



Review Article

## Living in the Era of Multiple Epidemics—A Malta Perspective

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**Abstract.** Non-communicable diseases (NCDs) have long been a global epidemic way before the onset of the COVID-19 pandemic. In 2016, it was estimated that 6.55% of the adult population in Malta suffered from at least one NCD, with type 2 diabetes, obesity and low back pain dominating the NCD scene. The onset of COVID-19 challenged the healthcare systems, as well as the wellbeing of the population. Restrictions instituted to control COVID-19 led to negative repercussions on those suffering from NCDs apart from bringing to the fore specific NCDs such as mental illness, obesity, and back pain. Furthermore COVID-19 increased the population burden through enhanced morbidity and mortality. However, the COVID-19 vaccination was observed to have helped dampen this burden. Yet, it is important that a syndemic approach is adopted to ensure that all epidemics are simultaneously given the appropriate attention and timely action is provided to safeguard the population health and wellbeing.

**Keywords:** Non-communicable diseases, Epidemics, COVID-19, Healthcare, Population Health Malta

### 1 Introduction

#### 1.1

Non-communicable diseases (NCDs) have long been acknowledged as being a global epidemic contributing to a substantial population burden, with enhanced morbidity and premature mortality (Vos et al., 2020). These have been dominating the world way before the onset of the SARS-CoV2 coronavirus epidemic in 2019 (Peng et al., 2020). Non-communicable diseases, also referred as chronic diseases, are non-infectious diseases that have a long-term impact on the effected population's health and wellbeing. Indeed, in 2019, it was estimated that NCDs contributed to 91.08% (4.9 million) deaths and 87.55% of all Disability-Adjusted Life Years (DALYs) across the

countries making up the European Union (EU) (Institute for Health Metrics and Evaluation, 2020).

The most commonly reported NCDs are cardiovascular diseases, chronic respiratory diseases, diabetes and cancers (World Health Organization, 2018). These NCDs have been linked to common behavioural risk characteristics namely poor diet, tobacco use, excessive alcohol consumption and lack of physical activity (Hunter et al., 2013; World Health Organization, 2016a). Poor diet refers to the consumption of the extensive availability and highly affordable processed food which is high in salt, sugar, fat, and calories. The consumption of which, leads to an enhanced body weight and waist circumference. Both of which are risk factors for the development of several NCDs (Webber et al., 2014; World Health Organization, 1994). The digital era we are living in, is further challenging the NCD epidemic as food delivery applications have been linked with increased consumption of unhealthy diet. Consequently increases the risk of NCD development (Halleran et al., 2022).

Yet, most NCDs can be preventable by tackling the risk factors such as unhealthy diet, tobacco and alcohol use, sedentary lifestyle as well as environmental factors. Indeed, 80% of diabetes heart disease and stroke cases can be prevented, as can 40% of cancer cases (World Health Organization, 2020a). Additionally, NCDs is an economic burden at the individual level, on the healthcare delivery and at a national level (Hofmarcher et al., 2020). In fact, the EU Member States account for at least 25% of their national healthcare spending on the four commonest NCDs (cardiovascular disease, diabetes mellitus, chronic respiratory disease, and cancer). Furthermore, these four NCDs also account for 2% economic loss from the EU Member states gross domestic product (GDP) (Hofmarcher et al., 2020). Countries have set up several national strategies and policies addressing the NCD epidemic, yet most countries lack the capacity to implement the interventions, subsequently resulting in a worse NCD

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state (Breda et al., 2019).

## 1.2 NCDs situation in Malta pre-COVID-19

The presence of the NCD epidemic is evident in the small Mediterranean Island of Malta, with type 2 diabetes being referred to as the national disease (Cuschieri et al., 2014). Indeed, the last nationwide cross-sectional health examination survey conducted (2016) in Malta, estimated that 10.31% of the adult population suffered from type 2 diabetes. 4% out of these were not aware of having this disease before taking part in this study (Cuschieri, 2020c). Another pressing epidemic in Malta, mirroring the global landscape, is obesity (Cuschieri, 2020a; World Health Organization, 2014). In 2016, 69.75% of the adult population in Malta was identified to be either overweight (body mass index (BMI)  $>25$  Kg/m<sup>2</sup> but  $<30$  Kg/m<sup>2</sup> or obese (BMI  $>30$  Kg/m<sup>2</sup>) (Cuschieri et al., 2016a). Meanwhile on a global level, in 2016 it was reported that 39% of adults were overweight and 13% were obese (World Health Organization, 2016b). This high occurrence of obesity in Malta has been attributed to the obesogenic environment the population lives in, as well as being associated with the male sex, increase in age, suffering from diabetes or impaired fasting glucose (IFG) (Cauchi et al., 2015; Cuschieri, 2020a). Another factor contributing to both the diabetes and obesity epidemics is the transition in the nutritional process from the traditional Mediterranean diet to a Westernized diet. This shift is being experienced across all the Mediterranean countries including in Malta (Cuschieri et al., 2021h; Da Silva et al., 2009; Dinu et al., 2021). The high prevalence of diabetes and obesity contributes to a high population burden, not only at an individual level but also at a national level, with increased economical and health service burdens. Indeed, it was estimated that the economic burden for both diabetes and obesity for the year 2016 was €52,891,997 equivalent to 6.61% of the total health expenditure for Malta (Cuschieri et al., 2016b).

Chronic low back pain is another non-communicable disease and reported to be a major health problem in Europe, with a prevalence of 19% among the adults in Europe (Breivik et al., 2006). In Malta, in 2015 it was estimated that 6.4% of the adults suffered from chronic low back pain, which contributed to 2,633 healthy life years lost in a year (716 disability adjusted life years DALYs per 100,000) (Cuschieri et al., 2020d; Directorate for Health Information and Research, 2018).

In the current ageing era, it is more common for the population to suffer from two or more concurrent NCDs, also referred to as multimorbidity, which is a pressing public health concern (Garin et al., 2016; Li et al., 2016). In 2016, 33% of the adults in Malta suffered from

multimorbidity, with the commonest concurrent diseases being myocardial infarction and hypertension (54.45%) (Cuschieri et al., 2021d). Interestingly, Gozo, was observed to have the highest multimorbidity prevalence when compare to the main island (Cuschieri et al., 2021d).

## 1.3 The Clash of Epidemics

The end of the year 2019 saw the emergence of the novel coronavirus SARS-CoV2, causing the COVID-19 infection. Within a short period of time, COVID-19 became an epidemic and by March 2020 it was declared a pandemic (World Health Organization, 2020b). This came at the backdrop of the soaring NCDs epidemic that was contributing to a large global burden, disability and overloading healthcare services (GBD 2019 Diseases and Injuries Collaborators et al., 2020). During the first phase of the COVID-19 pandemic, most governments, including in Malta, instituted a number of restrictions including the postponements of elective surgeries and consultations to prioritize health resources towards COVID-19 management, along with mandates for social distancing and lockdowns (Cuschieri, 2020b; Tabari et al., 2020). These restrictions also had a negative effect on the screening and management of NCDs, with an anticipated negative effect in the long term (Palmer et al., 2020). Indeed, in the United Kingdom between March and December 2020 it was estimated that 60,000 individuals with type 2 diabetes were missed (Carr et al., 2021). Although these measures enabled the curbing of the viral spread, they imposed additional challenges for those already suffering from NCDs apart from increasing health inequalities (Cuschieri et al., 2021i). It needs to be noted that those suffering from NCDs, including diabetes and obesity, exhibited a higher susceptibility to get complications if infected by COVID-19 (Cuschieri et al., 2020b, 2020c; O'Donovan et al., 2019). Therefore, the collusion of these two epidemics increased the burden of COVID-19 through morbidity and mortality (Azarpazhooh et al., 2020). Hence protecting the vulnerable, including those suffering from NCDs was the way forward before vaccination came in play (Cuschieri et al., 2021g). Additionally, the pandemic brought about an increased mental health burden even among the previously healthy population (Pan et al., 2021). The fear and anxiety brought about by COVID-19 also impacted negatively on the willingness to seek medical care especially among those already suffering from NCDs, as was observed in a Malta Survey (Cuschieri et al., 2021f).

## 1.4 The Impact of COVID-19 in Malta

The first reported COVID-19 case in Malta was on the 7th of March 2020 (Cuschieri, 2020b). Timely measures, adequate hospital preparedness along with the population's

cooperation led to a low burden on the healthcare system as well as minimal population morbidity and mortality during the first wave (Cuschieri, 2020b; Cuschieri et al., 2021c). Indeed, compared with other small islands in Europe, Malta had the best first wave COVID-19 outcome (Cuschieri et al., 2021j). Gradual lifting of restrictions in May 2020 saw Malta move into the transmission period and enter Summer 2020 (Cuschieri, 2021). However, unrestricted mass events tipped the scales and Malta entered into a rapid incline in COVID-19 cases and mortality as of August 2020 (Cuschieri et al., 2020a). Over the first year of COVID-19, it was estimated that the direct burden of COVID-19 imposed on the Maltese population contributed to 5,478 (DALYs) healthy life years lost, with the highest contributing factor being mortality (Cuschieri et al., 2021b). It was noted that the burden of COVID-19 ranked the fourth leading disease in Malta following ischemic heart disease (1<sup>st</sup>), low back pain (2<sup>nd</sup>) and diabetes (3<sup>rd</sup>) (Cuschieri et al., 2021b). The end of 2020 saw the approval of the first COVID-19 vaccine and the start of the vaccination programme across Europe (European Medical Agency, 2021). Malta was able to secure enough vaccine doses for the whole eligible population and adopt a rapid vaccination strategy to inoculate the population over a couple of months (Cuschieri et al., 2021a). It was expected that the COVID-19 burden on healthcare systems and on the population reduced as the vaccination update increase. Indeed, the positivity rate (number of positive cases divided by the number of swabs) and the mortality rate among the 65+ years decreased drastically only a few months following the vaccination uptake (Cuschieri et al., 2021g).

### 1.5 Covid-19 Impact on NCDs

Taking Malta as a case study, it was estimated that 6.55% of the adult population suffers from at least one NCD (Cuschieri et al., 2021e). These are known to be more susceptible to acquire COVID-19 complications and may need medical attention with a possibility of hospital admission. A predictive modeling exercise was carried out, before the initiation of the COVID-19 vaccination programme, using local data (Malta). This exercise estimated that 20,527 Maltese adults suffering from NCDs were at risk of requiring hospitalization if infected by COVID-19 (Cuschieri et al., 2021e). Of note, those suffering from NCDs are associated with having a higher risk of developing depressive illness that inevitably will have a negative repercussion on the individual's health outcome (Chudasama et al., 2020). Additionally, individuals suffering from NCDs that survive the COVID-19 infection are at higher risk of enhancing the progression of their pre-existing NCDs as well as develop long-haul symptoms

(Al-Jahdhami et al., 2021; Palmer et al., 2020).

The COVID-19 restrictions brought additional risks towards developing new onset NCDs. A survey conducted among Maltese adults observed that 49% of the responders started to experience back pain following the onset of COVID-19. Indeed, the factors associated with back pain were identified to be prolonged sitting down (15% increase risk) and lack of physical activity (4% increase risk) (Grech et al., 2022). Prolonged periods at home and restricted access to leisure areas tend to increase the sedentary behaviour and screen time, all of which are associated with higher risk of weight gain even among children (Tripathi et al., 2020). Increased screen time is also associated with increased snacking frequency, which further enhances the risk of weight gain (Tripathi et al., 2020). Additionally, the COVID-19 pandemic is a psychological stress on its own, which may result in stress-eating of high calorie food and drinks, which also increases the risk of weight gain (Pietrobelli et al., 2020). Therefore, development of obesity is an indirect effect of COVID-19 (Jia et al., 2021; Mulugeta et al., 2021).

## 2 Implications to Policy and Practice

As the COVID-19 pandemic keeps on soaring across the world, containment, curbing the spread and protecting the population remains on top of the policy agenda. Yet, it is important to remember the NCDs epidemic has been a global emergency way before the onset of the COVID-19 pandemic. While controlling the viral spread will indirectly reduce the progression of NCDs and the development of pandemic related new onset NCDs, direct action targeting the NCD epidemic is required (Cuschieri et al., 2021d; Cuschieri et al., 2021i). Indeed, a syndemic approach has been proposed, where both COVID-19 and NCDs are managed simultaneously. The primary healthcare should be the hub for this management as it offers holistic care as well as being located within the community, enabling a better access to medical care. Furthermore, shifting such care to the primary healthcare will reduce the burden on the tertiary healthcare systems which will enable these systems to dedicate their resources to treating the acute and critically ill population (Cuschieri et al., 2021i).

## 3 Conclusion

We are living in an era of multiple concurrent epidemics, some of which have conquered the world for decades. Malta, like the rest of the world, has been in the constant battle to control the growing epidemic of NCDs. The onset of the COVID-19 pandemic shifted the focus temporarily from the NCD epidemic, causing the disruption and potentially negative repercussions to the long-term management of NCDs. It is therefore important that

a syndemic approach is adopted to ensure that all epidemics are simultaneously given the appropriate attention and timely action is provided to safeguard the population health and wellbeing.

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