1. Title

Coronial investigations in people with diabetes aged <40 years: Who dies and why?

2. Research team members

Chief investigators (all from Australia)

Dr Steven James (University of the Sunshine Coast, Petrie; University of Melbourne, Parkville; and University of Western Sydney, Penrith); **Prof Maria E. Craig** (Children's Hospital at Westmead, Westmead; University of Sydney, Camperdown; and University of New South Wales (UNSW), Kensington); and **Prof Kim Donaghue** (University of Sydney, Camperdown).

Co-investigators (from Australia unless stated)

Prof Jennifer Couper (University of Adelaide, Adelaide); **Prof Peter Colman** (Royal Melbourne Hospital, Parkville; and Medicine, University of Melbourne, Parkville); **Prof Edward Gregg** (Royal College of Surgeons, Dublin, Ireland; and Imperial College London, London, United Kingdom); **Prof Lin Perry** (University of Technology Sydney, Ultimo; and Prince of Wales Hospital, Randwick); and **Assoc Prof Julia Lowe** (University of Toronto, Toronto, Canada).

3. Study summary

Coronial investigations can afford a unique opportunity to gain further information around death in people with diabetes, especially when considering sudden unexpected death. The reasons for a coronial investigation include unknown cause of death, unknown identity of the deceased, the death being violent, unnatural/suspicious, occurrence in care, custody or as a result of police operations, related to health care, or if a 'Cause of death' certificate has not/is not likely to be issued [1]. Surprisingly, international and Australian data relating to coronial investigations involving people with diabetes are limited.

This study aims to investigate, in people with diabetes aged <40 years,

1) the main causes of death in those undergoing coronial investigation; and
2) factors associated with premature death, including
    a) HbA1c since diabetes diagnosis and in the 24 months prior to death;
    b) diabetes healthcare engagement since diabetes diagnosis and in the 24 months prior to death;
    c) clinical and demographic characteristics (including age, sex, diabetes type, diabetes duration, socioeconomic status, diabetes therapy, blood pressure and body mass index); and
    d) diabetes-related complications (severe hypoglycaemia, diabetic ketoacidosis, retinopathy and nephropathy)

The study involves linkage between coronial investigation data in people with diabetes aged <40 years (National Coronial Information System [NCIS]) and diabetes registry data (Australasian Diabetes Data Network [ADDN]) (Figure 1).

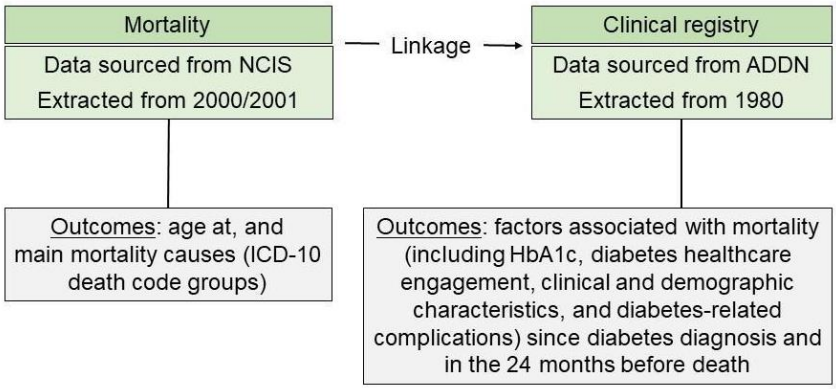

Figure 1: Methodology summarized

Data manually extracted from the NCIS will include case demographics; cause of death details. Such data will be extracted from 2000/2001 (from when data are available) to 2021/2022 (most recent data availability). In autopsy reports that only mention "diabetes" or "diabetes mellitus", type 1 diabetes will be classified using the criteria of taking insulin at or within one year of type 1 diabetes diagnosis; people recorded as having type 2 diabetes and who were diagnosed at ≤30 years and taking insulin within six months of diagnosis, will be reclassified as having type 1 diabetes

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Data retrieved from the NCIS will be shared and linked with ADDN, a prospective clinical quality registry that currently houses data for around 25,000 people with type 1 or type 2 diabetes. Possible identifiers retrieved from the NCIS will be shared with the ADDN team, who will then link this with ADDN based on algorithm led-probabilistic sampling -matching available people where possible using identifiers where known; ADDN does not collect identifying information such as patient names, addresses and medical record numbers. Socio-demographic and clinical data on each person identified as having had a coronial investigation will be extracted from ADDN for all years on which data are available. No exclusion criteria will be applied.

4. Progress

The study is progressing according to the proposed timeline. Access to NCIS data requires approval by the Justice Human Research Ethics Committee, with several steps being required before an application for approval can be made; with each step having a variety of required documents and a due date for submission. This includes submission to the NCIS unit for review and feedback; submission to the NCIS Research Committee, and the Coroners Court of Victoria. Having now received all required approvals, including from

the Justice Human Research Ethics Committee, we are currently awaiting completion of a legal agreement between the University of the Sunshine Coast and the NCIS – before commencing data collection.

5. Reference

1. Queensland Health, *Coronial investigations explained*. Available at: https://clinicalexcellence.qld.gov.au/sites/default/files/2018-02/coronial-investigation.pdf, accessed 30th May 2024, 2024.