Resilience, **E**thnicity, and **A**doles**C**ent Mental **H**ealth (REACH)

Study Protocol

Time 4 (2020/21) Covid-19 enhancement

This document outlines protocols for REACH Time 4 (T4), which will focus on the impact of the Covid-19 pandemic on young people's mental health. Protocols for previous waves of REACH (T1-T3) are available on our website: www.thereachstudy.com/information-for-researchers.html.

Aims

(1) To examine the impacts of COVID-19 and related social restrictions on the mental health of adolescents in disadvantaged and vulnerable groups, focusing on impacts at the intersections of ethnicity, gender, and poverty and on protective factors

(2) To inform the rapid development of strategies to mitigate the effects of COVID-19 and to support young people's mental health

(3) To consolidate a socially and ethnically diverse cohort of adolescents, with extensive data at 3 previous time points, to support subsequent studies of longer terms impacts of COVID-19, of mechanisms, and of interventions

Research Questions and Hypotheses

(1) Are the acute effects of COVID-19 and social restrictions on mental health among adolescents more pronounced among those in low-income households, in minority ethnic groups, and with pre-existing mental health problems?

(2) Are inequalities in mental health outcomes explained by variations in access to and quality of material and social resources (e.g., household income, food insecurity, overcrowding, internet access)?

(3) Do modifiable protective factors, such as social support, structured daily routines, and access to virtual schooling, mitigate the impacts of COVID-19 and social restrictions on mental health among adolescents?

To answer these questions, we will test several hypotheses that posit the impacts will be most pronounced in disadvantaged and vulnerable groups, particularly at the intersections of these, that disparities will be explained by variations in material and social resources, and that modifiable protective factors mitigate risk.

Study Design and Cohorts

REACH (**R**esilience, **E**thnicity, and **A**doles**C**ent Mental **H**ealth) is an accelerated cohort study of the development of mental health during adolescence. (Please refer to the T1-T3 Protocol for more detailed information on study design.) The cohort is socially and ethnically diverse and comprises 4,300 adolescents recruited from 12 mainstream secondary schools in south London who have been extensively assessed, initially, at ages 11-14 years and, subsequently, 1 and 2 years later. The samples are highly representative, with around 80% participation at each time point. Participants are currently aged 14 to 17 years, 85% are from black and minority ethnic backgrounds, 24% receive free school meals, and around 20% experienced mental health problems pre-Covid-19. At each time point, participants have provided extensive information on mental health, home and social circumstances, exposure to adverse experiences, including bullying and violence, and putative protective factors, including school environment, social support, physical activity, and individual coping strategies. REACH, therefore, provides a unique opportunity to examine the impacts of the Covid-19 crisis on mental health in a large, diverse, and representative cohort of adolescents directly affected by school closures and other restrictions.

Attrition and Power

In previous waves, we have achieved follow up rates in excess of 80%, with over 90% providing data for at least two time points. T4 data collection will be more challenging because of school closures and ongoing restrictions as schools reopen during the Covid-19 pandemic. However, we have worked closely with young people and schools in preparation for T4 to optimise strategies for reassessment and these include moving from our previous model of school-based assessment to a blend of school-based and direct contact. At the point of lockdown, around

2,500 participants had provided direct contact details. Further, we have refined our procedures for re-contact, with input from young people, during our pilot work and, based on this, anticipate following - at the very least - 60% (~ 2,500) of the cohorts. We will assess possible biases using previous waves of data and will work closely with schools to ensure young people in hard to reach groups are followed. This is aided by the fact that many in the most disadvantaged and vulnerable groups continue to attend school. A sample of 2,500 has over 80% power, after accounting for clustering by school, to detect odds ratios of 1.5 or above (at $p < 0.05$) for differences between groups and impacts of hypothesised exposures on mental health.

Setting

The REACH cohort was recruited from 12 mainstream secondary schools in Lambeth and Southwark, south London, selected to be representative of the target population. Lambeth and Southwark are among the most ethnically diverse and densely populated areas of the UK, with high levels of inequality, pockets of severe deprivation, and, pre-pandemic, high levels of mental health problems among both adolescents and adults. The two boroughs have been especially affected by Covid-19, with high rates of infections and deaths.

The impacts of Covid-19 and related social restrictions will vary by region and by social and ethnic group. There are already reports that rates of infections and deaths are higher in the poorest areas and among black and minority ethnic groups. Understanding these differential effects - and tailoring responses to local conditions - is consequently essential to a comprehensive and effective national public health response. It follows that we need a combination of national studies that can inform broad public health responses and focused studies that can inform responses targeted at the most affected populations and groups. REACH has the potential to provide unique and urgently needed information on the acute - and ultimately long-term - effects of Covid-19 and social restrictions on mental health among adolescents in diverse, densely populated, and deprived areas.

Preparatory and Pilot Work

With support from the newly established ESRC Centre for Society and Mental Health, we have completed substantial preparatory and pilot work that will maximise the robustness of our proposed approach and enable rapid mobilisation if funding is awarded. This includes:

(1) Coproduction of this project, with young people, schools, and community organisations

(2) Development, programming, and piloting of an online questionnaire comprising validated assessments that have been used in previous waves of data collection, plus new COVID-19 measures from other studies, which enhances comparability

(3) Building a new participant contact system that allows us to work flexibly and directly with REACH participants, online, in addition to our usual route through school.

(4) Securing ethical approvals (All study procedures were approved by the Psychiatry, Nursing and Midwifery Research Ethics Subcommittee [PNM-RESC], King's College London [ref: 15/162320]).

(5) Securing participation of and partnerships with schools

(6) Completing initial work to digitise our extensive engagement programme, which has been critical for participant and school retention at previous points, including virtual work experience placements and online research methods training for young people

Data Collection

Researchers and community champions will invite REACH participants, either via schools or directly using details provided, to complete an online questionnaire about their mental health and social and personal circumstances and experiences, since the start of lockdown and closure of schools in the UK. The questionnaire takes around 30 minutes to complete and comprises validated measures of mental health used in previous waves of REACH and in other similar studies. This includes measures of depression, anxiety, self-harm, anomalous experiences, and emotional and behavioural difficulties. The online questionnaire also contains Covid-19-specific items and collects information on putative risk and protective factors for adolescent mental health, including personal, social, and household experiences and circumstances. A detailed overview of the information collected in the online questionnaire is presented in Table 1. Those who complete the questionnaire will receive a £15 e-voucher for their

time. Researchers will work closely with schools to ensure all have an opportunity to participate, and participants will be offered the option to complete a paper version of the questionnaire, to ensure those without access to a computer are able to participate.

Table 1. Measures and items included in the online T4 questionnaire.

Domain	Measure
Basic information	
	Age
	Gender
	Sexual orientation
Mental Health	
Depression	Short mood and feelings questionnaire (Angold 1995)
	(13 items on symptoms/experiences of depression in the past 2 weeks)
Anxiety	Generalised Anxiety Disorder Scale (Spitzer 2006)
	(7 items on symptoms/experiences of anxiety in the past 2 weeks)
Self-harm	2 items on self-harm from the Development and Adolescent Wellbeing Assessment (DAWBA) (Goodman 2000); 1 item on frequency
Emotional and behavioural difficulties	Strengths and Difficulties Questionnaire (Goodman 1998)
	(25 items on emotional problems, conduct problems, hyperactivity and inattention, peer relationship problems, and prosocial behaviour in past 6 months)
Anomalous experiences	Adolescent Psychotic Symptom Screener (Kelleher 2011)
	(6 items on the presence of unusual thoughts and feelings [2 items on hallucinatory experiences, 4 on delusional experiences] and 2 items on frequency and distress)
Risk factors	
SES	1 item on free school meals status (prior to school closures)
	2 items on parental employment status
	1 item on change in household employment due to COVID-19
	2 items on parent occupation from the Labour Force Survey
	2 items (on own bedroom and ownership of tablets, computers, and laptops) from the Family Affluence Scale (Wardle, 2002)
Education	1+2 items on young person's education/occupation status
Transition to adulthood	1 item on independent living
	3 items on future aspirations and concerns, and 5 items on helping at home, from the Transition to Adulthood (TA) arm of the Panel Survey of Income Dynamics (PSID) (Kendig 2014)
Housing quality	2 items on number of people and who the young person lives with
	1 item on number of bedrooms in the home
	8-item housing quality scale from British Household Panel Survey
Difficult experiences	14 items from the Adolescent-appropriate Life Events Checklist (Heubeck 1998)
Cyber bullying	1 item on cyber bullying from the Revised Olweus Bully/Victim Questionnaire (Olweus 1996)
Social media	9 items on feelings about own use of social media
Family health	1 item on participant's physical health
	2 items on parents' physical and mental health
	1 item on siblings' mental health

Young carers	3 items on carer roles at home
Loneliness	1 item on loneliness
Sleep	3 items on sleep quality, duration, and change in last 4 weeks
Protective factors	
Social support	Multidimensional Scale of Perceived Social Support (Zimmet 1990) (12-item questionnaire on perceived support from family, friends, others)
Physical activity	2 items on frequency of and change in moderate-to-vigorous activity
Social connections	2 items on new activities to keep connected with people inside and outside home 1 item on frequency of remote contact with people outside home
Access to green space	3 items on perceptions of, access to, and use of green space (Dzhambov, 2018)
Covid-19 experience	
Infection	6 items on symptoms/diagnoses (self, family, friends)
Compliance	3 items on contact with police and compliance with social distancing measures
Main concerns, worries	2 items on sources of minor and significant worries in last week 1 item on parents'/carers worries in last week 1 item on amount of day spent thinking about COVID-19 1 item on perceived risk of impact on mental health 1 item on perceived stress due to restrictions on leaving home 18 items on own level of concern about impact of COVID-19 2 items on overall negative and positive impacts
Daily routine	2 items on activities missed the most and the least 5 items on impact on daily routine
School closures	1 item on loss of in-school mental health support (e.g., counselling) 1 item on school approaches to continuing education 1 item on loss of lunch among free school meals pupils
Coping activities	26-item questionnaire on coping activities 3 items on helping others
Relationships	3 items on change in relationships with family and friends
Family conflict	10-item measure on tension and conflict with parents

Process for informed consent

Following HRA guidance for obtaining informed consent for non-CTIMP (Clinical Trial of an Investigational Medicinal Product) research with young people (hra.nhs.uk), and in line with consent procedures used in previous waves of REACH and in other observational studies involving young people (e.g., DASH (Harding 2007), RELACHS (Stansfeld 2004), ORIEL (Smith 2015), SCAMP (Toledano 2018), and others (Mackie 2013)), the process for obtaining informed consent will be:

(1) for those age 16 or older who, as part of REACH, have already provided their contact details and permission to be contacted for future waves of data collection, we will:

   (i) Contact them directly, via their preferred method of communication, to provide information about this part of REACH and to invite them to take part

   (ii) Ask them to complete an online consent form (enclosed) and to reconfirm their date of birth (for the purpose of cross-checking their age with existing data from earlier waves of REACH) at the start of the first questionnaire

(2) for those under the age of 16: we will follow our existing procedures for obtaining informed consent (with the exception of being online).

Analysis

We have established procedures and syntax from previous waves to facilitate the rapid cleaning and preparation of data collected electronically for analysis (see Table 2 for an overview of data collected at previous [pre-covid-19] REACH time points). Our analysis plan recognises the importance of rapidly producing findings, while maintaining accuracy and quality, and will focus on producing descriptive statistics documenting the prevalence of mental health problems by ethnic and social group and fitting multi-level regression models, with interaction terms as necessary, to test our hypotheses. These primary sets of analyses can be completed quickly and will produce robust, yet interpretable and informative, findings for our target audiences.

Platform for Studies of Medium- and Long-Term Impacts

In conducting our proposed, we will consolidate a cohort and provide a unique platform for subsequent studies of the medium- and long-term impacts, of putative mechanisms and of community- and school-based interventions. In addition, this work will enhance a unique data resource, with the addition of a fourth wave of data for use – subject to appropriate permissions and data sharing agreements – by the research community. Finally, REACH provides a template for generating representative samples for the conduct of robust studies of adolescent mental health in focused settings that can be scaled and applied in other regions in the UK and beyond.

References

Angold A, Costello EJ, Messer SC, Pickles A. Development of a short questionnaire for use in epidemiological studies of depression in children and adolescents. *International Journal of Methods in Psychiatric Research* 1995; 5(4): 237-49.

Dzhambov A, Hartig T, Markevych I, Tilov B, Dimitrova D. Urban residential greenspace and mental health in youth: Different approaches to testing multiple pathways yield different conclusions. Environ Res. 2018 Jan;160:47-59.

Goodman R, Ford T, Richards H, Gatward R, Meltzer H. The Development and Well-Being Assessment: description and initial validation of an integrated assessment of child and adolescent psychopathology. *J Child Psychol Psychiatry* 2000; 41(5): 645-55.

Goodman R, Meltzer H, Bailey V. The Strengths and Difficulties Questionnaire: a pilot study on the validity of the self-report version. Eur Child Adolesc Psychiatry 1998; 7(3): 125-30.

Harding S, Whitrow M, Maynard MJ, Teyhan A. Cohort profile: The DASH (Determinants of Adolescent Social well-being and Health) Study, an ethnically diverse cohort. Int J Epidemiol. 2007 Jun;36(3):512-7. PubMed PMID: 17664225. Epub 2007/08/01. eng.

Heubeck B, O'Sullivan C. An exploration into the nature, frequency and impact of school hassles in the middle school years. Aust Psychol 1998; 33: 130–7

Kelleher I, Cannon M. Psychotic-like experiences in the general population: characterizing a high-risk group for psychosis. Psychol Med. 2011 Jan;41(1):1-6.

Kendig SM, Mattingly MJ, Bianchi SM. Childhood Poverty and the Transition to Adulthood. Fam Relat. 2014 Apr 1;63(2):271-286. doi: 10.1111/fare.12061.

Mackie CJ, O'Leary-Barrett M, Al-Khudhairy N, Castellanos-Ryan N, Struve M, Topper L, et al. Adolescent bullying, cannabis use and emerging psychotic experiences: a longitudinal general population study. Psychol Med. 2013 May;43(5):1033-44. PubMed PMID: 23171473.

Olweus D. The Revised Olweus Bully/Victim Questionnaire. Bergen, Norway: Research Centre for Health Promotion, University of Bergen; 1996.

Smith NR, Clark C, Fahy AE, Tharmaratnam V, Lewis DJ, Thompson C, Renton A, Moore DG, Bhui KS, Taylor SJC, Eldridge S, Petticrew M, Greenhalgh T, Stansfield SA, Cummins S (2012). The Olympic Regeneration in East London (ORiEL) study: protocol for a prospective controlled quasi-experiment to evaluate the impact of urban regeneration on young people and their families. BMJ Open, 2(4), e001840

Spitzer RL, Kroenke K, Williams JB, Lowe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Archives of internal medicine. 2006 May 22;166(10):1092-7.

Stansfeld SA, Haines MM, Head JA, Bhui K, Viner R, Taylor SJ, et al. Ethnicity, social deprivation and psychological distress in adolescents: school-based epidemiological study in east London. Br J Psychiatry. 2004 Sep;185:233-8.

Toledano MB, Mutz J, Röösli M, Thomas MS, Dumontheil I, Elliott P. Cohort profile: the study of cognition, adolescents and mobile phones (SCAMP). International journal of epidemiology. 2019 Feb 1;48(1):25-6l.

Wardle J, Robb K, Johnson F. Assessing socioeconomic status in adolescents: the validity of a home affluence scale. Journal of epidemiology and community health. 2002 Aug;56(8):595-9. PubMed PMID: 12118050. Pubmed Central PMCID: 1732226

Zimet GD, Powell SS, Farley GK, Werkman S, Berkoff KA. Psychometric characteristics of the Multidimensional Scale of Perceived Social Support. J Pers Assess. 1990 Winter;55(3-4):610-7. PubMed PMID: 2280326. Epub 1990/01/01. eng

Table 2. Overview of data collected in previous REACH time points

(For more detailed information www.thereachstudy.com/information-for-researchers.html)

Domain	Questionnaire, item, measure
Basic Information	Date of birth Gender Postcode Place of birth of pupil and parents Language Self-reported ethnicity Religion
Mental Health	Strengths and Difficulties Questionnaire (Goodman, 1998) (25 item questionnaire covering presence and impact of emotional problems, conduct problems, hyperactivity and inattention, peer relationship problems, and prosocial behaviour over past 6 months) Adolescent Psychotic Symptom Screener (Kelleher, 2011) (8 items on the presence of unusual thoughts and feelings – 2 items on hallucinatory experiences, 6 on delusional experiences – with additional questions on timing, frequency, impact, context, conviction, and a description of the experience) Short mood and feelings questionnaire (Angold, 1995)* (13 items on symptoms/experiences of depression in the past 2 weeks) Generalised Anxiety Disorder Scale (Spitzer, 2006)* (7 items on symptoms/experiences of anxiety in the past 2 weeks)

Domain	Questionnaire, item, measure
	1 item on self-harm from the Development and Adolescent Wellbeing Assessment (DAWBA) (Goodman, 2000)
	6 items on troublesome behaviour from the DAWBA (Goodman, 2000)
Risk	
Socioeconomic Status	Family Affluence Scale (Wardle, 2002)
	(4 item index of common indicators of wealth - ownership of car, computer, number of bedrooms in household, and number of yearly holidays)
	Self-reported free school meal status
	Parental employment status
Family Structure	1 item on who the pupil currently lives with
	1 item on reason not living with mum or dad, if applicable
Family health	1 item on participant's physical health
	2 items on parents' physical and mental health
	1 item on siblings' mental health
	2 items on participant's height and weight
Life events	Adolescent-appropriate Life Events Checklist (Heubeck & O'Sullivan, 1998)
	(16 item checklist; items include death of someone close, parental separation/divorce, serious accident or illness, being a victim of crime)
	9 items assessing other difficult experiences, including accidents (family); school exclusions; foster care; family money problems; parental alcohol misuse; migration; homelessness.
Peer Bullying	Revised Olweus Bully/Victim Questionnaire (Olweus, 1996)
	(4 items covering physical, verbal, relational, and cyber bullying)
Discrimination	2 items on unfair treatment due to race and religion
Substance Use	3 items on smoking
	1 item on alcohol use
	4 items on cannabis use
	1 item on other substance use
Neighbourhood	1 item on length of time lived in neighbourhood
	4 items on perception of neighbourhood (Smith, 2012)
Street Gangs	3 items from the British Crime Survey for 10-15 year olds (Milard, 2010), and 3 items from the Eurogang Survey (Medina, 2013)
Protective	
Social Networks	1 item on number of friends
	2 items on peer and adult confidants
	1 item on loneliness
	1 item on best friends in own year group at school (for Social Network Analysis)
	2 items on internet use
Family Relationships and Social Support	Parental Bonding Instrument, short version (Parker , 1979)
	(12-item questionnaire on parental care and parental control)
	3 items on perceived quality of relationships with parents/carers and siblings
	Multidimensional Scale of Perceived Social Support (Zimet, 1990)
	(12 item questionnaire on perceived support from family, friends, and others)

Domain	Questionnaire, item, measure
Help & Support	11 + 3 items on contact with a range of formal helping agents for emotional or behavioural difficulties (e.g. school counsellors, mental health professionals) (Green, 2005)
School Environment	5 items on perception of school environment/climate (McNeelyet al., 2002)
Cultural Integration	2 items on how many friends are from the pupil's ethnic group and how many from other ethnic groups (Bhui et al., 2005a and 2005b; Berry, 2004)
Coping Strategies	Children's Coping Strategies Checklist (Ayers et al., 1996) (26 item questionnaire assessing four types of coping: distraction, support seeking, active, avoidant)
Mechanisms	
Sleep	Child Report Sleep Patterns Questionnaire (Meltzer, 2013) (9 item questionnaire on frequency, duration, and quality of sleep)
Physical activity	Physical Activity Questionnaire for Children (Kowalski, 2004) (9 items on frequency, intensity, and types of activities in past seven days

*T1 and T3 only.