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Risk of diagnosed and undiagnosed mental distress in coastal and inland English adult residents

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Context

- In 2021, the United Kingdom's Chief Medical Officer highlighted the inequitable health outcomes of coastal compared with inland residents in England (Whitty, 2021)
- Increased risk of mental health burden for coastal youth, with a 35% higher rate of hospital admission due to self-harm in 10- to 24-year-olds relative to non-coastal youth (Whitty, 2021).
- CMO findings based on GP data therefore omitted people who have not sought support. This population may be as large as large as two-thirds of adults experiencing a common mental health disorder (McManus et al., 2018).
- Using population level data, the coastal effect for mental health was found only in individuals who grew up in the 20% most deprived coastal areas of England versus those who grew up in the 20% most deprived inland areas (Murray, et al. 2024).

Research Questions

1. Does the risk of diagnosed and undiagnosed mental distress differ between UK residents residing in inland or coastal areas?
2. Is area deprivation associated with risk of diagnosed mental distress?
3. Do compositional factors explain risk of diagnosed or undiagnosed mental distress?
4. Does risk of undiagnosed distress differ across stages of adulthood?

Methodology

Sample: 28,549 adult respondents across waves 10-13 of the UKHLS (January 2018 to May 2023).

Analyses completed in Stata version 18.

Multinomial regression: IV = coastal status, DV = mental health status.

Covariates: **age, age squared, area deprivation** (Townsend Index; ONS quintiles), **sex** (male or female), **ethnicity** ("British/English/Scottish/Welsh/Northern Irish" or "other ethnic background"), **net income, tenure** ("homeowner", "social renter", and "private renter/other".

Methodology

- Weights: UKHLS cross-sectional adult self-completion weight applied.
- Adjustments: clustering by LSOA using the clustered sandwich estimator.
- Statistical output: Relative Risk Ratios (RRR), 95% Confidence Intervals (95%CI).

Coastal community status (IV)

- Respondents dichotomised as either a “coastal” or “inland” resident.
- 2011 Lower Layer Super Area Output (LSOA) codes provided under a special user licence agreement with UKHLS.
- Cross-referenced with the Appendix of the CMO of England's 2021 report and provided by the University of Plymouth's Centre for Coastal Communities
- The CMO’s report defined “coastal” LSOAs as those that included or overlapped with built-up areas, which lay within 500 metres of the “Mean High Water Mark” (excluding tidal rivers).

Defining undiagnosed mental distress

Mental distress	Diagnosis
Measured using a **self-report** scale the "General Health Questionnaire-12" (GHQ-12) 0 (least distressed) >>>12 (most distressed) Score of ≥4 indicates mental distress 	UKHLS asks questions about history of mental health **professional diagnosis** A response of "NO" indicates **no diagnosis has been received** 
Self-report mental distress + No professional diagnosis = **Undiagnosed mental distress**   	

Mental health categories (DV)

i. No treatment need: GHQ-12 caseness score of <4 and no history of a mental health diagnosis.
ii. Undiagnosed mental distress: GHQ-12 caseness score of ≥4 and no history of mental health diagnosis.
iii. Diagnosed mental distress: GHQ-12 caseness score of ≥4 and a history of mental health diagnosis.

Demographic characteristics

	Total (n=28,549) Frequency (%)	Coastal (n= 4,752) Frequency (%)	Inland (n= 23,797) Frequency (%)
Age (mean, SD)	49.8, 19.4	51.7, 19.4	49.5, 19.3
16–24-year-olds (young adults)	3,615 (24.2)	523 (11.0)	3,092 (13.0)
25–65-year-olds (working adults)	18,011 (63.1)	2,912 (61.3)	15,099 (63.4)
66 years + (older adults)	6,923 (12.7)	1,317 (27.7)	5,606 (23.6)
Sex: Male	12,953 (45.4)	2,163 (45.6)	10,790 (45.3)
Sex: Female	15,596 (54.6)	2,589 (54.4)	13,007 (54.7)
Ethnicity: White British	21,112 (74.0)	4,357 (91.7)	16,755 (70.4)
Ethnicity: Other Ethnicity	7,437 (26.0)	395 (8.3)	7,042 (29.6)

Analytical models & Findings: Model 1

Coastal status (IV)

Covariates
Age, age squared

Mental Health Status (DV)

- Coastal study members had a 19% higher risk (RRR=1.19, 95%CI: 1.07, 1.33) of having diagnosed mental distress than inland study members.
- No association between coastal residence and undiagnosed mental distress.
- Descriptive data revealed that 17% of inland and 15% of coastal residents were living with undiagnosed mental distress.

Analytical models & Findings: Model 2

Coastal status (IV)

Covariates
Age, age squared,
area deprivation

Interaction term
Coastal status x
area deprivation

Mental Health Status (DV)

Participants residing in the top 20% most deprived coastal areas had a 75% (RRR=1.75, 95%CI: 1.15, 2.67) higher risk of diagnosed mental distress than those who resided in equivalently deprived inland areas.

Analytical models & Findings: Model 3

Coastal status (IV)

Covariates
Age, age squared,
area deprivation,
income, ethnicity,
tenure, sex

Interaction term
Coastal status x area deprivation

Mental Health Status (DV)

After controlling for socio-demographic variables (sex, household income, tenure, ethnicity) there were no associations between coastal or inland residence and undiagnosed or diagnosed mental distress

Analytical models & Findings: Model 4

Subgroup analysis by age category*

Coastal status (IV)

Covariates
Area deprivation

Interaction term
Coastal status x area deprivation

Mental Health Status (DV)

- Young adults residing in the top 20% most deprived coastal areas had over three times (341%) higher risk of undiagnosed mental distress compared with equally deprived inland residents (RRR=3.41, 95%CI: 1.35, 9.45).
- Older adults residing in the top 20% most deprived coastal areas experienced one-third of the risk (35%) of experiencing of undiagnosed mental distress compared with equally deprived inland residents (RRR=0.35, 95%CI: 0.13, 0.90).

**Young adults: 16-24 n=4430 , Working age adults: 25-65, n=8760 , Older adults: 66+ n=6923*

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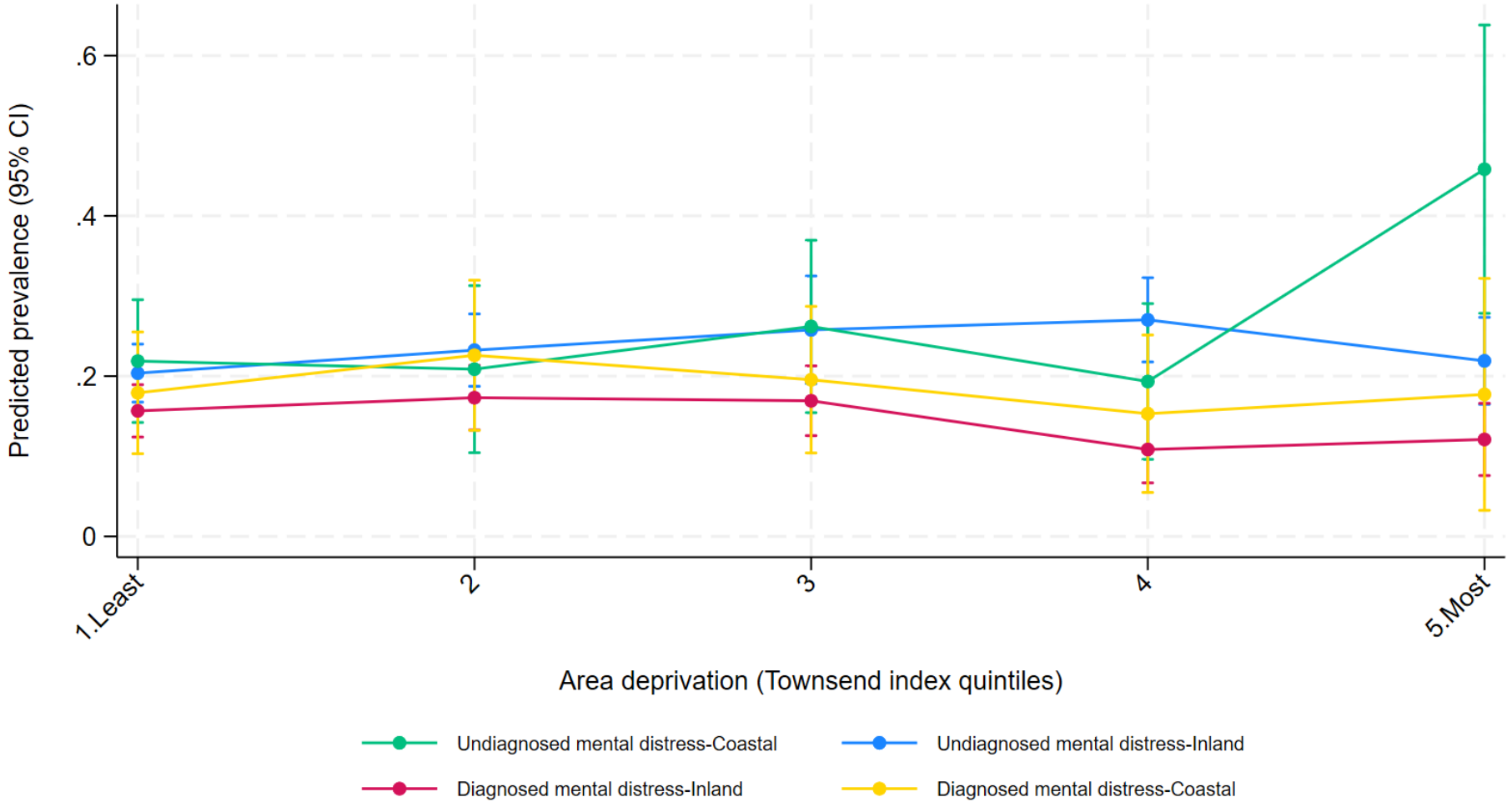
Analytical models & Findings: Young adults



Implications and recommendations

Short-term recommendations

- Investment in and delivery of interventions to support the mental health of coastal young adults in most deprived areas of the UK should be a priority. This should include facilitating access to services with a focus on the most at-risk groups.
- At national level, the government should reinvest in youth mental health services, which have been dramatically reduced in recent years (Davies, 2019). Mental health care policy should insist on joined up working between adolescent and adult mental health services for continuity of care to protect young people from falling victim to the service gap.

Implications and recommendations

Long term recommendations

- investment in deprived coastal communities to tackle the drivers of poor mental health.
    - improving opportunities for education, employment, housing and social connection with improved public transport essential for all of these.
    - Investment should be considered on an individual basis with the needs and assets of each community at the heart of developments, e.g. new opportunities should not threaten existing income streams, opportunities for health or the natural environment.

References

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