIs) enacted when medical interventions are absent or severely constrained (1). Currently for COVID-19, there are no available vaccines or antivirals, Hence the PH response has a heavy focus on interrupting the chain of transmission via using distance to separate people and thus prevent person-to-person spread of disease (1,2).

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Community Containment in the context of other actions used to disrupt the chain of transmission

Quarantine: means the movement restriction of potentially exposed persons who are not ill. Typically involves restricting individuals or groups and to their homes or designated quarantine facility.
Keys to success: settings with prompt case detection of potential cases and implementation of the restriction measures, effective contact tracing and good compliance to the restriction.

Social distancing: most appropriate in presumed community transmission possible but without clear linkages between cases, thus requiring additional restrictions beyond known exposures. Ranges from closure of institutions to proscription of mass gatherings

Community containment: is applied when quarantine and social distancing alone are deemed insufficient. Aim is to severely curtail personal interactions, to essential activities such as procuring vital supplies (2).

Although used synonymously there may be negative connotations to the use of the term curfew.

Curfew: May be defined as a law indicating restrictions have been imposed on the movement of persons. It is "a regulation requiring people to remain indoors between specified hours…"[2] This a control strategy typically used by law enforcement to combat crime and maintain order [3].

Community containment - considerations and opportunities for achieving compliance (1,2, 3)
1. Ethical and legal: There is potential criticism about loss of fundamental human rights but the communitarian approach to ethics provides a justification. The legal framework to invoke penalties must be activated within the country
2. Resources: This requires human and other resource inputs to enforce compliance e.g. setting up of checkpoints (2, 3) and presumably patrols and related activities.
3. Social media (SM): often seen as the "foe" but can be the "friend, if applied using best practice e.g. for risk communication. SM is good for "communicating the reasons for quarantine, reassurance and practical advice and to pre-empt false rumours and panic" (2). Current opinion is that failure to clearly and consistently communicate objectives and strategies has created challenges in the USA (3, 4)
4. Coordinated law enforcement and defence and security but they should not be the lead agency to announce curfews or shelter-in-place orders Suggestions senior government, particularly public health officials (3).
5. Variations on a theme exist:
    a. China: with social distancing, community-use of facemasks at all times and the "lock down" of the epicentre via disruption of all public transportation.

Implications for trade and travel especially international travellers (psychological and financial implications (individual traveller and home governments ability to evacuate its citizens (2)
    b. California and Maryland: instituted curfews. Activated state codes e.g. in California the penal code speaks to preventing "people from becoming a public "menace" in the face of a public health emergency" (3). This was accompanied by public messaging about

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[2] https://www.lexico.com/en/definition/curfew
[3] https://www.dictionary.com/browse/curfew

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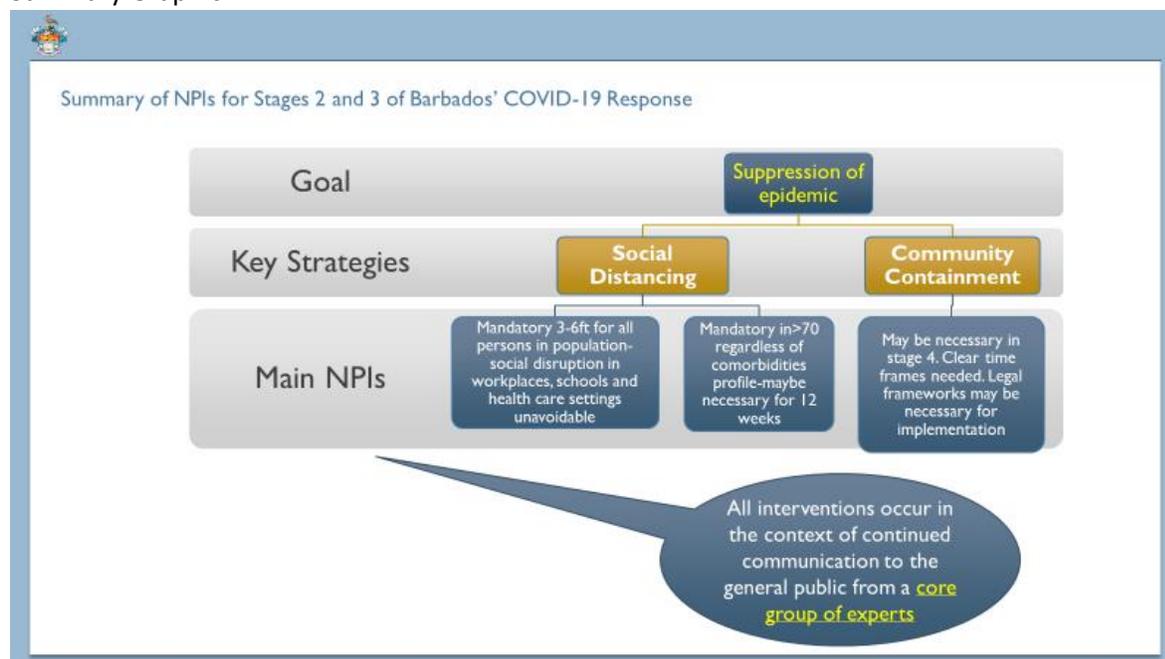March 25th 2020

enforcement and penalties, but use of language implying moral suasion is at play rather than compliance may have set the stage to undermine successful application (3, 4).

Notable is that reviewed studies reported negative psychological effects associated with quarantining including post-traumatic stress symptoms, confusion, and anger, due to: longer quarantine duration, infection fears, frustration, boredom, inadequate supplies, inadequate information, financial loss, and stigma with potential long-lasting effects. If quarantine is necessary, results indicate that every measure must be taken to ensure that this experience is as tolerable as possible. There is no evidence to determine if the effectiveness of other public health measures that prevent the need to impose quarantine (such as social distancing, cancellation of mass gatherings, and school closures) might be more favourable (5).

Take Aways
1. Community containment is merited when basic quarantine and social distancing remain necessary but are **no longer sufficient**
2. Need exists for clear consistently used terminology and given the potential negative connotation community containment may be the preferred term over curfew
3. Various models, but the A's of Primary Health Care (i.e. availability, acceptability, affordability etc.) may aid decision-making
4. To maximize benefits: ensure people are not quarantined for any longer than required, clear protocols and communication that explain what is happening, why, and how long it will continue, provide meaningful activities for them to do while in quarantine (e.g. free online services, support groups etc.), ensuring basic supplies (such as food, water, and medical supplies) are available, and reinforcing a sense of altruism (5).

Summary Graphic

Summary of NPIs for Stages 2 and 3 of Barbados' COVID-19 Response

Goal		Suppression of epidemic	
Key Strategies	Social Distancing		Community Containment
Main NPIs	Mandatory 3-6ft for all persons in population- social disruption in workplaces, schools and health care settings unavoidable	Mandatory in>70 regardless of comorbidities profile-maybe necessary for 12 weeks	May be necessary in stage 4. Clear time frames needed. Legal frameworks may be necessary for implementation

All interventions occur in the context of continued communication to the general public from a core group of experts

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