

# The Scientific Advisory Group for Emergencies (SAGE)

## What is SAGE?

The [Scientific Advisory Group for Emergencies \(SAGE\)](#) is responsible for providing Cabinet Office Briefing Room (COBR) meetings with coherent, coordinated advice and to interpret complex or uncertain scientific evidence in non-technical language.

Typically, SAGE meets in advance of COBR and the Government's Chief Scientific Adviser (GCSA) subsequently represents SAGE at COBR. SAGE provides COBR with science advice at the UK level.

In relation to COVID-19, SAGE brings together expertise from across the scientific spectrum, including epidemiologists, clinicians, therapeutics and vaccine expertise, public health experts, virologists, environmental scientists, data scientists, mathematical modellers and statisticians, genomic experts, and behavioural and social scientists who feed analysis, research and data into SAGE.

SAGE's role is to provide unified scientific advice on all the key issues, based on the body of scientific evidence presented by its expert participants. This includes everything from latest knowledge of the virus to modelling the disease course, understanding the clinical picture, and effects of and compliance with interventions. This advice together with a descriptor of uncertainties is then passed onto government ministers. The advice is used by Ministers to allow them to make decisions and inform the government's response to the COVID-19 outbreak.

The government, naturally, also considers a range of other evidence including economic, social, and broader environmental factors when making its decisions.

## SAGE and COVID-19

The scale and nature of the COVID-19 pandemic means that the breadth and length of the SAGE capability required is unprecedented. The science advice being provided by SAGE is relevant to a wide range of policy and operational areas. Consequently, SAGE has been operating at considerable pace to ensure the government has the best possible advice available and to keep the advice under review as more is learnt about the disease.

## SAGE COVID-19 evidence release

Scientific evidence supporting the government response to COVID-19 is published on [GOV.UK](#). The evidence sets out a number of the methods and findings that have informed SAGE advice on the COVID-19 outbreak. This evidence was often compiled rapidly during fast-moving responses, drawn together from a wide range of sources to provide a summary of the information to facilitate discussion, and should be viewed in this context. The data and information inevitably change over time. The papers presented here are the best assessment of the evidence at the time of writing. As new evidence or data emerges, SAGE updates its advice accordingly. Therefore, some of the information in these papers will have been superseded.

Among the papers referenced here, some are pre-prints. These are academic papers that have not yet been through the peer-review process, which can take months, and have been drawn upon by SAGE to ensure that the most current evidence is being reviewed in order to provide rapid advice to policy makers.

Some of the evidence that SAGE has drawn upon to formulate its conclusions has not yet been published. This is to allow scientists time to publish their research through the usual academic channels.

SAGE participants also receive regular updates and data from NHS-X, PHE and other relevant sources to help inform discussions. It should also be noted that SAGE participants of course draw on a huge range of published academic literature as you would expect for experts in their fields. Many other academic papers were taken in account during discussions.

As our understanding of the virus grows, we will continue to feed in essential scientific advice needed by the government to respond to the virus. During this time, we will update these pages with the evidence we are collecting to keep the public informed, while also continuing to provide free and frank advice to policy makers.

## **When does SAGE meet?**

Since mid-January, SAGE has met regularly and usually twice weekly. Typically, SAGE meets in advance of COBR and the GCSA subsequently represents SAGE at COBR. It first met formally to discuss specific science questions raised by COVID-19 on 22 January and has convened on a regular basis since then.

## **Who contributes to SAGE?**

SAGE is comprised of leading lights in their representative fields from across the worlds of academia and practice. They do not operate under government instruction and expert participation changes for each meeting, based on the expertise needed to address the crisis the country is faced with.

SAGE is chaired by the Government Chief Scientific Adviser, Sir Patrick Vallance and in health emergencies such as COVID-19 co-chaired where appropriate by the Chief Medical Officer, Professor Chris Whitty. It includes participation from Public Health England, Medical Director for NHS England, the Office for National Statistics, the NHS, the Food Standards Agency, Health and Safety Executive, and Chief Scientific Advisers of government departments relevant to specific meetings or their own scientific expertise.

In addition to core participants, SAGE is also attended by official representatives from relevant parts of government. There are roughly 20 such officials involved in each meeting and they do not frequently contribute to discussions, but can play an important role in highlighting considerations such as key questions or concerns for policymakers that science needs to help answer or understanding Civil Service structures. They may also ask for clarification on a scientific point.

## **What about the sub-groups?**

In a highly complex crisis such as COVID-19, a lot of work is done by sub-groups and de-facto sub-groups – covering for instance epidemiological modelling, clinical questions and behavioural science. For COVID-19 SAGE has two main subgroups:

- Scientific Pandemic Influenza Group on Modelling (SPI-M) (40-45 Participants)
- Scientific Pandemic Influenza Group on Behavioural Science (SPI-B) (18 participants)

In addition to the above groups, ad-hoc subject specific groups have been and will be stood up as needed. Examples include groups on transmission in children, environmental considerations, care homes and nosocomial spread.

SAGE also calls on advice from the standing expert group, New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG) (16 Participants) and the Chair of NERVTAG attends SAGE meetings.

These groups consider the scientific evidence and provide their consensus conclusions to SAGE.

In addition to SAGE other scientific advisory groups, such as the Advisory Committee on Dangerous Pathogens, give advice on specific aspects.

## **Who are the participants?**

When it comes to COVID-19, participants on SAGE and the expert groups come from over 20 different institutions who in turn consider research and original work from many sources including the COVID-19 Genomic UK Consortium, Imperial College London, London School of Hygiene & Tropical Medicine, Manchester Epidemic Group and many academic, clinical and other groups. Not all participants are at every meeting.

Names of participants were not previously published to date in line with advice from the Centre for the Protection of National Infrastructure and following standard procedure for COBR meetings, to which SAGE gives advice. Given the extraordinary and extended nature of the COVID-19 outbreak, [details of SAGE participants have now been published online](#).

## **Does the government have to listen to SAGE's advice?**

The government is not beholden to what SAGE says, and the evidence SAGE puts forward forms just one part of what the government considers before adopting new policies and interventions during an emergency. In this current pandemic, the government also has to consider other factors.

## **Can I read what goes on at a SAGE meeting?**

The government has published a number of the pieces of scientific evidence supporting the UK's response to COVID-19. You can [read the available evidence online](#) and plans are in place to publish evidence, research and supporting documents at regular intervals, when they are no longer under live consideration for policy decisions.

## **When has SAGE been activated before?**

The coronavirus is not the first time SAGE has been activated - there have been eight previous emergencies in the last 11 years, since its conception, when the government has sought expert scientific advice through the SAGE mechanism. Expert participants at SAGE are determined by the scientific expertise needed in that particular situation.

SAGE was last activated in response to the potential breach of Toddbrook reservoir in Whaley Bridge in August 2019. A Precautionary SAGE (known as Pre-SAGE) was activated to advise on the Zika virus outbreak in 2016. In 2015, SAGE was activated to advise on the Nepal earthquake, and in 2014 it was called in response to the Ebola outbreak in West Africa. It was also activated during the nerve-agent poisonings in Salisbury.

SAGE also advised on winter flooding in the UK in 2013, the Japan nuclear incident in 2011, the volcanic ash emergency in 2010 and the Swine Flu pandemic in 2009.