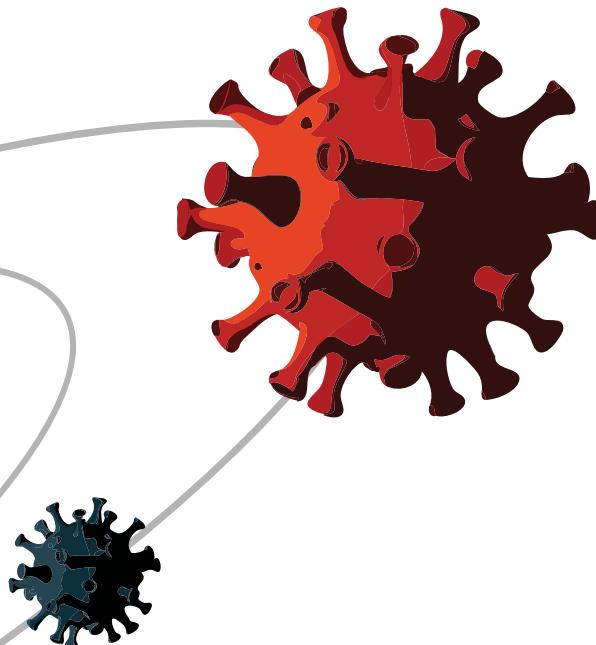


The COVID-19 impact on the Maltese population's well-being





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As the COVID-19 pandemic took over Europe, there was no question that the disease had a profound effect on public health in Malta. But as cases were rising, **Dr Sarah Cuschieri** noticed that nobody was reporting the impact on people's lives. Here she tells **Becky Catrin Jones** how doing the maths could help us face challenges in public health.

early two years into the pandemic, it's almost impossible to remember a time when COVID-19 wasn't in the news. Since March 2020, the Maltese population has had to adapt to life with an unwelcome visitor on its shores – a virus causing a respiratory illness, fatal in the most extreme cases. The newly identified coronavirus, SARS-CoV-2, spurred the scientific community into action as more details, symptoms, and variants were revealed.

Wishful thinking that the virus might just disappear by itself seemed more and more unlikely, and the impact of the virus on long-term public health was called into question. While some who contracted the virus appeared to recover with no symptoms at all, others were far less lucky. Particularly distressing for a subset of COVID-19 sufferers was the talk of so-called 'long-COVID', where some symptoms of the infection could persist for weeks or even months. A growing number of reports told tales of patients who, although no longer needing

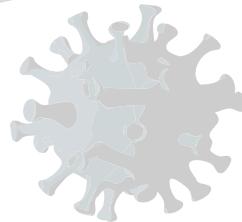
treatment at a hospital, were still struggling to complete everyday tasks without becoming very short of breath. Others had lingering fatigue, headaches, or loss of smell and taste.

The numbers of infected or hospitalised COVID-19 patients were being published weekly by the Ministry for Health, but there was no real sense of what these numbers meant for the Maltese population. For Dr Sarah Cuschieri, this was a question far too important to ignore.

PUBLIC HEALTH

Cuschieri's background in epidemiology and public health had given her plenty of experience in mapping the impact of disease on our health. With a particular interest in diabetes, Cuschieri had begun studying the burden of particular diseases on society.

By only considering the mortality rate of a disease, we miss the impact that it has on the day-to-day life of a patient. For example, someone with Type II diabetes might have a lower life expectancy than average. But poorly managed ➤



Dr Sarah Cuschieri

diabetes might mean that the patient suffers with pain in their fingers and toes, loses their eyesight, or has to inject insulin, all of which affects their quality of life compared to a healthy individual. To get a real understanding of a disease, there needs to be a way to measure how much of a burden living with a particular condition is to an individual life.

'We call these Disability Adjusted Life Years, or DALYs,' Cuschieri says. DALYs are a measure of time lost – either through premature death due to disease (mortality), or what an individual might miss out on due to pain or disability related to their condition (morbidity).

WHAT IS DALY?

Mortality, or Years of Life Lost to premature death (YLL), can be calculated relatively simply by comparing the age at which the patient died to the average life expectancy. Morbidity, however, takes a little more thought. To assess this, symptoms are further divided into severity categories: moderate, severe, or critical. These are used to give weighting to each of the symptoms that an individual might experience, producing a number for Years Lived with Disability (YLD).

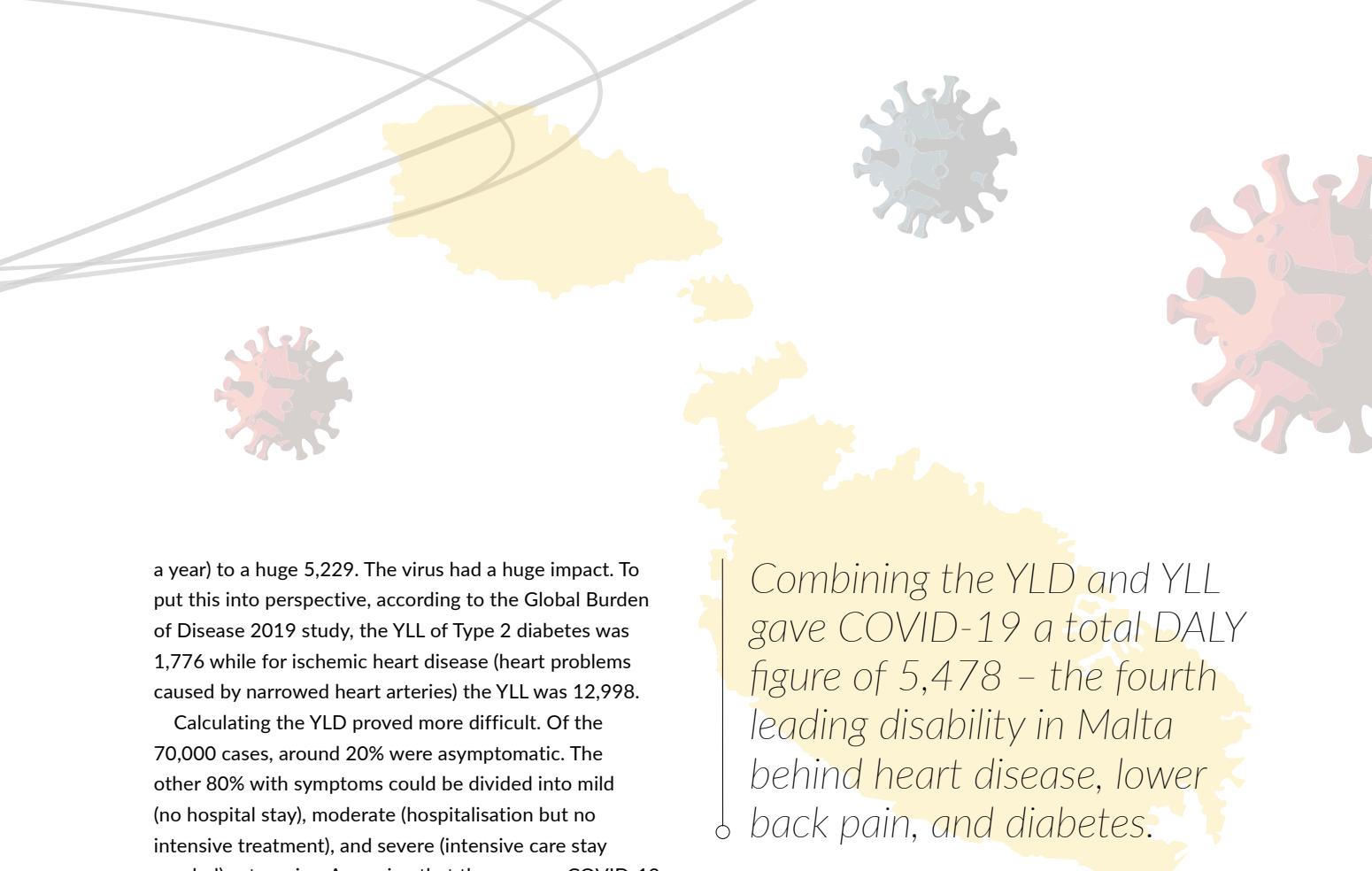
Working alongside epidemiologists, the YLL and YLD are combined to produce a single number, which can be used to compare the impact of different diseases on a population. This can be an incredibly useful tool for determining priorities in healthcare research and funding.

Such studies are uncommon in Malta. In fact, there had only been one such epidemiological study in Malta before COVID-19 – led and conducted by Cuschieri herself.

But the growing impact of COVID-19 required further action. Although the first wave of COVID-19 infections had been relatively low and controlled, summer of 2020 brought much greater numbers and more stress on healthcare systems. Cuschieri and her colleague, Prof. Neville Calleja, began documenting the numbers of COVID-19 infections and hospitalised patients reported by the government in their weekly updates, along with any reports on mortality of patients.

THE IMPACT OF COVID-19

In the year between March 2020–2021, over 70,000 people were reported as testing positive for COVID-19 in Malta, of whom 331 sadly died. Using these figures alongside data on the average life expectancy, Cuschieri calculated that on average the disease robbed patients of 16 whole years of life. Across all patients, that brought the YLL (which represents the impact of a disease over



a year) to a huge 5,229. The virus had a huge impact. To put this into perspective, according to the Global Burden of Disease 2019 study, the YLL of Type 2 diabetes was 1,776 while for ischemic heart disease (heart problems caused by narrowed heart arteries) the YLL was 12,998.

Calculating the YLD proved more difficult. Of the 70,000 cases, around 20% were asymptomatic. The other 80% with symptoms could be divided into mild (no hospital stay), moderate (hospitalisation but no intensive treatment), and severe (intensive care stay needed) categories. Assuming that the average COVID-19 infection lasted 14 days, Cuschieri and team used these figures to calculate the YLD for each category.

But those long-COVID sufferers made the story more complicated. Reports of breathlessness and fatigue couldn't be ignored when considering the impact that COVID-19 was having on Maltese lives. To account for this, the team adapted the calculation to include an extra 14 days of infection, bringing the total to 28 days. Altogether, these long-COVID patients accounted for more YLD than all the other groups combined.

Combining the YLD and YLL gave COVID-19 a total DALY figure of 5,478 – the fourth leading disability in Malta behind heart disease, lower back pain, and diabetes. The impact is massive, especially when considering that the vast majority of this big number comes from the number of people who died from the disease or who suffered the effects for longer than two weeks.

It's difficult to know if some of these long-COVID symptoms are purely caused by lingering effects of the virus, or whether the side effects of being in lockdown have had some impact too. In another study, Cuschieri used a prediction methodology to examine the burden that COVID-19 has put on those with pre-existing health conditions, such as diabetes or obesity. 'We're finding that those with chronic disease had worse COVID, and when they recovered, their chronic disease was worse or responded less well to medication,' she said.

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A lack of available data at the beginning of the pandemic and other compounding factors such as existing health conditions made the DALYs modelling more challenging. But Cuschieri is confident of the overall conclusions. 'We had to adapt the maths to make sure we had a clear picture,' she said, but she stresses that she would like to work more closely with healthcare providers on other follow-up projects to model the burden of disease.

LONG-TERM EFFECTS

It's undeniable that COVID-19 has had a profound effect on our lives, but having the numbers down in black and white to compare with other diseases has helped many realise the extent of COVID's impact. Since publishing this research, lessons are already being learnt. The Maltese Parliament was offered the paper to prove the need for continued testing, and Cuschieri has been invited on various platforms to share her work.

What next? Cuschieri has already worked on a number of related projects examining the effect of COVID on other diseases – those with chronic illnesses who have then caught COVID, or those with undiagnosed conditions that have slipped unnoticed in the midst of lockdowns and full hospitals.

'The health and socioeconomic repercussions of the pandemic could be huge,' Cuschieri says. 'There is a lot more that we need to understand.'