



# Impact of the COVID-19 pandemic on the quality of diabetes care: Insights from longitudinal data in Switzerland

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## ABSTRACT

In this population-based cohort study on diabetes care, self-reported quality indicators measured just before (2019) and during (2021) the COVID-19 pandemic were comparable, apart from a modest increase in seasonal influenza immunization and a small decline in patient-centeredness of care in 2021.

## 1. Introduction

Impact of the pandemic on the provision of non-COVID-19 health-care services has been substantial [1], with well-documented effects on the quality of primary care and cancer care for instance [2,3]. In the field of diabetes care, evidence is equivocal. Some research found that quality indicators like glycaemic control slightly improved during lockdown [4], while other works reported a decline in the quality of diabetes care [5–7]. Taking advantage of longitudinal data collected in the setting of a Swiss population-based cohort study, this research aimed at comparing the quality of diabetes care before and during the COVID-19 pandemic, as measured by self-reported indicators.

## 2. Material and methods

Data come from the 2019 and 2021 follow-up surveys of the CoDiab-VD cohort, which includes noninstitutionalized adults living with diabetes recruited in 2011–12 and 2017 through community-based pharmacies in the canton of Vaud, Switzerland [8]. The self-administered paper-based follow-up questionnaire encompasses different aspects of diabetes and its care, as well as health status and sociodemographic characteristics of the participants. The quality of diabetes care was assessed through the delivery of specific processes of care in the previous 12 months as reported by the participants (glycated hemoglobin (HbA1c) check, eye examination, microalbuminuria test, feet examination, lipid test, influenza immunization, blood pressure measurement,

and weight measurement) and outcomes of care measures (HbA1c value, and scores from the Patient Assessment of Chronic Illness Care (PACIC) instrument [9], the Diabetes Self-Efficacy Scale [10], and the Audit of Diabetes-Dependent Quality of Life (ADDQoL) [11]). Summary statistics were used to describe the participants in 2019 (mean and standard deviation for continuous variables, frequency and percentage for categorical variables). Processes and outcomes of care in 2019 and 2021 were compared using paired statistics (paired t-test for continuous variables, and McNemar or chi-squared test for categorical variables with two or more than two categories, respectively).

## 3. Results

Of the 649 individuals for which data were available in 2019, 538 (82.9%) participated in 2021 and were included in this analysis. Mean age of the participants in 2019 was 68 years (range 20–92, Table 1) and 42.8% were female. Most had type 2 diabetes (72.7%) and the majority reported using insulin or other injectable antidiabetic medication (60.0%).

Regarding the quality of diabetes care, participants reported a slight increase in seasonal influenza immunization in 2021 (62.6%, vs 57.2% in 2019, Table 1). Annual eye examination tended to be less frequently reported in 2021 (73.9%, vs 77.8% in 2019), but this tendency was not significant at the 0.05 threshold. The performance of other processes of care was comparable in 2019 and 2021. Except for the mean PACIC score, which showed a modest decline in 2021 (2.6, vs 2.8 in 2019),

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**Table 1**  
 Characteristics of the participants in 2019, and comparison of the processes and outcomes of care in 2019 and 2021.

Characteristics of the participants in 2019	N	Mean (SD; range) or % (n)	
Age (years)	538	68.0 (11.4; 20–92)	
Sex: female	538	42.8 (230)	
Education level	507		
Primary		13.4 (68)	
Secondary		54.4 (276)	
Tertiary		32.1 (163)	
Type of diabetes			
Type 1	538	11.5 (62)	
Type 2		72.7 (391)	
Other/unknown		15.8 (85)	
Antidiabetic medication including insulin or other injectable	522	60.0 (313)	
Number of diabetes-related complications <sup>a</sup>	499	0.5 (0.8; 0–4)	
Number of comorbidities <sup>b</sup>	518	1.7 (1.3; 0–6)	
Body mass index	507	29.3 (5.4; 17–63)	

  

Processes of care	N	2019 % (n)	2021 % (n)	P-value
≥ 2 HbA1c checks (previous 12 m)	487	76.6 (373)	79.1 (385)	0.261
Annual eye examination	513	77.8 (399)	73.9 (379)	0.100
Annual microalbuminuria test	416	78.6 (327)	78.1 (325)	0.912
Annual feet examination	512	68.4 (350)	67.8 (347)	0.859
Annual lipid test	494	95.1 (470)	94.9 (469)	1.000
Seasonal influenza immunization	514	57.2 (294)	62.6 (322)	< 0.001
≥ 2 blood pressure measurements (previous 12 m)	522	84.9 (443)	86.2 (450)	0.547
Annual weight measurement	521	90.0 (469)	91.2 (475)	0.512

  

Outcomes of care	N	2019 Mean (SD)	2021 Mean (SD)	p-value
HbA1c value [%]	265	7.0 (0.8)	7.0 (0.9)	0.107
PACIC score	519	2.8 (1.0)	2.6 (1.0)	< 0.001
Diabetes Self-Efficacy Scale score	503	8.0 (1.7)	8.0 (1.7)	0.275
ADDQoL score	535	-1.3 (1.6)	-1.3 (1.5)	0.317

Statistical significance calculated using McNemar or chi-squared (if >2 groups) test for categorical variables; paired t-test for continuous variables. Abbreviations: SD: standard deviation; 12 m: 12 months; HbA1c: glycated hemoglobin; PACIC: Patient Assessment of Chronic Illness Care; ADDQoL: Audit of Diabetes-Dependent Quality of Life.

<sup>a</sup> Among the following: ischemic heart disease, stroke, retinopathy, chronic kidney disease (CKD) without dialysis, CKD with dialysis or kidney transplant, neuropathy, foot ulcer, lower limb amputation, severe hypo- or hyperglycemia.

<sup>b</sup> Among the following: heart disease, chronic lung disease, osteoporosis, osteoarthritis or arthritis, malignancy, gastric or duodenal ulcer, depression, Parkinson disease, hypertension, hypercholesterolemia, other chronic condition.

there was no change in reported outcomes of care between 2019 and 2021.

**4. Discussion**

In this community-based sample of patients with diabetes in Switzerland, the quality of diabetes care as measured by self-reported processes and outcomes of care indicators was not substantially affected by the COVID-19 pandemic.

The higher uptake of seasonal influenza immunization is congruent

with other international research showing increased intention to vaccinate against influenza during the COVID-19 pandemic [12]. Patients with diabetes are at risk of severe illness from both influenza and COVID-19 and sense of vulnerability may have contributed to promote vaccination in this population. The small but significant decline in the mean PACIC score suggests that participants have perceived a decrease in the patient-centeredness of diabetes care during the COVID-19 pandemic. This corroborates findings from other works conducted in patients with chronic illness, who reported a reduced perceived support from health professionals during COVID-19 restrictions [13,14].

Globally, the COVID-19 pandemic has resulted in a heterogeneous disruption of outpatient care, which can stem from differences in the resilience of national health systems and variable government responses to face the spread of SARS-CoV-2 [1,15,16]. This could explain the absence of apparent decline in the quality of diabetes care in our setting, while a significant drop in quality was found in other countries [5,7]. This hypothesis is corroborated by the results of a recent international survey, which showed that 66.6% of Swiss primary care providers considered that the overall quality of medical care had not been affected by the COVID-19 pandemic, whereas this share ranged from 16.6% to 40.1% in the nine other high-income countries included in the study [17]. However, the timeframe considered could also play a role: the CoDiab-VD questionnaire was sent in late 2021 and covered the past 12 months, which does not include the period with the strictest public health measures in Switzerland (from March to May 2020). On the contrary, another study conducted in Switzerland and including the early months of the COVID-19 pandemic found a significant decrease in the quality of diabetes care as measured by comparable indicators [6]. These observations highlight the complex impact of the COVID-19 pandemic on the quality of diabetes care, which appears to vary across contexts and time periods. Further research is warranted to explore the factors leading to this heterogeneity.

It must be recognized that the self-reported nature of the data may limit the validity of our observations. For instance, participants may overestimate adherence to recommended care processes or report lower HbA1c values for social desirability reasons. However, there is no evidence that such limitation would differentially affect 2019 and 2021 findings and introduce bias in comparisons. In addition, it must be acknowledged that the generalizability of these findings to other contexts, populations and timeframes (e.g. with stricter containment measures) may be limited. Lastly, the absence of control group precludes a definite conclusion regarding the effective impact of the COVID-19 pandemic on the quality of diabetes care, which may have been affected by other unmeasured factors.

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**Ethical considerations**

The Ethics Committee of Research on Human Beings of the canton of Vaud approved the protocol of the CoDiab-VD cohort study (ID 151/11 and PB\_2017\_00232), and the protocol was registered on ClinicalTrials.gov (NCT01902043). All participants provided written informed consent.

**CRedit authorship contribution statement**

Concept and design: all authors. Data acquisition: EZ, IPB. Statistical analysis: EZ. Interpretation of data: all authors. Drafting of the manuscript: JD, EZ. Critical revision of the manuscript for important intellectual content: all authors.

## Declaration of Competing Interest

The authors have no conflict of interest to disclose.

## Data availability

The metadata from the CoDiab-VD datasets supporting the conclusions of this article are available in a public repository: <https://doi.org/10.16909/dataset/18>. Data are available upon request to be made via the repository.

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