The Strategy Unit.

Estimating the impacts of COVID-19 on mental health services in England

Summary of results and methods

November 2020

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NHS
Midlands and Lancashire
Commissioning Support Unit

Our aim is to estimate COVID-19 related impacts on mental health services

Recent research has highlighted the impact of the COVID-19 pandemic and associated social distancing measures on mental health in England (see Appendix 3).

This brief report estimates the impact of these changes on future demand for mental health services, setting out the approach we have adopted and the results we have obtained.

Here we concentrate on providing selected 'national headlines'. These are useful for seeing the potential scale of coming demand and for attracting appropriate attention.

We provide some of the detail underpinning these headlines. We also introduce the full model and associated materials, use of which can help local services to plan their response to coming demand.

The work was initiated as part the Analytical Collaboration for COVID-19. Initial outputs were developed with Mersey Care NHS FT.

We used a system dynamic (SD) simulation approach. SD is a well-tested, agile modelling approach that tracks changes in stocks and flows. SD has limitations, but where delayed effects, accumulations and feedback loops are present it is often most appropriate.

Our approach therefore incorporates a wide range of evidence, data, and expert opinion from colleagues at Mersey Care NHS Foundation Trust.

Model code and an interactive tool are freely available from the Strategy Unit website: https://www.strategyunitwm.nhs.uk/mental-health-surge-model

Headline results for England

Results suggest a 33% increase in demand over the next three years

Modelled new referrals to service	2020/21	2021/22	2022/23	Overall
Number	720k	669k	388k	1,777k
% (v. typical year)	13%	12%	7%	33%

We estimate that over the next three years, there may be 1.8m new presentations, recurrences or exacerbations of mental ill health across England as a direct or indirect result of the pandemic. The next 18 months could be particularly demanding on services.

As people tend to remain in contact with services for many months, the caseload demands of these surges will be felt for longer than the pandemic itself. Many who receive support during the main disease waves will have ongoing needs that will require future referral and treatment.

These figures represent the specific impact on specialist mental health services. Acknowledging the potential flows of symptomatic people to primary care and non-mental health support (i.e.GP, 111 and 999 call services), we estimate an additional surge demand of c780k people managed by those access points over the next three years as well as acting as a triage, referral and signposting of more severe cases for specialist mental health.

Increased demand varies by mental health service ‘types’

Service type (e.g.)		2020/21	2021/22	2022/23	Overall*^
Primary mental health	n	379k	352k	204k	935k
(IAPT, primary MH team)	*%*	*22%*	*20%*	*12%*	*53%*
Crisis service	n	141k	131k	76k	348k
(CRHT, SPA, 24/7, Walk-in CAU)	*%*	*13%*	*12%*	*7%*	*32%*
Secondary care	n	78k	72k	4k	191k
(General psychiatry, non-IAPT therapy)	*%*	*25%*	*24%*	*14%*	*63%*
Secondary Community	n	69k	64k	37k	169k
(CAMHS, CMHT, Older adults)	*%*	*5%*	*5%*	*3%*	*13%*
Other specialist	n	29k	27k	16k	72k
(Psychiatric Liaison, CJL, Gambling)	*%*	*5%*	*4%*	*2%*	*11%*
Secondary Specialist	n	21k	20k	12k	53k
(ASD, LD, Perinatal)	*%*	*14%*	*13%*	*8%*	*35%*
Specialist inpatient	n (admit)	1k	0.9k	0.5k	2.4k
	%	*1%*	*1%*	*0%*	*2%*

* May not sum due to rounding.

^ Cumulative 3yr effects

Increased activity could cost around £3 billion

	2021/22	2022/23	2023/04	Total
Modelled surge impact (overall)	13%	12%	7%	**33%**
Cost implication [1]	£1.63bn	£1.5bn	£0.87bn	**£4bn**
Cost implication [2]	£1.24bn	£1.15bn	£0.66bn	**£3.05bn**

[1]. This estimate assumes the case-mix of new patient needs would be the same as pre-covid case-mix. Using the total mental health budget in 2018/19 of £12.5bn, we applied the surge in each year and assumed a static budget.

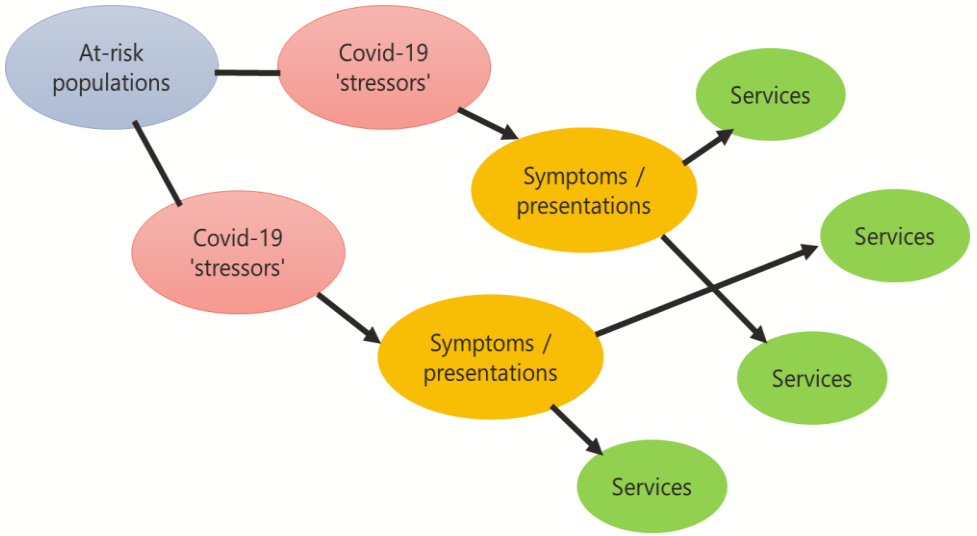
[2]. This is a more conservative estimate assuming a lower acuity of new patients. Taking the surge demand at a service level, we have applied unit costs for assessment for each likely referral case. These are based on average Mental Health cluster assessment costs. Additionally, for those whom our model assumes will require service support after assessment, we have applied average treatment costs depending on whether the service is a primary service (e.g. IAPT, primary care mental health), a secondary/specialist service (e.g. CAMHS, Substance Misuse, Crisis team) or an inpatient service (e.g. children or older adults). These costs are all derived from the latest published NHS reference costs – 2018/19. No adjustments have been made in either of these approaches for inflation.

NHS England. National cost collection for the NHS, 2018/19; national schedule of costs. https://www.england.nhs.uk/national-cost-collection/#ncc1819. Accessed November 2020.

Further detail on the model

We used a ‘systems dynamic’ approach to modelling

Our conceptual model assumes that populations at risk will experience direct or indirect COVID-19-stressors, causing psychiatric symptoms and conditions which in turn would lead to demand for mental health services.



Using a systems dynamic approach (https://www.systemdynamics.org/what-is-sd) our aim was to map the flows between and through these different stocks and simulate the potential impacts on service demand over a three-year period.

The initial model was developed with Mersey Care and a design workshop enabled us to map local service provision against the likely effects of the covid-19 pandemic and associated lockdown policies. We have developed that design to create a more generic service landscape for England as a whole, one based on the full basket of teams/services in national Mental Health Services Data Set (MHSDS).

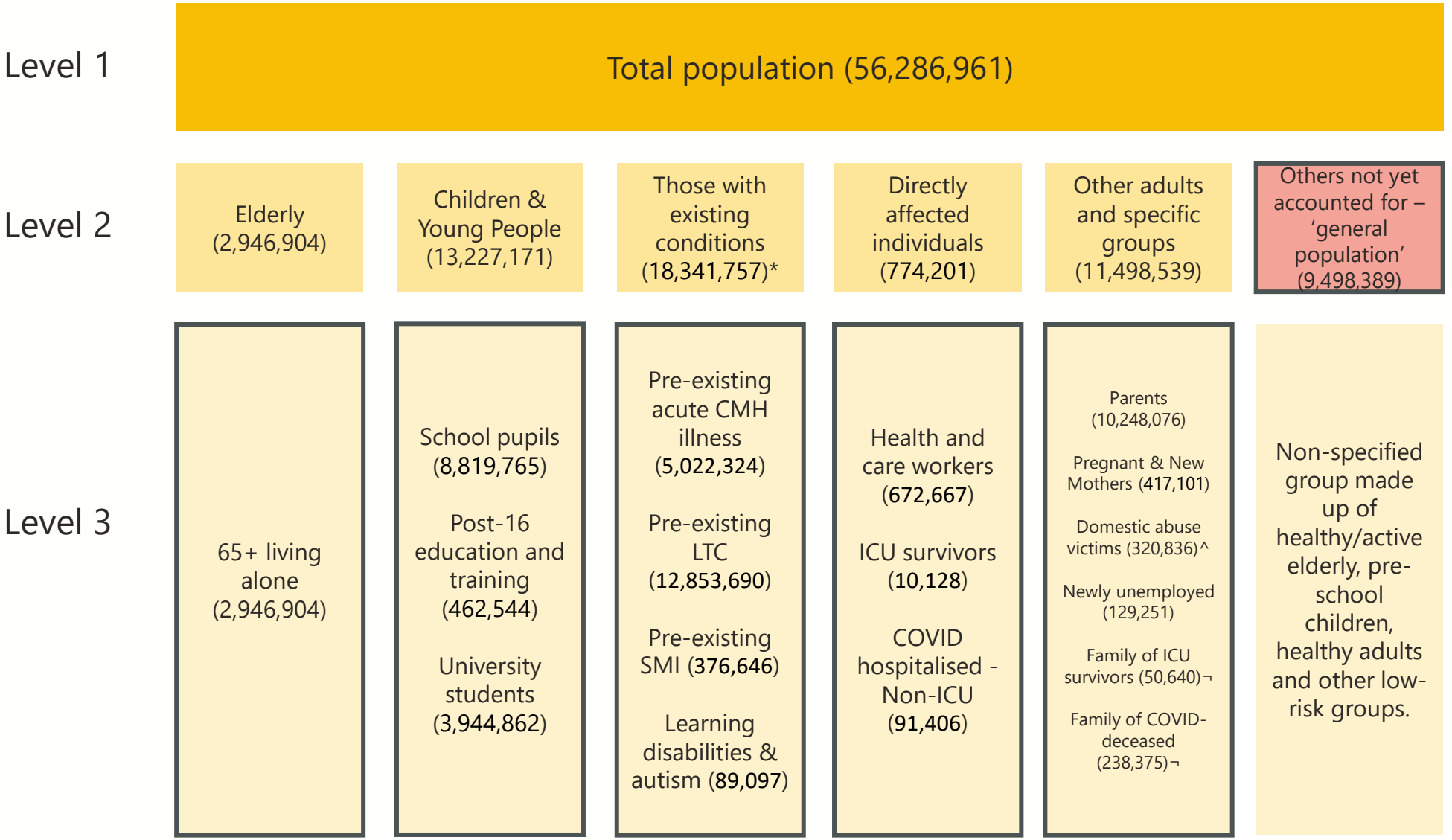
The model accounts for different ‘at risk’ populations

Our model accounts for the whole resident population of England. The sub-populations at risk have been quantified using multiple aggregated data sources.

To remove (some) risk of double-counting, we have arranged the input populations for our model into a three-tier hierarchy and deducted each lower layer from the one above.

Additionally, we have reduced the population figures for those with existing physical and mental health conditions by 1/3 to account for likely double-counting of people with multiple conditions.

A list of data sources for population groups is summarised in Appendix 2.



Notes:
* Acknowledging the effects of co-morbidity, we have reduced each constituent group here by 33%
^ Evidence suggests a 10% increase in domestic abuse. We have applied this figure to the current catchment uplifted case-load (modelled from national survey-based estimate)
¬ Assumption that 5 people per patient in either of these cases will be materially affected by the trauma

Populations in highlighted boxes are explicitly modelled

We accounted for a wide range of COVID-19 ‘stressors’

The effects of the COVID-19 pandemic on individuals’ health and wellbeing, over and above regular life ‘stressors’ can be classified as either direct or indirect.

Direct - those who have been exposed to the virus itself e.g.

- Contracting the virus and experiencing severe symptoms, some of which may be ongoing.
- Admission to hospital as a result of the virus and symptoms.
- People working in settings in which the above occur.

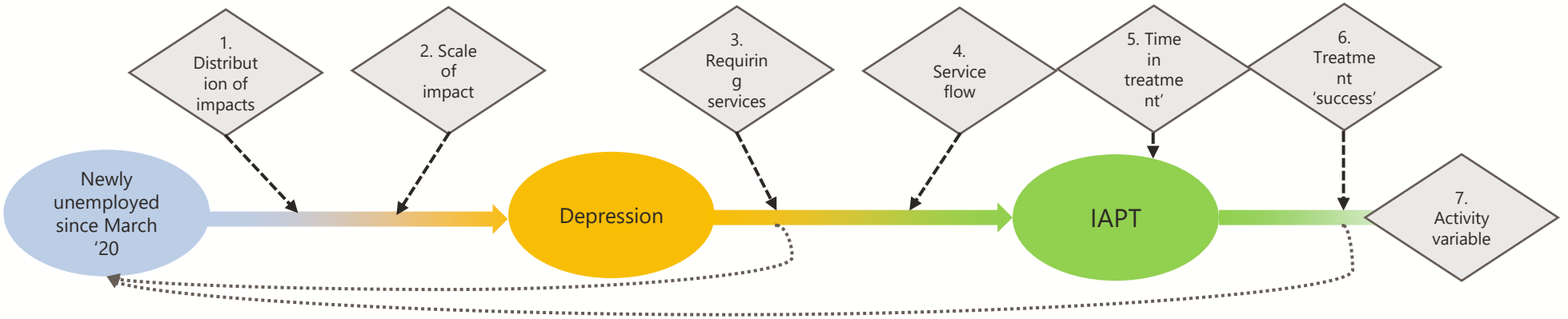
Indirect – associations with individuals directly affected or exposure to the impacts of policy response and the wider social effects of lockdown e.g.

- Close friend or relative of severe cases or those dying from the disease.
- Inability to access other services during lockdowns
- Loneliness or isolation caused by lockdown measures
- Disruption to usual routines – such as working, childcare and social contact
- Economic hardship

Our model is implicitly accounting for these by the careful selection of population groups against which to simulate the psychological impacts.

We also included several service ‘pathway’ variables

Whilst our conceptual model is highly simplified, we need to apply variables that make the pathways within them behave as close to reality as possible. The diagram below shows one example of how this has been deployed and explains the nature of each variable that determines a flow rate or direction. The final national model has multiple impacts and multiple service lines flowing from each population – 638 potential interactions or ‘micro-models’ in total.



1. A judgement on the likely inflow rate of patients to becoming symptomatic. Chosen from 1 of 5 scenarios on previous slide.	2. Determined where possible by evidence e.g. 16% of unemployed people will experience symptoms of depression. Effectively the number of referrals	3. Based on empirical data from MHSDS and IAPT datasets, the historic % of referrals that are offered a service.	4. As agreed with Mersey Care and other advisors, the %’s of each condition that are likely to flow to each service line. Effectively the patients ‘in service’.	5. A decay function to move people out of services. Based on MHSDS and IAPT data – the month that 50% of patients are discharged.	6. Based on empirical data from MHSDS and IAPT datasets, the re-referral rates (<12 months of service discharge) or ‘reliable improvement’ for each service line.	7. Based on MHSDS & IAPT data, an average (clinical) contact rate per patient per month per service. Used to convert patient throughputs to operational information.

The model has important limitations

Our conceptual model simplifies the referral pathways that may be experienced in the real world. More complex pathways are not explicitly modelled.

Each local mental health service is configured distinctly. To produce a model with national relevance, it was necessary for to impose a generic national service model. Differences in local service structures and coding practices introduces some risks to validity.

The research evidence relating to COVID-19 and its impacts changes quickly. Our literature search was completed in June to allow for model design and development. Our interactive tool, will enable users to overwrite estimates of impact on population groups with more recent or robust evidence.

We anticipate that the COVID-19 pandemic and associated lockdown measures will suppress health-seeking behaviour. Our model does not explicitly model this effect. This may lead to an overstatement of the rate at which demand is converted into referrals and supply.

Our model deliberately estimates referrals and activity levels if capacity were not constrained. In practice some services may reach capacity and be unable to accept new referrals therefore risk large waiting times.

Providers/commissioners will not have 'saved' money (cash) from suppressed activity during the pandemic as staff will all still have been deployed and estate still used or re-purposed.

As such, the costs of fulfilling the catch-up assessment and treatment of 100% of the missed referrals during the first lockdown in addition to usual activity could require in the region of **£1bn**.

The majority of that referral catch-up would likely appear in the months after the first major set of restrictions ended (mid-June 2020) and as services became more accessible again.

Our tool profiles catch-up of suppressed activity depending on the % drop-off during March to June 2020:

<=0% = no catch-up required

0-9% referrals suppressed = 6mths

10-19% referrals suppressed = 9mths

20%+ referrals suppressed = 12mths

All 'catch-up' would begin in July as national lockdown restrictions were released.

Appendices and acknowledgements

Appendix 1. Supressed demand during lockdown

During the COVID-19 lockdown period, referrals and admissions to many mental health services reduced. Between March and June 2020, referrals to assertive outreach services were 48% lower than during the same period in 2019.

Over the same period, referrals to memory services or clinics fell by 14%, to IAPT (psychological therapy) services by 10% and to psychiatric liaison services by 4%.

In total, referrals (or admissions for inpatient services) were down by just under half a million (10%) cases.

People affected by these delayed referrals or admissions may present with worsened conditions at a later date as the effects compound.

Similarly, those already in touch with services and their carers who rely on the structure of their care (e.g. those with Dementia in care, autism spectrum disorders & learning disabilities in education) may experience heightened symptoms or support needs.

Whilst we do measure these suppressions and assume 100% of that need is still there in counts of total future demand, our model has not directly and explicitly accounted for the effects of missed referral. Stronger evidence of these impacts may however be emerging for inclusion in future models.

Suppressed referrals/admissions March 2020 to June 2020 by MHSDS service lines

Team Type	Description	Suppressed*	% vs 1yr
A08	Assertive Outreach Team	7,366	48%
D04	Asylum Service	102	28%
E04	Enhanced/Intensive Support Service	1,401	25%
E03	Specialist Parenting Service	245	22%
A01	Day Care Service	2,495	21%
C03	Eating Disorders/Dietetics Service (Retired 1 April 2020)	5,801	19%
A15	Young Onset Dementia Team	589	18%
C09	Community Eating Disorder Service	808	18%
C04	Neurodevelopment Team	6,564	17%
A17	Memory Services/Clinic	25,902	14%
A07	Community Mental Health Team - Organic	19,150	14%
C07	Youth Offending Service	190	14%
B02	Forensic Learning Disability Service	112	14%
A16	Personality Disorder Service	2,548	13%
D01	Substance Misuse Team	576	13%
A09	Community Rehabilitation Service	3,247	13%
IAPT	IAPT	207,970	12%
C01	Autistic Spectrum Disorder Service	5,625	12%
A10	General Psychiatry Service	24,109	11%
A03	Crisis Resolution Team	17,465	11%
A13	Psychological Therapy Service (non IAPT)	7,131	11%
B01	Forensic Mental Health Service	2,822	11%
C08	Acquired Brain Injury Service	256	10%
C06	Looked After Children Service	1,100	10%
A06	Community Mental Health Team - Functional	60,625	9%
A12	Psychotherapy Service	1,541	9%

Team Type	Description	Suppressed*	% vs 1yr
E01	Community Team for Learning Disabilities	7,064	9%
A14	Early Intervention Team for Psychosis	3,750	9%
IPCYP	Inpatient - CYP	2,159	8%
C05	Paediatric Liaison Service	1,344	8%
A18	Single Point of Access Service	37,863	7%
D05	Individual Placement and Support Service	429	4%
A05	Primary Care Mental Health Service	2,630	4%
IPA	Inpatient - Adult	3,307	4%
A11	Psychiatric Liaison Service	19,863	4%
E02	Epilepsy/Neurological Service	79	4%
A04	Home Treatment Service	1,409	3%
IPOA	Inpatient - Older Adult	443	3%
D03	Prison Psychiatric Inreach Service	153	2%
C02	Specialist Perinatal Mental Health Community Service	414	1%
A02	Crisis Resolution Team/Home Treatment Service	0	0%
A19	24/7 Crisis Response Line	0	0%
A20	Health Based Place of Safety Service	0	0%
A21	Crisis Café/Safe Haven/Sanctuary Service	0	0%
A22	Walk-in Crisis Assessment Unit Service	0	0%
A23	Psychiatric Decision Unit Service	0	0%
A24	Acute Day Service	0	0%
D02	Criminal Justice Liaison and Diversion Service	0	0%
D06	Mental Health In Education Service	0	0%
D07	Problem Gambling Service	0	0%
D08	Rough Sleeping Service	0	0%
	Grand Total	**486,647**	

* Suppressed = the drop in patients referred (admissions for inpatient services) during the lockdown months of March to June 2020 compared to the same months in 2019. A total volume of just under 500k or 9% of a typical years' total referral activity.

Appendix 2. Population group data sources and notes

Population group	Date	Source	Additional notes
Children & Young people (School age)	2019	DfE	All schools
COVID hospitalised - Non-ICU	2020	SUS inpatient tables (June refresh)	Primary or secondary diagnosis of U071 or U072
Domestic abuse victims	2020	Sentinel integrated database via Liverpool City Council	Total * 0.1 as per evidence proportion increase in Domestic Abuse
Family of COVID-deceased	2020	ONS Weekly deaths	Count*5 for average family
Family of ICU survivors			No.ICU survivors * 5
General population	2019	ONS mid-year pop estimates	All ages
Health and care workers	2020	NHS Digital	Excluding Ambulance Staff. Provider driven (selectively).
ICU survivors	March1st to June 30th 2020	Covid-19 datastore (daily sitreps)	Metrics SIT001+SIT002+SIT053
Learning disabilities & autism	March 2020	Monthly MHSDS report	By provider
Living Alone (65+)	2019	Census 2011	Census * ONS mid-year population 2019
Newly unemployed	2020	NOMIS Jobseekers Claims	June total - February total = Newly unemployed
Parents	2011/2019	Census 2011	% Working parents of dependent children (2011) * 2019 MYE, 16+ population
Pre-existing LTC	as at May 2020	Liverpool & Sefton CCG analysis	Proportion of Liverpool/Sefton registrants with CMHP recorded on EMIS = 5.71% multiplied by 2019 mid-year population for England.
Pre-existing LTC	2019/20	MerseyCare/CCG analysis	Proportion of Liverpool residents with 1+ LTC = 34.6%. Known and Not-known to Mersey Care multiplied by 2019 mid-year population for England.
Pre-existing SMI	2018/19	QOF SMI register	QOF Mental Health and Neurology group
Pregnant & New Mothers	2018	ONS Birth characteristics	Births in average 4 months period ((Live births in 2018/12)*4) --> Doubled to also represent pregnant women.
Students: FE + University	2011/2019	Census 2011 and DfE	2011 student population/total population * 2019 pop; No.Pupils at end of KS4 (2016/17) * % attending "Any sustained Education Destination"

Appendix 3. Selected references to existing research

Codagone C, Lupiañez-Villanueva F, Liva G, Folkvord F, Bogliacino F, Charris R, Gómez C, Montealegre F, Veltri G. Longitudinal study on the effects of COVID 19 and lockdown in Italy, Spain, and United Kingdom. Open Evidence. Date: May 2020

Kwong A, Pearson R, Adams M, Northstone K, Tilling K, Smith D, Fawns-Ritchie C, Bould H, Warne N, Zammit S, Gunnell D, Moran P, Micali N, Reichenberg A, Hickman M, Rai D, Haworth S, Campbell A, Altschul D, Flaig R, McIntosh A, Lawlor D, Porteous D, Timpson N. Mental health during the COVID-19 pandemic in two longitudinal UK population cohorts. medRxiv 2020.06.16.20133116

Matthias Pierce M, Hope H, Ford T, Hatch S, Hotopf M, John A, Kontopantelis E, Webb R, Wessely S, McManus S, Abel K. Mental health before and during the COVID-19 pandemic: a longitudinal probability sample survey of the UK population. The Lancet Psychiatry Vol. 7, Issue 10 P883-892. Date: October 1 2020

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