1. Name of Governmental Department or Agency
Food Safety Authority of Ireland (FSAI)
2. Title of the Project
Data analytics for signals of emerging food safety risks
3. Description of the Project
The FSAI routinely reacts to food safety risks from known (and sometimes unknown) hazards like chemical and biological contaminants. However, there is a desire in Europe, led by the European Food Safety Authority, to be more proactive by anticipating risks to the food system before they actually materialise. To this end many countries and EFSA have developed emerging risk systems which seek to use horizon scanning for early identification of situations that could lead to the emergence of a food safety risk. In Ireland we are at the very early stages of developing an emerging risk system and we would like to explore opportunities to identify and mine big data sets to allow prediction of future food safety events. As a start, we would like to examine the possibility that existing data (Irish, EU and global) for areas not related to food and food safety could contain signals for the subsequent emergence of food safety risks in past. For example, we could look at climate change patterns, agrifood policy and production changes, geological data, societal changes etc that could be linked to the emergence in Ireland (or the EU) of a food safety risk? Where a possible link (no matter how tentative) is established, more contemporary data could be then used to see if it can be used to predict the future emergence of a similar food safety risk. This project would seek to identify publicly available data sets that could be mined for signals of emerging risks when coupled with predictive models for contamination events. This would be a capability building exercise and a blue sky study aimed at demonstrating the value of data analytics in emerging risk systems.
4. Project Scope **Task 1: Examination of state of the art:** The fellow will look at the published literature (Irish, EU and global) regarding data analytic work and emerging food safety risks from around the world and provide a short report on the state of the art. This will facilitate ideas generation and validate this approach. **Task 2: Identification of publicly available data sets:** Following ideas generation the Fellow will identify publicly available data sets (not necessarily related to food or food safety) that could be useful. The person will work with the FSAI IT and Data Analytics sections to develop a data capture system for FSAI where these data can be stored, updated and interrogated. **Task 3: Deriving associations between historical data and subsequent food safety risks:** By examining and analysing historical data sets, determine whether any signals could have been derived as early warnings of known food safety events. **Task 4: Predictive modelling:** The Fellow will identify publicly available models for hazards in the food chain and work to study hazards in the Irish food supply in the future using scenario analysis. **Task 5: Reporting and Evaluation:** The Fellow will publish peer reviewed publications on their work and lead an evaluation of the findings of the study to decide on future direction and continuation of the work.

5. **Skills/Expertise Required**

The skills required are as follows:

- Big data analytics
- Predictive modelling
- Ability to review and collate the peer reviewed and grey literature
- Science communication (written and oral)

6. **Expected Outputs of Project**

The outcome of the project will be a pilot emerging risk system based on scenario analysis that could be used for anticipation of future risks. An evaluation report and peer reviewed papers would provide the FSAI with an understanding of the utility of this type of work.

7. Working Arrangements

The placement would ideally be based at the FSAI offices in Dublin's IFSC area. However, flexibility to work remotely or other working arrangements could be considered. Any arrangement would require researchers to have access to the FSAI IT systems and to attend FSAI's offices as required. They will report to the Chief Specialist Food Science and Technology who will be responsible for directing the work.

8. Expected Timeline

The project is expected to take 9-12 months.