

Learning from serious incidents using improvement science, health services research and machine learning to make hospitals safer for surgical patients

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Patient safety is a serious worldwide public health concern. Adverse events in the United Kingdom (UK) are estimated to occur in 10% of hospital admissions and costing £2 billion per year. In the UK, all serious incidents (SIs) are systematically reported and stored in the Strategic Executive Information System (StEIS). This repository, managed by National Health Service (NHS) Improvement, holds an enormous amount of data spanning the whole of the UK over many years.

The data is currently not systematically reviewed to improve patient care, however we will describe how this data can be used to prioritise Health Service Research by using it to identify; patterns, comparative information, trends and hot spots on a national level and we will explain a methodology that can be used in countries with similar types of centralised databases. The aim is to allow changes applicable nationally to be designed and prioritised for the highest impact on patient safety.

We will provide an example, as proof of concept, where our team have used this repository to evaluate a common acute paediatric surgical emergency. As a result, over 1000 patients in the UK were discovered with SIs relating to this condition during a 3-year period. These SI reports underwent thematic analysis with the aim of feeding into a 'logic model' and pragmatic trial evaluation of the impact quality improvement intervention can make on safer care outcomes in this condition.

We describe the potential for machine learning to process high volumes of information within the database. Machine learning or artificial intelligence is based on data pattern analysis and is capable of processing overwhelming amounts of complex data. This can be applied to reported SIs to identify common themes and enable us to strategically make changes to enhance patient safety within our nation's Health Service.

Biography

Mr Tony Tien studied Medicine at Imperial College London and graduated in 2015. He became a member of the Royal College of Surgeons England in 2017. He has completed his Core Surgical Training in the United Kingdom and is now working as a Research Fellow with Professor James Green at Whipps Cross University Hospital. He has multiple publications and has presented internationally.

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