Message

From:	Van Tam, Jonathan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D29C846FC8FA4678B419C6F0DC3836F3-JVANTAM]
Sent:	12/02/2020 07:30:05
То:	Vallance, Patrick (GO-Science) [P.Vallance1@go-science.gov.uk]; Whitty, Chris [/o=ExchangeLabs/ou=Exchange
	Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0b3ee62e0ca04e978730b14f9b416a1e-Whitty, Chr]
CC:	Harries, Jenny [/o=ExchangeLabs/ou=Exchange Administrative Group
	(FYDIBOHF23SPDLT)/cn=Recipients/cn=cb41e14f2b234dbeb666d05ef2623bc1-JHarries]
Subject:	RE: The value and use of nonpharmaceutical interventions

OK, here's my overall thesis, and probably best kept at CMO/GCSA/DCMO level until we have a consensus position.

- 1. 1918 was a catastrophic pandemic (CFR typically 2.5%, definitely not under 2%)
- 2. 1957 was still tough to deal with but far easier (CFR probably 1-1.5%)
- 3. It would seem to be proportionate to think more seriously about layered containment (simultaneous NPIs) if our estimate of CFR is 2% or higher; but that's my started for ten and it is debatable if the threshold is actually 1.5% (I don't think there's a magic number).
- 4. We need a more settled CFR with higher confidence than at present
- 5. We don't yet have adequate projections on population clinical attack rate (but I'm personally forecasting 50%)
- 6. We don't have adequate data yet on hospitalisation rate, % requiring ventilatory support and in-hospital mortality rate; once we do we can understand the potential mismatch (gap) between likely reconfigured NHS emergency capacity and overall demand week on week. This in turn will tell us how pressing is the need to flatten the curve and shift it to the R.
- 7. Concerns with shifting it to the R 'in hope' rather than 'as deliberately planned' is that if by doing so, combined with what looks likely now a diminution of transmission rate over the summer (weather + school closures), we create a second wave in October to February (when influenza and other RVIs add to the joy and climatic conditions favour transmission) is a spectacular own goal, because we still won't have vaccines.
- 8. The, already aired, considerations about the attack rate in children and the contribution they might be making to transmission to adults (in spite of clinically inapparent disease) still apply and until we have some serological data from reliable sources (possible Singapore will be first as they have an assay and they have close to sustained transmission) we won't know how much we will get back from school closures.
- So I agree we need an intelligent, data led, and highly focused discussion over the next month on this.

Regards

JVT

From: Vallance, Patrick (GO-Science) <P.Vallance1@go-science.gov.uk>

Sent: 12 February 2020 06:46

Cc: Harries, Jenny <Jenny.Harries@dhsc.gov.uk>

Subject: Re: The value and use of nonpharmaceutical interventions

To: Van Tam, Jonathan <Jonathan.VanTam@dhsc.gov.uk>; Whitty, Chris <Chris.Whitty@dhsc.gov.uk>

Very interesting and hard to disagree with the suggestion that these are measures we need to consider in the context of covid19. Will you make a proposal on what you think we should do and which ones needs further evaluation and discussion?

Patrick

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This email is for personal matters only. If your email relates to the Government Office for Science, please re-send to my office email account - <u>gcsa@go-science.gov.uk</u>

From: Van Tam, Jonathan <<u>Jonathan.VanTam@dhsc.gov.uk</u>>
Sent: Wednesday, February 12, 2020 5:55:53 AM
To: Whitty, Chris <<u>Chris.Whitty@dhsc.gov.uk</u>>; Vallance, Patrick (GO-Science) <<u>P.Vallance1@go-science.gov.uk</u>>
Cc: Harries, Jenny <<u>Jenny.Harries@dhsc.gov.uk</u>>
Subject: RE: The value and use of nonpharmaceutical interventions

To follow up, having now found it. This paper is from 1918 when there were no antivirals. They are only correlations but there does seem to be something broadly consistent about layered NPIs and an early start. This is the kind of stuff I'd suggest we test with Spi-M and SAGE.

JVT

From: Whitty, Chris
Sent: 11 February 2020 22:32
To: Vallance, Patrick (GO-Science) <<u>P.Vallance1@go-science.gov.uk</u>>
Cc: Van Tam, Jonathan <<u>Jonathan.VanTam@dhsc.gov.uk</u>>; Harries, Jenny <<u>Jenny.Harries@dhsc.gov.uk</u>>
Subject: FW: The value and use of nonpharmaceutical interventions

Interesting fron **NR** Ithough there are some critical differences from flu, including R and possibly children, and I am not sure I would have done it via the press if I were him, but that's his call)...

С

 From
 NR
 @cepi.net>

 Sent: 11 February 2020 08:17
 To: Whitty, Chris < Chris.Whitty@dhsc.gov.uk>

 Cc: Jeremy Farrar
 Irrelevant & Sensitive

 Subject: FW: The value and use of nonpharmaceutical interventions

Dear Chris

Just wanted to give you prior notice about some direct outreach to Sarah Boseley at the Guardian in response to her article this morning about Gabriel Leung's recommendations concerning the evaluation of NPIs and moving from containment to mitigation – please see below the note to Ms. Boseley.

If problematic let me know and I can stor **NR** from sending this.

Best, NR

Dear Ms. Boseley,

I read your article "Coronavirus: expert warns infection could reach 60% of world's population" with great interest and strongly support Professor Leung's call to determine whether the non-pharmaceutical interventions used in Wuhan and other cities have reduced infections. Like Professor Leung, I am concerned that we are moving from a stage when containment might have been possible to one in which mitigation will become necessary. Limiting the social and economic costs of such mitigation to the greatest extent compatible with effective reduction of disease transmission will be critical.

When I was in the Bush White House working on national pandemic planning in 2005/6, I led efforts to reevaluate nonphamaceutical interventions in the event we encountered a pathogen (at the time we were worried about H5N1) that had some degree of asymptomatic or mildly symptomatic transmission and that would not be containable by case-focused interventions.

The goal (and we had access to the world's best modelers, including those at Imperial, through US NIH and the resources of the US National Laboratories) was to design a strategy that layered calls for responsible behavior by individuals, case-based interventions, and social distancing measures to try to suppress the points of disease amplification within social networks. We used agent based modeling to test how far the strategy could be pushed, in terms of Ro and decreasing rates of compliance (we assumed 30% in our most stringent scenario). See the attached "Modeling targeted layered containment" article.

We also performed deep historical research on the use of NPIs in 1918 (see the attached "Public health interventions and epidemic intensity during the 1918 influenza pandemic").

The bottom line is that for such interventions to be successful, at least with a disease like influenza that moves fast and where some degree of asymptomatic or mildly symptomatic transmission is thought to occur, they need to be used early (certainly before 1% of the population is infected, ideally before 0.1%), fast, and in a sustained way. The magic comes from combining case-based with social distancing interventions. The models suggested that they can be highly effective if implemented locally before 0.1% (ideally) to 1% of population infected. See Fig. 3 in the "Modeling targeted layered containment" paper for the benefits of early interventions. This finding was also confirmed by the historical analysis. In a more recent illustration of the value of such interventions, Chowell, et al., demonstrated a similar effect on epidemic curves when combined interventions, including school closure, were used to suppress disease transmission in the first weeks of the 2009-H1N1 epidemic in Mexico City.

The very best real world demonstration of this that I've ever seen is the comparison between outcomes in St. Louis and Philadelphia, which used nearly identical interventions in 1918 (see attached Powerpoint slide). The difference was that Philadelphia waited 16 days from the first known civilian case of Spanish flu to implement the interventions while St. Louis, having the advantage of lead time and seeing what was happening on the East Coast, implemented theirs 2 days after the first known civilian case. The bump at the tail end reflected St. Louis lifting the interventions due to severe pressure from the business community after 6 weeks, then reimplementing them as the number of cases began to rise.

Case-based interventions

- Isolation of cases
- Home quarantine of household contacts x 1-2 incubation periods
- Treatment if available
- Prophylaxis of household contacts, if available

Social distancing

- Closure of schools
- Cancellation of mass gatherings

- Workplace interventions to reduce transmission (liberal sick leave policies, telework, VTC rather than meetings, limit travel, etc.)
- Individual social distancing behaviors (avoiding mass transit, theaters, restaurants; home delivery of groceries; etc. if feasible)

NPIs are literally all we have right now. Their main benefit is in reducing peak intensity (see 1918 paper attached), which allows you to keep control in hospitals and across society while the infection wave passes through.

The interventions included in the Targeted Layered Containment (TLC) paper were, after about 18 months of scrutiny and debate, adopted with no fundamental change into US CDC's original Community Mitigation Guidance in 2007. The full set of interventions was designed for the truly break-the-glass scenario – these were developed for H5N1. Whether they are applicable in the case of 2019-nCoV is, of course, a matter for public health authorities to determine.

I would be happy to walk you and your colleagues through these papers and our findings and insights in more detail if that would be helpful.

At CEPI, we are working as hard as we can to deliver vaccines and ensure global access to these. In the interim, we need to buy time, which the application of these interventions will provide.





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