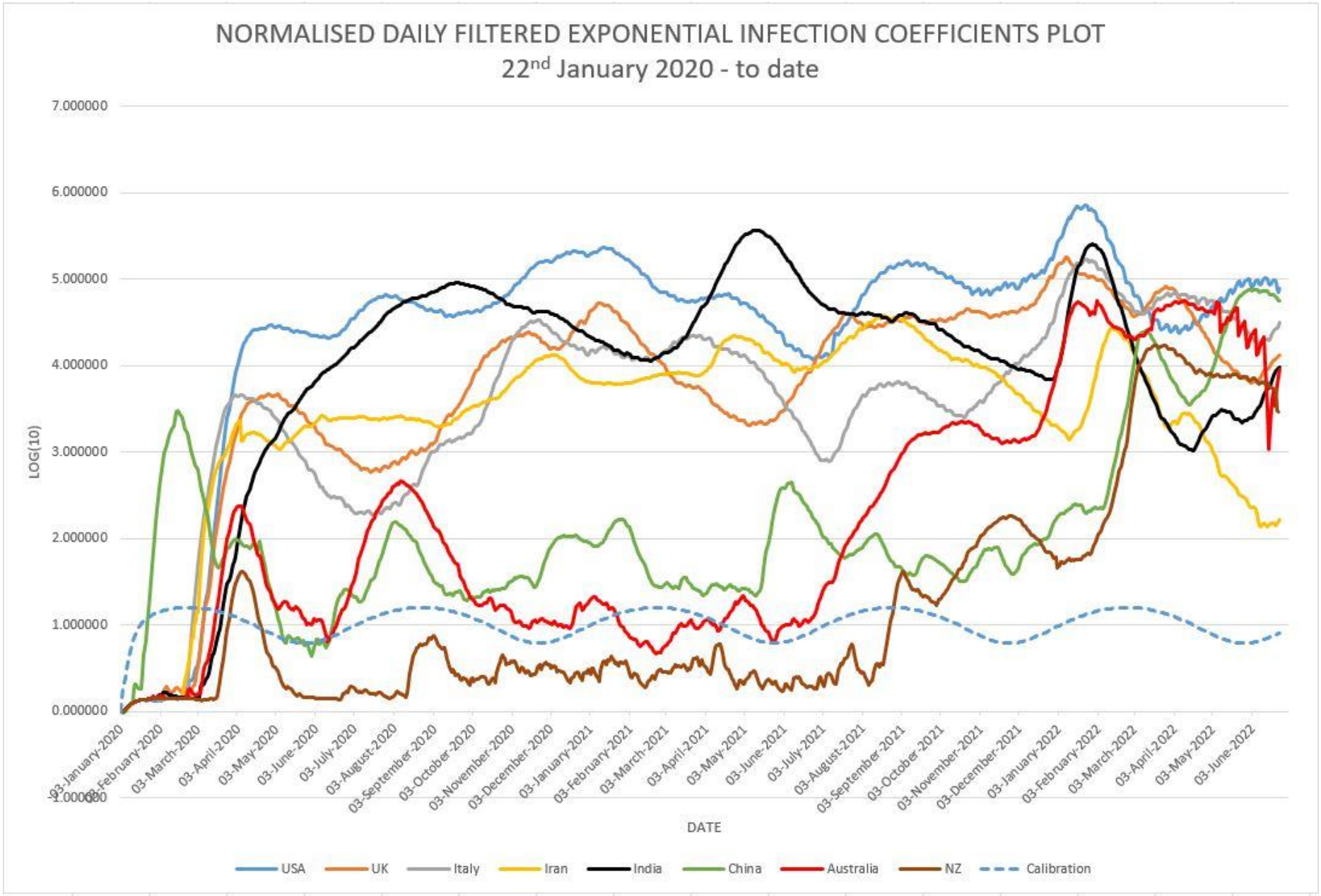
NORMALISED DAILY FILTERED EXPONENTIAL INFECTION COEFFICIENTS PLOT
22nd January 2020 - to date
LOG(10)
DATE
USA
UK
Italy
Iran
India
China
Australia
NZ
Calibration

CHART UPDATED 5/07/2022

Infection Status of Countries

All of the countries selected, with the exception of New Zealand, saw early infections (China was the first) and since WHO infection records go back to January 2020, it allows the first wave of COVID-19 to be captured in detail. In each case the first wave provides good insights into the exponential spread of the virus before appropriate national infection control measures were understood adequately by governments and health agencies, and control measures initiated. The logarithmic coefficients plots show community transmission and the effectiveness of control measures in individual countries, while the sinusoidal harmonic components of the trace show the natural daily variations in infection numbers – it should be noted that these frequency components are also influenced by non-periodic reporting intervals and the accuracy of the reporting.

Countries with regular and accurate case number reporting tend to have smooth plots with low frequency sinusoidal variations in the identity of the signal data, while countries with irregular or haphazard reporting produce traces with numerous step-changes. Step-changes and other irregularities also occur in countries that struggle to submit accurate reports on time, or do not have effective reporting in place. Even though the reporting from some countries may not accurately represent the true infection status, this data still has relevance if the country maintains a consistent reporting regime, albeit a flawed system.

In the interpretation of this data it is important to understand that when rigorous and effective control measures are in place i.e. closed borders, quarantine, lockdowns in conjunction with widespread community sampling, then the coefficient of infection spread will decrease and its characteristics will tend to reflect similar step changes to those seen with rising coefficients; however, in this case the irregularity of the traces is the result of positive interventions and should be regarded favourably.

The analysis model includes daily confidence checking routines to evaluate percentage error of predicted calculations i.e. this not only tests the infection coefficients, but also consistency of infection data provided to WHO as well as the tuning of the filter coefficients to track the daily changes in data rate. Further confidence checking of the model is provided by passing an internally generated sine wave calibration signal through the model at an amplitude of 1 on the coefficient scale.