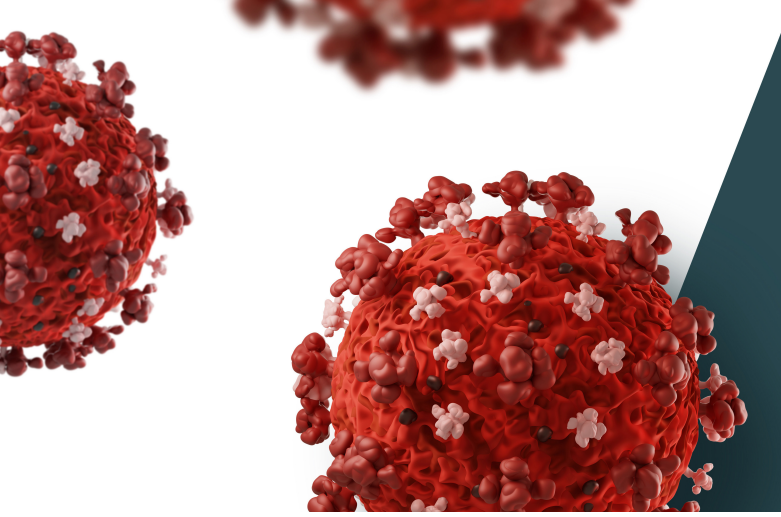

COVID-19 CORONAVIRUS

GENERAL PRACTICE SNAPSHOT

ISSUE 5 **31 March 2021**

The impact of the COVID-19 pandemic on general practice-based HbA1c monitoring in type 2 diabetes

INTRODUCTION

In addition to self-monitoring of blood glucose, people living with type 2 diabetes are recommended to receive regular monitoring care using glycated haemoglobin A1c (HbA1c) as an indicator of long-term glycaemic control. Guidelines in Australia and overseas recommend HbA1c monitoring at least every 6 months for well-controlled diabetes, and more often (3 months) if HbA1c results are out of the recommended range[1-4]. In Australia, general practitioners (GPs) play an important role in this crucial aspect of diabetes care by ordering tests and counselling patients with diabetes[1].

HbA1c monitoring in type 2 diabetes	VIC	NSW
% change in number of HbA1c tests March-May 2020 vs mean 2018-2019	-25.6% (8,439 vs 10,596 tests)	-19.1% (5,962 vs 7,103 tests)
% of patients outside target HbA1c level	34.4% (2020) 30.8% (2019)	32.5% (2020) 29.0% (2019)

A decline in HbA1c testing in patients with type 2 diabetes was observed during the waves of the COVID-19 pandemic in both NSW and Victoria.

Existing evidence indicates that patients with poor blood glucose control are at a higher risk of co-morbidities such as micro- (e.g. renal) and macro-vascular (e.g. coronary heart) diseases[5], and worse outcomes in general[6-8]. The full long-term extent of the COVID-19 lockdown and restrictions on diabetes care and management remain unclear. However, early reports indicate that the impact of lockdown restrictions (e.g. effect on lifestyle such as dietary changes, reduced access to gyms, pools, and exercise facilities; effect on social and mental health; reduced access to medical facilities) may have created barriers to patients' diabetes management and thus substantially affected glycemic control in type 2 diabetes[9]. It has also been reported that patients with type 2 diabetes, especially those with poor glycaemic control,[10] who become infected with COVID-19 have a greater risk of developing severe COVID-19 symptoms which can lead to intensive care admission and death[11, 12], and that better glycaemic control might help in reducing the disease severity of COVID-19[13].

Our previous research Snapshots, which used the same Australian data sample as the current Snapshot, showed that both face-to-face visits[14] and overall pathology testing[8] dropped during the first wave of the COVID-19 pandemic in New South Wales (NSW) and Victorian populations. This raises the question as to whether this situation was also reflected for specific pathology tests and the management of chronic conditions, such as diabetes.

The aim of this Snapshot is to examine the potential impacts of the COVID-19 pandemic on diabetes care in Australian general practice, by looking at patients with type 2 diabetes using: (a) the volume of HbA1c tests conducted during this period as an indicator of care/access to care; and (b) HbA1c levels as an indicator of glycaemic control.

METHODS

The study population covers nearly 30% of the Australian population, including urban and rural regions from approximately 800 general practices (456 from Victoria and 347 from NSW). The participating Primary Health Networks (PHNs) included two urban (Eastern Melbourne and South Eastern Melbourne) PHNs and a predominantly rural (Gippsland) PHN from Victoria, and Central and Eastern Sydney (urban) and South Western Sydney (incorporating rural areas Wingello to Bundanoon) PHNs from NSW.

Outcome Health, as a data custodian, provides a secure and comprehensive digital health platform which collects data from the consenting general practices across the above mentioned PHNs. Ethics approval for the project has been obtained from the Macquarie University Human Research Ethics Committee (52020675617176). Ethics to collect and use general practice data has been obtained by the data custodians, and approval granted by the Royal Australian College of General Practitioners (RACGP) ethics committee (17-008).

The study period was from January 2018 to December 2020. The study population included patients who had a diagnosis of type 2 diabetes before 2017 and regularly visited a general practice during the study period. Patients with regular visits were identified by using the definition of 'active patient' defined by the RACGP as individuals who had attended the practices three or more times in the past two years[15].

We first examined the weekly volume of HbA1c testing performed within the study population, comparing the volumes of 2020 and the average (i.e. mean) of 2018 and 2019. Then, as a subgroup analysis, patients who had HbA1c testing in both 2018 and 2019 were identified and evaluated for the number of HbA1c tests conducted for each patient by year from 2018 to 2020 to compare with the testing frequency recommended by the Australian clinical guideline (i.e. at least every 6 months)[1]. For patients who had HbA1c testing, we further examined their HbA1c values in comparison with the target HbA1c range recommended by clinical guidelines. The target HbA1c was defined as ≤ 58 mmol/mol as per the RACGP guideline (i.e. ≤ 53 mmol/mol with the range of 48 – 58 mmol/mol)[1].

RESULTS

Figure 1 shows the decline in the volume of HbA1c testing in 2020 during the weeks of the first wave of COVID-19 (approximately 10th – 20th weeks (March-May)). The total volumes of HbA1c testing during the period decreased by 19.1% (5,962 vs 7,103 tests) in NSW and 25.6% (8,439 vs 10,596 tests) in Victoria, compared to

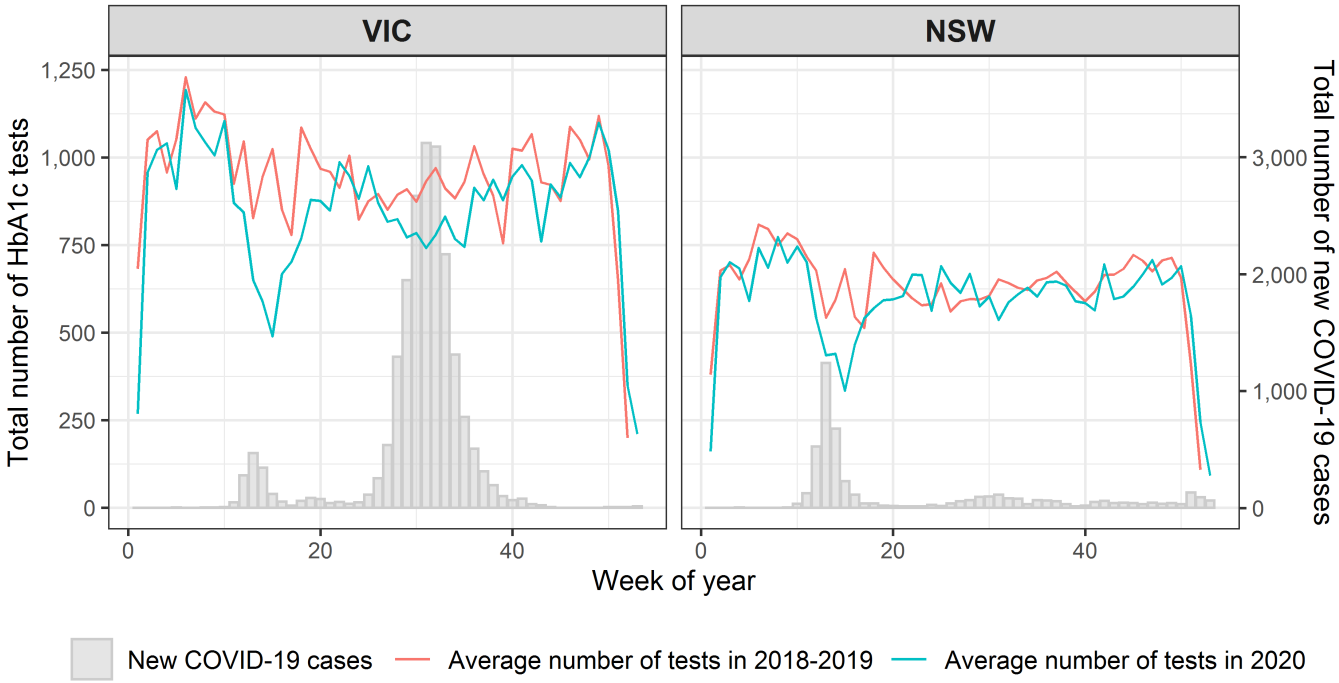

Figure 1. Weekly total number of HbA1c tests in patients with type 2 diabetes.

the average volume of 2018-2019. Although it was not as large as the first wave, there was another fall in the total HbA1c testing volume in 2020 during the weeks of the second wave (approximately 25th – 40th weeks (June - September)). The HbA1c testing volume during the second wave decreased by 1.1% (9,850 vs 9,958 tests) and 8.4% (13,458 vs 14,584 tests) in NSW and Victoria respectively, compared with the average volume of 2018-2019.

Figure 2 shows the number of the subgroup of patients who had records of HbA1c testing in both 2018 and 2019 (n=22,804 in Victoria, n=15,399 in NSW) and their HbA1c testing frequencies. Approximately 14 – 15% of these patients did not have HbA1c testing in 2020 (15.3% (n=3,492) in Victoria, 14.1% (n=2,173) in NSW). The number of patients who had multiple HbA1c tests also decreased in 2020 in both states.

Figure 3 shows the proportion of patients with HbA1c values within the target range for the subgroup of patients who had HbA1c testing. The proportion of patients above the recommended level in 2020 was slightly higher than the previous two years: the proportion increased from 30.8% (n=7,031 out of 22,804) in 2019 to 34.4% (n=6,637 out of 19,312) in 2020 in Victoria, and from 29.0% in 2019 (n=4,417 out of 15,399) to 32.5% (n=4,298 out of 13,226) in 2020 in NSW. We also examined HbA1c levels by patient characteristics (i.e. age, gender, remoteness, and socioeconomic status) and found the increasing pattern in 2020 appeared consistent regardless of patient sociodemographic factors (Supplementary figure S1). Furthermore, we descriptively examined the relationship between testing frequency and HbA1c levels and found that the pattern was consistent across 2018-2020.

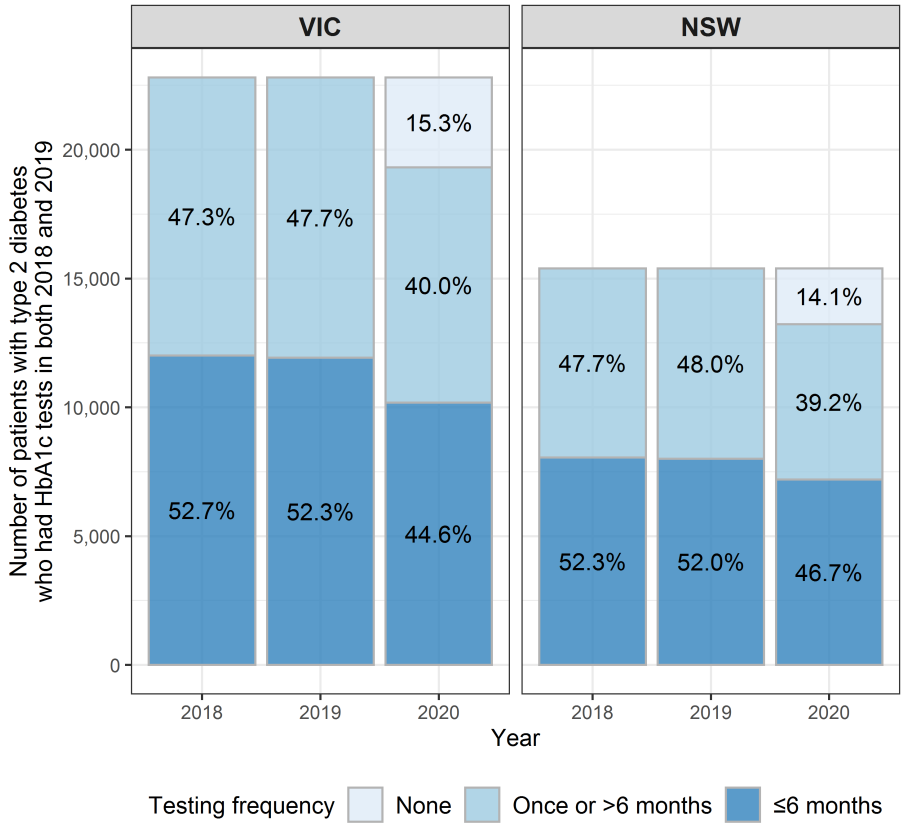

Figure 2: Number of subgroup patients by HbA1c testing frequency. The subgroup patients were those who had records of HbA1c tests in both 2018 and 2019.

Figure 3: Proportion of patients by HbA1c level for the subgroup patients who had HbA1c testing.

IMPLICATIONS

A decline in HbA1c testing in patients with type 2 diabetes was observed during the waves of the COVID-19 pandemic in both NSW and Victoria. Although there was the potential that some patients had visited different practices outside the study catchment area during the pandemic, it seems plausible that restrictions put in place to minimise COVID-19 transmissions may have contributed to missed or delayed monitoring of diabetes patients.

An increase in patients with higher than recommended HbA1c levels observed in 2020 compared with previous years, suggests that there may be factors affecting: (a) which patients visited general practice and received monitoring; (b) the timing of monitoring; and (c) lifestyle and self-care monitoring practices, which were impacted by the COVID-19 pandemic. Further studies are required to understand the barriers associated with maintaining HbA1c monitoring and glycaemic control during the pandemic. Potential areas for further study include socioeconomic and demographic factors, lifestyle (e.g. diet, reduced access to exercise facilities), impacts on social and mental health, and access to medical facilities.

The relationship between the frequency of HbA1c testing and the severity of diabetes (e.g., glycaemic level, complications) during the pandemic could have been impacted by a range of factors (e.g., accessibility). This is an important area for further study.

The use of telehealth services for diabetes monitoring care is a particularly important area to explore as our recent study reported a large increase in telehealth services for GP consultations during the pandemic[14]. Emerging evidence has shown the benefits of teleconsultations to patients with type 2 diabetes despite the many challenges.[16] A greater understanding of telehealth use for our Australian diabetes cohort will reveal more about this emerging extension of regular care, and how it can evolve as telehealth developments are informed by further evidence.

It is important to identify which factors have the greatest impact on the quality of care and develop strategies for not only GPs but also patients and policy-makers, which may support the most effective delivery of continuity of care in diabetes patients – even moving beyond crises such as the COVID-19 pandemic.

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About the project

Since its identification in December 2019, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and its associated coronavirus disease (COVID-19) has had a devastating effect on communities around the world. Health systems have been forced to make rapid choices about how to prioritise care, manage infection control and maintain reserve capacity for future disease outbreaks. The interruption of normal patterns of health care and the suspension of services has meant that the pandemic has also had a major impact on the detection and treatment of many non-COVID-19 conditions. Electronic general practice data are a valuable resource which can be used to inform population and individual care decision-making.

This project is based on a collaborative relationship involving the Digital Health Cooperative Research Centre, Macquarie University, Outcome Health, Gippsland, Eastern Melbourne and South Eastern Melbourne Primary Health Networks (PHNs), and the Royal College of Pathologists of Australasia Quality Assurance Programs, with participation from Central and Eastern Sydney and South Western Sydney PHNs. It will use an innovative secure and comprehensive digital health platform, Population Level Analysis & Reporting (POLAR) to:

- Generate near real-time reports to identify emerging trends related to COVID-19, its diagnosis, treatment and medications prescribed, and its impact on patients.
- Monitor the impact of interventions/policy decisions.