

Impact of the COVID-19 pandemic on diagnoses of common mental health disorders in adults in Catalonia, Spain: a population-based cohort study

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Supplementary materials

eTable 1. ICD-10CM codes used to identify incident cases of anxiety and depressive disorders

eFigure 1. Flowchart with the inclusion and exclusion criteria of the study population

eTable 2. Characteristics of study participants

eTable 3. Incidence rates of anxiety and depressive disorders during the prelockdown period (March, 2018 - February, 2020)

eTable 4. Incidence rates of anxiety and depressive disorders during the lockdown period (March, 2020 - June, 2020)

eTable 5. Incidence rates of anxiety and depressive disorders during the first trimester of the postlockdown period (July, 2020 - September, 2020)

eTable 6. Incidence rates of anxiety and depressive disorders during the second trimester of the postlockdown period (October, 2020 - December, 2020)

eTable 7. Incidence rates of anxiety and depressive disorders during the third trimester of the postlockdown period (January, 2021 - March, 2021)

eTable 8. Incidence rates of anxiety and depressive disorders during the postlockdown period (July, 2020 – March, 2021)

eFigure 2. Expected and observed incidence of anxiety and depressive disorders in primary care in Catalonia (March, 2017– February, 2020).

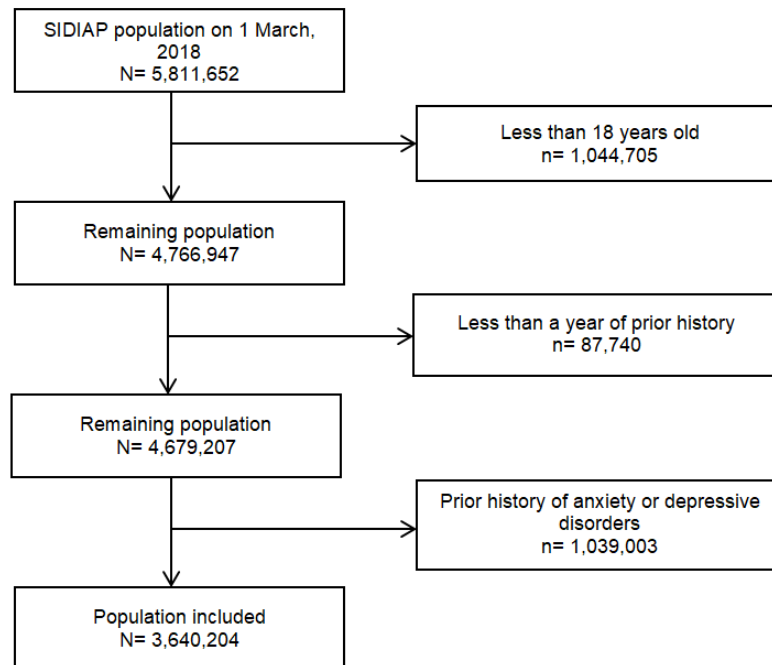
eFigure 3. Expected and observed incidence of anxiety and depressive disorders stratified by sex and age group in primary care in Catalonia (March, 2017– February, 2020).

eFigure 4. Expected and observed incidence of anxiety and depressive disorders stratified by MEDEA deprivation index in primary care in Catalonia (March, 2017– February, 2020).

eTable 1. ICD-10CM codes used to identify incident cases of anxiety and depressive disorders

For depressive disorders, all descendants of the F32 and F33 categories were included except the ones referring to episodes in partial or complete remission (F32.4, F32.5 and F33.4). For anxiety disorders, the F41 category and all its descendants were included. ICD-10-CM: International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Clinical Modification

Outcomes	ICD-10CM categories included	ICD-10CM codes included
Anxiety Disorders	F41 Other anxiety disorders	F41.0 Panic disorder
		F41.1 Generalized anxiety disorder
		F41.3 Other mixed anxiety disorders
		F41.8 Other specified anxiety disorders
		F41.9 Anxiety disorders, unspecified
Depressive disorders	F32 Major depressive disorder, single episode	F32.0 Major depressive disorders, single episode, mild
		F32.1 Major depressive disorders, single episode, moderate
		F32.2 Major depressive disorders, single episode, severe without psychotic features
		F32.3 Major depressive disorders, single episode, severe with psychotic features
		F32.8 Other depressive disorders
		F32.9 Major depressive disorder, single episode, unspecified
	F33 Major depressive disorder, recurrent	F33.0 Major depressive disorders, recurrent, mild
		F32.1 Major depressive disorders, recurrent, moderate
		F32.2 Major depressive disorders, recurrent, severe without psychotic features
		F32.3 Major depressive disorders, recurrent, severe with psychotic features
		F33.8 Other recurrent depressive disorders
		F33.9 Major depressive disorder, recurrent, unspecified

eFigure 1. Flowchart with the inclusion and exclusion criteria of the study population

eTable 2. Characteristics of study participants

Demographic characteristics of individuals in the study population. Individuals were aged 18 years or older and had at least one year of prior history before index date (1 March 2018) in the database. The MEDEA deprivation index is calculated at the census tract level in urban areas of Catalonia and is categorised in quintiles of deprivation. It also includes a rural category for individuals living in rural areas. The study periods are: 1) the pre-lockdown period from 1 March, 2018 to 29 February, 2020; 2) the lockdown period from 1 March, 2020 to 30 June, 2020; and 3) post-lockdown period, from 1 July, 2020 to 31 March, 2021. The postlockdown period was divided into three trimestres: 1) Postlockdown 1: from 1 July 2020 to 30 September, 2020; 2) Postlockdown 2: from 1 October, 2020 to 31 December, 2020; 3) Postlockdown 3: from 1 January, 2021 to 31 March, 2021. IQR: Interquartile range; MEDEA: "Mortalidad en áreas pequeñas Españolas y Desigualdades Socioeconómicas y Ambientales".

Characteristics	People, No (%)		
	Total (n =3640204)	With anxiety disorders (n=196933)	With depressive disorders (n=40020)
Age at index date, median (IQR)	47 (35 to 63)	43 (32 to 56)	57 (42 to 74)
Sex: women			
Age group (years), n (%)			
18 to 34	408508 (23.9)	35841 (29.5)	3530 (14.2)
35 to 64	867338 (50.7)	64628 (53.3)	11465 (46.0)
>65	433813 (25.4)	20825 (17.2)	9909 (39.8)
Sex: men			
Age group (years), n (%)			
18 to 34	462194 (23.9)	23584 (31.2)	2435 (16.1)
35 to 64	1072603 (55.6)	42674 (56.4)	7477 (49.5)
>65	395748 (20.5)	9381 (12.4)	5204 (34.4)
MEDEA deprivation index, n (%)			
First, least deprived	555522 (15.3)	26741 (13.6)	5586 (14.0)
Second	531562 (14.6)	28809 (14.6)	5760 (14.4)
Third	522999 (14.4)	29363 (14.9)	5573 (13.9)

Fourth	512786 (14.1)	30163 (15.3)	5487 (13.7)
Fifth, most deprived	506950 (13.9)	28965 (14.7)	5372 (13.4)
Rural	574875(15.8)	30047 (15.3)	6846 (17.1)
Missing	435510 (12.0)	22845 (11.6)	5396 (13.5)
Study period			
Prelockdown		129934 (66.0)	28137 (70.3)
Lockdown		24944 (12.7)	2965 (7.4)
Postlockdown 1		13062 (6.6)	2746 (6.9)
Postlockdown 2		13600 (6.9)	2882 (7.2)
Postlockdown 3		15393 (7.8)	3290 (8.2)

eTable 3. Incidence rates of anxiety and depressive disorders during the prelockdown period (March, 2018 - February, 2020)

For each outcome, the number of observed events, person-months contributed by the study population and incidence rates (No. of New Cases per 100,000 person-months) are given. The MEDEA deprivation index is calculated at the census tract level in urban areas of Catalonia and is categorised in quintiles of deprivation. IR: Incidence rate. MEDEA: "Mortalidad en áreas pequeñas Españolas y Desigualdades Socioeconómicas y Ambientales".

	Anxiety disorders			Depressive disorders		
	Events, n	Person-months at risk	IR per 100,000 person-months (95 %CI)	Events, n	Person-months at risk	IR per 100,000 person-months (95 %CI)
Overall	126133	83454341	151.1 (150.3 to 152.0)	27317	846702978	32.3 (31.9 to 32.6)
Sex: women						
Age group (years)						
18-34	23216	9241425	251.2 (248.0 to 254.5)	2358	94945951	24.8 (23.8 to 25.9)
35-64	41030	19963790	205.5 (203.5 to 207.5)	7779	20374765	38.2 (37.3 to 39)
>65	13530	9796463	138.1 (135.8 to 140.5)	6953	98801684	70.4 (68.7 to 72)
Sex: men						
Age group (years)						
18-34	15224	10624052	143.3 (141.0 to 145.6)	1639	10789186	15.2 (14.5 to 15.9)
35-64	27053	24859486	108.8 (107.5 to 110.1)	5062	25131574	20.1 (19.6 to 20.7)
> 65	6080	8969125	67.8 (66.1 to 69.5)	3526	9000007	39.2 (37.9 to 40.5)
MEDEA deprivation index						
First, least deprived	17090	12872784	132.8 (130.8 to 134.8)	3803	13036925	29.2 (28.3 to 30.1)
Second	18357	12321767	149.0 (146.8 to 151.2)	3948	12499762	31.6 (30.6 to 32.6)
Third	18733	12101406	154.8 (152.6 to 157)	3754	12286193	30.6 (29.6 to 31.5)
Fourth	19251	11838748	162.6 (160.3 to 164.9)	3688	12030834	30.7 (29.7 to 31.7)
Fifth, most deprived	18497	11674126	158.4 (156.2 to 160.7)	3706	11856858	31.3 (30.3 to 32.3)
Rural	18998	13283877	143.0 (141.0 to 145.1)	4567	13461018	33.9 (33.0 to 34.9)

eTable 4. Incidence rates of anxiety and depressive disorders during the lockdown period (March, 2020 - June, 2020)

For each outcome, the number of observed events, person-months contributed by the study population and incidence rates (No. of New Cases per 100,000 person-months) are given. The MEDEA deprivation index is calculated at the census tract level in urban areas of Catalonia and is categorised in quintiles of deprivation. IR: Incidence rate. MEDEA: "Mortalidad en áreas pequeñas Españolas y Desigualdades Socioeconómicas y Ambientales".

	Anxiety disorders			Depressive disorders		
	Events, n	Person-months at risk	IR per 100,000 person-months (95 %CI)	Events, n	Person-months at risk	IR per 100,000 person-months (95 %CI)
Overall	24150	13178002	183.3 (181.0 to 185.6)	2880	13628189	21.1 (20.4 to 21.9)
Sex: women						
Age group (years)						
18-34	3646	1437066	253.7 (245.5 to 262.1)	208	1529308	13.6 (11.8 to 15.6)
35-64	8389	3168561	264.8 (259.1 to 270.5)	870	3322235	26.2 (24.5 to 28.0)
> 65	2440	1514677	161.1 (154.8 to 167.6)	712	1544847	46.1 (42.8 to 49.6)
Sex: men						
Age group (years)						
18-34	2644	1684117	157.0 (151.1 to 163.1)	143	1745003	8.2 (6.9 to 9.7)
35-64	5724	3984959	143.6 (139.9 to 147.4)	540	4086126	13.2 (12.1 to 14.4)
> 65	1307	1388622	94.1 (89.1 to 99.4)	407	1400670	29.1 (26.3 to 32.0)
MEDEA deprivation index						
First, least deprived	3205	2060299	155.6 (150.2 to 161.0)	435	2121094	20.5 (18.6 to 22.5)
Second	3605	1970556	182.9 (177.0 to 189.0)	404	2037028	19.8 (17.9 to 21.9)
Third	3745	1932078	193.8 (187.7 to 200.1)	411	2000913	20.5 (18.6 to 22.6)
Fourth	3795	1885193	201.3 (195.0 to 207.8)	377	1956700	19.3 (17.4 to 21.3)
Fifth, most deprived	3602	1853871	194.3 (188.0 to 200.7)	334	1922105	17.4 (15.6 to 19.3)
Rural	3642	2116760	172.1(166.5 to 177.7)	528	2182924	24.2(22.2 to 26.3)

eTable 5. Incidence rates of anxiety and depressive disorders during the first trimester of the postlockdown period (July, 2020 - September,2020)

For each outcome, the number of observed events, person-months contributed by the study population and incidence rates (No. of New Cases per 100,000 person-months) are given. The MEDEA deprivation index is calculated at the census tract level in urban areas of Catalonia and is categorised in quintiles of deprivation. IR: Incidence rate. MEDEA: "Mortalidad en áreas pequeñas Españolas y Desigualdades Socioeconómicas y Ambientales".

	Anxiety disorders			Depressive disorders		
	Events, n	Person-months at risk	IR per 100,000 person-months (95 %CI)	Events, n	Person-months at risk	IR per 100,000 person-months (95 %CI)
Overall	12503	9796629	127.6 (125.4 to 129.9)	2625	10180277	25.8 (24.8 to 26.8)
Sex: women						
Age group (years)						
18-34	2364	1065308	221.9 (213.1 to 231.0)	222	1142846	19.4 (17.0 to 22.2)
35-64	3938	2360439	166.8 (161.7 to 172.1)	713	2491273	28.6 (26.6 to 30.8)
> 65	1314	1118592	117.5 (111.2 to 124.0)	624	1145086	54.5 (50.3 to 58.9)
Sex: men						
Age group (years)						
18-34	1638	1253129	130.7 (124.5 to 137.2)	172	1304700	13.2 (11.3 to 15.3)
35-64	2678	2973142	90.1 (86.7 to 93.6)	494	3059678	16.1 (14.8 to 17.6)
> 65	571	1026018	55.7 (51.2 to 60.4)	400	1036694	38.6 (34.9 to 42.6)
MEDEA deprivation index						
First, least deprived	1688	1537101	109.8 (104.6 to 115.2)	348	1588836	21.9 (19.7 to 24.3)
Second	1720	1470094	117.0 (111.5 to 122.7)	362	1526766	23.7 (21.3 to 26.3)
Third	1889	1440864	131.1 (125.3 to 137.2)	362	1499844	24.1 (21.7 to 26.8)
Fourth	1917	1404980	136.4 (130.4 to 142.7)	375	1465990	25.6 (23.1 to 28.3)
Fifth, most deprived	1834	1380401	132.9 (126.8 to 139.1)	348	1438667	24.2 (21.7 to 26.9)
Rural	2053	1578490	130.1 (124.5 to 135.8)	514	1635187	31.4 (28.8 to 34.3)

eTable 6. Incidence rates of anxiety and depressive disorders during the second trimester of the postlockdown period (October, 2020 - December, 2020)

For each outcome, the number of observed events, person-months contributed by the study population and incidence rates (No. of New Cases per 100,000 person-months) are given. The MEDEA deprivation index is calculated at the census tract level in urban areas of Catalonia and is categorised in quintiles of deprivation. IR: Incidence rate. MEDEA: "Mortalidad en áreas pequeñas Españolas y Desigualdades Socioeconómicas y Ambientales".

	Anxiety disorders			Depressive disorders		
	Events, n	Person-months at risk	IR per 100,000 person-months (95 %CI)	Events, n	Person-months at risk	IR per 100,000 person-months (95 %CI)
Overall	13207	9689894	136.3 (134.0 to 138.6)	2821	10103525	27.9 (26.9 to 29.0)
Sex: women						
Age group (years)						
18-34	2586	1051282	246.0 (236.6 to 255.7)	308	1135429	27.1 (24.2 to 30.3)
35-64	4408	2338168	188.5 (183.0 to 194.2)	839	2479387	33.8 (31.6 to 36.2)
> 65	1421	1099323	129.3 (122.6 to 136.2)	647	1127938	57.4 (53.0 to 62.0)
Sex: men						
Age group (years)						
18-34	1508	1241216	121.5 (115.4 to 127.8)	174	1296852	13.4 (11.5 to 15.6)
35-64	2716	2951310	92.0 (88.6 to 95.6)	519	3044172	17.0 (15.6 to 18.6)
> 65	568	1008596	56.3 (51.8 to 61.1)	334	1019747	32.8 (29.3 to 36.5)
MEDEA deprivation index						
First, least deprived	1893	1525568	124.1 (118.6 to 129.8)	385	1581670	24.3 (22.0 to 26.9)
Second	1982	1459436	135.8 (129.9 to 141.9)	421	1520613	27.7 (25.1 to 30.5)
Third	1942	1430148	135.8 (129.8 to 142.0)	400	1493770	26.8 (24.2 to 29.5)
Fourth	2051	1393725	147.2 (140.9 to 153.7)	418	1459503	28.6 (26.0 to 31.5)
Fifth, most deprived	1883	1368960	137.5 (131.4 to 143.9)	388	1431714	27.1 (24.5 to 29.9)
Rural	2057	1564926	131.4 (125.8 to 137.2)	483	1626265	29.7 (27.1 to 32.5)

eTable 7. Incidence rates of anxiety and depressive disorders during the third trimester of the postlockdown period (January, 2021 - March, 2021)

For each outcome, the number of observed events, person-months contributed by the study population and incidence rates (No. of New Cases per 100,000 person-months) are given. The MEDEA deprivation index is calculated at the census tract level in urban areas of Catalonia and is categorised in quintiles of deprivation. IR: Incidence rate. MEDEA: "Mortalidad en áreas pequeñas Españolas y Desigualdades Socioeconómicas y Ambientales".

	Anxiety disorders			Depressive disorders		
	Events, n	Person-months at risk	IR per 100,000 person-months (95 %CI)	Events, n	Person-months at risk	IR per 100,000 person-months (95 %CI)
Overall	15159	9340485	162.3 (159.7 to 164.9)	3248	9775522	33.2 (32.1 to 34.4)
Sex: women						
Age group (years)						
18-34	3002	1009534	297.4 (286.8 to 308.2)	329	1098369	30.0 (26.8 to 33.4)
35-64	4958	2259825	219.4 (213.3 to 225.6)	954	2408484	39.6 (37.1 to 42.2)
> 65	1450	1053026	137.7 (130.7 to 145.0)	710	1083073	65.6 (60.8 to 70.6)
Sex: men						
Age group (years)						
18-34	1849	1196688	154.5 (147.5 to 161.7)	234	1255055	18.6 (16.3 to 21.2)
35-64	3309	2855973	115.9 (111.9 to 119.9)	651	2953534	22.0 (20.4 to 23.8)
> 65	591	965439	61.2 (56.4 to 66.4)	370	977007	37.9 (34.1 to 41.9)
Deprivation						
First, least deprived	2060	1476681	139.5 (133.5 to 145.7)	474	1535922	30.9 (28.1 to 33.8)
Second	2327	1413831	164.6 (158.0 to 171.4)	470	1478415	31.8 (29.0 to 34.8)
Third	2239	1384872	161.7 (155.0 to 168.5)	469	1451856	32.3 (29.4 to 35.4)
Fourth	2287	1348191	169.6 (162.8 to 176.7)	468	1417388	33.0 (30.1 to 36.1)
Fifth, most deprived	2269	1322119	171.6 (164.6 to 178.8)	442	1388176	31.8 (28.9 to 35)
Rural	2389	1514584	157.7 (151.5 to 164.2)	575	1579297	36.4 (33.5 to 39.5)

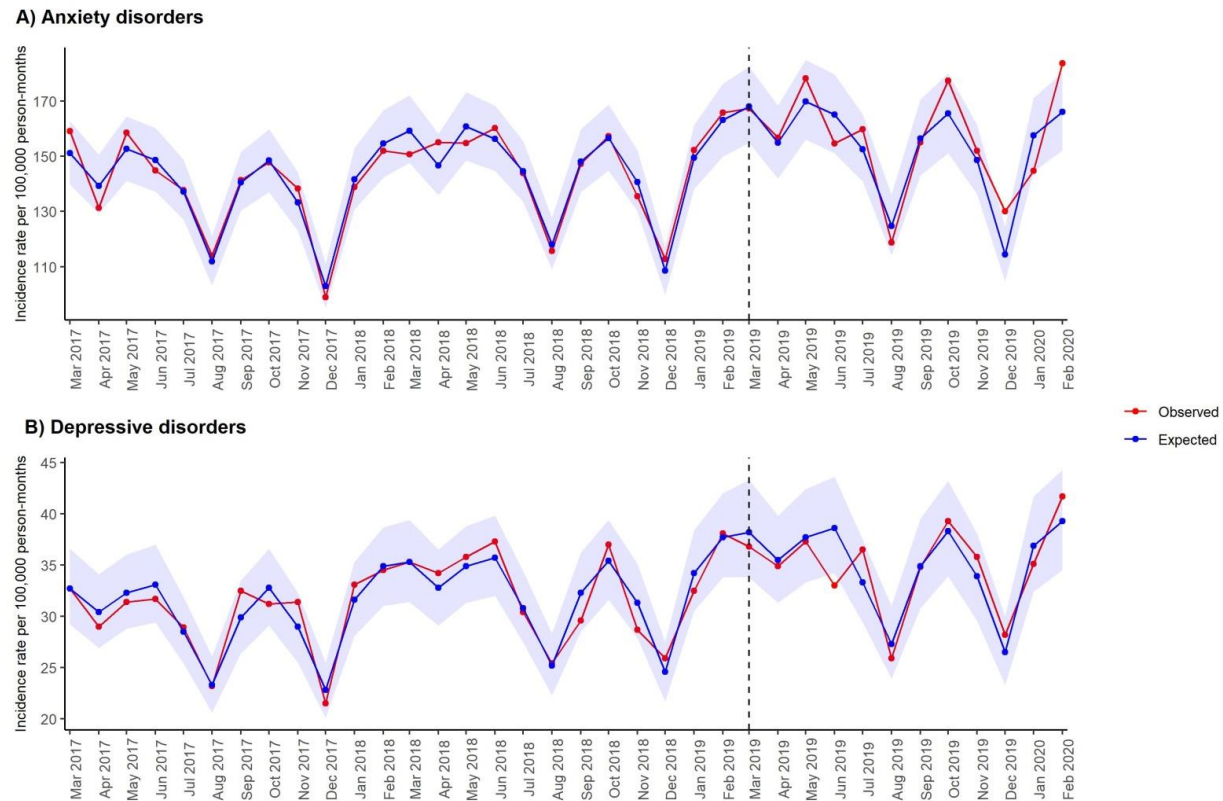
eTable 8. Incidence rates of anxiety and depressive disorders during the postlockdown period (July, 2020 – March, 2021)

For each outcome, the number of observed events, person-months contributed by the study population and incidence rates (No. of New Cases per 100,000 person-months) are given. The MEDEA deprivation index is calculated at the census tract level in urban areas of Catalonia and is categorised in quintiles of deprivation. IR: Incidence rate. MEDEA: “Mortalidad en áreas pequeñas Españolas y Desigualdades Socioeconómicas y Ambientales”.

	Anxiety disorders			Depressive disorders		
	Events, n	Person-months at risk	IR per 100,000 person-months (95 %CI)	Events, n	Person-months at risk	IR per 100,000 person-months (95 %CI)
Overall	40869	28827008	141.8 (140.4 to 143.2)	8694	30059324	28.9 (28.3 to 29.5)
Sex: women						
Age group (years)						
18-34	7952	3126123	254.4 (248.8 to 260)	859	3376644	25.4 (23.8 to 27.2)
35-64	13304	6958432	191.2 (188.0 to 194.5)	2506	7379144	34.0 (32.6 to 35.3)
> 65	4185	3270941	127.9 (124.1 to 131.9)	1981	3356096	59.0 (56.5 to 61.7)
Sex: men						
Age group (years)						
18-34	4995	3691033	135.3 (131.6 to 139.1)	580	3856607	15.0 (13.8 to 16.3)
35-64	8703	8780425	99.1 (97.0 to 101.2)	1664	9057384	18.4 (17.5 to 19.3)
> 65	1730	3000053	57.7 (55.0 to 60.4)	1104	3033448	36.4 (34.3 to 38.6)
Deprivation						
First, least deprived	5641	4539350	124.3 (121.0 to 127.6)	1207	4706428	25.6 (24.2 to 27.1)
Second	6029	4343361	138.8 (135.3 to 142.4)	1253	4525794	27.7 (26.2 to 29.3)
Third	6070	4255885	142.6 (139.1 to 146.3)	1231	4445470	27.7 (26.2 to 29.3)
Fourth	6255	4146895	150.8 (147.1 to 154.6)	1261	4342881	29.0 (27.5 to 30.7)
Fifth, most deprived	5986	4071480	147.0 (143.3 to 150.8)	1178	4258556,406	27.7 (26.1 to 29.3)
Rural	6499	4658001	139.5 (136.2 to 143.0)	1572	4840749	32.5 (30.9 to 34.1)

eFigure 2. Expected and observed incidence of anxiety and depressive disorders in primary care in Catalonia (March, 2017– February, 2020).

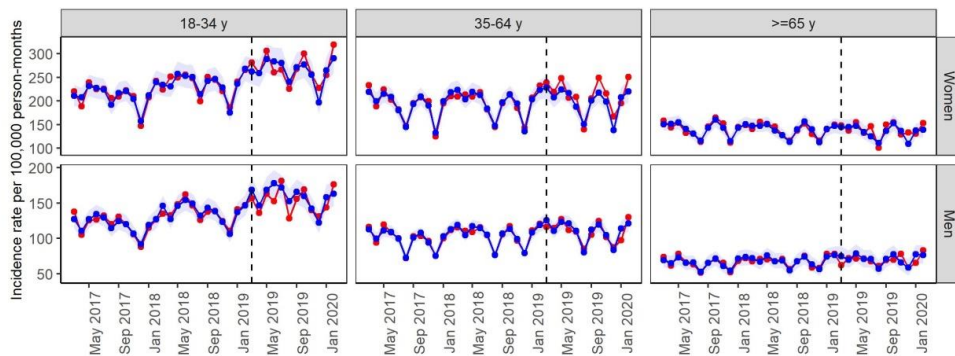
Validation of the modelling approach for overall incidence rates of anxiety and depressive disorders. Number of expected cases (95% PI) were estimated with negative binomial models, using data from 1 March, 2017 to 28 February, 2019. Shaded areas in blue represent 95 % PI. Vertical lines show 1 March, 2019. PI, prediction interval.



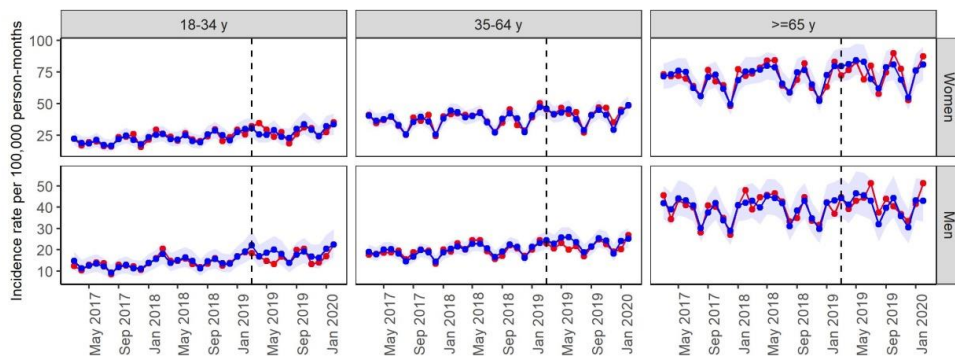
eFigure 3. Expected and observed incidence of anxiety and depressive disorders stratified by sex and age group in primary care in Catalonia (March, 2017–February, 2020).

Validation of the modelling approach for incidence rates of anxiety and depressive disorders stratified by sex and age groups. Number of expected cases (95% PI) were estimated with negative binomial models, using data from 1 March, 2017 to 28 February, 2019. Vertical lines show 1 March, 2019. Shaded areas in blue represent 95 % PI. Y, years; PI, prediction interval.

A) Anxiety disorders



B) Depressive disorders

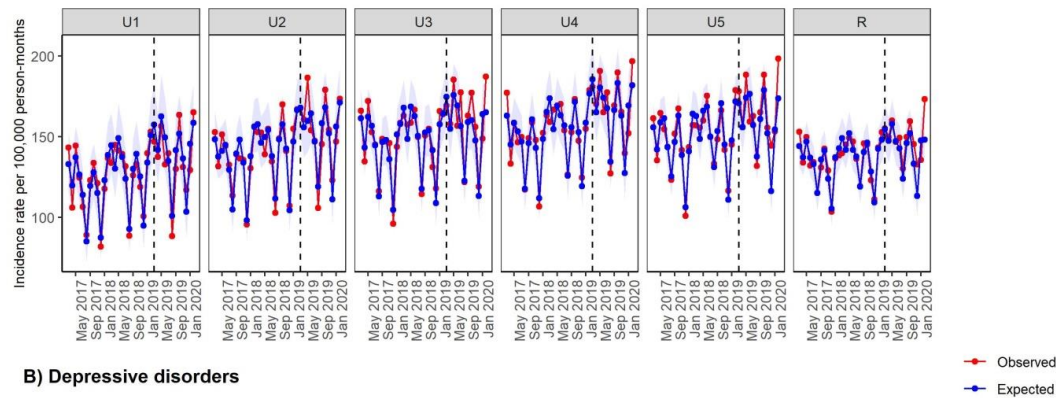


—●— Observed
—●— Expected

eFigure 4. Expected and observed incidence of anxiety and depressive disorders stratified by MEDEA deprivation index in primary care in Catalonia (March, 2017– February, 2020).

Validation of the modelling approach for incidence rates of anxiety and depressive disorders stratified by MEDEA deprivation index. Number of expected cases (95% PI) were estimated with negative binomial models, using data from 1 March, 2017 to 28 February, 2019. Shaded areas in blue represent 95 % PI. Vertical lines show 1 March, 2019. The MEDEA deprivation index is calculated at the census tract level in urban areas of Catalonia and is categorised in quintiles of deprivation. It also includes a rural category for individuals living in rural areas. U, urban; R, rural; PI, prediction interval.

A) Anxiety disorders



B) Depressive disorders

