JOINT COMMITTEE ON VACCINATION AND IMMUNISATION

Minute of the JCVI Extraordinary Meeting on COVID-19 Immunisation prioritisation held 7 May 2020 13:00-16:00

Members

Prof Wei Shen Lim (Chair)
Professor Jeremy Brown
Ms Alison Lawrence
Prof Simon Kroll
Dr Rebecca Cordery
Prof Matt Keeling
Dr Fiona Van der Klis
Prof Adam Finn
Prof Rob Read
Prof Anthony Scott
Dr Maggie Wearmouth
Dr Martin Williams
Dr Kevin Brown
Prof Maartin Postma

Co-opted members

Dr Jillian Johnston (NI)
Dr Lorna Willocks (Scotland)
Mrs Anne McGowan (Wales)
Dr Julie Yates (England)

Medical Advisor

Prof Jonathan Van Tam

Secretariat

Andrew Earnshaw
Ruth Parry
Jonathan Crofts
Chris Lucas
Dr Mary Ramsay
Dr Gayatri Amirthalingam

Invited experts/presenters

Dr Peter Horby (Oxford University)
Jonathan Pearson-Stuttard (Imperial College)
Majid Ezzati (Imperial College)
Jasvir Singh (Moral and Ethical Advisory Group)
James Bennett (Imperial College)
Dr Jamie Lopez (PHE)

Invited observers from Devolved Administrations

Dr Syed Ahmed (Scotland)
Dr Jenny Mack (NI)
Dr Stephen Thomas (Wales)

Other invited observers

Dr Linda Diggle (Jersey)
Dr Jacqui Dunn (IoM)
Joana Rocha (Guernsey)
Nicola Brink (Guernsey)
Alex Hawkins-Drew (Guernsey)
Professor Maria Zambon (PHE)
Dr Michael Edelstein (PHE)
Gary Holden (MoD)
Dr Richard Roberts (PHW)
Anna Clarke (Eire)
Lucy Jessop (Eire)
Dr Vanessa Saliba (PHE)
Gavin Dabrera (PHE)
David Green (PHE)

Nick Andrews (PHE)
Joanne Yarwood (PHE)
Sema Mandal (PHE)
Dr Louise Newport (DHSC)
Stacey Jones (PHE)
Ellie Rose (DHSC)
Morwenna Carrington (DHSC)
Rory Constable (DHSC)
Peter Howitt (DHSC)
Dr Phil Bryan (MHRA)
Chris Pile (BEIS)
Nisha Jayatilleke (NHSE)
Louise Letley (PHE)
James Vaudrey (DHSC)
Karen Powell (PHE)
Suzanna Macdonald (PHE)
Elizabeth Miller (PHE)
Shamez Ladhani (PHE)
Andre Charlett (PHE)
Geoff Wootton (DHSC)
Will Morrison (DHSC)
Sandra Anglin (NHSE)
Dr Katherine Donegan (MHRA)
Claire Cameron (PHS)

Apologies

Prof Anthony Harnden (Deputy Chair JCVI), (Oxford University), Professor John Edmunds (LSHTM), Professor Graham Medley (LSHTM), Dr Jim McMenamin (PHS) Matthew Olley (NHSE) Dr Sandra Anglin (NHSE).

I. Welcome and Introduction

1. The Secretariat welcomed everyone to the meeting and thanked them for attending at short notice this extraordinary meeting on prioritisation of vaccine for SARS-CoV-2 (COVID-19).

2. The Committee noted that the JCVI Chair (Prof Andrew Pollard), was involved in the development of a SARS-CoV-2 vaccine at Oxford. In order to prevent any perceived conflict of interest, it had been agreed that he would recuse himself from the meeting. It had also been agreed that he would not attend or take part in any discussion at the Committee on COVID-19 vaccination at any future meeting.

3. The vice-chair who also worked for Oxford University but was not involved in any way in vaccine development, was also unable to Chair the meeting. As a result, JCVI member Professor Wei Shen Lim, who was also a member of the New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG) had been asked to chair this extraordinary meeting.

4. It was noted that there could be a requirement for JCVI Sub-Committee meetings on COVID-19, which would allow the opportunity for vaccine developers and industry to present their data. COVID-19 vaccine horizon scanning was to be covered at the upcoming June JCVI meeting.

5. Members were reminded that the discussions and papers for the meeting were highly confidential. The Chair thanked the Secretariat for their role in arranging this meeting at short notice.

6. The Chair outlined the aim of the meeting which was to provide provisional advice on prioritisation of person groups for vaccination with a potential COVID-19 vaccine to the Department of Health and Social Care (DHSC) to help with their planning for COVID19 vaccines.

II. Vaccine strategy (DHSC)

7. The Committee noted that a Vaccine Taskforce had been set up on 17th April 2020 to support development of SARS-CoV-2 vaccine. The role of the task force was to support industry and research institutions to rapidly develop and scale up manufacturing of a vaccine. This would help ensure enough vaccine would be available to vaccinate the UK population and prioritisation would be essential to ensure available quantities of vaccine were appropriately targeted.

8. The Committee noted that COVID-19 vaccines were in early development, with some at the early clinical trial stage, but none were at the point where detailed information could be provided to the Committee. This meeting would look at the available epidemiological data to aid initial discussions around prioritisation for vaccination and risk groups. Any early advice was subject to change as further information came to light.

MHRA regulatory work

9. The Committee received an overview from the Medicines and Healthcare products Regulatory Agency (MHRA) on the regulatory work underway to support vaccine development. The MHRA was proactively involved in the Vaccine Taskforce and was responsible for regulatory oversight of manufacture which included:

    - scientific advice and dialogue to manufacturers and researchers around trial design and product development;
    - expedited review of clinical trial authorisations, and
    - support on manufacturing facilities and clinical trial batches/mass production.

10. MHRA were also working with PHE on a safety surveillance strategy to enhance the routine yellow card reporting system alongside analysis of background disease rates from GP data to undertake real time statistical analysis of safety, as well as help manage any concerns about vaccine safety.

11. Monitoring of the safety was also to be expanded to include near real time surveillance and epidemiological analysis for defined clinical endpoints of adverse incidents of interest, as well as monitoring disease enhancement, safety in pregnancy and high-risk groups.

12. The MHRA was in the process of reviewing what electronic datasets were available and what additional information would be required, including data from delivery in novel settings.

13. The Commission on Human Medicines (CHM) had convened an expert working group to advise on this strategy and the MHRA would be working with other key stakeholders to reduce risk of duplication and ensure studies were complementary. Once vaccine was deployed the CHM group would continue to advise on the continuous safety analysis and risk-based approach.

14. The Committee noted that passive surveillance would be near real time as reports would be received by MHRA. The MHRA were continuing to review how quickly data would be made available for analysis. Use of these datasets was highly dependent on linking exposure and outcomes which presented challenges and MHRA were engaging with NHS digital to support this.

15. The Committee asked the MHRA if they could provide a summary on how quickly potential safety signals were likely to be reported on by MHRA. Key to this was ensuring that appropriate clinical endpoints were being collected so that the correct data was being reviewed, which the CHM would be advising on. It was noted that members of JCVI had been invited to sit on the CHM group. **Action – MHRA to provide summary on timeliness of safety monitoring.**

PHE planning

16. The Committee received an update from PHE on planning underway for the delivery of a COVID-19 vaccination programme.

17. PHE had begun development of a draft plan for the delivery of a COVID-19 vaccine and were planning for delivery over and above current services, ensuring the routine immunisation programmes remained in place, including any risk to the influenza programme. Planning was very dependent on the volumes of vaccine that might be available. Various scenarios were being planned for hypothetically. If a vaccine for all citizens was available, the aim would be to work alongside current programmes, with additional workforce and settings engaged, to prevent any delay in delivery. Timings for full programme delivery were dependent on a host of factors including any social distancing restrictions in place at the time and the volume of vaccine available

18. The Committee received an update from the Deputy Chief Medical Officer (DCMO) noting that several scenarios were in place for a safe and effective vaccine becoming available, including a best-case scenario of later in 2020, by mid-2021, or in the worst case not at all. A vaccine was of paramount importance, and Government was looking for early views on the volumes required (either one dose or two) in the UK and the priority groups to receive this based on limited or staggered availability. Therefore, DHSC was asking JCVI to convene in the absence of full information to give an early steer to inform strategic thinking.

19. The Committee asked what estimates there were on the volume of vaccine that might be initially available. Noting commercial sensitivities and research and manufacturing uncertainty, there was the potential for RNA vaccine manufacture to provide a million doses in a single batch. Therefore, bulk volume might not be an issue, but fill and finish capacity would be the rate limiting step. A fully equipped factory could potentially supply millions of doses per week.

20. The Committee asked whether any plans for modelling effectiveness was underway to help in prioritising those at risk, especially in groups where the vaccine might be less effective and with few years left to live. The Committee noted that a team at Warwick had begun modelling for COVID-19 vaccination, but this was at an early stage. It was highly likely that JCVI would ask for modelling for future meetings. A current challenge was using the latest data to inform the understanding of those considered extremely vulnerable that constituted the shielded population, and work on this could feed in to JCVI discussions.

III. Review of epidemiological data

21. The Committee received a presentation from PHE on epidemiological picture of the impact of COVID-19 focused on data generated from the surveillance systems in England.

22. These routine systems were based on influenza surveillance but had been adapted to include different case definitions and to reflect the data being returned. The data being generated represented all stages of the disease pyramid from asymptomatic infection through to death and included:

    - data on infections from seroprevalence and mass screening;

- data on symptomatic disease reports – web searches, population surveys, syndromic surveillance;
- data on patients seeking healthcare – GP sentinel swabbing, syndromic surveillance;
- hospitalisation data from the COVID-19 Hospitalisations in England Surveillance System (CHESS), including intensive care – CHESS, and
- mortality data – COVID-19 deaths from hospital surveillance and ONS and, excess all-cause mortality estimates.

23. Several enhanced surveillance studies had also been undertaken including

    - the first few 100 cases (FF100) surveillance, enhanced household transmission studies, the 'Flu survey' for patients tested, an Easter weekend care home study, health worker sero-incidence surveys and of an outbreak in a London army barracks.

24. Early cases were first seen at the end of January and over February, the majority of which were imported. Numbers were low until the end of February with most associated with travel from Europe. From early March case numbers had started to increase exponentially, and social distancing measures had been introduced. Advice from 12 March (week 11) introduced measures such as self-isolation of those with symptoms and cancelling school trips. Enforceable social distancing measures were introduced from 23 March (week 13) and included school closures and remaining indoors.

25. PHE had tracked how the interventions impacted on case numbers, which was dependent on the incubation period and the time taken for patients to contact health services.

26. The first impact of social distancing was expected in self-reported symptoms through community surveillance. The 'Flu survey', showed a decrease in reports from week 13, which was also mirrored in other systems e.g. google web searches.

27. PHE implemented sentinel swabbing of those attending GP surgeries which moved to a postal self-swabbing system with lockdown and recorded onset date. Data analysis showed the positive sample rate started to decrease from week 14.

28. Data from CHESS indicated that the peak in COVID-19 hospitalisations occurred in week 14 and had been coming down slowly since then. Excess all-cause mortality peaked in week 15 and was decreasing slowly.

29. The impact of social distancing had a more delayed effect in care homes which had continued to show high numbers of respiratory outbreaks until recently, with a decrease starting to be seen in the last week.

30. Limited data were available on asymptomatic infection. The 'Flu survey' snapshot of London showed 18 out of 948 patients were SARS-CoV2 PCR positive and 4

(22%) reported no symptoms in the preceding two weeks. A repeat survey was underway.

31. Serological surveillance had been initiated looking to test various serology collections of adult paediatric and adult populations and by geographical regions. Samples had first been tested using the commercial Euroimmun IgG assay and validated by PHE, which suggested that 26 – 30 days after onset sensitivity was around 75% and specificity around 95%. Antibodies appeared to take 2-3 weeks to develop. There were uncertainties around how well this assay performed in children. Results from two collections were presented:

    - Great Ormond Street Hospital (GOSH) - 10-12% positivity in children, but no obvious change in positivity over time.
    - NHS Blood and Transplant (NHSBT) – across the UK, positivity in adults varied by region, with highest positivity in London which increased from 3.3% to 14.2% from late March to mid-April.

32. Analysis of NHSBT samples by age group showed a higher prevalence in younger adults compared to older. Limited samples were available from children, but other paediatric collections were now being added and residual primary and secondary care samples were also being analysed.

    Risk Factors

33. Most of the risk factor data gathered came from symptomatic patients presenting to healthcare services. In the RCGP sentinel swabbing scheme a higher positivity was seen among males and older age groups.

34. Data on underlying medical conditions from the FF100 survey was used to compare against population data from the General Practice Research Database (GPRD). Imported cases in the First Few Hundred were not associated with the presence of comorbidities. This may have been because those who travel tend to be healthier. In the sporadic secondary cases analysed the main risk factors associated with infection were chronic liver disease, chronic heart disease, diabetes and immunosuppression.

35. A similar analysis of GP records (RCGP) of patients with COVID-19, likely to represent hospital visits, found the main risk factors associated with COVID-19 were obesity and chronic kidney disease but not diabetes, chronic heart disease or chronic respiratory disease. A higher risk of COVID-19 disease was associated with black ethnicity compared with white ethnicity and residence in more deprived areas compared with least deprived areas (index of multiple deprivation). It was noted there could be other factors which increased the risk for these individuals e.g. underlying health conditions, rates of which were higher in certain black and minority ethnic groups.

36. Looking at risk factors for severe disease the following was noted:

    - laboratory confirmed cases of COVID-19 showed a clear increase in hospitalisations in older individuals, especially males.

- CHESS data showed the oldest age groups were at highest risk of being hospitalised and a higher proportion of these were male especially those admitted to ICU.
- 60% of laboratory confirmed COVID-19 deaths were in males and 80% of deaths were in those 70 years of age and over;
- most of the excess all-cause mortality consisted of older age groups with more than 90% of excess deaths over the age of 75 years old;
- a multi-variable analysis of Hospital Episode Statistics (HES) data adjusted for socioeconomic status, age and region, but not co-morbidity, indicated that those from African, Bangladeshi, Caribbean, Indian, Pakistani and 'any other Asian' ethnic groups had a higher risk of a positive infection compared with the British White ethnic group;
- it was considered that this could be associated with occupation, household composition, and prevalence of pre-existing conditions;
- 88.2% of hospital admissions were of white ethnicity, but only around 66.3% of admissions to ICU were of white ethnicity;
- a greater proportion of younger patients were in non-white ethnic groups, when compared with white ethnic groups;
- Asian, Black and mixed-ethnic groups a had higher prevalence of diabetes and hypertension, while white ethnic groups had a higher prevalence of coronary heart disease;
- hospitalisation data were relatively underreported in London, meaning there could be some biases in the data;
- data on deaths, adjusted for age, sex, region and index of multiple deprivation, indicated that those of Bangladeshi, Caribbean, Indian, Pakistani and 'any other Black background' had higher odds of death from COVID-19 compared with those of white British ethnicity;
- in those of White ethnic groups, 84% of deaths were in those aged 70 years and over, compared with 62% of deaths in those aged 70 years and over in Black and Asian ethnic groups; and
- data indicated that the odds of death from COVID-19 increased with increasing levels of deprivation.

37. On risk factors for transmission, the Committee noted that:

- from the FF100 analysis, and based on symptomatic contacts, an analysis of secondary attack rates indicated transmission to children was much lower than in older household contacts;
- analysis on the age of the index case indicated a higher secondary attack rate where the index case was a child; however, this was based on only 7 households in the FF100; and
- prior to this data, there was no evidence of increased transmission with children.

38. In summary, the Committee noted that:

    - there had been a clear impact of social distancing, detectable through a range of surveillance systems;
    - care home outbreaks remained relatively high, compared with other indicators, but were starting to reduce;
    - older age and male sex appeared to be factors associated with a higher risk of disease;
    - evidence indicated that some Black and Asian groups were associated with increased test positivity and a higher risk of severe disease;
    - seroprevalence estimates indicated more infections in younger adults than older adults, however data on children were insufficient at this time to draw any conclusions; and
    - there were early suggestions that children may be more likely to transmit the virus.

39. The Committee thanked PHE for the presentation and noted that this information would be helpful in considering vaccination strategies targeting those at risk or targeting transmission.

40. The Committee noted that the data indicated lower sero-prevalence in older age groups, compared with younger age groups. Members questioned whether this was associated with the rate of infection, or the inability to generate detectable antibody in older age groups. It was noted that PHE were working to develop a better understanding of this. It was considered possible that assay performance varied by age. PHE were working to validate the assays using convalescent sera from a wide age range, and from those with milder or more severe disease, to develop a better understanding of the data.

41. Members asked whether there was any evidence on test-seeking behaviour by ethnic group. The Committee noted that evidence available indicated that the odds of being tested was higher for every ethnic group compared with White British. An increased risk of death was also seen in certain ethnic minority groups in all-cause mortality data.

42. The Committee agreed that the data indicated that those in certain ethnic minority groups were more likely to be infected. While data were limited, among those hospitalised there was an increased risk of ICU admission in certain ethnic groups. Many factors could be associated with these findings, including housing, prevalence of co-morbidities, and socio-economic status.

43. It was noted that numbers were small in the data which indicated increased transmission from children, and only included children who were symptomatic. Most children were over 10 years of age. Household mixing patterns would also be important to consider.

44. The Committee considered that studies which suggested children were less likely to be infected, would be biased if children were less likely to be symptomatic. It was noted that household studies underway would test all members of the household, irrespective of symptom presentation. It was noted that a number of studies had been published where all household members were tested, and these indicated a lower likelihood of transmission to children.

45. Members questioned whether there were studies underway to better understand transmissibility in childhood. It was noted a SAGE group looking at the reopening of schools, had formed the view that limited school opening would not have a significant impact on the national outbreak. The weight of evidence tended toward children playing a smaller role in transmission, although it was noted that the data were limited.

46. It was considered important for the Committee to understand the role children played in transmission when finalising advice on target groups for vaccination.

47. It was considered that social distancing could have an impact on transmission to and from children, as household contact would be very different from contact with other children in a school setting. Some modelling studies had indicated that school closure could have a substantial impact on community transmission. As schools reopened in other countries, data would develop on the impact of school closures on transmission.

48. The Chair summarised that more information on transmission in children was required, which would inform later decisions on vaccine priority groups.

<u>Imperial College London</u>

49. The Committee received a presentation from Majid Ezzati from Imperial College London on measuring the total mortality impact of the COVID-19 pandemic. The Committee noted that:

- the study examined all-cause mortality in the UK;
- excess deaths would be affected by the COVID-19 pandemic, but also could be impacted by restrictions in access to healthcare, and factors such as lower air pollution;
- the initial challenge was to assess how many deaths would have occurred in the absence of the pandemic, broken down by age, sex, cause of death and geography;
- the group had analysed a historical time series of weekly deaths from 2010 to the end of January 2020 and used an ensemble of 16 models to predict the number of deaths likely to have occurred in the absence of the COVID-19 pandemic;
- this approach potentially provided more robust projections, a fuller picture of uncertainty and the ability to review specific causes of death and smaller geographies;

- considerations in the study included medium- and long-term trends, seasonality, temperature levels beyond seasonality, holidays and the impact of deaths in one week on subsequent weeks on mortality;
- historical time series of deaths by age group indicated a small number of deaths in younger ages, with substantial fluctuation; in older adults there was a clear yearly pattern in the number of deaths over time;
- it had been assumed that COVID-19 had no impact on changes in the number of deaths up to the end of January 2020;
- the study predicted the number of deaths which would have happened from January 2020, in the absence of a COVID-19 outbreak, and uncertainty estimates were provided;
- up to mid-March 2020 the predictions and real data matched well;
- deaths recoded as COVID-19 related, and deaths not recorded as COVID-19 related, both increased above predicted levels from mid-March 2020;
- this increase was seen in all age bands from 15-44 years upwards, most pronounced in the oldest age groups;
- in those aged 15-44 years, most excess deaths were attributed in records as COVID-19 related;
- it was considered that there could be a number of deaths being associated with COVID-19, but not being recorded as such;
- at the time of analysis 27,000 deaths had been recorded as related to COVID-19; and
- the study estimated that around 7000 additional deaths had occurred which had not been recorded as COVID-19 related, that would not have occurred in the absence of the pandemic.

50. Members asked how many excess deaths were unrecorded COVID-19 related deaths, compared with mortality from other causes. It was noted that this analysis had not been undertaken and would be challenging. However, some work could be undertaken to examine those individuals where cause of death was highly likely to be non COVID-19 related, e.g. end stage cancer patients.

51. It was noted that this analysis differed from the ONS analysis, which was based on the average number of deaths over time. It was noted that PHE were reviewing all-cause excess mortality, by cause of death and region. The analyses up to Friday 1 May indicated 50,000 excess deaths, which indicated a bigger difference between excess deaths and COVID-19 associated deaths. The most recent excess mortality data from ONS indicated around 10,000 additional deaths not recorded as being COVID-19 related.

IV. Priority groups for immunisation - preliminary advice

52. The Chair noted that the task was to identify priority groups for COVID-19 vaccination, in the knowledge that there were a lot of uncertainties and absent

information, including on the epidemiology, transmission and vaccine characteristics. The Committee however had to form an initial view, to help inform planning in PHE, DHSC and NHSE&I.

53. The Committee noted that timelines for vaccine availability would be important to consider.

54. It was noted that DHSC had asked NERVTAG to look at at-risk group stratification to inform social distancing measures and healthcare advice. This work could feed into JCVI considerations on priority groups for vaccination.

55. The Committee noted that in recent considerations on influenza pandemic vaccination strategies, the Committee had considered vaccination of those most at risk, and vaccination to reduce transmission.

56. Members questioned whether a vaccination strategy targeting risk groups or transmission groups would be preferred. Members noted that no information on the ability of potential vaccines to prevent infection acquisition and transmission was available.

57. The Committee agreed that data on the ability of vaccines to protect against acquisition, carriage and transmission should be assessed by those developing vaccines. It would be important for study endpoints to include active surveillance for virus as well as disease.

58. Members noted that there were limited epidemiological data available on transmission, however more data were available on disease risk groups.

59. Members questioned the potential effectiveness of COVID-19 vaccines in risk groups such as immunocompromised individuals. It was agreed that data on vaccination in risk groups should be available from studies, and developers should incorporate risk groups in study designs.

60. Member considered that it would be important to develop research into acceptance of vaccination in different potential target groups.

61. Healthcare workers were considered to be at higher risk of exposure and it was noted that PCR positivity for SARS-CoV-2 was an order of magnitude higher in healthcare workers than those in the community. This meant that healthcare workers could be a priority group for vaccination. The importance of health and social care worker infection in onward transmission would also mean that vaccination in this group could be an important part of any vaccination strategy. Acceptance of vaccination in this group was considered important to understand.

62. Healthcare workers previously infected could have natural immunity to subsequent infection, although evidence on this was limited.

63. When considering onward transmission, duration of protection would be important to consider.

64. Given the lack of information on the ability of the vaccine to interrupt transmission, the Committee proceeded to focus on risk groups for severe disease and mortality, and the prioritisation of these groups for vaccination.

65. It was considered reasonable to assume that relatively healthy older adults would respond better to any vaccine, compared with those who were frailer and had co-morbidities.

66. The Committee noted that the available data indicated that disease severity and mortality increased markedly from age 50 upwards, with the highest risk in those aged 80 years and above, and that age might form the basis of a vaccination strategy for preventing morbidity and mortality. The Committee questioned, if vaccine supply was limited, whether the priority for vaccination would be for those over 50 years of age, and whether prioritisation would need to be considered for those most senior with fewer years of life left to live, compared with 'younger' older ages with more years of life left to live.

67. The Committee noted that in normal circumstances for vaccine assessments the usual process was to take a quality adjusted life years (QALY) based approach. Modelling was underway but at this stage it would be challenging to define model parameters in the absence of any data on a vaccine. Nonetheless, this could still be done based on certain standard assumptions on vaccine effectiveness (VE).

68. The Committee considered one priority group could be healthcare professionals, as this was a group at increased risk of exposure and infection, and of transmitting infection to vulnerable patients. It was also considered important to maintain resilience in the NHS during the pandemic. Older age groups could also be a priority, as they were at the greatest risk of serious disease, and vaccination of this group could also indirectly protect the NHS, by preventing admissions.

69. The Committee noted that geography might need to be considered in a strategy of prioritising for vaccination, since urban areas were more densely populated and had the highest rates of disease, and there was an unequal burden of disease by deprivation.

70. The Committee noted that social care workers were at increased risk of exposure to infection and subsequent disease and there was also the risk to those they cared for including those in residential and care homes. Social care workers were often low paid and from the BAME population, which were other potential risk factors associated with exposure/disease.

71. The Committee considered that the license of the vaccine would determine who would be eligible first. The current view was that, due to a mixture of safety requirements and a priority for adult groups, any vaccine would likely be licensed first in adults and then children.

72. In summary, the Committee agreed that health and social care workers were the first priority for vaccination, as it was important to protect them, reduce

transmission to vulnerable individuals, and to ensure resilience in the NHS and care sector. This was considered provisional advice.

73. It had been estimated that prioritising health and social care workers could involve vaccination of approximately 2.5 million individuals.

74. The Committee noted that with regards to the next priority groups for vaccination there might be three possible approaches to consider: a QALY based approach (which would need modelling with various assumptions), an age-based approach or an algorithmic approach looking at risk groups for severe disease/mortality and transferring this to vaccine priority groups, for example the shielded population.

75. At this stage modelling a QALY based approach would be challenging in the absence of important information on a potential vaccine (safety, effectiveness, duration etc). For the vaccines furthest in development, it was not known whether a single dose or a two dose schedule would be required. The Committee noted that there was likely to be a streamlined regulatory process for COVID-19 vaccines.

76. The Committee noted that a full economic analysis of the continued cost of lockdown was likely to be taken into account rather than the usual health economic analysis, and that there was unlikely to be a cost-effectiveness analysis in the assessment of a potential vaccine.

77. Prioritisation of vaccine would be health-based rather than economic-based as the underlying principle was about saving lives and protecting the NHS.

78. The Committee considered the information presented on who were most at risk in terms of morbidity and mortality and whether this should form the basis of vaccine prioritisation.

79. In older groups the vaccine might not work so well and that there might be the need to consider a cocooning strategy of vaccinating those they live with if this reduced transmission.

80. The Committee considered a list put together by the secretariat as a starting point for their considerations:

    i. frontline health and social care workers;
    ii. those aged 65 years and older in a risk group
    iii. those aged 65 years and older not in a risk group;
    iv. those aged 50-64 years in a risk group;
    v. those aged 50 to 64 not in a risk group;
    vi. those aged 18-50 in a risk group;
    vii. all other adults.

81. The Committee agreed that this provisional list which started with HCWs and then mortality groups according to risk and age to be a good starting point. This was likely to be the rough order if the vaccine was effective in the older ages and the list could be revisited as more data emerged to refine the advice and priority order. The list gave an early indication about the numbers needed to vaccinate.

82. The Committee considered that more granularity was needed in the data to better define the risk groups and form definitive advice on the age stratification. It was noted that there would likely be individuals in the 18-50 age range also at high risk of severe disease, for instance those with poor lung function, or in the shielded population. These would likely be a higher priority for vaccination than healthy individuals at older ages.

83. The shielded group could be the second priority group followed by stratification by risk group and age. The Committee noted that the group which constituted the shielded population was currently under review by NERVTAG and DHSC. The Committee noted that individuals belonging to BAME groups had a higher propensity for ICU admission. Ethnicity as a risk factor for morbidity and mortality was a factor to consider and work was ongoing to look at this. The Committee agreed that priority for vaccination should be ranked based on size of risk.

84. The Committee noted that there was a lot of experience in delivering vaccines to well defined groups, such as in the influenza programme, and that this was achievable for a COVID-19 programme. A clear communications approach and explanation to the public on who the risk groups were, and why they would be offered the vaccine first, would be needed. Experience in 2009 showed the public to be very accepting of such a policy. In 2009, work had been done in advance with the public about the need for stratification of risk groups and prioritisation for health care workers. The Committee noted that work was already underway in this area.

85. If a vaccine was able to block transmission, then the strategy might radically change to target transmission groups as a priority and provide indirect protection to other groups.

86. In summary the Committee agreed on the prioritisation of front-line health and social care workers followed by a mortality risk-based strategy. The latter, which needed to be developed, might be based on age or a risk algorithm which could be modified as more information became available.

87. Information which could modify the priority groups included:

- transmission groups;
- the properties of the vaccine (safety, effectiveness including across different age groups, duration of protection, number of doses, prevention of transmission);
- the timing of availability of vaccine in the pandemic and manufacturing capacity;

- operational delivery issues – e.g. with social distancing or if vaccine had certain storage requirements or short shelf life;
- the levels of natural immunity in the population at the point of vaccine deployment and duration of natural immunity;
- genetic drift of the virus which could impact on vaccine effectiveness, and
- repeated vaccination with viral vector type vaccines generating immunity to the vector itself.

Ethical considerations

88. The Committee received an introduction from Jasvir Singh co-chair of the moral and ethical advisory group (MEAG) which advised DHSC on ethical considerations. MEAGs work built on an existing ethical framework for pandemic influenza, developed by the Committee on Ethical Aspects of Pandemic Influenza (CEAPI) from 2006 to 2010. The latter was a useful reference point for issues arising in the current pandemic as was a 2006 paper from Jonathan Montgomery, the other co-chair of MEAG, on vaccine prioritisation during a pandemic.

89. MEAG had a diverse membership and range of views and was currently meeting on a weekly basis. MEAG was not at this stage in a position to give ethical advice on vaccine prioritisation but was expecting to start discussions on this shortly and could provide feedback on the outcome of this to the Committee.

90. The Committee noted that items likely to be discussed by MEAG included the difference between a transmission and mortality approach, and if a risk group strategy were employed, how these might be prioritised and also the issues of geography and ethnicity. The Committee noted that it would be useful if the ethics committee could give a steer on the questions being developed as part of the attitudinal survey on COVID-19 vaccination.

91. The Committee agreed that JCVI advice would be based on scientific principles from the available scientific evidence and this would not include detailed ethical considerations which were for DHSC to consider, informed by MEAG.

V. Conclusions and summary

92. The Committee agreed that it was content to offer interim advice, with all the associated uncertainties and caveats stated, noting that DHSC would consider the ethical dimensions of the advice. The Committee's advice was to prioritise vaccination of healthcare workers and social care workers and then prioritise vaccination using a mortality risk-based approach. The list that the Committee had discussed was a useful starting point but at this stage the Committee was working from broad principles rather than clearly defining what the groups should be and in what order.

93. The Committee agreed that more data on risk of serious disease and mortality were required, in particular on the risk of disease by age, sex, underlying health condition and ethnicity.

Declarations – (Conflicts of interest specific to COVID-19 vaccines)

Prof Wei Shen Lim (CHAIR)
Professor Wei Shen has no registered conflicts of interest Other information Member of the New and Emerging Respiratory and Viral Threats Advisory Group (NERVTAG) Co-investigator of the NIHR-funded (COVID19) RECOVERY Trial.
Prof Anthony Harnden (Deputy Chair)
Professor Harnden has no registered conflicts of interest.
Prof Adam Finn
Professor Adam Finn receives no personal payments from the manufacturers of vaccines. Non personal interest: The local Principle Investigator at Bristol for trials of the University of Oxford tChAdOx vaccine.
Prof Matt Keeling
Professor Matt Keeling has no registered conflicts of interest. Other information Member of SPI-M and occasionally sits on SAGE
Prof Jeremy Brown
Professor Brown has no registered conflicts of interest
Dr Martin Williams
Professor Martin Williams has no registered conflicts of interest. Other information Professor Williams holds a contract for work with Public Health England.
Dr Fiona Van der Klis
Dr Fiona van der Klis has no registered conflicts of interest
Ms Alison Lawrence
Ms Alison Lawrence has no registered conflicts of interest

Prof Maarten Postma
Professor Postma has no registered conflicts of interest
Prof Robert Read
Professor Read receives no payments from the manufacturers of vaccines. Professor Read has no registered conflicts of interest
Prof Anthony Scott
Professor Scott receives no payments from the manufacturers of vaccines. Professor Scott has no registered conflicts of interest Other information Professor Scott is Director of the Health Protection Research Unit at the London School of Hygiene and Tropical Medicine. He receives research funding from the National Institute for Health Research, the Medical Research Council, the Wellcome Trust and Gavi, The Vaccine Alliance, and the Bill & Melinda Gates Foundation.
Dr Maggie Wearmouth
Dr Wearmouth has no registered conflicts of interest
Professor Simon Kroll
Professor Kroll r has no registered conflicts of interest Other information He is the Honorary Medical Director of Meningitis Now
Dr Rebecca Cordery
Dr Cordery has no registered conflicts of interest Other information Dr Cordery works for Public Health England
Dr Kevin Brown
Dr Brown has no registered conflicts of interest Other information Dr Brown works for Public Health England
Dr Jillian Johnston (co-opted member)
Dr Jillian Johnston has no registered conflicts of interest

Mrs Anne McGowan (co-opted member)
Mrs McGowan receives no payments from the manufacturers of vaccines Mrs McGowan has no registered conflicts of interest
Dr Lorna Willocks (co-opted member)
Dr Lorna Willocks has no registered conflicts of interest
Ms Julie Yates (co-opted member)
Ms Julie Yates has no registered conflicts of interest