



## Why diabetes outpatient clinics should not close during pandemic crises

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Since beginning of 2020, new coronavirus disease 2019 (COVID-19) spread from China to the rest of the world. According to the timeline of geographical spread, Italy was the second most affected country, with epidemic numbers rapidly matching and overlapping those observed in China. One of the first Italian COVID-19 outbreaks started on Feb 21st in Vo' Euganeo, a small town located in the Padua province of the Veneto Region (North-East Italy) [1]. To confine spreading of the outbreak, the area was promptly quarantined and most symptomatic COVID-19 inhabitants were admitted to the nearby Padua University Hospital. Then, due to escalating numbers of cases in the Region, the local government issued progressive lockdown measures, including social distancing, closure of educational and leisure activities, and prohibiting mass gatherings. Such interventions had proven effective in controlling the Chinese outbreak [2] and, along with mass testing [1], eventually helped to restrain COVID-19 in Veneto.

During lockdown, healthcare services were reorganized to cope with the mounting numbers of COVID-19 patients and the need to avoid spreading of the infection. Nurses and physicians from several specialty areas were recruited to COVID-19 wards, while the functioning of outpatient clinics was reduced because of personnel cuts and to avoid people crowding. Starting from March 15, 2020, onsite outpatient visits were limited to nondeferrable ones and to those related to maternal and child care. All other appointments were switched to telemedicine, postponed, or cancelled, forcing diabetes outpatient clinics into a partial shutdown.

Similar restrictions were applied in many other hospitals and outpatient clinics in Italy and around the world, directly or indirectly causing a drop in the care for many acute conditions other than COVID-19 and for most chronic diseases,

including diabetes. A striking example is the reduction in the number of hospital admissions for acute coronary syndromes that has been reported globally after COVID-19 outbreaks [3], mainly due to patients' reluctance to go to the hospital, which were overcommitted to the cure of infected people. The notion that diabetes negatively affected the outcome of COVID-19 [4, 5] has scared patients and discouraged them from seeking care and from attending the scheduled visits. During lockdown, there were fewer opportunities to exercise and more chances of falling into unhealthy nutritional habits [6]. In addition, many aged patients with type 2 diabetes (T2D) and their caregivers had limited digital access to remote consultations. These reasons, along with the burden of diabetes care, comorbidities, and polypharmacy, explain why people with diabetes are expected to be among those who suffered the most from lockdown.

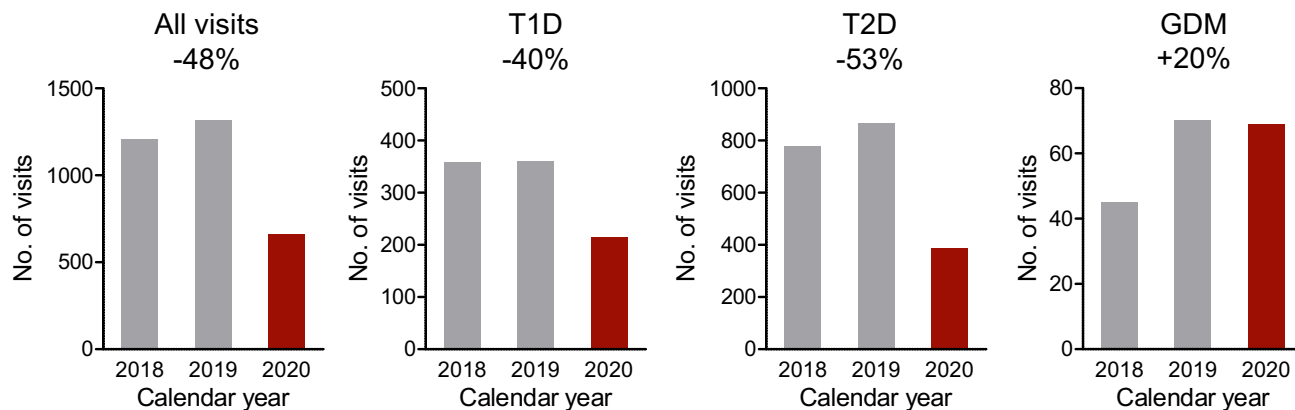
We have recently performed a retrospective analysis of the impact of lockdown on diabetes care at the outpatient clinic of the Padua University Hospital [7], serving as a hub for patients being infected in the primary local outbreak.

Using historical trends, we observed that, based on the expected number of visits, about 50% of patients who should attend the clinic were prevented to do so, either physically or remotely (Fig. 1). Most visits physically conducted onsite had high priority due to emerging issues on diabetes management, glucose control, or complications. Yet, the vast majority of diabetes specialist visits performed during lockdown were conducted remotely using email, phone calls, and other media. This was likely to affect the patients' ability to get in contact with the clinic and attend the visit, particularly for those with T2D, who are often aged and arguably have less digital skills than patients with T1D. These limitations forced a specific spectrum of clinical characteristics of patients with T2D who were assisted by the clinic during lockdown. When compared with patients attending the clinic in 2018–2019 and after accounting for lockdown-independent changes, T2D patients assisted during lockdown were younger with a shorter disease duration, and had less

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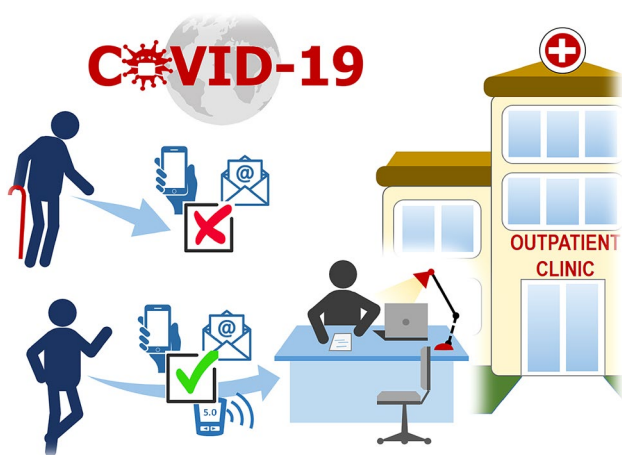
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## Period from 15 Mar to 15 Apr 2020



**Fig. 1** Reduction in the number of visits during 2020 lockdown as compared to 2018 and 2019. T1D, type 1 diabetes. T2D, type 2 diabetes. GDM, gestational diabetes. Percentages below type of visit

preceded by the minus sign, indicate the extent of reduction observed during 2020 lockdown as compared to the average of 2018 and 2019. Original data are from [7]



**Fig. 2** A vignette showing the impact of lockdown on access to outpatient consultation

frequent macroangiopathy and less complex pharmacotherapies. Therefore, as compared to historical trends, we missed aged T2D patients with a heavier complication burden and complex pharmacotherapies, likely because they could not get in contact with the clinic for an onsite or remote consultation. The interpretation of this finding is that the toll of lockdown on diabetes outpatient care has been paid by the most fragile patients. Worryingly, they actually may need more attention than others during a critical period with reduced functioning of many healthcare services (Fig. 2). Unfortunately, these patients remained invisible to our system, as we cannot capture the characteristics of those who were not seen, even remotely.

Another worrying piece of information emerging from our analysis is that the trend increase in the prescription of

cardioprotective drugs may have been blunted by lockdown. The proportion of patients under GLP-1RA more than doubled from 2018 to 2019 to the prelockdown period of 2020, whereas such increase was significantly halted for T2D patients assisted during lockdown. The use of antiplatelet agents and lipid-lowering therapies was also significantly reduced. These differences may have several explanations, including the fact that patients who showed-up during lockdown had better cardiovascular health or that patients on GLP-1RA had better glycemic control; thereby, not needing an outpatient visit, or did not need to refill prescriptions because the validity of prescriptions was extended. However, our observations might also imply a less appropriate management of cardiovascular risk factors. This should be interpreted in view of the observation that, during lockdown, emergency accesses for acute cardiovascular events were dramatically reduced all over the world because of healthcare service shutdown and patients' fear of infection. Thus, maintaining a high standard in the management of cardiovascular risk factors becomes critical to minimize the risk during lockdown periods and prevent cardiovascular events for which patients might not seek care. In this perspective, a widespread use of glucose lowering medications provided with cardio-renal protective effects, including GLP-1RA and SGLT-2 inhibitors [8], should be once more advocated. Prevention of myocardial infarction and heart failure should always be the top priority in the management of T2D, but it becomes even stronger when cath-labs are difficult to reach, and cardiologists are recruited to COVID-19 clinics.

It should be clearly acknowledged that, so far, we do not know whether the changes imposed by lockdown on diabetes outpatient care resulted in worsening of chronic complications. We advocate for future studies that analyze whether

the rate of cardiovascular events and other hard outcomes of diabetes including, e.g., foot ulcerations and worsening retinopathy, have increased during lockdown and in the following months.

Maintenance of the number of visits for GDM, most of which were performed onsite, was due to the fact that no restriction was imposed to maternal and child care. Of note, the drop in the number of visits for T1D during lockdown was significantly smaller than that observed for T2D, and we found no significant difference in the clinical profile of T1D patients assisted by the clinic during lockdown as compared to prior years. This suggests no specific issue in the short-term management of T1D during lockdown and is consistent with other findings. Nowadays, people with T1D in Italy make frequent use of glucose sensors, which allow them to be remotely connected to diabetes specialists and seek advice outside the scheduled visits. Indeed, we and others have found that patients with T1D, whose glucose control could be monitored through sensors connected to cloud platforms, displayed no glycemic deterioration or even improved during lockdown [9]. We do not argue that all people with T1D are exempt from the adverse consequences of healthcare limitations during lockdown, but they may be less susceptible to harm, at least in the short term and due to the widespread use of technology.

Our analysis of the reaction to the first SARS-CoV-2 pandemic wave suggests that the toll of lockdown on diabetes outpatient care has been paid by the most fragile ones, especially aged individuals with T2D, heavier complication burden and complex polypharmacy. Along with the drop in the use of cardioprotective drugs, such slump in diabetes care is expected to boomerang in the months after lockdown and bring about a new burden to patients and healthcare services.

Analyses like ours are crucial to aid a better preparedness and reorganization of healthcare facilities during the next pandemic phases and eventual future challenging crises. It is important to note that we only examined the short-term impact of lockdown on diabetes outpatient care and that a more prolonged shutdown is expected to impress even heavier burdens to patients with type 2 diabetes and start to affect those with type 1 diabetes. Several preventive measures have proven critically effective in contrasting the pandemic, such as prohibiting mass gathering and social events, limiting public transportation and other interpersonal contacts, along with widespread use of personal protective equipment. The first wave of infections has been effectively restrained, but the healthcare consequences for people went far beyond COVID-19 related morbidity and mortality [10].

Diabetes increases the risk of severe COVID-19 and poses specific issues in its management, including risk of hypoglycemia (due to anorexia and use hydroxychloroquine or macrolids) or hyperglycemia (due to inflammation and use of corticosteroids). In addition to the challenges of

lockdown, these latter aspects require continued attention by diabetes specialists which should be part of a multidisciplinary team to fight COVID-19.

This is why we argue that healthcare services for people with chronic diseases, like diabetes outpatient clinics, should not shutdown totally or partially during pandemic crises, and keep serving fragile patients who are less resilient to these unprecedented stressful conditions.

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## Compliance with ethical standards

**Conflict of interest** MLM received lecture fees or grant support from Amryt Pharma and Servier. BMB received lecture or advisory board fees from AstraZeneca, Eli Lilly, Boehringer Ingelheim, Novo Nordisk, and Novartis. AA received research grants, lecture or advisory board fees from Merck Sharp & Dome, AstraZeneca, Novartis, Boehringer-Ingelheim, Sanofi, Mediolanum, Janssen, Novo Nordisk, Lilly, Servier, and Takeda. GPF received lecture fees or grant support from Abbott, AstraZeneca, Boehringer, Lilly, Merck-Sharp-Dome, Mundipharma, Novartis, Novo Nordisk, Sanofi, Servier.

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