

Measures at the border

Triggering measures at the border

1. There are ongoing discussions about the possibility of putting restrictions at the border. SAGE previously discussed this issue and concluded that as imported cases account for such a small percentage of total cases (~0.5% at the time), there was little scientific justification for implementing any measures at the border at that point.
2. However, as cases in the UK reduce and the number of travellers increases and/or more countries experience high numbers of cases, there will come a point when imported cases could account for a much higher percentage of imported cases and will make a material difference to the UK epidemic.

Does SAGE agree with the principle that if imported cases represent a higher proportion of total UK cases, there would be scientific reason to implement measures at the border?

3. If so, then it would be useful to provide scientific advice on what might constitute a 'trigger point' for implementing measures at the border. The level of risk associated with imported cases will vary depending on the number of those cases and the level of domestic transmission, and it may not be possible to define a particular trigger point.

Is it possible for SAGE to use public health and modelling input to provide definitive advice on a particular point at which it would be advisable to implement measures at the border to control imported cases?

If not, is it possible to model a range of scenarios to inform decision-making based on risk appetite?

Assessing numbers of imported cases

4. How to assess the number of imported cases is not trivial. In the absence of direct data on the number of cases coming into the country from abroad, analytical approximation of predicted imported cases is likely to be the best measure.
5. The Home Office monitors data on the expected numbers of flights and passengers into the UK (see Annex A). Analysis could focus on countries that are assessed as being particularly high risk based on the incidence of COVID-19 cases in their population. The numbers of deaths reported in those countries is likely to be a better indicator of incidence than confirmed cases, given differences in testing regimes in different countries. Reported numbers of deaths could therefore be used to extrapolate the likely incidence in the general population, and in conjunction with the predicted passenger numbers, give an estimate of the

numbers of cases likely to be imported from those countries over the coming week.

6. A similar approach could be taken to include passengers travelling by rail and by sea.
7. These figures could be used to determine the contribution of imported cases to the UK totals. If the total number of UK cases falls to very low numbers, then the associated uncertainties would require absolute numbers of imported cases, rather than the proportion, to be considered.

Does SAGE agree to the approach outlined above to determine the proportion of total UK cases that are imported (and thus the level of risk from imported cases)?

If not, what is the best way to determine this?

Is SAGE able to stand up the ability to determine the level of risk from imported cases at any particular time?

Options for measures at the border

8. If the decision is taken to put in place measures at the border, there are a number of different measures that could be taken, which will have varying effectiveness. They will also each have policy and operational, as well as political, considerations. The main options are:
 - Screening on arrival. Possibilities include:
 - *Testing for infection*. At present, it would not be possible to test directly for infection in the rapid, high throughput way that would be required to be of use in this context. Even if this were possible, very early stages of infection would not be detected.
 - *Temperature screening*. Temperature screening is not effective as it will miss asymptomatic and presymptomatic cases, and not all symptomatic cases present with fever. There will also be a high rate of false positives from those who have an increased temperature for reasons that are unrelated to COVID-19 (see Annex B for a paper assessing the utility of temperature screening for influenza).
 - *Other screening*. Other ways of screening individuals may include screening for symptoms other than temperature (or in combination with temperature), but this would have similar inherent issues as temperature screening. Travel history may be used as a means of risk-profiling people, but this would be highly unspecific.

- Screening prior to travel, with passengers being refused travel if they do not meet the requirements. This would involve the sorts of screening noted above, with the same associated issues. Compared with screening upon arrival, this has the benefit of avoiding infected people potentially infecting other passengers, but is reliant on the country of departure for implementation.
- Quarantine/self-isolation. Passengers could be placed in quarantine for 14 days before they are allowed to travel to their final destination in the UK; this would have large practical implications in terms of accommodation. Alternatively, they could be told to self-isolate for 14 days upon arrival at their final destination in the UK.
 - These measures could be applied to all passengers, or just those arriving from higher risk countries. In the latter case, passengers from higher risk countries who have travelled via a third country would not be subject to quarantine/self-isolation.
 - The measures could be mandatory or voluntary.
 - As an alternative to a 14 day period, passengers could be offered a test and be released from quarantine if they test negative for COVID-19; however, the effectiveness of this would be dependent on the sensitivity and of any test used.
- Tracking and tracing. As part of a wider track and trace strategy, measures could be taken to ensure visitors to the UK can be contacted and require them to take part in any track and trace programme.

Which measure(s) would SAGE recommend as being the most effective?

Are there other measures that should be considered?

ANNEX A: Predicted numbers of passengers and flights from countries with high incidence of COVID-19 (Data from 23 April 2020)

In past weeks the actual numbers passengers arriving (indicated by passport swipes), has been lower than the forward look estimations. Thus the estimations presented here are likely to be upper limits.

Only direct flights are represented here. There are currently no flights from Brazil or Belgium.

Table 1. Approximate numbers of passengers expected, by country

Date	Belgium	Brazil	Canada	France	Germany	Iran	Italy	Spain	Turkey	USA
23/04/2020	0	0	71	0	117	0	76	22	0	421
24/04/2020	0	0	49	64	313	0	41	59	0	382
25/04/2020	0	0	53	29	104	0	18	0	0	429
26/04/2020	0	0	26	51	301	83	36	72	0	412
27/04/2020	0	0	72	0	344	0	26	22	0	431
28/04/2020	0	0	60	16	96	0	37	20	178	414
29/04/2020	0	0	24	9	263	0	65	38	0	408
Total	0	0	355	169	1538	83	299	233	178	2897

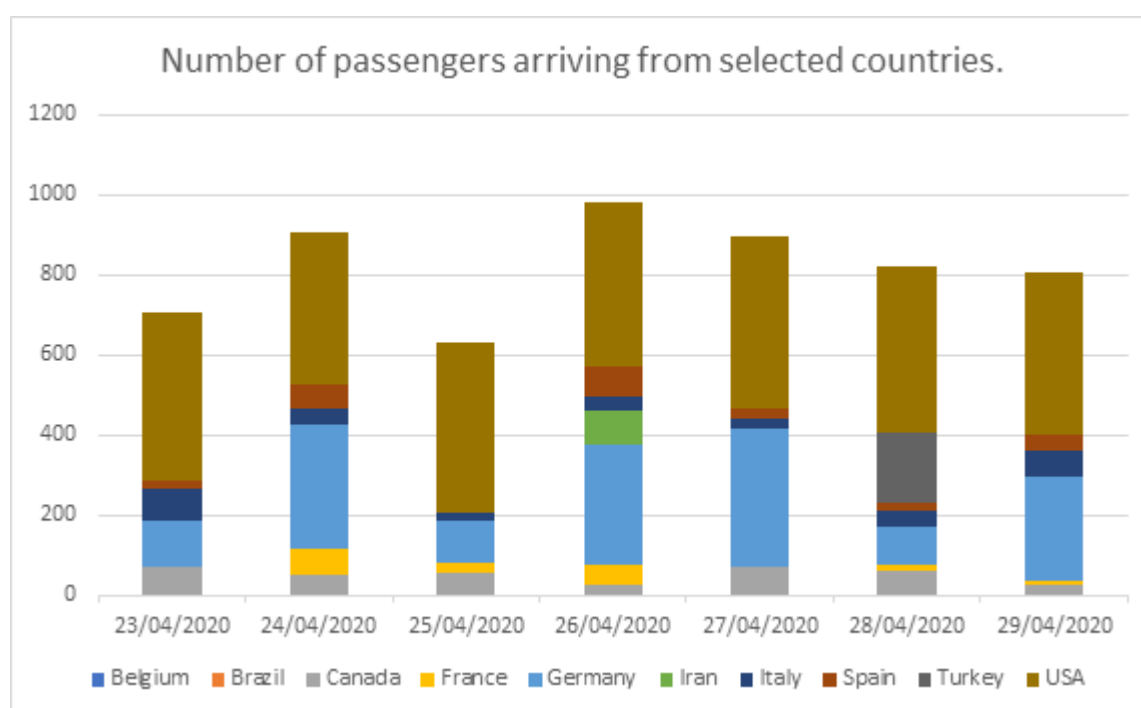
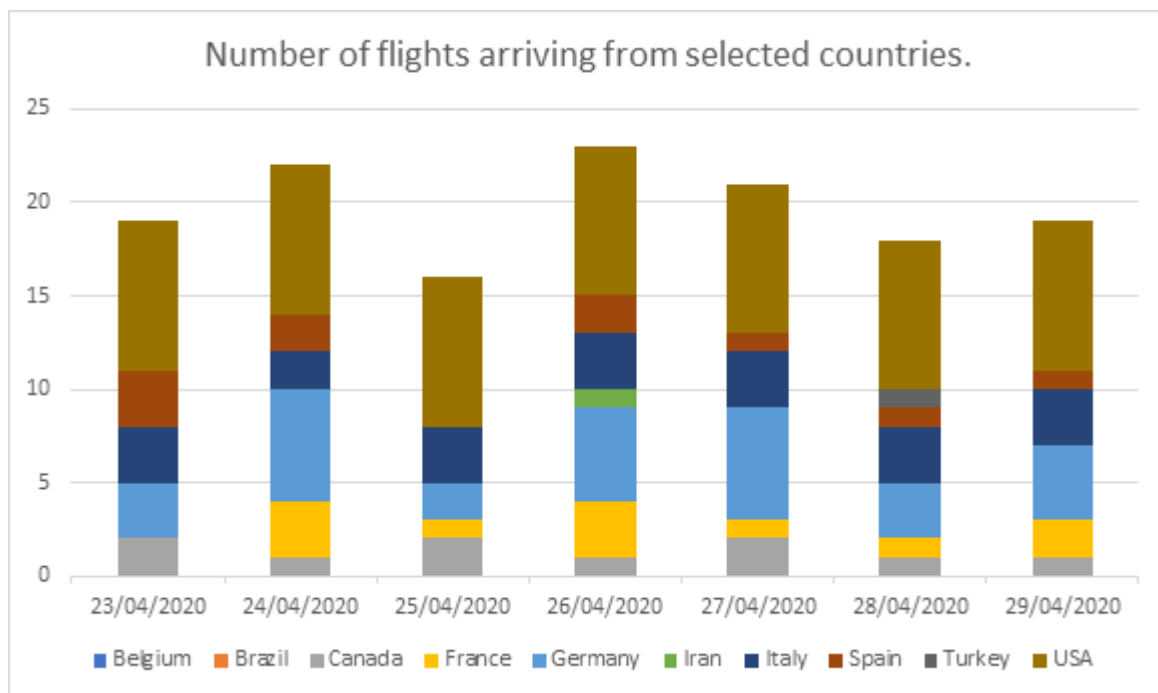
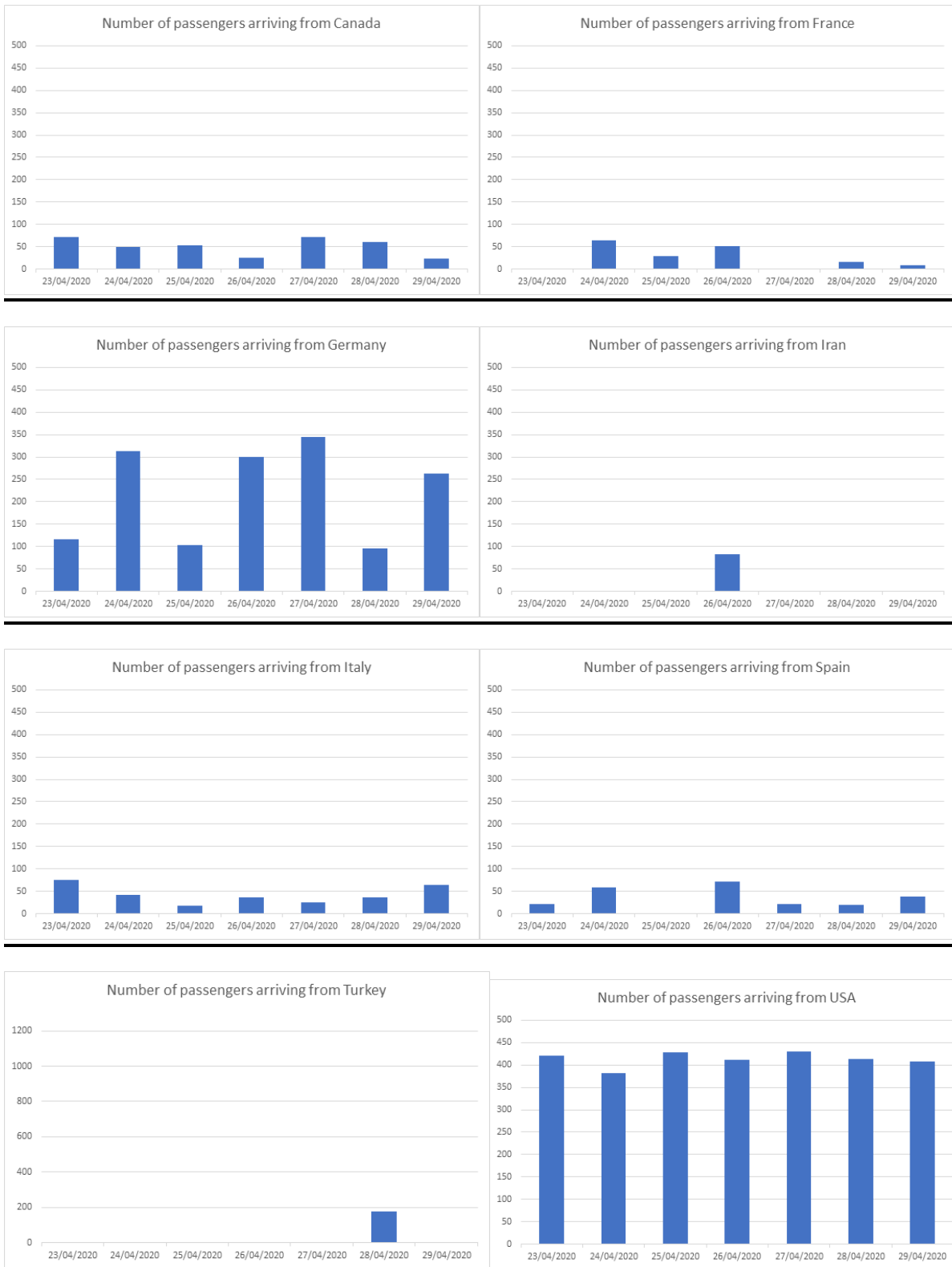


Table 2: Numbers of flights expected, by country

Date	Belgium	Brazil	Canada	France	Germany	Iran	Italy	Spain	Turkey	USA
23/04/2020	0	0	2	0	3	0	3	3	0	8
24/04/2020	0	0	1	3	6	0	2	2	0	8
25/04/2020	0	0	2	1	2	0	3	0	0	8
26/04/2020	0	0	1	3	5	1	3	2	0	8
27/04/2020	0	0	2	1	6	0	3	1	0	8
28/04/2020	0	0	1	1	3	0	3	1	1	8
29/04/2020	0	0	1	2	4	0	3	1	0	8
Total	0	0	10	11	29	1	20	10	1	56



Breakdown of passengers by country:



Breakdown of flights by country:

