Fifty years of anaesthetic mortality review
An Australian story
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INTRODUCTION
Anaesthesia is not a therapy in itself and ideally should have no adverse outcomes. The administration of anaesthesia may lead to procedural complications and physiological changes that contribute to morbidity and mortality.

In NSW anaesthetists are legally required to notify the death of a person while under, or as a result of, or within 24 hours after the administration of an anaesthetic for a medical, surgical or dental operation or procedure (anaesthesia-related death). The Special Committee Investigating Deaths Under Anaesthesia (SCIDUA) is an expert committee with members appointed by the NSW Minister for Health to review all anaesthesia-related deaths since 1960. The Committee identifies the causal and/or contributory factors associated with anaesthetic deaths and examines emerging trends due to developments in anaesthesia and medical interventions. Information collected by SCIDUA is protected by legislation. SCIDUA provides confidential feedback to the reporting anaesthetist. The Committee has published special reports in peer-reviewed journals and submits annual de-identified and aggregate data to the Australian and New Zealand College of Anaesthetists for triennial reporting on anaesthesia safety. The audit has encouraged reflective learning among anaesthetists and facilitated improvement in anaesthetic practice.

METHODS
This study involves:
• Examination of the data published/colllected by SCIDUA between 1960 and 2010
• Determining the comparable data across the past five decades
• Analysis of change across the five decades since 1960 by chi-squared test for trends.

RESULTS
Between 1960 and 2010, SCIDUA classified 1196 (14%) of 8761 reported deaths as attributable to anaesthesia. The estimated anaesthesia-related mortality has declined significantly from 1 in 5,500 procedures in 1960 to 1 in 55,140 procedures in 2008. Our data indicated a reduction in the following anaesthesia-related deaths reported between 1960 and 2010:
• Maternal deaths (from 22 or 7% to 1 or <1%, p<0.001)
• Patients under 40 (from 93 or 33% to 17 or 6%, p<0.001)
• Patients who were “fit and well”* (from 65 or 19% to 24 or 9%, p<0.001)

Our data also showed an increase in the number of anaesthetic-related orthopaedic deaths from 0% in 1960 to 112 or 40% in 2010 (p<0.001).

SCIDUA identified 2322 causal factors in the anaesthetic management, which represents 1.9 factors per death. The most commonly identified factors across the decades include:
• inadequate preparation
• wrong choice of anaesthesia
• inadequate post-operative management, and
• incorrect drug dosage.

Inadequate ventilation as a factor has declined considerably since 1970 but inadequate intra-operative monitoring has become more frequently identified and was among the top five factors in the 2000s.

DISCUSSION
This study confirms improvement of anaesthesia safety, particularly in children, obstetric patients, patients aged under 40 or who were deemed “fit and well”* New challenges for anaesthetists today include a willingness to operate on older and sicker patients (as observed in the increasing numbers of reported deaths following hip fracture surgery), the increasing complexity of modern surgical interventions, new drugs and equipment and the demand for increased efficiency.

* “Fit and well” refers to patients who were assessed to have an ASA Grade of 1 or 2. ASA grades were devised by the American Society of Anaesthesiologists.