



OFFICE OF THE ASSISTANT SECRETARY
FOR PLANNING AND EVALUATION

New Onset of Mental Health Conditions, Social Determinants of Health and COVID-19: Evidence from a National Health Insurance Claims Database

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DISCLAIMER

- **The views expressed here are those of the authors and do not necessarily reflect the views of the Office of the Assistant Secretary for Planning & Evaluation, or the US Department of Health & Human Services**



COVID-19 DIAGNOSIS & MENTAL HEALTH OUTCOMES: Psychiatric Antecedent & Sequelae

- From the beginning of the pandemic concerns have been raised about its impact on mental health (Druss 2020)
- Susceptibility of patients with mental illness to COVID-19 (Yao et al. 2020)
- Mental health consequences of COVID-19 (Taquet et al. 2020)
 - Bi-directional relationship between COVID-19 and mental illness
 - 18.1% incidence of psychiatric illness after COVID-19, with 5.8% being a first diagnosis



SOCIAL DETERMINANTS OF HEALTH: Correlation & Utilization

- Pre-existing conditions associated with severe COVID-19 are more common in disadvantaged population (Singu et al., 2020)
- The effect of the pandemic might be long lasting - food insecurity, housing instability and slow job recovery (Peretz et al. 2020)
- Disparities in mental health treatment and outcomes are correlated with SDOH measures (Shim et al., 2018)
- Very low utilization of SDOH measures (Truong et al. 2020; Week et al. 2020)



RESEARCH OBJECTIVE

- Rate of new onset of mental health conditions (among those without any history of mental illness) after COVID-19 diagnosis
- Factors correlated with new onset of mental health conditions after COVID-19 diagnosis
 - Role of SDOH



DATA: IQVIA US OPEN SOURCE CLAIMS

- Time Period: December 2018 – January 2021
- Individuals with:
 - COVID-19 Diagnosis (B97.29, B34.2, U07.1, U07.2)
 - No mental health related claims (diagnosis or services utilization)
 - Analytic Sample = 4,556,217



MENTAL HEALTH MEASURES:

ICD-10 Codes, CPT Codes, Psychotropic Medication

- Mental Health Diagnosis:
 - Psychotic Disorder: F20-F29
 - Major Depression: F32, F33
 - Mood Disorder: F30, F31, F34-F39
 - Anxiety & Related Disorder: F40-F48
 - Other: F53, F60, F63, F68, F90-F94, F99
- CPT Codes:
 - 90791; 90792; 90804-90876; 90901-90880; 96101-96120; 97110-97535; 98968; 99443
- Psychotropic Medication:
 - Antidepressants; antipsychotics; anticonvulsants; antimanic agents; antiparkinsonian agents; anxiolytics/sedatives; hypnotics; benzodiazepines; barbiturates; central nervous system agents—miscellaneous (CNS miscellaneous); stimulants



SOCIAL DETERMINANTS OF HEALTH: ICD-10 Z Codes

- Social Determinants of Health Z Codes:
 - Z55 – Education and Literacy
 - Z56 – Employment and Unemployment
 - Z57 – Occupational Risk
 - Z59 – Housing and Economic Circumstances
 - Z60 – Social Environment
 - Z62 – Childhood Upbringing
 - Z63 – Primary Support
 - Z64/65 – Psychosocial Event



SAMPLE CHARACTERISTICS: Mental Health Conditions

	Overall N = 4,556,217	Mental Health Condition N = 122,201	No Mental Health Condition N = 4,434,016
Mental Health Condition			
Anxiety & Related Disorder	2.02%	75.21%	-
Major Depression	0.89%	33.14%	-
Mood Disorder	0.15%	5.52%	-
Other Mental Health Condition	0.41%	15.43%	-
Psychotic Disorder	0.17%	6.34%	-



SAMPLE CHARACTERISTICS: Health Conditions

Variable	Overall N = 4,556,217	Mental Health Condition N = 122,201	No Mental Health Condition N = 4,434,016
Severe COVID-19			
Hospitalization	15.44%	27.50%	14.68%
Health Conditions			
Asthma	5.66%	10.82%	5.33%
Bronchitis	5.63%	9.22%	5.40%
Cancer	6.13%	8.18%	6.00%
Diabetes	15.36%	22.80%	14.89%
Heart Disease	6.75%	12.30%	6.40%
Hypertension	23.91%	38.87%	22.96%
Kidney Disease	10.44%	17.56%	9.99%
Liver Cirrhosis	0.39%	0.80%	0.36%
Nicotine Dependence	4.56%	9.66%	4.24%
Obesity	13.00%	21.87%	12.44%



SAMPLE CHARACTERISTICS: SDOH Z Codes

Variable	Overall N = 4,556,217	Mental Health Condition N = 122,201	No Mental Health Condition N = 4,434,016
SDOH Measures			
Any Z Code	0.75%	3.10%	0.61%
Z55 (Education & Literacy)	0.03%	0.21%	0.02%
Z56 (Employment & Unemployment)	0.05%	0.23%	0.04%
Z57 (Occupational Risk)	0.03%	0.04%	0.03%
Z59 (Housing & Economic Circumstances)	0.17%	0.77%	0.13%
Z60 (Social Environment)	0.07%	0.24%	0.06%
Z62 (Childhood Upbringing)	0.03%	0.29%	0.02%
Z63 (Primary Support)	0.15%	1.01%	0.09%
Z64/Z65 (Psychosocial Event)	0.12%	0.38%	0.11%



LOGISTIC REGRESSION MODEL

Variable	Odds Ratio	95% CI	P-value
Severe COVID-19			
Hospitalization	1.56	1.57; 1.59	<0.001
Health Conditions			
Asthma	1.61	1.59; 1.64	<0.001
Hypertension	1.59	1.57; 1.61	<0.001
Kidney Disease	1.17	1.15; 1.18	<0.001
Liver Cirrhosis	1.22	1.16; 1.29	<0.001
Nicotine Dependence	1.78	1.76; 1.81	<0.001
Obesity	1.4	1.38; 1.42	<0.001



LOGISTIC REGRESSION MODEL: SDOH Indicators

Variable	Odds Ratio	95% CI	P-value
SDOH Measures			
Z55 (Education & Literacy)	8.26	7.31; 9.34	<0.001
Z56 (Employment & Unemployment)	4.49	4.02; 5.01	<0.001
Z57 (Occupational Risk)	1.51	0.92; 1.44	0.219
Z59 (Housing & Economic Circumstances)	3.50	3.30; 3.72	<0.001
Z60 (Social Environment)	2.52	2.28; 2.79	<0.001
Z62 (Childhood Upbringing)	13.34	11.84; 15.03	<0.001
Z63 (Primary Support)	8.82	8.33; 9.33	<0.001
Z64/Z65 (Psychosocial Event)	2.45	2.27; 2.65	<0.001



ROBUSTNESS CHECK: SDOH Measures Pre COVID-19

Variable	Odds Ratio	95% CI	P-value
Z55 (Education & Literacy)	3.601	2.918; 4.443	<0.001
Z56 (Employment & Unemployment)	1.774	1.433; 2.195	<0.001
Z57 (Occupational Risk)	1.006	0.704; 1.438	0.974
Z59 (Housing & Economic Circumstances)	2.583	2.357; 2.831	<0.001
Z60 (Social Environment)	1.477	1.211; 1.801	<0.001
Z62 (Childhood Upbringing)	2.808	2.229; 3.539	<0.001
Z63 (Primary Support)	2.181	1.935; 2.458	<0.001
Z64/Z65 (Psychosocial Event)	1.443	1.251; 1.665	<0.001

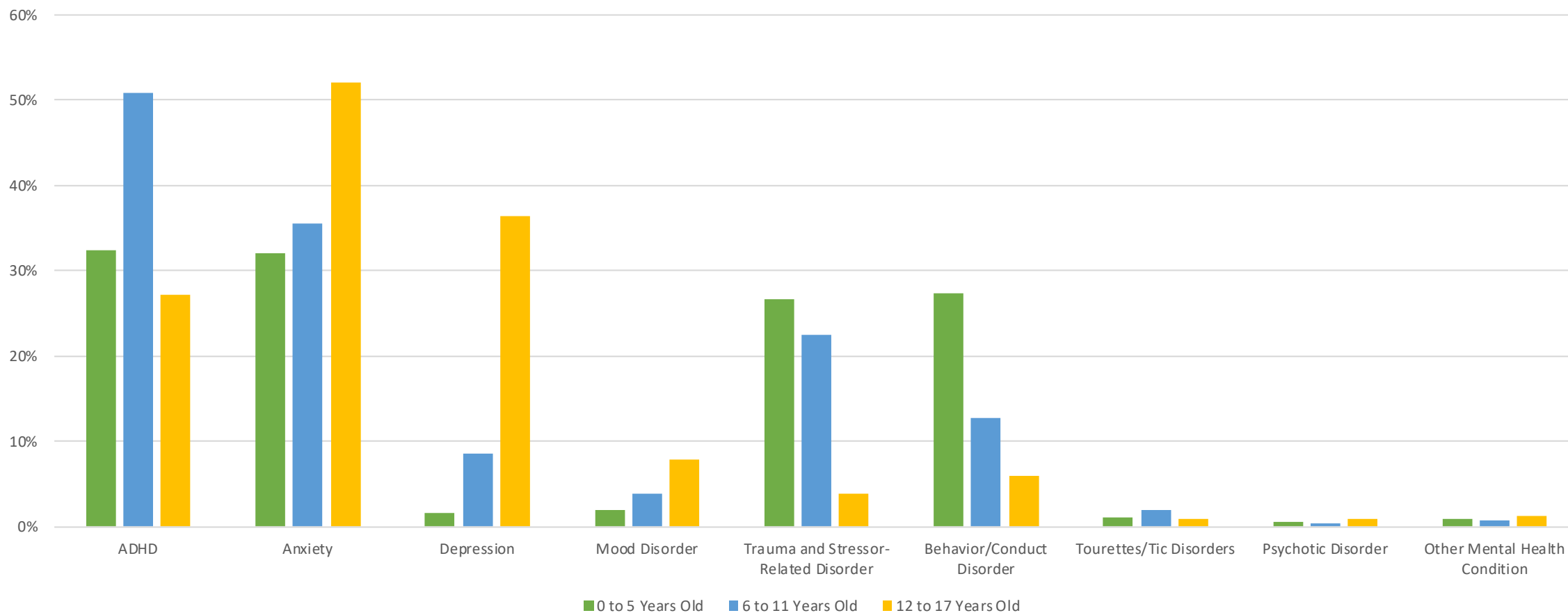


ROBUSTNESS CHECK: SDOH Measures Post COVID-19

Variable	Odds Ratio	95% CI	P-value
Z55 (Education & Literacy)	15.864	12.422; 20.259	<0.001
Z56 (Employment & Unemployment)	6.937	5.865; 8.204	<0.001
Z57 (Occupational Risk)	1.722	1.063; 2.787	0.027
Z59 (Housing & Economic Circumstances)	5.499	5.042; 5.997	<0.001
Z60 (Social Environment)	4.054	3.513; 4.680	<0.001
Z62 (Childhood Upbringing)	29.564	23.929; 36.525	<0.001
Z63 (Primary Support)	22.253	20.351; 24.332	<0.001
Z64/Z65 (Psychosocial Event)	5.085	4.417; 5.852	<0.001



PREVIEW: MENTAL HEALTH CONDITIONS AMONG CHILDREN



CONCLUSION

- SDOH were a significant predictor of new onset of mental health conditions
- Regardless of when the Z codes were documented their impact was robust
 - Magnitude was higher when they were documented after a patient's COVID-19 diagnosis (employment, housing & education)
- Growing consensus that addressing SDOH is crucial to improving both mental health and health more broadly
- Health systems are beginning to adopt patient-level screening for social risk factors
- Low utilization of Z codes by providers
 - Limited awareness among providers
 - Providers are not incentivized to document these codes



Thank you!

For more information see: <https://aspe.hhs.gov/mh-consequences-covid>

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