The wider benefits of SGLT2 inhibitors

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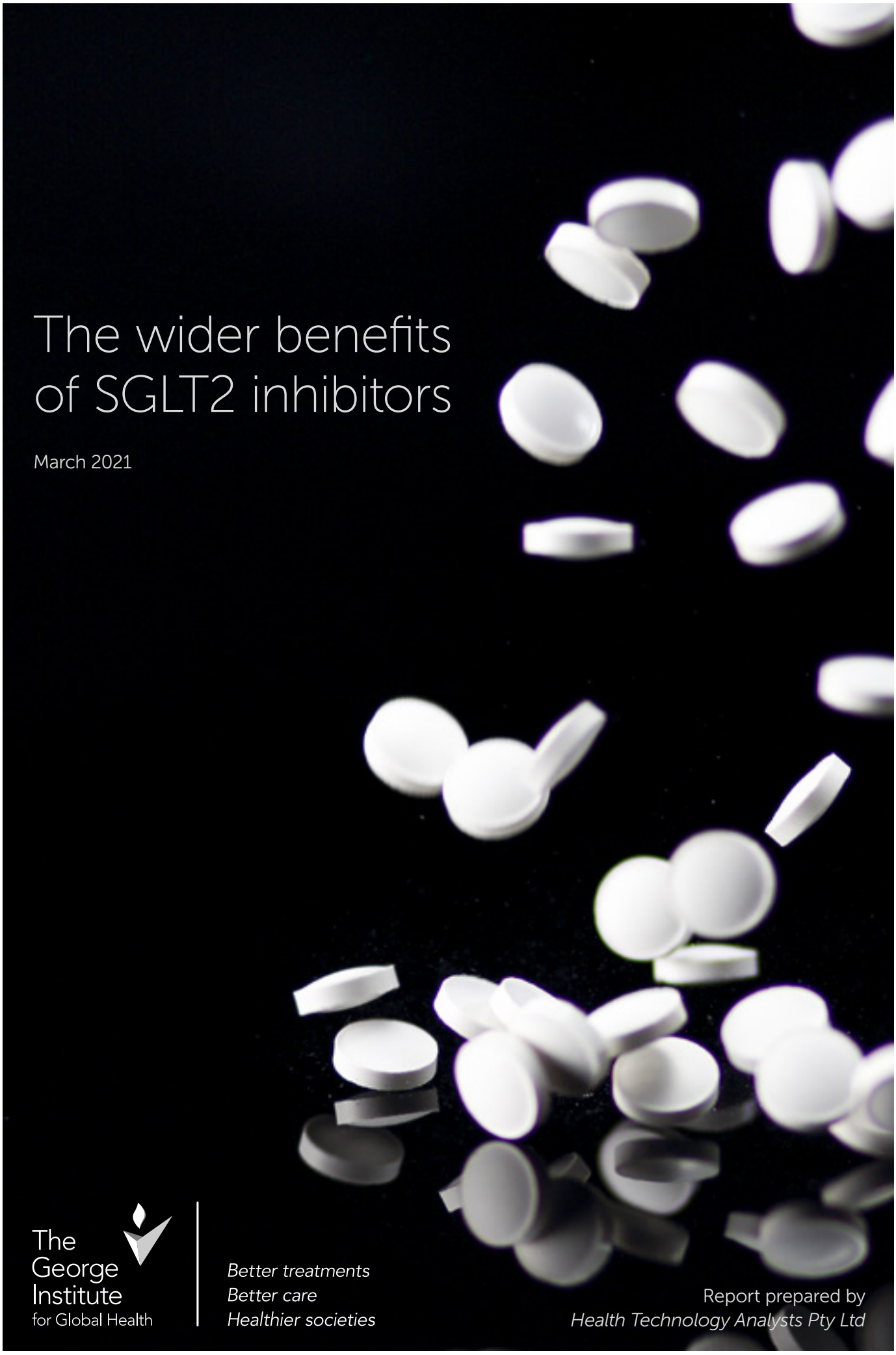

The George Institute for Global Health

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Report prepared by
Health Technology Analysts Pty Ltd

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Acknowledgement of country

The George Institute acknowledges the Gadigal people of the Eora Nation as the First Custodians of the land on which our Australian office is situated. We pay our respect to Elders past, present and emerging.

The George Institute for Global Health – global headquarters
ABN 90 085 953 331

Level 5,
1 King Street
Newtown, Sydney NSW 2042
Australia

T +61 2 8052 4300
info@georgeinstitute.org
www.georgeinstitute.org

Executive Summary

Increasing constraints placed on public resources have led to increased accountability and the requirement to demonstrate the value-for-money of healthcare and community funding decisions.

Social Return on Investment (SROI) frameworks go beyond traditional valuation methods, to assess the broader socio-economic impact of a program. The goal of these analyses is to encapsulate the costs and impacts of a program and translate them into a digestible and meaningful language for a non-academic audience.

The purpose of this analysis is to examine the social benefit of treating eligible type 2 Diabetes Mellitus (T2DM) patients in Australia with a class of drugs called sodium-glucose co-transporter-2 (SGLT2) inhibitors.

T2DM is associated with a substantial risk of cardiovascular and kidney disease. Approximately two-thirds of Australians with diabetes having comorbid cardiovascular disease (CVD) or chronic kidney disease (CKD). A total of over $6.0 billion is spent on hospital admissions for CVD and end-stage kidney disease (ESKD) each year, representing a significant burden on the Australian healthcare system.

SGLT2 inhibitors have shown remarkable results in subjects with T2DM. A series of published trials* led by The George Institute, demonstrates SGLT2 therapy, in addition to improving glycaemic control, have renoprotective and cardioprotective benefits in patients with T2DM. This project builds on the findings of two key meta-analyses which pooled together the results of these trials and aims to demonstrate the economic value of using SGLT2 for T2DM patients in Australia. The key efficacy and safety outcomes reported by the four trials identified and included in the two meta-analyses were used to assess the impact of the SGLT2 treatment. The outcomes included myocardial infarction (MI), acute kidney injury (AKI), end stage kidney disease (ESKD), hospitalisation for heart failure (HF), amputation, diabetic ketoacidosis and death.

An Excel model was developed to assess the benefit of SGLT2 inhibitor therapy for T2DM patients across Australia. These benefits (in comparison with cost of therapy) are realised through:

- direct prevention of cardiac and renal events,
- prevention of ESKD,
- avoided deaths
- corresponding reductions in healthcare use,
- reduced productivity costs,
- and reduced need for informal care

In order to cover all eligible patients for SGLT2 therapy in Australia, the Government would be required to spend approximately $1bn over 10 years. Our analysis indicate that this investment would produce considerable value for money through the avoidance of 4284 acute kidney injuries, 8744 cases of end stage renal disease, 4148 myocardial infarctions and 7450 deaths. Avoiding these events would save over $4bn and the estimated SROI is 4.77. In other words, for each AU$1.00 invested in the SGLT2 inhibitor pharmaceutical treatment, AU$4.77 are returned to society.

* The CREDENCE and CANVAS trials were funded by Janssen, which manufactures canagliflozin, and were led by an independent, academic-led Steering Committee. George Clinical, a contract research organisation owned by George Health (the social enterprise arm of the George Institute), performed contract research services for Janssen on both trials.

Introduction

Type 2 Diabetes Mellitus (T2DM) is associated with a substantial risk of cardiovascular and kidney disease.[1,2] It is estimated that at least 1.5 million Australians have T2DM.[3] The Australian Institute of Health and Welfare (AIHW) reports that in 2012, 68% of Australians with diabetes had comorbid cardiovascular disease (CVD) or chronic kidney disease (CKD).[4] T2DM is a significant risk factor for premature CVD mortality and is the most common cause of CKD. Both CVD and CKD have a high burden of disease in Australia, with approximately $5.0 billion spent on hospital admissions for CVD in 2013, and end-stage kidney disease (ESKD) costing the Australian health care system approximately $1.0 billion per year.[5]

Previous glucose lowering medications have not demonstrated a direct benefit on reducing adverse cardiac and renal outcomes.[6] As such, the role of medication in the T2DM management has focussed predominantly on glycaemic control.

Sodium-glucose co-transporter-2 (SGLT2) inhibitors have shown advantageous results in subjects with T2DM. SGLT2 inhibitors currently listed on the Australian PBS include dapagliflozin, ertugliflozin and empagliflozin.[a]

A series of published trials led by The George Institute, demonstrates SGLT2, in addition to improving glycaemic control, have renoprotective and cardioprotective benefits in patients with T2DM.[7,8,9,10] The first indication of this effect came with the report of the EMPA-REG-OUTCOME (Empagliflozin Cardiovascular Outcome Event Trial in Type 2 Diabetes Mellitus Patients) study in 2016, using empagliflozin,[7] which was followed by canagliflozin trials including CANVAS (CANagliflozin cardioVascular Assessment Study)[8] and CREDENCE (Evaluation of the Effects of Canagliflozin on Renal and Cardiovascular Outcomes in Participants With Diabetic Nephropathy).[9] Additional evidence of the renoprotective property of dapagliflozin was then provided by the DECLARE-TIMI (Multicenter Trial to Evaluate the Effect of Dapagliflozin on the Incidence of Cardiovascular Events)10 randomized trial. All these results strongly suggest the presence of a class effect of the SGLT2 inhibitors.

To assess this hypothesised class effect, the results of these trials were analysed in two systematic review and meta-analyses, which pooled together data relative to 38,723 participants across six continents.[11],[12] These meta-analyses show SGLT2 inhibitors reduce the risk of cardiovascular diseases, dialysis, acute kidney injury, and death in individuals with T2DM. These data provide substantive evidence on the positive outcomes of SGLT2 inhibitors treatment, beyond glycaemic control.

This report and accompanying analysis build on these findings and aim to demonstrate the economic value of using SGLT2 for T2DM patients in Australia.

a http://www.anzca.edu.au/documents/ads_alert-update-(002).pdf

Objectives and scope

The objective of this analysis is to investigate the social return of investing in SGLT2 inhibitors therapy for T2DM patients across Australia. The approach adopted in in this analysis is outlined in the linkage logic map illustrated in Figure 1.

Figure 1 Linkage logic map

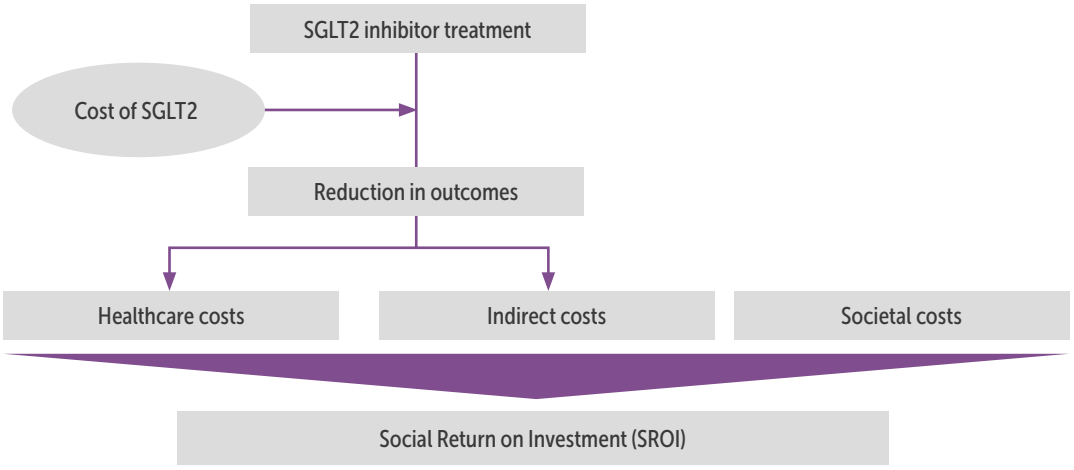
An Excel model was developed to assess the benefit of SGLT2 inhibitor therapy for T2DM patients across Australia. These benefits (in comparison with cost of therapy) are realised through:

- direct prevention of cardiac and renal events,
- prevention of ESKD,
- avoided deaths
- corresponding reductions in healthcare use,
- reduced productivity costs,
- and reduced need for informal care

Methodology

This analysis aims to capture the impact of treating all eligible T2DM patients with SGLT2 inhibitors in Australia. The patients were considered eligible for inclusion in the assessment if they met Pharmaceutical Benefits Scheme (PBS) prescribing criteria for SGLT2 inhibitors, i.e. uncontrolled T2DM defined as HbA1c > 7% despite previous treatment,b and with comorbid CVD or CKD, based on the key trial inclusion characteristics.[7,8,9,10] The evaluation then uses the results from the two systematic review and meta-analyses to estimate the rates of cardiac and renal events, development of ESKD, and death with and without SGLT2 therapy. These events were associated with healthcare costs, productivity changes (including participation, absenteeism and presenteeism for the person affected by the event) and informal care requirements. A schematic of the methodology developed for this analysis is summarised in Figure 2.

Figure 2 **Flowchart of the methodology of this analysis**



Abbreviations: SGLT2, Sodium-glucose co-transporter-2; SROI, social return on investment.

The model combines the costs of investing in SGLT2 therapy with the savings due to SGLT2 use to calculate the social return on investment (SROI) of the intervention.

The SROI is a method to measure values not traditionally reflected in financial analysis, to assess the creation of value for the community. Within this framework, inputs are applied to service activities to produce outputs, from which outcomes are derived, which result in the overall impact. The purpose of SROI is to examine the relationship between inputs and impact to assess the social value an activity creates in a robust and rigorous way. SROI puts social impact into the language of 'return on investment', a common language bridging sector-specific barriers.

b http://www.pbs.gov.au/pbs/home

The analysis uses an SROI-informed methodology, but it does not claim to be a complete SROI evaluation; the term SROI is thereby used for simplicity of understanding.

The key efficacy and safety outcomes reported by the four trials 7-10 identified and included in the two meta-analyses[11, 12] were used to assess the impact of the SGLT2 treatment. These included myocardial infarction (MI), acute kidney injury (AKI), end stage kidney disease (ESKD), hospitalisation for heart failure (HF), amputation, diabetic ketoacidosis and death. For each of these outcomes, the rate per 1,000 person years in the placebo arm was obtained from each trial. The relative risk and hazard ratio reported in the meta-analyses were then applied to those values to estimate event rates in the SGLT2 arm. Costs were then associated with each of these outcomes. Costs were differentiated between acute, chronic, and indirect societal costs, where appropriate.

The model uses a 10-year time horizon, with a 5% yearly discount rate and a half-cycle adjustment, to reduce the risk of overclaiming.

Model input

Epidemiology input

Patients were considered eligible in this analysis if they met PBS prescribing criteria for SGLT2 inhibitors (i.e. had uncontrolled T2DM defined as HbA1c >7% despite previous treatment)[c] and had comorbid CVD or CKD.

The 2017 Drug utilisation sub-committee (DUSC) Medicines for the treatment of diabetes report[13] estimated that in mid-2012 811,009 patients were on diabetes treatment which increased to 928,561 in mid-2016 representing an average monthly growth of 0.28%. Assuming this level of growth is sustained and constant, the estimated number of patients on diabetes treatment is expected to be 1,041,315 at the start of 2020. This figure is used as a proxy for the number of diabetes patients in Australia.

The AIHW4 estimates that 86% of diabetes patients have T2DM representing a total of 895,531 patients, with 47% of these patients with uncontrolled disease[14] as defined by having HbA1c levels of >7%. Thus, it is predicted that 420,899 patients are currently on treatment for uncontrolled T2DM. The AIHW also reports that 10.53%, 37.04% and 19.30% of diabetics have CKD, CVD or both comorbidities, respectively.[4] In the absence of more specific data, this patient distribution is assumed to apply for patients with uncontrolled T2DM. Therefore, it is estimated that of the total T2DM patient population, 44,305 have CKD alone, 155,889 have CVD alone and 81,226 have both CKD and CVD comorbidities. It is assumed patients with CVD or CKD have the same rate of uncontrolled T2DM as patients without comorbidities. T2DM patients with stage 4 CKD are excluded as all trials excluded patients with eGFR of <30 mL/min/1.73m2 body surface area (BSA). This reflects utilisation in the Australian population as the canagliflozin Australian Product Information specifies that patients with stage 4 or 5 CKD should not receive canagliflozin.[15] Eligible patients with CKD in the Australian population are assumed to already be on an ACE-inhibitor or angiotensin receptor blocker.

Due to the lack of reliable patient estimates, Medicare Statistics PBS utilisation data for the 12 months ending July 2019[16] were used as a proxy to estimate the number of patients currently accessing SGLT2 inhibitors. It was estimated that 147,821 patients are currently treated with PBS-listed SGLT2 inhibitors.

c http://www.pbs.gov.au/pbs/home

Efficacy and safety input

The two key meta-analyses[11, 12] were used to estimate the effectiveness of SGLT2 treatment. The key efficacy outcomes included:

- MI: a myocardial infarction (commonly referred to as a heart attack) occurs when one of the heart's coronary arteries is blocked suddenly or has extremely slow blood flow. Following an MI most patients are hospitalised, with the major aim of treatment being reducing the size of the infarct.
- AKI: acute kidney injury is the sudden and dramatic loss of kidney function. This can happen rapidly, often in just a few days. In many cases the kidney can recover almost completely from acute kidney failure, but urgent treatment including dialysis may be needed while waiting for the kidneys to recover.
- ESKD: chronic kidney disease (CKD) refers to all conditions of the kidney, lasting at least 3 months, affecting the filtration and removal of waste from the blood by the kidneys (indicating kidney dysfunction), and/or leakage of protein or albumin in the urine (indicating kidney damage). End stage CKD (ESKD) is the last stage of the disease, which occurs when the kidneys are no longer able to work at a level needed for day-to-day life. The model assumes a proportion of patients developing ESKD will require conservative care, whereas a proportion will require dialysis.[17]
- Hospitalisation for heart failure: HF, sometimes referred to as congestive heart failure, occurs when the heart muscle doesn't pump blood as well as it should. This can lead to severe consequences, including hospitalisation.
- Mortality

As with any treatment, SGLT2 may cause some side effects. The two key side effects identified by Arnott[12] as statistically significant were:

- Amputation: People living with diabetes have an increased risk of lower limb amputation. Wounds or ulcers that do not heal are the most common cause of amputation among people with this condition.
- Diabetic ketoacidosis: diabetic ketoacidosis is a serious complication of diabetes, occurring when the body produces high levels of ketones. People with diabetic ketoacidosis have high blood sugar levels and a build-up of ketones in the body, that makes the blood more acidic than usual.

For each of these outcomes, the rate per 1,000 person years in the placebo arm was obtain from each trial and weighted for the size of the individual trial population. The relative risks[11] and hazard ratios[12] reported in the meta-analyses were then applied to those values to obtain the rates in the SGLT2 arm. The values obtained were transformed into risk per person over the time horizon and applied to the eligible population. The values used in the model are reported in Table 1.

Table 1 Effectiveness and safety outcomes of SGLT2 inhibitors

Outcome	RR/HR	Rate per 1,000 person years		Risk per person over time horizon (10 years)	
		SGLT2	Placebo	SGLT2	Placebo
Non-fatal MI	0.88	12.32	14.00	0.116	0.131
AKI	0.75	4.83	6.44	0.047	0.062
ESKD	0.64	5.96	9.32	0.058	0.089
Hospitalisation for HF	0.68	7.85	11.55	0.076	0.109
Death from any cause	0.85	18.31	21.54	0.167	0.194
Amputations	1.23	5.34	4.34	0.052	0.042
Diabetic ketoacidosis	2.46	0.74	0.30	0.007	0.003

Abbreviations: AKI, acute kidney injury; ESKD, end-stage kidney disease; HF, heart failure; HR, hazard ratio; MI, myocardial infarction; RR, relative risk.

Source: Arnott[12], Neuen[11], Perkovic[9], Neal[8], Zinman[7], Wiviott[10]

Cost input

The model assessed the impact of SGLT2 inhibitor treatment by comparing the effect of treatment on the same hypothetical cohort of patients. The cost of SGLT2 inhibitors assigned to the intervention cohort was calculated by including all estimated patients on treatment multiplied by 13.04 packs per year (calculated as 365.25 days / 28 doses per pack). The average monthly cost of SGLT2 inhibitors is estimated to be $60.29, based on the DPMQ of the PBS available SGLT2.[d] This cost was then adjusted for treatment discontinuation, and mortality, based on the values observed in the trials. Discontinuation is assumed to occur only after the first year of treatment, and all deaths are assumed to occur at the midpoint of the time horizon. All costs are also discounted using a 5% annual discount rate.

A direct healthcare cost is then associated with each of the identified outcomes; the direct healthcare costs are primarily due to hospitalisation, pharmaceutical treatment and surgical intervention. The direct healthcare costs associated with the identified relevant outcomes were sourced from Australia specific sources, such as the National Hospital Cost Data Collection (NHCDC) report produced by the Independent Hospital Pricing Authority (IHPA). When Australian sources were not identified, international sources were used to assess the relative cost of the assessed intervention compared to an Australian available cost. The relative cost was used to estimate the Australian cost. For example, the long-term cost of MI was sources from a Swedish study which reports both first year (A) and subsequent year (B) cost.[18] As the first year cost of MI in Australia is available, the proportion between the two Swedish costs (B/A) was applied to the Australian value.

In addition to the acute direct cost associated with the event, chronic direct healthcare costs were linked to MI, HF, ESKD and amputation. These conditions require longer term care, and significant healthcare resources going beyond the first year when the acute event is experienced. As the most common long-term consequence of an AKI event is ESKD, which was already captured in the analysis, and therefore no long-term cost was associated with AKI, to avoid the risk of overclaiming.

The model also considers indirect care costs, associated with the value of informal care provided by friends or family carers. While informal care is provided free of charge, there is an economic cost, as time spent caring is time that cannot be directed to other activities such as paid work, unpaid work e.g. housework or yard work, or leisure.[19] For simplicity, informal carer cost is limited to productivity losses for the purposes of this model. Carer costs varied depending on the different healthcare event. In particular:

- MI and HF: a Heart Foundation report observed that carers spent an average of 280 hours per year caring for their loved ones experiencing cardiovascular disease events.[20] The average cost of lost productivity was estimated to be $1,128 (2012 AU$) per carer per patient per event. The average cardiovascular patient was assumed to require an estimated 6.27% full-time equivalent care.[19,e]
- ESKD: it is estimated that across all forms of dialysis 7.6% of patients requires full-time care and 30.6% requires part-time care.[17] Full-time care was assumed to consist of 40 hours per week, while part-time care was assumed to consist of 16 hours per week,[17] based on the estimated average weekly hours for full-

d http://www.pbs.gov.au/pbs/home

e The figure was calculated on stroke patients, but due to the lack of cardiovascular-specific data, this value was used as a proxy for cardiovascular events

time and part-time work in Australia.[21] In Australia, 46% of people with severe or profound restriction from disability receive help only from family and friends, 48% receive assistance from family and friends supplemented by formal care services and 3% receive assistance only from formal services.[22] Since the split between formal and informal care was not reported for those receiving a mixture of both types of care, it is assumed that care time was split equally between formal and informal care. The productivity loss for informal care is valued at $13 per hour, using the value reported for cardiovascular diseases as a proxy.[19]

In addition to carer costs, patients who receive dialysis outside of the home are subject to transport costs. Total annual transport costs of approximately $3.5 million (2009 $AU) were reported,[17] with an estimated 3,057 T2DM patients on dialysis in 2009–10, equal to $1,145 (2009 $AU) per patient per year.

Only non-fatal health events are assumed to incur a healthcare cost i.e. fatal events incur only the GDP loss due to premature death. In addition, of those patients who die, only those employed are assumed to incur a mortality cost, calculated as the lost wages/earnings that would have been earned by the person over the time horizon.

Key direct (acute and long-term) and indirect healthcare costs are reported in Table 2.

Table 2 Direct and indirect healthcare costs (year)

	Event (year 1)	Long-term (year 2-10)	Carer		Transport	
MI	$27,232 [23]	$3,296 [18]	6.27%	$1,255 [D]		
AKI	$31,863 24 [24]					
Dialysis (ESKD)[A]	$88,083 [17]		70.0% [17]	$14.46 [E]	69.8% [17]	$1,361 [17]
ESKD conservative care	$14,584 [17]					
HF	$7,602 [B]	$1,927	6.27%	$1,255 [D]		
Amputation	$26,843 25 [25]	$6,911 [25]				
Diabetic ketoacidosis	$6,195 [C]					

A: the cost of kidney transplant is not included in this analysis – it is assumed that patients on RRT continue RRT throughout the time horizon

B: DRG F62A, F62B, F62C – NHCDC Round 22

C: DRG K60A, K60B – NHCDC Round 22

D: cost per year for FTE carer

E: hourly cost of informal care

Abbreviations: AKI, acute kidney injury; ESKD, end-stage kidney disease; HF, heart failure; MI, myocardial infarction.

The model also assesses the productivity losses associated with efficacy and safety inputs, to capture the broader social implications of SGLT2 inhibitor treatments for T2DM. A loss of work productivity can arise from absenteeism, being away from work due to illness or disability, and presenteeism, being present at work but constrained in certain aspects of job performance by health problems. Indeed, even if a significant proportion of people can return to work after a serious healthcare event, their condition increases the amount of sick days taken throughout the year and reduces an individual's ability to function effectively while at work. The reasons for leave taken included in the model are due to general unwellness and medical appointments (MI), hospitalisation (HF) or hospital dialysis (ESKD). These values were adjusted to incorporate a household productivity loss for those individuals that are not employed, assumed to be valued at 30% of the average Australian wage amount.[19]

In addition, the model assesses the impact of treatment on broader participation, arising from reduced employment, as people recovering from cardiovascular events, amputation surgeries and in ESKD have a lower gainful level of employment compared with the working age population in Australia that did not experience these events.[19,20,26,27]

Nonetheless, even if a significant proportion of people can return to work after a serious healthcare event, their condition increases the amount of sick days taken throughout the year.

Despite not being employed in a paid job, the same number of days are estimated to be lost for those who are unemployed from lost household productivity. Average household productivity is valued at 30% of the average Australian wage amount.[19] This productivity estimate is applied to those MI, HF, ESKD and amputation patients who would have not been employed in a paid job regardless of their healthcare condition. The value was obtained from The economic impact of stroke in Australia report[19] which specifically focuses on stroke. Nevertheless, there is no reason to believe this to be a stroke specific value, as it assesses the productivity of the general population. Therefore, in the lack on CHD-specific data, the stroke value was used.

Finally, the cost associated with premature death was estimated by calculating the lost earnings of those who were employed before their death. Each person who dies is assumed to accrue lost earnings for half the time horizon (assuming that on average people will die halfway through the model time horizon).

Key direct (acute and long-term), and indirect healthcare costs are reported in Table 2.

Table 3 Societal cost components

	MI	AKI	HF	RRT	Amputation
Relative participation	66.8% [28]	N/A	66.8% [28]	56.7% [26]	71.7% [27]
Absenteeism (days)	23 [29]	12 [A]	23 [29]	52 [B]	N/A
Presenteeism	13.5%	N/A	13.5%	N/A	32.0%

A: DRG L60A average length of stay – NHCDC Round 22

B: Kidney Health Australia reports that patients who require haemodialysis are treated at least three times a week for up to four to five hours per treatment.[30] To maintain a conservative approach, the model assumes the proportion of patients requiring RRT outside of home would lose 1 working day a week.

Productivity losses for diabetic amputation are sourced from Fisher[27] which reports on patients who underwent unilateral lower limb amputation.

Abbreviations: AKI, acute kidney injury; HF, heart failure; MI, myocardial infarction; N/A, not applicable; RRT, renal replacement therapy.

All costs included in the model have been indexed to 2019 AUD values using consumer price index data sourced from the Reserve Bank of Australia, and the loss of income is based on the average ordinary time weekly earnings for full-time adults in Australia of $1,659 in November 2019, as reported by the Australian Bureau of Statistics (ABS) in February 2020.

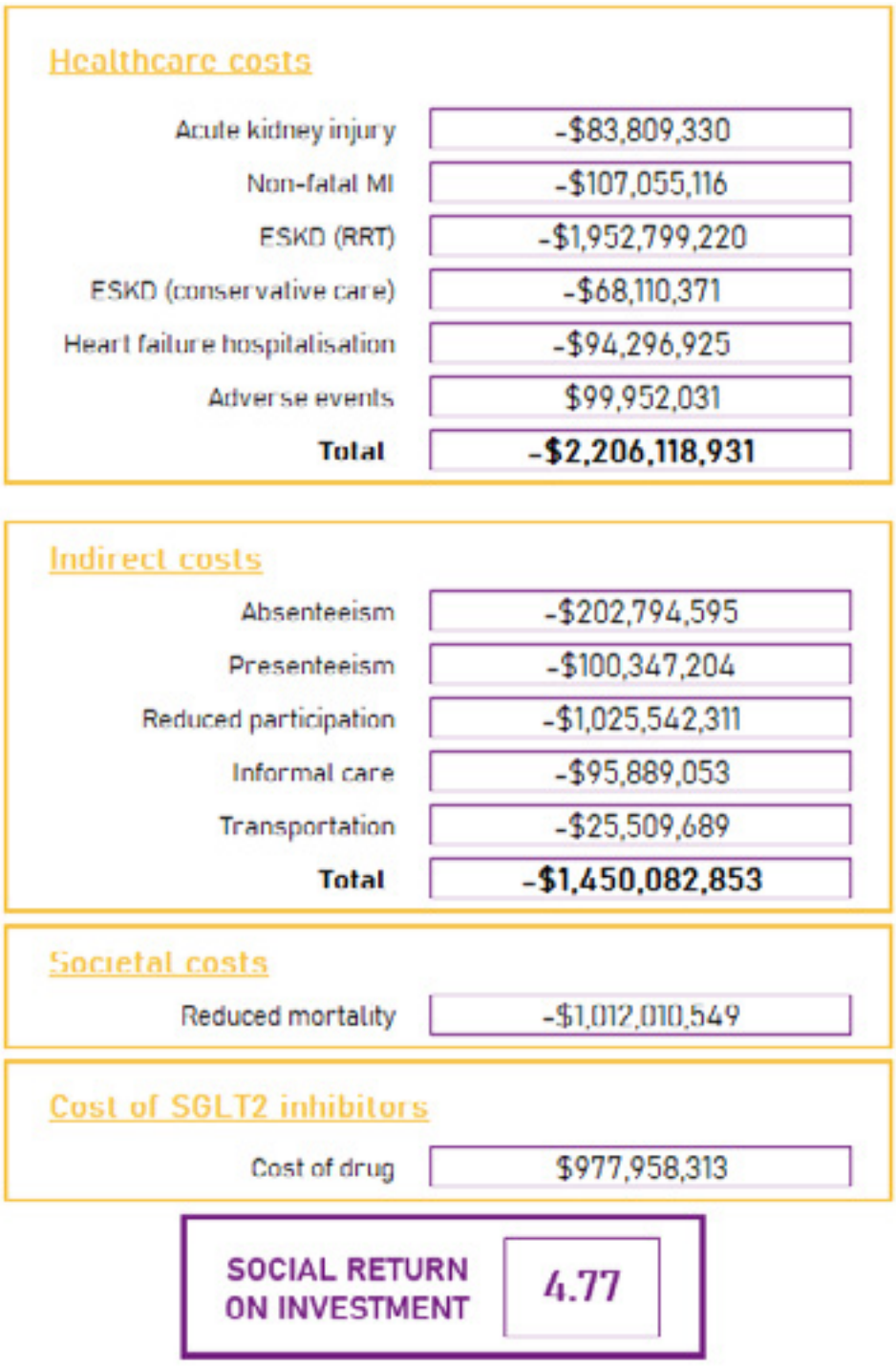
Impact

Base case

In order to cover all eligible patients for SGLT2 therapy in Australia, the Government would be required to spend approximately $1bn over 10 years. Our analysis indicate that this investment would produce considerable value for money through the avoidance of 4,284 acute kidney injuries, 8,744 cases of end stage renal disease, 4,148 myocardial infarctions and 7,450 deaths. Avoiding these events would save over $4bn and the estimated SROI is 4.77. In other words, for

each AU$1.00 invested in the SGLT2 inhibitor pharmaceutical treatment, AU$4.77 are returned to society. The breakdown of the analysis results is shown in Figure 3.

Figure 3 **Impact of SGLT2 inhibitors – 10-year time horizon**



Abbreviations: ESKD, end stage kidney disease; MI, myocardial infarction; RRT, renal replacement therapy; SGLT2, Sodium-glucose co-transporter-2.

These results are consistent with the cost-effectiveness of SGLT2 found in numerous studies,[31] expanding on these result to show the broader implications of treating TD2M with this antidiabetic medication.

Sensitivity analyses

The sensitivity of the model to the time horizon was tested. Results of the analyses are shown in Figure 4 and Figure 5.

Figure 4 Impact of SGLT2 inhibitors – 1-year time horizon

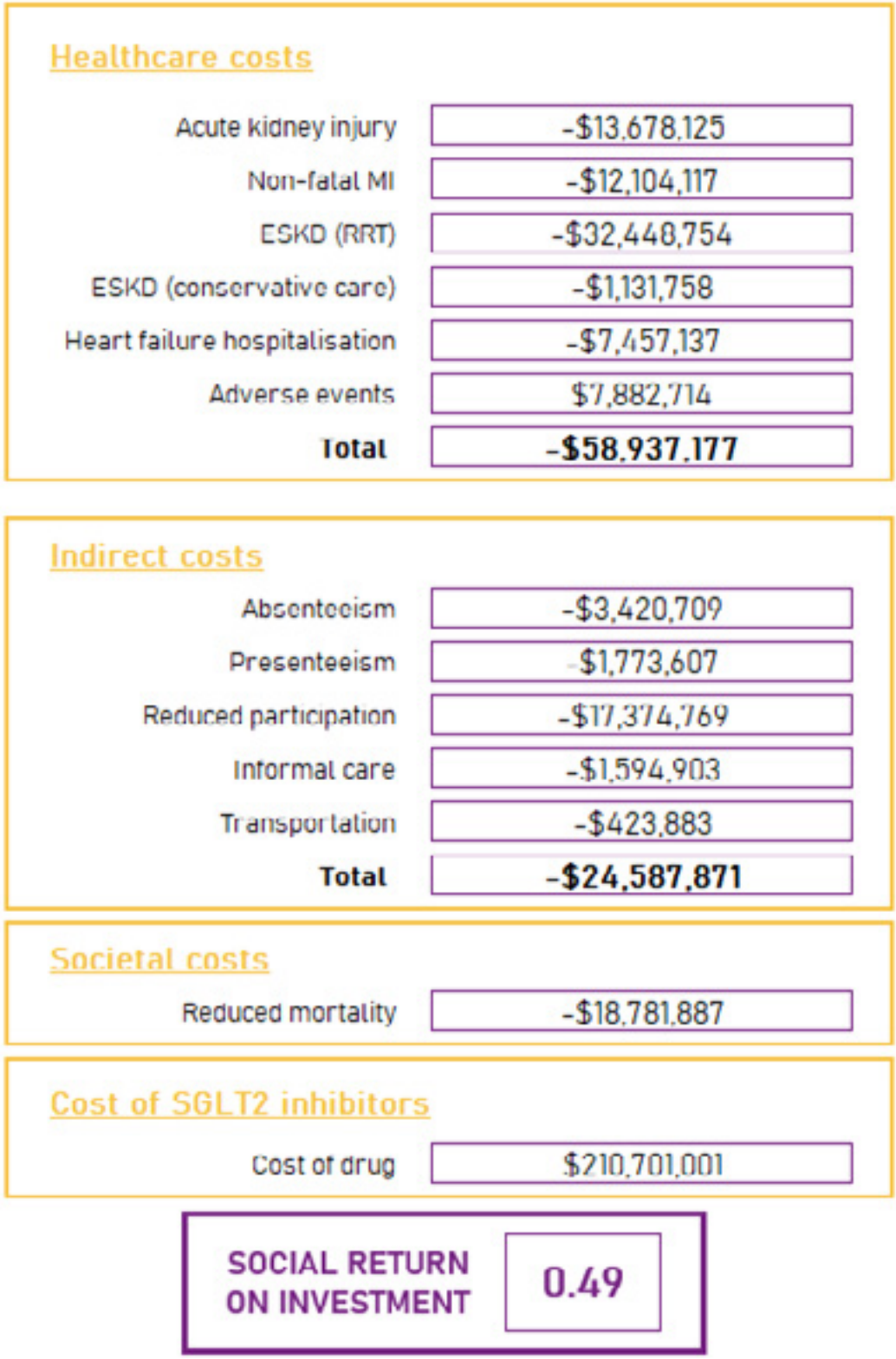
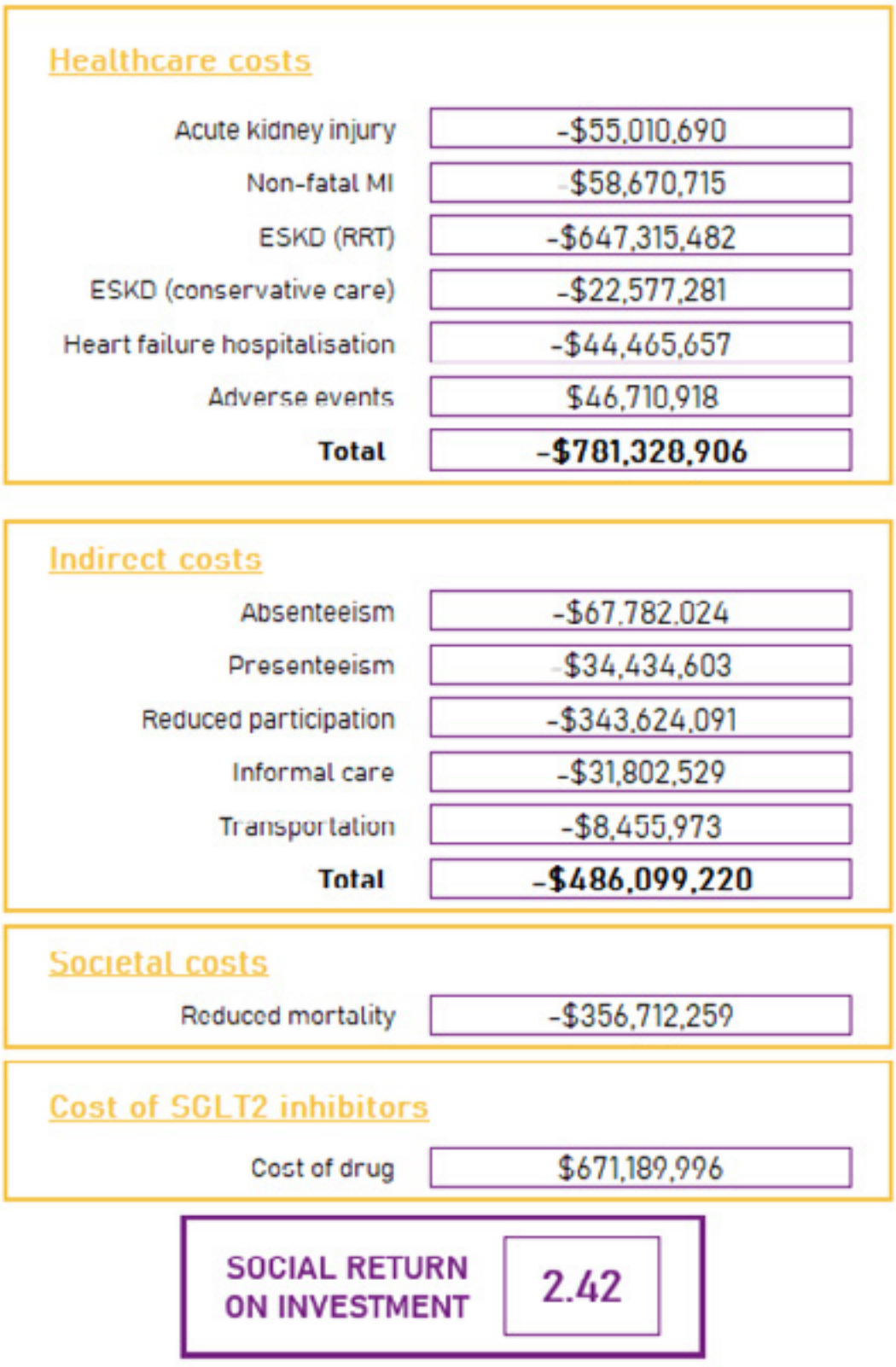


Figure 5 **Impact of SGLT2 inhibitors – 5-year time horizon**



Assumptions and limitations

The benefits of SGLT2 assessed in this analysis are assumed to apply to all eligible T2DM in Australia. This assumes that patients in the two key meta-analyses are comparable to Australian T2DM population and thus experience identical outcomes. Nonetheless, these meta-analyses pool data from four large randomised studies, including a total of 38,723 participants across six continents, each with a robust design and low risk of bias, providing power to explore the effects of SGLT2 inhibitors on cardiovascular and renal outcomes.

The number of patients currently on SGLT2 inhibitors was estimated by using script utilisation for dapagliflozin, empagliflozin and ertugliflozin sourced from Medicare Statistics.[16] Discontinuation rates of SGLT2 from the four clinical trial included in the meta-analyses were applied to these script numbers to generate an estimate of the number of patients that would receive SGLT2 inhibitors. This assumes that discontinuation of SGLT2 inhibitors in the Australian population follows the discontinuation rates seen in the clinical trials. In addition, the model only considers patients who initiate treatment in 2020 and excludes treatment initiators in subsequent years.

The clinical inputs used in this analysis are reported in the trial as event rates and hence consider patients experiencing more than one event. However, the model assumes patients can experience only one unique event.

As this analysis does not include a yearly breakdown of the costs and savings accrued during the 10 years assessed in the base case time-horizon, all events were assumed to take place in a mid-point time (i.e. 5 years for the base case). This represents a half-cycle correction adjustment to reduce the risk of overclaiming.

From a methodological perspective, the analysis represents a simplified application of the SROI methodology. No SROI valuation filters such as deadweight, attribution or displacement metrics were used. For this reason, the analysis presented is informed by the SROI methodologies, but cannot be wholly defined as a SROI analysis.

Conclusions

This project assessed the impact of funding SGLT2 inhibitors in Australia using a SROI framework to inform decision makers and demonstrate the value of investment in this treatment.

The assessment found that, as a result of treating T2DM patients with SGLT2 inhibitors, the number of avoided AKI, ESKD, MI and deaths is estimated to be 4,284, 8,744, 4,146, and 7,450 respectively. The estimated SROI of treating these patients with SGLT2 inhibitors is 4.77. In other words, for each dollar invested, $4.77 are returned to society.

These findings demonstrate the positive impact of reducing cardiovascular and renal events through the use of SGLT2 inhibitors in TD2M patients, and signal decision makers the value of investing in such treatment.

The SROI method is a recognised methodology for providing a holistic framework in its inclusion of broader social impact, with strong foundations in traditional economic evaluation. Whilst having limitations, this method represents a scientifically sound and verifiable instrument to improve decision-making when allocating public health budgets.

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The wider benefits of SGLT2 inhibitors

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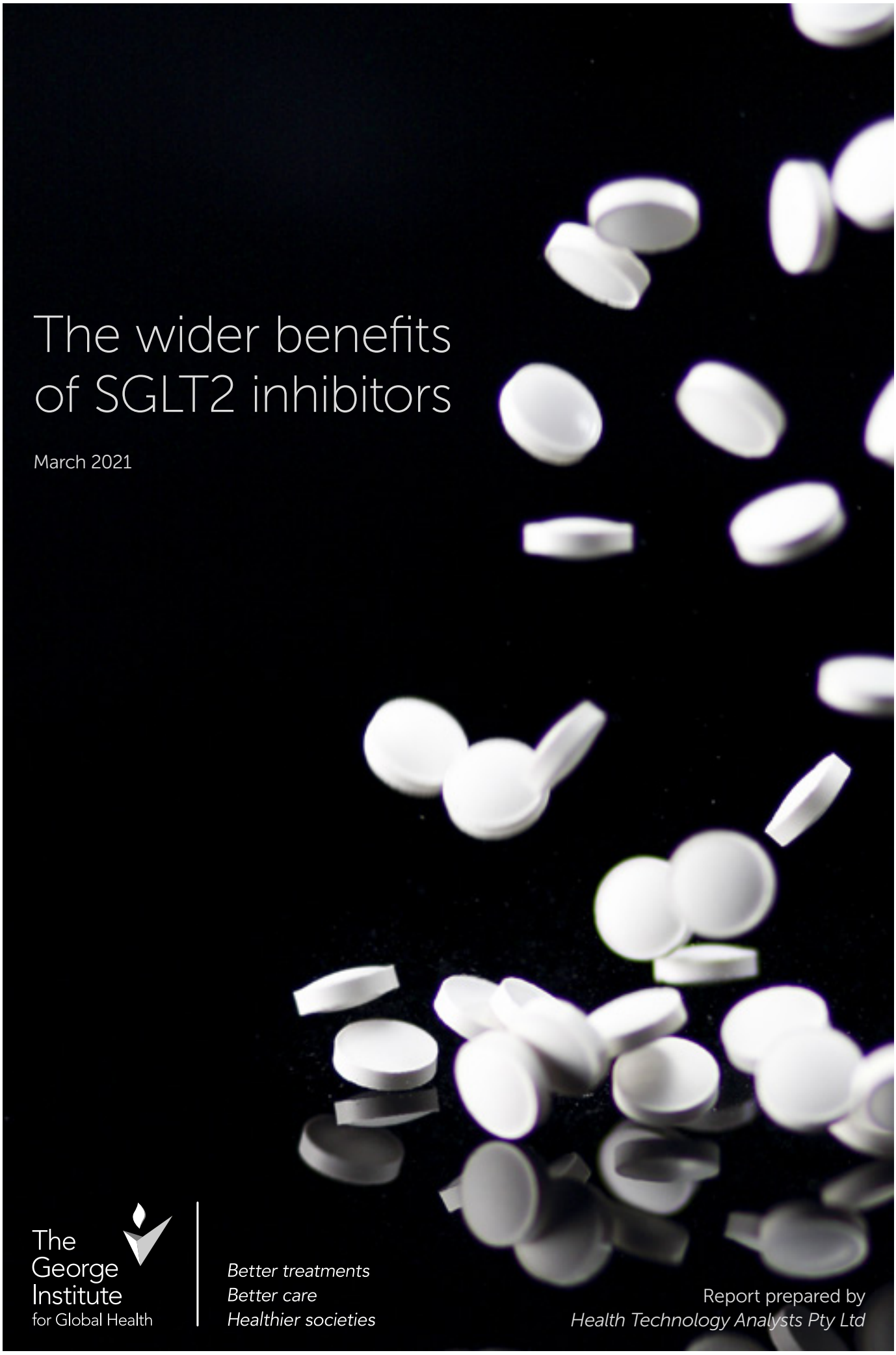

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