

**Precautionary Meeting of the Scientific Advisory Group for Emergencies
Zika Virus**

Summary Minute of 2nd Meeting

23 February 2016

Room LG21, Public Health England, Wellington House, SE1 8UG

List of attendees

Chair

Sir Mark Walport Government Chief Scientific Adviser

Attending

Emma Aarons Public Health England
Paul Cosford Public Health England
Tony Fooks Animal and Plant Health Agency
Robin Grimes Chief Scientific Adviser, FCO
David Lalloo Liverpool School of Tropical Medicine and Chair of ACMP
James Logan London School of Hygiene and Tropical Medicine
Dilys Morgan Public Health England
Mark Rowland London School of Hygiene and Tropical Medicine
Charlotte Watts Chief Scientific Adviser, DFID
Chris Whitty Chief Scientific Adviser, DH

Dialling in

Jeremy Farrar Wellcome Trust
Simon Hay University of Washington
Andrew Jackson University of Edinburgh
Michael Johansson US Center for Disease Control and Prevention
Alain Kohl University of Glasgow
Tom Solomon Liverpool School of Tropical Medicine

Secretariat

Katie Badman Government Office for Science
Colin Armstrong Government Office for Science
Elizabeth Surkovic Government Office for Science
Jack Wardle Government Office for Science

Observers

Hugo Jones DH (dialled in)
Alex McLaughlin DH
Jasdeep Sandhu DFID
Stuart Wainwright Cabinet Office

ACTIONS

1. **James Logan** to share update on lab data of competence of Culex as vector.
2. **Simon Hay** to circulate distribution maps of Zika that take account of Aedes Albopictus as vector.
3. **Michael Johansson** to share CDC statement on effectiveness of disinsection of planes.
4. **PHE** to review vector control advice for travellers in light of information in James Logan's paper.
5. **DFID** to work with **FCO** and **James Logan** to develop a set of vector control recommendations.
6. **GCSA and CSAs from DFID, FCO, DH and Defra** to use the advice from pre-SAGE for communication purposes.
7. **PHE** to continue to use the same advice for pregnant women in countries with sporadic transmission, with pre-SAGE's endorsement.
8. **PHE** to liaise with **CDC** about plans for the Olympics.
9. **PHE, DCMS, FCO** and **James Logan** to work together on travel advice related to the Olympics.
10. **Pre-SAGE Secretariat** to commission a piece of work on understanding the link to Guillain-Barré syndrome in advance of next meeting.
11. **All** to provide comments on research paper to Wellcome Trust
12. **Wellcome Trust** to publish research strategy as soon as possible.
13. **Wellcome Trust** to keep group updated on developments on immunology and pathogenesis.

AGENDA ITEM 1: WELCOME

The Chair welcomed participants to the second pre-SAGE meeting, which had been convened to ensure that government gets the scientific advice that it needs during the Zika epidemic. The aim was to focus on international issues. Attendees were informed that they should continue to speak to the media in their capacity as experts but content from pre-SAGE meetings was to be treated as confidential.

AGENDA ITEM 2: UPDATE ON THE LATEST SITUATION

As of 22 February 2016, 40 countries had reported active Zika transmission with new countries being affected; Trinidad and Tobago and the Marshall Islands. The Centers for Disease Control and Prevention (CDC) had reported 82 travel associated cases, with the majority in Florida. The European Centre for Disease Control and Prevention (ECDC) had reported 114 imported cases, with 20 in Germany and 24 in the Netherlands. Cases in the UK remain at 8; 5 of those in 2016 and 7 associated with the current outbreak.

The latest data from Brazil strengthened the evidence that microcephaly was associated with Zika infection during pregnancy. The view from US CDC was that the evidence was becoming much clearer and that it was highly likely, although not certain, there was an association between microcephaly and Zika infection.

It was noted that only *Aedes aegypti* had supported outbreaks of Zika in the past and there was no evidence that *Culex* mosquitos were efficient vectors.

Action 1: James Logan to share update on lab data of competence of *Culex* as vector.

AGENDA ITEM 3: THE GLOBAL SPREAD OF ZIKA VIRUS

Early modelling, based on *Aedes aegypti* distribution, demonstrates that many tropical and sub-tropical regions globally have suitable environmental conditions for Zika transmission to humans. It was estimated that 2.7 billion people live in these areas. If *Aedes albopictus* were to become a more efficient vector, modelling suggests that the areas suitable for Zika transmission would widen to include parts of southern Europe and continental USA. The UK is beyond the limits of transmission.

It was noted that caution should be taken when interpreting the outputs of modelling. There were many uncertainties about how Zika would spread over the coming months and years. This would be influenced by levels of pre-existing immunity within populations (which is currently unknown) and the ability of *Aedes Albopictus* to act as an efficient vector.

In conclusion, pre-SAGE agreed that Zika is likely to spread geographically over the coming months and years most likely to areas where there have been outbreaks of Dengue and Chikungunya in the past. Outbreaks in areas where there have not been outbreaks of Dengue or Chikungunya cannot be ruled out.

Action 2: Simon Hay to circulate distribution maps of Zika that take account of *Aedes Albopictus* as vector.

AGENDA ITEM 4: SLOWING OR STOPPING THE SPREAD OF ZIKA VIRUS

An array of vector control tools are available to prevent Zika transmission, but the epidemiological evidence about the effectiveness of these tools is mixed and weak.

Aedes aegypti mosquitoes has adapted to the urban environment. They breed in a wide-range of manmade containers found around the home, schools and industrial locations. In addition, they readily bite indoors as well as outdoors as well as during the day and evening.

In terms of personal protection, DEET and permethrin treated clothing may be the best recommendations. DEET should be recommended for pregnant women and safety data exists. Studies have demonstrated that permethrin treated clothing provides significant protection against landing and biting from *Aedes aegypti* mosquitoes and it could significantly reduce local mosquito populations. Research has also indicated that impregnated clothing can provide group wide protection, even to those not wearing the clothing,

The use of larvicides and removal of breeding sites can reduce vector populations, although this requires skilled personnel and training. 500,000 people are being deployed to do this in Brazil, with no training.

Bed nets should be recommended for those sleeping during the day, as this is when the mosquito bites.

Space spraying is unlikely to be effective. It is influenced by the design of buildings and the environmental conditions. In addition, it is likely to have a short term impact on mosquito populations as surrounding populations will re-invade and many mosquito populations are likely to show resistance to insecticides.

There is a lack of evidence that disinsection will be an effective intervention. In addition, there are anecdotal reports of variable compliance with recommended procedures. CDC will be publishing a statement on disinsection, highlighting that it is unlikely to have a large effect on preventing the spread of Zika. This was because there are very few mosquitoes on aircraft compared to people and it is likely that humans will introduce the virus to other parts of the world and not the mosquito.

It was noted that London School of Hygiene and Tropical Medicine were looking to develop an open, online course (MOOC) on Zika vector control.

The Chair concluded the discussion by recommending that PHE review their advice to travellers to ensure it was in line with the discussion and the information within Dr Logan's paper. In addition, it was recommended that DFID and FCO should use the paper developed by Dr Logan to develop a practical set of vector control recommendations and work with individual countries to develop tailored interventions.

Action 3: Michael Johansson to share CDC statement on effectiveness of disinsection of planes.

Action 4: PHE to review vector control advice for travellers in light of information in James Logan's paper.

Action 5: DFID to work with FCO and James Logan to develop a set of vector control recommendations.

It was agreed that the use of genetically modified (GM) mosquitoes would not be a feasible way to control a widescale epidemic. They could have niche roles, such as in geographically confined areas (ie islands), or in areas where there are low densities of mosquitoes and towards the end of an outbreak. There are also logistical issues, related to the manufacture of large enough quantities of GM mosquito required for widescale application and a lack of evidence on the effectiveness of using aircraft for dispersal. The current outbreak does, however, provide the perfect opportunity to conduct well designed trials to answer some of the unknowns and this should be reflected in the research strategy being developed by the Wellcome Trust.

Action 6: GCSA and CSAs from DFID, FCO, DH and Defra to use the advice from pre-SAGE for communication purposes.

AGENDA ITEM 5: THE RISK TO PREGNANT WOMEN

It was agreed that the risk to a pregnant woman if she developed Zika infection is the same irrespective of whether she catches it within a country with sporadic transmission or a country with active Zika transmission. However, the likelihood of a pregnant women catching Zika in a country with sporadic transmission (eg Thailand) is not significantly increased compared to countries with widespread transmission.

Action 7: PHE to continue to use the same advice for pregnant women in countries with sporadic transmission, with pre-SAGE's endorsement.

It was unknown whether pregnant women were at a greater risk of being bitten by an *Aedes aegypti* mosquito compared to the general population. It has been demonstrated that pregnant women are more attractive to *Anopheles* (malaria) mosquitoes. This could be the case for *Aedes* mosquitoes but it has never been studied. The mechanism that makes pregnant women more attractive to malaria mosquitoes is also unknown. It could be due to their rate of respiration, their higher body temperature or other factors.

During the Olympics, individuals should follow normal travel advice. The Olympics will be in Brazil's winter so the mosquito density will be lower, which may reduce the risk of contracting Zika virus. Risk should be considered as a broader issue, and therefore should also include risk from Dengue and Chikungunya.

Action 8: PHE to liaise with CDC about advice for the Olympics.

Action 9: PHE, DCMS, FCO and James Logan to work together on travel advice related to the Olympics.

AGENDA ITEM 6: CHANGES TO PREVIOUS ADVICE

There were signs of increased Guillain-Barré syndrome in individuals with Zika but this was still a rare event. It was agreed that this should be reflected in the advice to HMG from pre-SAGE. This would be reviewed further at the next meeting.

Action 10: Pre-SAGE Secretariat to commission a piece of work on understanding the link to Guillain-Barré syndrome in advance of next meeting.

In addition, the advice to HMG should be updated to state that people who sleep during the day should use bed nets.

It was agreed that the science on the risk of sexual transmission had not changed but this should be kept under review by the group.

AGENDA ITEM 7: UPDATE ON RESEARCH AGENDA

Further work was needed to develop the research strategy, including prioritisation of the gaps identified. Once finalised, the research strategy should be published as soon as possible.

Action 11: All to provide comments on the research paper to Wellcome Trust.

Action 12: Wellcome Trust to publish research strategy as soon as possible.

Action 13: Wellcome Trust to keep the group updated on developments in immunology and pathogenesis.

There had been 90 applications to MRC's research call, covering many of the areas in the draft research strategy.

AGENDA ITEM 8: AOB

The vaccines being developed for dengue could potentially be adapted for Zika. Work was underway to explore this further. Further work is also needed to explore the most effective way of utilising a vaccine once it becomes available.

The GCSA reminded the group that the next meeting would be in two weeks' time.

**SAGE Secretariat
24 February**