THE IMPACT OF THE COVID-19 PANDEMIC ON PRIMARY HEALTHCARE DISEASE INCIDENCE RATES: 2017 TO 2020

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ABSTRACT.

We analyzed variations in the annual incidence of the main cardiovascular risk factors, prevalent chronic diseases, common mental health disorders and neoplasms in 2020 compared with 2017-2019. In 2020, there was a significant decrease in the incidence of hypertension, hypercholesterolemia, type 2 diabetes mellitus, chronic kidney disease, ischemic heart disease, benign prostatic hypertrophy, osteoporosis, hypothyroidism, chronic obstructive pulmonary disease, alcohol use disorder, benign tumors, and melanomas. Only anxiety disorders increased significantly (IRR 1.16; 95% CI 1.07-1.24). Prioritization of COVID-19 care has changed the doctor-patient relationship to the detriment of face-to-face scheduled visits of chronic disease detection and monitoring protocols.

KEYWORDS:

COVID-19, SARS-Cov-2, Primary healthcare, Chronic conditions, Underdiagnosis.

INTRODUCTION.

The SARS-CoV-2 coronavirus pandemic has placed unprecedented stress on health systems. In Spain, with a total of 2,883,465 confirmed cases and 60,370 deaths (1), it has led to radical changes in primary care medicine and nursing. Primary care centers have detected > 80% of all cases and have redirected their efforts to the prevention, diagnosis and monitoring of COVID-19 cases and their contacts (2). They have also responsible for the early detection of complications and mass testing of vulnerable patients in nursing homes and schools. The prioritization of COVID-19 care has changed the doctor-patient relationship through widespread use of teleconsultations, email consults, and telemonitoring to avoid face-to-face care and minimize the risk of contagion (3). However, COVID-19 preventive measures (especially home confinement, curfews, and physical distancing), the fear of contagion and the transformation of family medicine services to respond to COVID-19 may have led to significant reductions in the care of chronic noncommunicable diseases and cancer (4,5). We aimed to assess the impact of the prioritization of care for COVID-19 patients on the detection and diagnosis of the main cardiovascular risk factors, prevalent chronic diseases (including mental health problems) and neoplastic diseases in 2020 compared with 2017-2019.

METHODS.

We made a retrospective, longitudinal study of variations in the annual incidence of the detection and diagnosis of the main cardiovascular risk factors, prevalent

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chronic diseases, frequent mental health disorders and neoplasms during 2017-2020. Data came from a centralized database that records the frequency of the diagnoses studied in three primary care centers in Barcelona (Spain). In 2020, the assigned population aged >15 years in the three centers was 87,478 patients, with 23.5% aged > 65 years. Diagnoses and health problems are recorded by physicians and nurses using the International Classification of Diseases (ICD-10). An SQL query system was used to obtain the aggregated frequency of the conditions studied. As data were anonymized, patient consent was not required, and the study was authorized by the Services Directorate. The annual incidence rates per 1000 patients were analyzed, and the incidence rate ratios (IRRs) were calculated to compare the incidence rate in 2020 with the mean of 2017-2019. The statistical analysis was made using R version 3.6.1. for Windows.

RESULTS.

In 2020, there were significant reductions in the incidence rates of hypertension (IRR 0.60, 95% CI 0.52-0. 68), hypercholesterolemia (IRR 0.64, 95% CI 0.57-0.72), type 2 diabetes mellitus (IRR 0.61, 95% CI 0.52-0.73), chronic kidney disease (IRR 0.57, 95% CI 0. 48-0. 68), ischemic heart disease (IRR 0.52, 95% CI 0. 39-0. 68), benign prostatic hypertrophy (IRR 0.62, 95% CI 0.5 4-0.72), osteoporosis (IRR 0.60, 95% CI 0.5 0-0.72), hypothyroidism (IRR 0.54, 95% CI 0. 46-0. 63), chronic obstructive pulmonary disease (IRR 0.50, 95% CI 0. 39-0. 65), alcohol use disorder (IRR 0.54, 95% CI 0. 38-0.77), benign tumors and colonic polyps (IRR 0.58, 95% CI 0. 49-0. 69) and melanomas (IRR 0.55, 95% CI 0.32-0.9 (2), compared with the

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mean in 2017-2019 (Table 1). The reductions ranged from 36% for hypercholesterolemia to 50% for chronic obstructive pulmonary disease. The incidence rates of heart failure, dementia, depression, renal cancer, and thyroid cancer were significantly lower than in the previous year. The only condition whose incidence significantly increased during 2020 relative to the mean incidence in 2017-2019 was anxiety disorders (IRR 1.16, 95% CI 1.07-1.24). There was a non-significant increase in the incidence of lung cancer. Figure 1 shows the trend of the annual incidence for each condition in the four years analyzed.

DISCUSSION.

Our results show a very significant decrease in the frequency of diagnoses of cardiovascular risk factors, chronic diseases, and some tumors in 2020 compared with 2017-2019, which can only be attributed to organizational changes in family medicine services aimed at prioritizing COVID-19 care. Other studies analyzing indicators of chronic disease follow-up reached similar conclusions during the first four months of the pandemic (6,7). The increased incidence of lung cancer, although non-significant, may be linked to the increase in pulmonary radiological tests (chest x-ray and chest CT) in the context of the pandemic.

Between February and December 2020, primary care centers have been "bunkerized" and the new accessibility and proximity model, the loss of scheduled preventive and health promotion visits and the change from face-to-face visits to virtual consults to the reduction in incidence rates (8). Therefore, the minimization of face-to-face contact to protect against COVID-19 may have induced a

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paradoxical contrary effect on the control of chronic disease. This effect might be further increased by the start of the COVID-19 vaccination campaign which is to be managed by primary care centers. The increase in anxiety disorders is also consistent with the current exceptional situation (9).

In the immediate future, self-care and self-management health and disease, which largely depend on the knowledge, skills, and confidence of patients, must be reactivated. However, these isolated measures will be of little use without a plan to transform and strengthen primary care focused on increasing human resources, modernizing infrastructure, and generalizing telecommunications, if we are to regain control of chronic diseases and ensure a life expectancy similar to the pre-pandemic situation.

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Table 1. Incidence rates (per 1000 persons) of cardiovascular diseases, chronic non-cardiovascular diseases, mental disorders, health problems and cancer diseases during the period from 2017 to 2020.

Diseases	2017	2018	2019	2020	IRR [95% CI]†	IRR [95% CI]‡
Cardiovascular risk factors and diseases						
Hypercholesterolemia	17.11 [15.88-18.42]	15.88 [14.72-17.11]	17.69 [16.47-18.97]	10.78 [9.86-11.77]	**0.61 [0.54-0.68]**	**0.64 [0.57-0.72]**
Hypertension	14.06 [12.96-15.22]	14.2 [13.11-15.34]	13.35 [12.31-14.46]	8.26 [7.46-9.12]	**0.62 [0.54-0.70]**	**0.60 [0.52-0.68]**
Type 2 diabetes	6.10 [5.46-6.81]	6.36 [5.71-7.06]	6.71 [6.05-7.42]	3.93 [3.44-4.47]	**0.59 [0.50-0.69]**	**0.61 [0.52-0.73]**
Chronic kidney disease	6.77 [6.10-7.48]	5.33 [4.75-5.96]	7.03 [6.37-7.75]	3.64 [3.18-4.15]	**0.52 [0.44-0.61]**	**0.57 [0.48-0.68]**
Heart failure	2.15 [1.79-2.57]	2.97 [2.54-3.44]	3.31 [2.87-3.81]	2.54 [2.16-2.96]	**0.77 [0.62-0.95]**	0.90 [0.72-1.12]
Stroke	1.86 [1.52-2.25]	2.22 [1.86-2.64]	1.74 [1.42-2.11]	1.86 [1.54-2.23]	1.07 [0.81-1.40]	0.96 [0.73-1.25]
Ischemic cardiomyopathy	3.24 [2.79-3.75]	2.23 [1.86-2.64]	2.24 [1.87-2.65]	1.32 [1.05-1.64]	**0.59 [0.44-0.78]**	**0.52 [0.39-0.68]**
Acute myocardial infarction	0.99 [0.75-1.29]	0.96 [0.72-1.24]	0.87 [0.65-1.14]	1.14 [0.89-1.44]	1.31 [0.91-1.91]	1.22 [0.84-1.76]
Chronic non-cardiovascular diseases						
Dementia	6.25 [5.60-6.95]	7.40 [6.71-8.14]	9.64 [8.85-10.47]	6.77 [6.13-7.45]	**0.70 [0.62-0.80]**	0.87 [0.76-1.00]
Asthma	5.34 [4.74-5.99]	6.86 [6.19-7.59]	5.68 [5.07-6.33]	5.07 [4.51-5.68]	0.89 [0.76-1.05]	0.85 [0.72-1.00]
Benign prostatic hypertrophy	9.00 [8.23-9.83]	9.23 [8.46-10.06]	8.25 [7.52-9.03]	5.47 [4.89-6.10]	**0.66 [0.57-0.77]**	**0.62 [0.54-0.72]**
Hypothyroidism/thyroiditis	7.39 [6.67-8.16]	7.32 [6.62-8.08]	7.92 [7.20-8.70]	4.07 [3.57-4.63]	**0.51 [0.44-0.60]**	**0.54 [0.46-0.63]**
Osteoporosis	5.83 [5.20-6.52]	4.92 [4.35-5.54]	5.76 [5.15-6.43]	3.31 [2.86-3.81]	**0.57 [0.48-0.69]**	**0.60 [0.50-0.72]**
Chronic obstructive pulmonary disease	2.73 [2.31-3.20]	2.75 [2.33-3.21]	3.22 [2.78-3.72]	1.46 [1.18-1.80]	**0.45 [0.35-0.59]**	**0.50 [0.39-0.65]**
Mental disorders and health problems						
Anxiety	24.03 [22.65-25.46]	26.37 [24.95-27.84]	32.37 [30.81-33.98]	31.94 [30.4-33.53]	0.99 [0.92-1.06]	**1.16 [1.07-1.24]**
Depression	6.90 [6.20-7.66]	7.05 [6.35-7.80]	7.60 [6.88-8.37]	6.21 [5.58-6.90]	**0.82 [0.71-0.95]**	0.86 [0.74-1.00]
Alcohol use disorder	1.32 [1.04-1.66]	1.54 [1.23-1.89]	1.78 [1.45-2.15]	0.84 [0.62-1.10]	**0.47 [0.33-0.66]**	**0.54 [0.38-0.77]**
Violence against women¶	1.05 [0.73-1.46]	0.78 [0.52-1.14]	0.89 [0.60-1.26]	0.91 [0.63-1.28]	1.03 [0.61-1.74]	1.01 [0.60-1.70]
Cancer diseases						
Breast cancer¶	3.61 [2.98-4.32]	2.68 [2.15-3.29]	3.11 [2.54-3.76]	2.44 [1.95-3.01]	0.78 [0.58-1.05]	0.78 [0.58-1.05]
Colon cancer	0.65 [0.46-0.90]	0.96 [0.72-1.24]	0.65 [0.47-0.89]	0.68 [0.50-0.92]	1.05 [0.66-1.66]	0.91 [0.58-1.41]
Benign tumors of the colon	5.76 [5.14-6.42]	7.06 [6.39-7.78]	5.27 [4.70-5.89]	3.51 [3.05-4.01]	**0.67 [0.56-0.80]**	**0.58 [0.49-0.69]**
Prostate cancer§	3.25 [2.56-4.08]	3.12 [2.45-3.91]	2.88 [2.25-3.64]	2.26 [1.72-2.91]	0.78 [0.54-1.12]	0.73 [0.51-1.05]
Lung cancer	0.55 [0.37-0.77]	0.43 [0.28-0.63]	0.60 [0.42-0.83]	0.74 [0.55-0.99]	1.24 [0.79-1.97]	1.42 [0.88-2.32]
Bladder cancer	0.69 [0.49-0.94]	0.75 [0.55-1.01]	0.87 [0.65-1.14]	0.67 [0.48-0.90]	0.77 [0.50-1.17]	0.87 [0.55-1.35]
Liver cancer	0.09 [0.03-0.20]	0.20 [0.11-0.36]	0.08 [0.03-0.19]	0.11 [0.04-0.23]	1.33 [0.36-5.31]	0.88 [0.27-2.89]
Thyroid cancer	0.33 [0.20-0.52]	0.12 [0.05-0.25]	0.32 [0.19-0.49]	0.09 [0.03-0.21]	**0.30 [0.10-0.78]**	0.37 [0.12-1.01]
Melanoma	0.69 [0.49-0.94]	0.68 [0.49-0.93]	0.80 [0.59-1.06]	0.40[0.26-0.59]	**0.49 [0.29-0.82]**	**0.55 [0.32-0.92]**
Stomach cancer	0.12 [0.05-0.25]	0.07 [0.02-0.17]	0.13 [0.06-0.26]	0.11 [0.04-0.23]	0.83 [0.26-2.62]	1.02 [0.30-3.59]
Kidney cancer	0.46 [0.30-0.67]	0.32 [0.19-0.50]	0.57 [0.39-0.79]	0.27 [0.16-0.43]	**0.47 [0.25-0.87]**	0.60 [0.31-1.14]
Lymphoma/Leukemia	0.11 [0.04-0.23]	0.10 [0.04-0.22]	0.13 [0.06-0.26]	0.17 [0.09-0.31]	1.30 [0.48-3.74]	1.53 [0.53-4.76]

Values are represented as incidence rates (95% confidence intervals) from to 2017 to 2020.

In bold, statistically significant (p<0.05) incidence rate ratios.

† Incidence rate ratios (IRRs) for incidence rates in 2020 compared with incidence rates in 2019

‡ Incidence rate ratios (IRRs) for incidence rates in 2020 compared with mean incidence rates from 2017 to 2019

¶ Incidence rates in women

§ Incidence rates in men

Figure 1. Incidence rates of selected conditions from 2017 to 2020. Thick lines show statistical significance.