

\The **Networked Data Lab**: Statistical Analysis Plan for Topic 2 on Mental Health of Children and Young People

Analysis for North West London

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Background and research question

North West London Networked Data Lab (NWL NDL), is a collaborative project between Imperial College Health Partners (ICHP), NWL Health and Care Partnership and the Institute of Global Health Innovation (IGHI), funded by The Health Foundation. Our group represents one of five NDL locations across the country. The overall aim of the NDL is to improve health and care services and reduce health inequalities in the UK, with the current project specifically aiming to explore mental health (MH) difficulties in children and young people (CYP), and how these have been affected by the COVID-19 pandemic. The pandemic has had a significant impact on the mental health of CYP in the UK¹, as well as on the services that diagnose, treat and monitor their mental health. There is currently limited data available on how access and utilisation of MH services for CYP has changed during the pandemic, and whether the MH needs of CYP have changed. Due to the linked nature and local accessibility of the Discover dataset, the NWL NDL can investigate this issue in detail.

Patient and public involvement and engagement (PPIE) is a core component of the NDL programme. NWL NDL held a PPIE workshop in May 2021 with a diverse group of 20 young people from NWL (e.g. 65% from ethnic minority groups and 20% non-binary). The workshop focused on identifying key health and care research priorities for young people in relation to mental health that could be answered by analysing the Discover dataset, with a particular focus on health inequalities. We then underwent a prioritisation exercise with the same group of CYP (who also sent it to their peers) to refine the priority areas. We have also consulted with a Professional Reference Group (PRG) including consultant paediatricians, consultant psychiatrists and representatives from community mental health trusts to understand what they believe should be the local focus of analysis.

The three themes which emerged from these conversations were:

- Access to mental health services
- Severity of mental health difficulties
- Transition to other types of mental health services

These themes were used to frame and inform our research questions.

Aims

The team will aim to explore at least one analytical question from the three main topics specifically in CYP (up to 25 years) in NWL:

1. Access to MH services

- a. Has there been adequate access to MH services for this group prior to- and during the COVID-19 pandemic?
- b. What proportion of patients who present to primary care and acute services with MH difficulties access community MH services?

¹ <https://youngminds.org.uk/media/4350/coronavirus-report-winter.pdf>

- c. Are there any subgroups (i.e. defined by age, ethnicity, geography, sex, deprivation) who are not achieving adequate access to mental health services?

2. Severity of mental health difficulties

- a. Has there been a change in severe presentations of MH disorders (i.e. suicidal ideation, self-harm, eating disorders) since the beginning of the pandemic?
- b. If there has been a change, are there any groups this has disproportionately affected?

3. Transition to other types of mental health services

- a. Is the transition from primary and secondary care to community MH services well-managed in NWL, and has this been affected by the COVID-19 pandemic? (i.e. how many patients access GP or acute secondary care services for mental health issues, receive a referral but do not go on to access services in mental health trusts?)
- b. Is the transition from child to adult mental health services well-managed in NWL (i.e. do all young people go on to access adult services in the recommended timeframe?), and has this been affected by the COVID-19 pandemic?

Methods

Cohort identification

Intended core analyses are listed for each research question below. Potential supplementary analyses are also listed in Table 1.

1. Description of CYP Population accessing MH services in NWL

Inclusion criteria: All CYP (Aged 0-25 years old) with either:

- 1. GP SNOMED code or Read code of MH
- 2. GP Prescription of MH drugs
- 3. GP referral to MH services
- 4. Acute admission for MH
- 5. A&E / Outpatient visit for MH
- 6. MH appointment (for MH NHS Trusts in NWL)

Timeline: February 2015 – February 2020 (Pre-COVID) and March 2020 to June 2021 (During COVID)

Core analysis:

- a. General demographic summary of population, split by:
 - i. Specific age groups based on guidance from PRG
 - ii. Indices of Multiple Deprivation (IMD)
 - iii. Sex

- iv. Ethnicity (further split by sex and age, where possible)
- v. GP population counts
- vi. Geography (electoral ward or Middle Super Output Area)

2. Access to mental health services

Inclusion criteria: Cohort (1)

Timeline: February 2015 – February 2020 (Pre-COVID) and March 2020 to June 2021 (During COVID)

Core analysis:

- a. Compare the “observed” number of secondary care referrals for specific mental health difficulties with the “expected” number of referrals (based on previous trends)
- b. Analysis will consider pre-existing trends (e.g. using an interrupted time-series model)
 - a. Split by:
 - i. Specific age groups based on guidance from PRG
 - ii. Indices of Multiple Deprivation (IMD)
 - iii. Sex
 - iv. Ethnicity (further split by sex and age, where possible)
 - v. Geography (electoral ward or Middle Super Output Area)

3. Severity of mental health difficulties

Inclusion criteria: Subcohort of (1) including all CYP admitted to a hospital with a mental health ICD-10 diagnosis codeⁱⁱ in both the primary and in any diagnostic position (subject to review by PRG)

Patients with no history of MH issues

Timeline: February 2015 – February 2020 (Pre-COVID) and March 2020 to June 2021 (During COVID)

Analysis options:

- a. Compare the “observed” number of admissions to the “expected” number of admissions (based on previous trends)
- b. Analysis will consider pre-existing trends (e.g. using an interrupted time-series model)
 - a. Split by:
 - i. Specific age groups based on guidance from PRG
 - ii. Indices of Multiple Deprivation (IMD)
 - iii. Sex
 - iv. Ethnicity (further split by sex and age, where possible)
 - v. Geography (electoral ward or Middle Super Output Area)

4. Transition to other types of mental health services

Inclusion criteria: Cohort (1). Patients up to 25 years of age are expected to have transitioned within the time-period allocated, however this is subject to review by the PRG.

Timeline: February 2015 – February 2020 (Pre-COVID) and March 2020 to June 2021 (During COVID)

Analysis options:

- a. Compare the duration of pathways from one service to another (e.g. primary care to secondary care, CAMHS to adult services)
 - a. Pathways will be defined by referrals and appointment dates for specific MH services, dependent on data quality and clinical relevanceⁱⁱⁱ
 - i. Split by:
 - 1. Specific age groups based on guidance from PRG
 - 2. Indices of Multiple Deprivation (IMD)
 - 3. Sex
 - 4. Ethnicity (further split by sex and age, where possible)
 - 5. Geography (electoral ward or Middle Super Output Area)

Potential supplementary analysis

Research theme	Additional Analysis	Method of analysis
Description of population	Compare population of CYP utilising MH services to reported population estimates for region (based on GP population counts)	Chi-squared test
Access to MH services	Compare the duration of pathways with the recommended / gold standard pathway (as recommended by professional reference group and NHS waiting time standards)	Calculating median and interquartile range of pathway duration during defined periods
Severity of MH difficulties	a. Compare the proportion of codes for specific disorders (e.g. psychosis) before and after a defined period b. Compare the proportion of new admissions for MH difficulty before and after a defined period	a. Chi-squared test b. Chi-squared test
Transition to services	a. Visualise the expected trends of transition through services prior to COVID-19 and compare to the trends observed during the COVID-19 pandemic b. Comparing the age of transition to adult MH services before and during the pandemic. Transition from CAMHS to adult MH services typically should occur between 18-21 years of age^{iv} .	a. Sankey diagram b. Calculating median and interquartile range of the age of transition (Boxplot)

Table 1: Potential supplementary analysis to be completed subject to capacity

Data and data linkages

In this study we use the longitudinal Discover dataset. This dataset provides linked coded primary care, acute, mental health, community health and social care record for over 2.5 million patients who live and are registered with a GP in NWL. This dataset consists of data from over 400 provider organisations including 360 GP practices, 2 mental health and 2 community trusts and all acute providers attended by NWL patients (in the form of Secondary Uses Service (SUS) data).

Local audience

- North West London Community
- Data Access Committee for North West London
- Professional Reference Groups

Dissemination plan

We plan to disseminate our findings through the Health Foundation, which publishes a report based on the overall findings from each NDL partner. We also plan to communicate our findings to local commissioners through our local system Boards and professional reference group. ICHP collaborates with NHS providers of healthcare services, clinical commissioning groups and leading universities across NWL. ICHP are also the designated academic health science network (AHSN) for NWL. By connecting ICHP's unique network of health experts, we can accelerate the adoption and spread of innovation for the insights created by this project among our member organisations and across the wider healthcare sector. We will also publish the findings in public-facing formats (e.g. blogs and social media channels) through our youth networks and charity network to reach our local youth community, the voluntary sector and the public. Findings may also be translated into an academic publication, led by IGHI, to share insights with the broader academic community.

ⁱ Inclusion criteria for all research questions are currently under review by the PRG

ⁱⁱ Subject to clinician review

ⁱⁱⁱ Definition of pathways is subject to review by the PRG

^{iv} Broad KL, Sandhu VK, Sunderji N, Charach A. Youth experiences of transition from child mental health services to adult mental health services: a qualitative thematic synthesis. BMC psychiatry. 2017 Dec;17(1):1-1.