

**From:** WOOLHOUSE Mark [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9C4153BCEE124D7181397F6F48883523-MEJW]  
**Sent:** 27/02/2020 21:56:20  
**To:** Catherine.Calderwood@gov.scot  
**CC:** CMO@gov.scot  
**Subject:** Re: COVID-19 discussions

Dear Catherine,  
I have appended a briefing for you below. I am hoping to bring some supplementary material to our meeting tomorrow.  
Kind regards,  
Mark Woolhouse

### **COVID-19: Informal Briefing #5 for the CMO Scotland**

The contents of this briefing reflect a series of conversations with colleagues on SAGE and a series of discussion meetings of SPI-M (which I attend).

Summary of events so far:

WHO declared a PHEIC on 30/01/20. WHO are not yet referring a pandemic but, as of 25/02/20, were referring to a "potential pandemic". [You will recall I advised you that a pandemic was "likely" in my 21/01/20 briefing].

As of this week, DHSC UK is putting together an alternative Reasonable Worst Case scenario (which is based on a hypothetical influenza pandemic). [You will recall that I advised you this might be necessary in my 31/01/20 briefing]. The main source of uncertainty around how bad the RWC could be continues (frustratingly) to be the difficulty in estimating the ratio of hospitalisations and deaths to cases of infection: the numerator is known very accurately but the denominator is very uncertain.

Also as of this week DHSC are considering strategies to prevent all UK health systems being overwhelmed. [You will recall that I advised you this might be necessary in my 31/01/20 briefing].

Some components of the current containment strategy (e.g. contact tracing, mass quarantine) will have to be abandoned should we experience a full epidemic. The main strategies available to try to prevent a UK epidemic overwhelming the health system involve social distancing. [You will recall that I advised you that social distancing measures might need to be implemented in my 26/01/20 briefing].

#### Social distancing

Social distancing refers to measures intended to reduce the rate of contacts between infected and uninfected individuals (a 'contact' equates with an opportunity for virus transmission, and has an operational definition of being within 2m for at least 15 minutes).

The kinds of measures being discussed include closures of schools and public buildings, cancellation of meetings and mass gatherings, travel restrictions, home working etc. in addition to the current measure of self quarantine. In addition to enforced measures spontaneous behaviour changes are also likely.

By reducing contact rates social distancing reduces the case reproduction number. This will slow the epidemic, delay the peak, lower the peak and perhaps even send the epidemic into decline (as now appears to have happened in Wuhan).

However, social distancing measures are not intended to be permanent and when they are relaxed it is expected that the epidemic will resume. For this reason they are expected to have limited effect on the total number of infections (and hence numbers hospitalised or dying), but they can change the shape of the epidemic curve.

Though there is some disagreement on this point, my view is that we are some way from being able to predict the impact of social distancing measures on a COVID-19 epidemic: we can't say how effective they could be and we can't say how effective they would be in actuality, so it's hard to judge what impact they might have on an epidemic we cannot reliably predict in the first place.

We can say, however, that in social and economic terms they would be extremely costly so, ideally, we would like to do the minimum necessary for as short a time as necessary.

There are two scenarios we particularly want to avoid:

1. Doing nothing, as that is likely to result in the health system being overwhelmed in a matter of weeks once an epidemic takes off.
2. Implementing extreme social distancing measures that, sooner or later, have to be relaxed and then, having already paid a high social and economic cost, experiencing a (delayed) epidemic that still overwhelms the health system.

So we need to an intermediate path. At this point my advice is that more research is needed, and SPI-M members are doing that work at this moment. This involves making some judgement as to the likely impact of different measures (but there are very few data to guide us), considering the triggers for those measures to be implemented, deciding should we start low and ramp up or start high and ramp down, and deciding how long should they last. I hope to be able to illustrate the kind of work being done when we meet tomorrow, but I must stress that these are very difficult questions to answer. Yet answers will be needed.

One thing I can say with confidence: no social distancing measures should be introduced without a clear exit strategy, i.e. there are pre-determined triggers for stopping, both in the event that the policy is apparently successful and in the (more difficult) event that it appears to fail. (The FCO will soon come up against this issue with regards to travel advice to countries experiencing COV-19 outbreaks).

Mark Woolhouse

Edinburgh 27/02/20

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**From:** Catherine.Calderwood@gov.scot <Catherine.Calderwood@gov.scot>

**Sent:** 27 February 2020 11:13

**To:** WOOLHOUSE Mark <[redacted] I&S >

**Cc:** CMO@gov.scot <CMO@gov.scot>

**Subject:** RE: COVID-19 discussions

Thank you.

Yes- a meeting would be helpful and briefing paper.

Tomorrow afternoon?

Catherine

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(www.blackberry.com)

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**From:** WOOLHOUSE Mark <I&S>  
**Date:** Wednesday, 26 Feb 2020, 6:28 pm  
**To:** Calderwood C (Catherine) <[Catherine.Calderwood@gov.scot](mailto:Catherine.Calderwood@gov.scot)>  
**Cc:** Chief Medical Officer <[CMO@gov.scot](mailto:CMO@gov.scot)>  
**Subject:** RE: COVID-19 discussions

Dear Catherine,

I think that the current situation has progressed to a point where a meeting would be useful – I hope you agree. I am intending to send you a briefing document in the next 24 hours concerning the pros and cons of the model-based design of non-pharmaceutical interventions, as are being discussed in London at this time.

I can make myself available whenever best suits you.

Kind regards,

Mark Woolhouse

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**From:** Catherine.Calderwood@gov.scot <[Catherine.Calderwood@gov.scot](mailto:Catherine.Calderwood@gov.scot)>  
**Sent:** 10 February 2020 15:25  
**To:** WOOLHOUSE Mark <I&S>  
**Cc:** CMO@gov.scot  
**Subject:** RE: Introducing Professor Mark Woolhouse

Many thanks for emailing again. You are being kept busy!

I agree that meeting as this progresses may be more helpful.

Let's keep in touch.

Catherine

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**From:** WOOLHOUSE Mark <I&S>  
**Sent:** 10 February 2020 14:52  
**To:** Calderwood C (Catherine) <[Catherine.Calderwood@gov.scot](mailto:Catherine.Calderwood@gov.scot)>  
**Cc:** Chief Medical Officer <[CMO@gov.scot](mailto:CMO@gov.scot)>  
**Subject:** RE: Introducing Professor Mark Woolhouse

Dear Catherine,

My apologies for the slightly slow reply. I was in Sudan last week, partly to discuss coronavirus preparedness with their Ministry of Health and Public Health Laboratories.

There has been a great deal of further analysis of the epidemiological data from China and elsewhere since my last briefing on January 31<sup>st</sup>. However, I don't believe that any of this changes my last briefing – the new analyses have been mostly confirmatory and the general impression among my colleagues is that we still do not have enough information to make more precise predictions as to how this event is likely to unfold, in Scotland or anywhere else. There are still too many uncertainties about key parameters.

Although I see that the public health response in the UK is gearing up further – as today's various announcements indicate – I am still concerned that there is a possibility that existing preparedness planning will prove inadequate for this new challenge (though thankfully we are not close to that point yet). One possible approach – now being discussed – is to define the triggers that will indicate that this event will go beyond the 'Reasonable Worst Case' scenario. We will work on that in the coming days.

I would be delighted to meet at your convenience but it may be that the meeting is more useful to you when we are somewhat further forward.

Kind regards,  
Mark Woolhouse

Professor M.E.J. Woolhouse OBE FRSE FMedSci,

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"Better health, better futures"

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**From:** [Catherine.Calderwood@gov.scot](mailto:Catherine.Calderwood@gov.scot) <[Catherine.Calderwood@gov.scot](mailto:Catherine.Calderwood@gov.scot)>

**Sent:** 06 February 2020 13:55

**To:** I&S

**Cc:** WOOLHOUSE Mark <I&S>; I&S <[CMO@gov.scot](mailto:CMO@gov.scot)>

**Subject:** RE: Introducing Professor Mark Woolhouse

Sally

How lovely to hear from you. I hope you are enjoying your new role- how time flies indeed!

Mark has emailed in the very recent past with some extremely helpful modelling estimates which I have fed in to our system here but as yet we have not met.

I will certainly be in touch if I am in Cambridge – Newnham has a new Principal so I need to ingratiate myself!

Mark- let's find a time to meet face to face.

Best wishes

Catherine

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**From:** Sally Davies <I&S>

**Sent:** 05 February 2020 16:17

**To:** Calderwood C (Catherine) <[Catherine.Calderwood@gov.scot](mailto:Catherine.Calderwood@gov.scot)>



Cc: WOOLHOUSE Mark <[redacted] I&S [redacted]>; Trinity College Master's PA <[redacted] I&S [redacted]>  
Subject: Introducing Professor Mark Woolhouse

Dear Catherine

I hope this email finds you well. I am now into my fourth month here at Trinity College in Cambridge — how time flies!

I write to introduce you to Professor Mark Woolhouse, who I think, time permitting, you might benefit from having a coffee and conversation with, particularly in relation to nCov19 and Scotland's preparedness.

I worked with Mark in my time as CMO and trust both his scientific expertise and understanding of the policy-making process. It is also worth noting that his lab picked up a lot of the workload in response to H1N1, so he has direct relevant experience with the Scottish context. Mark is in copy and I will leave him to follow-up.

If you ever make your way to Cambridge, please do get in touch as it would be absolutely lovely to see you. In the meantime, I would like to wish you all the very best for 2020.

Sally

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