To: 5.1.2e 5.1.2e [5.1.2e @rivm.nl]; 5.1.2e 5.1.2e [5.1.2e @rivm.nl]; 5.1.2e 5.1.2e [5.1.2e @rivm.nl]; 5.1.2e 5.1.2e [5.1.2e @rivm.nl]; 5.1.2e 5.1.2e [5.1.2e @rivm.nl]
From: 5.1.2e 5.1.2e 5.1.2e 5.1.2e
Sent: Wed 1/6/2021 12:09:14 PM
Subject: RE: draft response to question from the ministry of health
Received: Wed 1/6/2021 12:09:15 PM
proposal scenario analysis 20201219_aj.docx

And I assume the uptake is 100% - thus old to young is roughly all vaccinated 65+, and young to old is all aged 20 to 35?

VE is 60% - thus max impact is 60% - reducing the 400DALYU per 100K to 160 DALY per 100K.
You seem to end up around 200 DALY per 100K when 25% is vaccinated, which means that with the old to young 83% of the disease burden is prevented when all 65+ are vaccinated?

Actually; do you have your distribution by age, because I could add this to the graph/text I made this morning, see at the end of the document attached "Exploration direct impact of vaccination targeting different age groups".

5.1.2e

From: 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>
Sent: 06 January 2021 12:49
To: 5.1.2e 5.1.2e 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>
Subject: RE: draft response to question from the ministry of health

Sorry, forgot to add that: 60% vaccine effectiveness across all age-groups

From: 5.1.2e 5.1.2e 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>
Sent: woensdag 6 januari 2021 12:47
To: 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>
Subject: RE: draft response to question from the ministry of health

Hi 5.1.2e

Which VE did you assume?

5.1.2e

From: 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>
Sent: 06 January 2021 12:03
To: 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>
Subject: RE: draft response to question from the ministry of health

Hi all,

Attached is the result of a static approach to estimating per capita disease burden as function of percentage of the population vaccinated, comparing two strategies. As the expected future disease burden is derived from the total burden estimated for the period until 31 Oct 2020, one should only interpret the relative impact on burden with increasing percentage vaccinated.
Note that because DALYs had been estimated using 5-year age-groups, for convenience I defined the vaccination-eligible population as 20 years and older (rather than the vaccine-dependent lower eligibility limit of 18 or 16 years)

groeten 5.1.2e

From: 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>

Sent: dinsdag 5 januari 2021 09:56
To: 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>
Subject: RE: draft response to question from the ministry of health

Hi 5.1.2e

I totally agree it's better to have something based on 5.1.2e work, my suggestion was only to have at least something already this week, should that be impossible.

By 'using a static model', do you mean: estimate current 'burden incidence' and calculate direct effect of vaccination, not taking transmission into account? That's more straightforward indeed, and interpretation is much easier. I think in that case it is more something for 5.1.2e (?), as the main issue in that case is estimating age-dependent burden.

5.1.2e

From: 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>
Sent: Tuesday 5 January 2021 09:47
To: 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>
Subject: RE: draft response to question from the ministry of health

Hi 5.1.2e
Thanks for thinking along.
About the first one (Effect of vaccination on R (dR/dv), as a function of age class vaccinated): sure, that would be great, no better suggestions from me. If you could update the Shiny app (perhaps together with 5.1.2e), it would be great.
About the second one: since it gives an indication for the short term, I would think it is better to invest our time into something that is based on 5.1.2e work. And if it turns out to be difficult to provide results on Thursday (which I think is too soon) we can see if it is possible to give a hint of the result using a static model based on current total burden by age.
Best
5.1.2e

From: 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>
Sent: maandag 4 januari 2021 17:40
To: 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>; 5.1.2e 5.1.2e < 5.1.2e @rivm.nl>
Subject: RE: draft response to question from the ministry of health

Hi 5.1.2e (and others)

Apart from thinking about all answers and suggesting alternative/complementary arguments, I see two concrete requests for (5.1.2e and) me:

- Effect of vaccination on R (dR/dv), as a function of age class vaccinated
- Figure of burden (Y-axis) vs Vaccine coverage (X-axis), for various strategies: from-young-to-old, from-old-to-young

For the first one: the model from your PNAS-paper with the code of the Shiny app could be used, with the most recent serology and incidence data. Was that your idea, 5.1.2e? Do you have other (better) suggestions, 5.1.2e and 5.1.2e?

For the second one: I can think of a way to calculate burden for the current situation and with vaccination, which is a quite narrow view, only using what I have done and can think of. That would be:

1. use your PNAS paper and the Shiny app, with most recent serology and incidence data, to calculate the largest eigenvalue_current + eigenvector_current for the current situation: the eigenvector provides a distribution of infections/age class/generation
2. normalise the eigenvector_current (sum = 1)
3. multiply with age-dependent measure of burden (e.g. probability to die, or something better provided by

[redacted]) -> the sum gives the 'current burden per generation'
4. now with vaccination: calculate the new eigenvalue_vacc + eigenvector_vacc for the new situation
5. normalise the eigenvector_vacc (sum = 1) and multiply with eigenvalue_vacc/eigenvalue
6. multiply with age-dependent measure of burden (as in 3.) -> the sum gives the 'burden per generation under vaccination'

This could give an indication for the short term; for the long term the effect on R will be more important, and some simple generation-by-generation simulation with these eigenvalues and eigenvectors could be an alternative.
But [redacted], you may have developed something that is much better suited for this question, or maybe any of you has alternative (better) suggestions

Best wishes
[redacted]

[redacted]