NATIZDAT · RESEARCH

Life Under Pressure from Coal

Mental health, living conditions and life expectancy among workers and residents in coal regions

Natalia Zubkova — author and investigative journalist.

Final editorial decisions and responsibility rest with Natalia Zubkova.

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From the author

I grew up in Siberia and have spent most of my life there. As a journalist in Kiselyovsk, I filmed coal dust, blasting and burning spoil heaps. But life in a coal town is more than what the camera captures. There is the job a family depends on. Money that stretches far enough—or does not. An illness that leaves someone unable to work as they once did. And the question: where do they turn next?

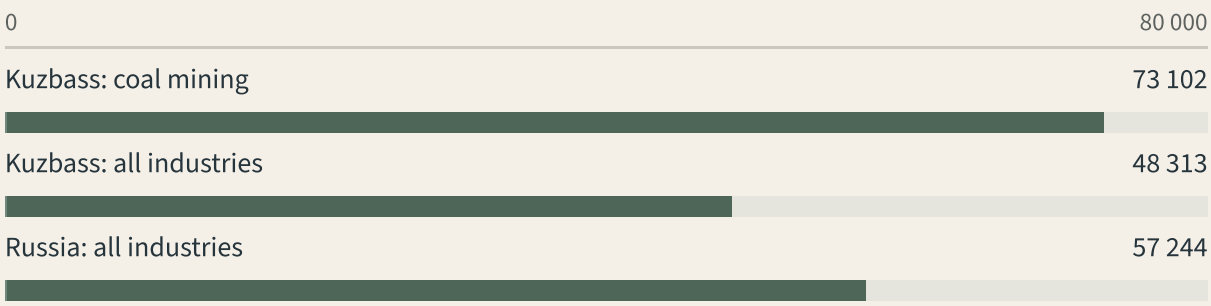
When people talk about what the coal industry brings to an area, they usually mention jobs and wages. I want to set another picture alongside that one: how people live, how they feel and how long they live. I want to look at both workers and people who have never been down a mine. Children, pensioners, shop assistants and teachers live in industrial towns too.

> **Dust spreads beyond the boundaries of an operation. Its wages reach far fewer people. In Kuzbass in 2021, average gross pay in coal mining was RUB 73,102 a month. The average across the region's organisations was RUB 48,313, compared with RUB 57,244 across Russia. Coal mining paid roughly one and a half times the regional average, while the regional average itself remained below Russia's.** [W01; W13]

Industry wages and the regional average

Average gross pay

2021 · RUB per month



Employees of organisations; before deductions. The industry figure reproduces Kemerovostat data.

Source: [W01; W13]

The same statistics show that coal mining accounted for 99.3 thousand of the 1,156.6 thousand people employed in the Kuzbass economy—about 8.6%. Other jobs may also depend on coal: transport, repairs, retail and services. But only some workers receive the wages recorded under “coal mining”. [W01]

That is the starting point of this research. What happens to mental health where incomes, the environment and families’ futures are closely tied to a single industry?

Introduction: questions and objectives

The problem and research question

A coal region brings together several different groups: employees, their families, other residents, children and people who have left work. Industry wages describe the earnings of people employed in a particular activity. Population health is described by other measures and other samples. The central research question is: how do the financial advantages of particular jobs, living conditions in an area and people’s mental health relate to one another?

Population and subject of study

The populations of interest are workers and residents of coal mining areas and the selected comparison areas. The subject is measured depressive symptoms, psychological distress, sleep, recorded mental disorders, suicide mortality, life expectancy and the socioeconomic circumstances considered alongside these outcomes.

Aim and objectives

The aim is to relate findings from specific surveys to accounts of living conditions while preserving differences between groups and measurement methods. The objectives are to: 1) distinguish workers' earnings from residents' resources; 2) examine mental health findings for current and former workers; 3) examine findings for adult residents and children; 4) assess suicide mortality separately; 5) compare life expectancy for men and women; 6) consider the role of income and support; 7) place Kuzbass alongside the selected areas in Switzerland and England; and 8) identify measures suitable for monitoring.

Existing knowledge

The collected studies use questionnaires, clinical samples, mortality registers, interviews and area statistics. The most detailed individual-level data in this collection concern workers in Australia, China and the United States. Population evidence includes Appalachia, Russian surveys and African studies of living conditions and resettlement. For children, specific studies from Brazil and Mongolia and material from Kuzbass are used. Geographical coverage is uneven; the source register shows exactly which material supports each section.

Geographical and temporal scope

The international literature is considered according to each study's observation period. The main territorial comparisons concern 2017–2021. A pre-war period was selected for Russia, with 2019 and the pandemic years of 2020–2021 distinguished. Later publications are included where they report relevant data or describe individual-level studies. Source records distinguish publication dates from survey dates.

Working expectations

The research examines substantive questions: whether high industry wages coincide with higher area incomes; how income relates to symptoms across surveys; and how mortality findings change with the comparison group. These are questions for comparing published data. The materials contain no preregistered statistical hypothesis-testing protocol.

Methodology and sources

Type of study

This is a targeted analytical review and a secondary comparison of published statistics. It draws on saved scientific publications, official tables, API results and documentary sources. The unit of analysis is a particular sample or indicator row, rather than a country treated as a single "case". No overall meta-analysis or single worldwide risk coefficient was calculated.

Search methods and provenance

The working collection was assembled on 25–26 October 2026 using previously saved project material. Searches covered scientific articles by title, DOI and keywords, statistical agency pages and specialist public bodies. English and Russian predominate in the saved queries; official German-language Swiss material is used in territorial comparisons. The exact queries that survive are included in the appendix. Additional work on earnings and England is documented in separate data extracts and working notes.

Completeness of the log

The 25 October log was compiled from the working session history. It explicitly records that query times and the number of results screened were not logged. This edition therefore presents the existing queries and files; it does not create a selection diagram using invented publication counts. Dates and provenance of local copies are retained in the manifest.

Inclusion criteria

Materials were included if they identify the area or occupational group, the outcome measured, the comparison method and the result used. Individual-level studies and primary official statistics take priority. Documentary interviews and perception surveys are included as evidence about living conditions; their measures are distinguished from clinical diagnoses. Address and organisational records for MIR Trade and Bettercoal are included to explain the selection of comparison areas.

Exclusions and incomplete information

Results with an unclear unit or denominator are excluded from quantitative comparisons unless these can be recovered from the saved source. Publications without an accessible full text may be used within the limits of their abstract, as noted in the source record. A media reproduction of an official table is identified as a reproduction rather than the agency’s original file. Further publications from the same sample do not become additional independent confirmations.

Data extraction

For each key study, the record includes the group, area, period, design, instrument, numerator and denominator, comparison, effect estimate and interval, adjustments, result location and text availability. Each territorial data row records the indicator and area codes, period, sex, age, unit and type of rate. There are 404 identified EMISS, OHID/ONS and Obsan rows; the chart dataset contains 555 records, including different breakdowns of the same indicators. These are data rows, not independent studies.

Checks during preparation

The accepted V03 text and V02 data package provided the editorial and numerical basis. Preparation of this PDF includes checking links between text, tables and sources, repeating arithmetic calculations and checking the transfer of numbers into charts. Checks are documented in a separate report. This stage does not involve rereading every primary source in full; source records retain the scope of the reading already completed.

Quality assessment

Rather than an overall score, the assessment considers identifiable features: design and sequence of events; selection method; individual or area-level exposure measurement; outcome instrument; comparison group; confounders; and accuracy and completeness of registration. The analytical assessment table identifies the conclusion supported by each study and what affects its transferability. It is a descriptive assessment of this collection, not a formal international grading system.

Overlapping samples

Australian materials M002 and M036 belong to the eight-operation project. The study of work organisation and the evaluation of a support programme address different questions, but do not represent two independent geographical tests. Occupational analysis B020 and whole-cohort study B032 refer to the same Queensland cohort. Repeated extracts of one indicator are likewise not counted as independent results.

Contradictory findings

Findings in different directions are retained. The ESSE-RF Kemerovo sample has a lower symptom proportion than the combined sample. Ömnögovi has lower poverty than Mongolia. In the selected Swiss canton, some survey measures are more favourable than national measures, while the suicide rate is higher. These results are analysed within their own groups and periods.

AI involvement and editorial decisions

AI was used to search for, extract and organise material, process tables programmatically, and prepare draft text and layout. Sergey Nikolaevich carried out an editorial review and selective checks against primary sources; this was not an exhaustive check of every file. Final editorial decisions and responsibility rest with Natalia Zubkova. Contributors' roles are stated in the publication credits.

Definitions of measures

Symptom screening

PHQ-8, PHQ-9, CES-D, HADS-D and K10 assess a defined set of symptoms over a specified period. A threshold identifies a group needing further attention. The percentage above a threshold should be read alongside the scale name, threshold and characteristics of the

people surveyed.

Diagnosis and registration

A clinical diagnosis, a registered case, a consultation and a hospital admission are different events. Changes in access to care can alter registration independently of symptom prevalence. England's QOF register describes practice patients, not a random sample of all residents.

OR and relative risk

An odds ratio (OR) compares the odds of an event: p/(1−p). A risk ratio (RR) compares probabilities, p. For common outcomes, their numerical values differ substantially. An OR of 1.40 is therefore described as an odds ratio, not as "40% more people becoming ill".

Mortality and standardisation

A mortality rate per 100,000 depends on the definition of the cause, population and period. A crude rate describes the area's actual population structure. A standardised rate uses a common age structure. Direct comparison of standardised rates requires compatible definitions and the same standard.

SMR and aRMR

SMR compares observed deaths with those expected under mortality rates in an external population. In the Australian study, the neutral SMR value is 100. Internal aRMR compares groups within a cohort with adjustment and has a neutral value of 1. These scales are not divided by one another.

Confidence interval

An interval expresses statistical uncertainty around an estimate under the model used. The neutral value is 1 for OR and aRMR, and 100 for the SMR reported here. If the interval includes the neutral value, the data are compatible with no difference on that scale and with a range of differences. This describes the precision of the estimate.

Life expectancy

Period life expectancy at birth is the lifespan of a hypothetical generation under the age-specific mortality rates of a selected period. It differs from the average age at death. An area difference in life expectancy describes overall population mortality; separating its causes requires a distinct analysis.

Earnings, income and poverty

Gross pay refers to employees in the selected statistical population. Cash income per person covers all residents and different sources of funds. The median divides the distribution in half. Poverty is defined by a particular national threshold; currencies and thresholds are retained without constructing an artificial international ranking.

Why compare Kuzbass with Switzerland and England?

I chose to compare Kuzbass with more than other mining areas. MIR Trade lists its office in Teufen, Switzerland, in the canton of Appenzell Ausserrhoden. The company trades coal, including Russian coal. The address was checked on 21 October 2026. The health figures below refer to the whole canton. Identifying specific shipments from Kuzbass would require the corresponding shipment records; the basis for this comparison is the location of an office belonging to a company involved in trading Russian coal. [A01]

Two other areas are linked to Bettercoal, a programme within RECOSI that assesses coal operations and works with them on improvement plans. RECOSI's registered office is in Hildenborough, in the English borough of Tonbridge and Malling. Bettercoal's published address for complaints is on Shelton Street in the London borough of Camden. The addresses serve different purposes; the statistics cover the boroughs as a whole. The functions of these addresses were checked on 26 October 2026. [A02]

Bettercoal's connection with Kuzbass is documented: Uniper describes taking part in a mission in September 2019 and visiting Kiselyovsk. This brings together mining locations, a trading address and addresses of an organisation that assessed coal operations. We will explore the history of those relationships separately. Here, I am interested in the living conditions of people in these areas. [A03]

This choice lets us look at different places along the coal supply chain. It is my reason for choosing the comparison, rather than a selection of control areas with matching populations. That is why I show each area alongside its national benchmark. Differences in age, income, treatment and other living conditions are part of the picture.

Basis and scope of the comparison

The trading company's address and the assessment programme's addresses connect the selected areas to the organisation of the coal supply chain. These documents establish the function of each location. Health measures, in turn, refer to the whole population of the canton or borough. Analysis therefore proceeds in two steps: each area is first compared with its own country; differences in conditions and recording methods between countries are then considered.

What exactly are we comparing?

The territorial time series is limited to 2017–2021: the period before the war was chosen in advance for the Russian comparison. It includes both pre-pandemic years and the difficult years of 2020–2021. The research studies cover other periods too. Survey or follow-up dates are given where they could be established; other cases are identified separately. A publication year is explicitly identified as such.

The article brings together two kinds of information. The first is research on people: mine workers, patients, county residents and children. These studies help us see relationships between living conditions and specific symptoms. The second is statistics for whole areas: income, poverty, mortality and life expectancy. These describe the conditions in which populations live.

Depressive symptoms identified by a questionnaire, a diagnosis in a medical register, anxiety, poor sleep and death by suicide are different measures. A questionnaire can identify people with substantial symptoms. Diagnosis and registration also depend on whether people seek help and can access it. Comparing percentages requires the same questions, ages and periods.

That is why there is no single global table of the “most depressed coal regions” here. There are findings for specific groups that readers can check. They reveal recurring problems as well as differences between places.

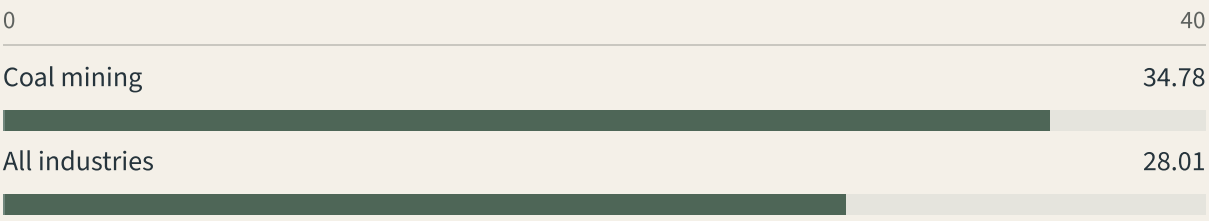
Good wages—for whom?

Higher wages in coal mining appear in several countries. In the United States in May 2021, mean hourly pay in coal mining was $34.78, compared with $28.01 across all industries. Median pay was $30, compared with $22. The median divides workers into two halves: one earns less than that amount, the other more. It is less affected by a small group of very high earners. [W03; W04]

United States: mean and median hourly pay

United States: mean hourly pay

May 2021 · USD per hour

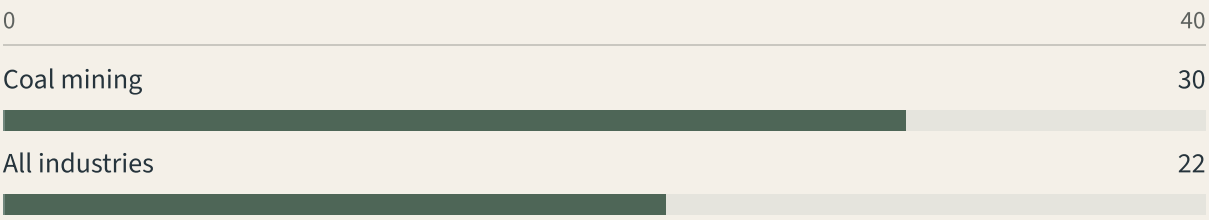


All occupations; self-employed people excluded.

Source: [W03; W04]

United States: median hourly pay

May 2021 · USD per hour



Median, shown separately from the mean.

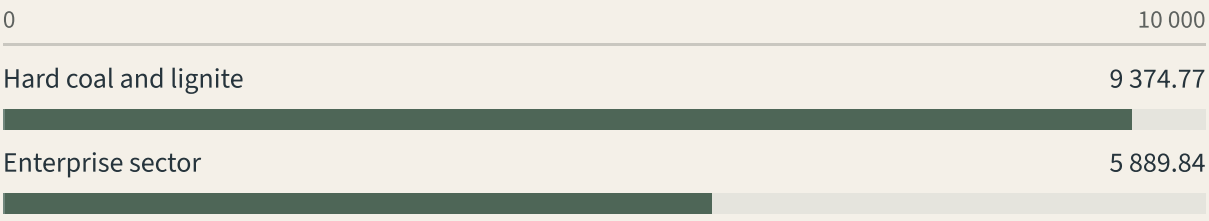
Source: [W03; W04]

In Poland in 2021, average gross monthly pay in hard coal and lignite mining was PLN 9,374.77. Across the enterprise sector, it was PLN 5,889.84—a difference of about 59%. This comparison specifically uses the enterprise sector, with its defined statistical coverage. [W11]

Poland: coal mining and the enterprise sector

Poland: average gross pay

2021 · PLN per month



The GUS enterprise sector, not the whole economy.

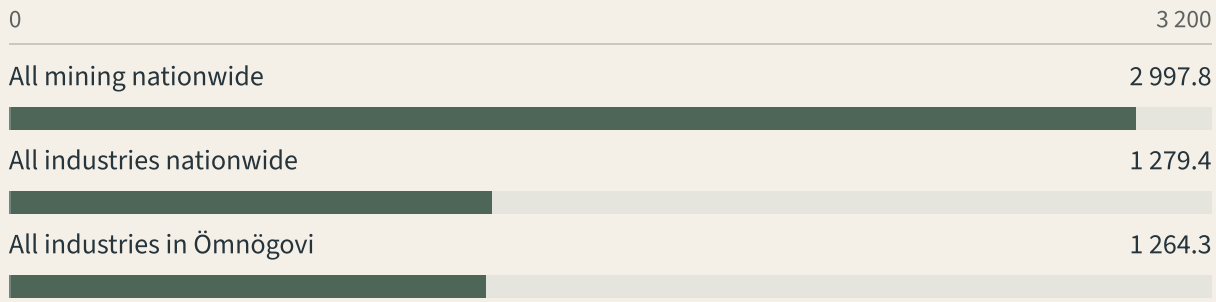
Source: [W11]

In Mongolia, average pay across the entire mining industry in 2021 was 2,997.8 thousand tugriks, compared with 1,279.4 thousand across all industries. Yet the average for all workers covered by the statistics in Ömnögovi province was 1,264.3 thousand—slightly below the national figure. The mining category also includes copper and other minerals. [W12]

High industry wages and earnings across a province

Mongolia: industry and province

2021 · thousand tugriks per month



Mean; employees of registered enterprises. Mining includes copper and other minerals.

Source: [W12]

Australian statistics show a similar industry advantage: in November 2021, ordinary-time weekly earnings for full-time adults across mining were AUD 2,656.30, compared with AUD 1,748.40 across all industries. In China, the advantage for mining as a whole in urban non-private organisations was small: CNY 108,467 a year, compared with CNY 106,837. In the private sector, mining was slightly below the overall average. The industries included and the statistical coverage matter here. [W05; W06; W07]

Australia and China: further earnings comparisons

Measure and period	Mining	All industries	Unit	Coverage and source
Australia: ordinary-time weekly earnings November 2021	2 656.3	1 748.4	AUD per week	Mean; full-time adults; excluding overtime. [W05]
China: urban non-private organisations 2021	108 467	106 837	CNY per year	Mean; the entire mining industry. [W06]
China: private sector 2021	62 665	62 884	CNY per year	Mean; separate statistical coverage. [W07]

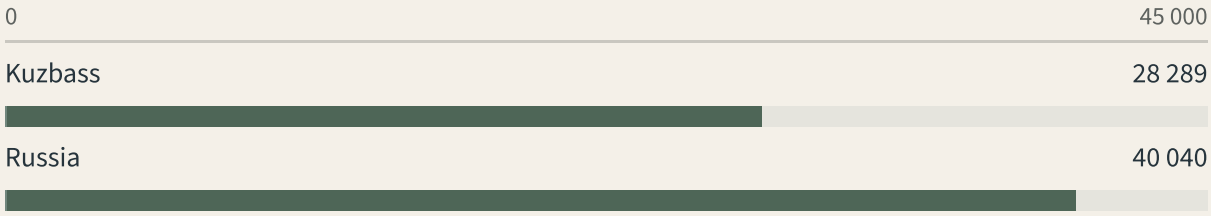
In South Africa, the industry series for 2021 gives annual earnings of ZAR 336,973 per coal mining employee. A comparable national figure for a full year with the same coverage was not obtained for this comparison, so no percentage wage advantage was calculated. [W09]

And what does this mean for residents as a whole? In Kuzbass, monthly cash income per person in 2021 was RUB 28,289, compared with RUB 40,040 across Russia. Some 12.5% of the region's residents were below the poverty line, compared with 11% nationally. These are measures of household income and circumstances, including children, pensioners and people who are not employed. [M037; M038]

Income and poverty: Kuzbass and Russia

Cash income per person

2021 · RUB per month

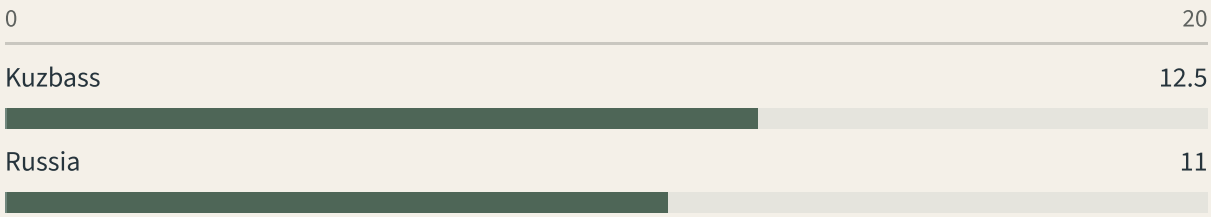


All residents, including children and people who are not employed; not wages.

Source: [M037]

Below the national poverty line

2021 · % of population



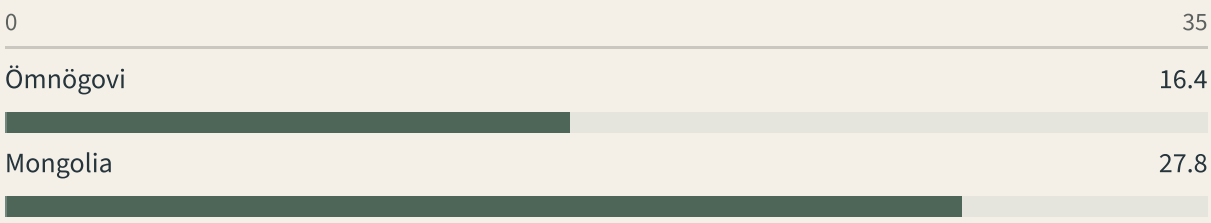
Source: [M038]

Ömnögovi in Mongolia, meanwhile, had lower poverty: 16.4% in 2020, compared with 27.8% nationally. Coal and copper are both mined there. In Appalachia, by contrast, higher earnings per job in coal counties went alongside somewhat higher poverty than in the region's non-coal counties. [M034; M019]

Poverty: Ömnögovi province and Mongolia

Below the national poverty line

2020 · % of population



Mongolia's national survey; not a common international poverty line.

Source: [M034]

The answer to "Are coal regions wealthier?" is therefore specific: some jobs really do pay more. What that means for the wider population depends on how many people have those jobs, what everyone else earns and the costs families face.

How to read the coal wage advantage

The statistical populations change across these tables: coal mining, all mining, the enterprise sector and all industries. The useful result is the size of the industry advantage within the corresponding national table. For residents, the share employed in the industry, other family members' incomes and living costs are considered separately. Mongolia is particularly illustrative: high average mining earnings coexist with lower average pay across the province's workforce than nationally.

More money—less depression?

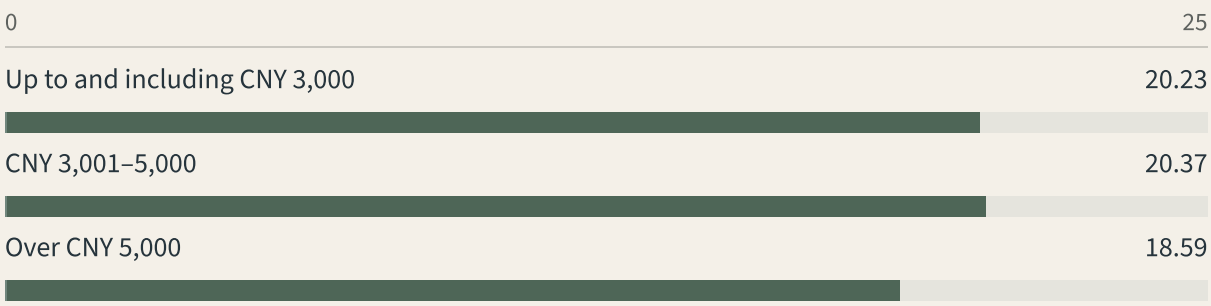
A study at six underground coal mines in north-eastern China in July–August 2013 included 1,936 men. Some 62.8% reached the CES-D threshold for depressive symptoms. This was a screening result for the group surveyed. [M010]

In the same study, higher earnings were associated with less severe depressive symptoms after accounting for age, family circumstances, chronic illness, working hours and psychosocial conditions. The mean score in the highest income group was 18.59; in the two lower groups it was 20.23 and 20.37. Alongside pay, the researchers examined effort–reward imbalance and work–family conflict. [M010]

Depressive symptoms and earnings in one sample

Mean CES-D score by monthly income

July–August 2013 · CES-D points



1,936 men at six underground coal mines. Mean scores, not proportions with a diagnosis.

Source: [M010]

Another Chinese study surveyed 1,027 employees at an operation in Shanxi in August–September 2022. It used family income and the shorter CESD-10 scale. In the model assessing whether participants crossed the symptom threshold, differences between income groups remained uncertain. In the analysis of symptom scores themselves, the two better-off groups had higher scores. These studies describe different samples and do not form a time series. [N01]

Other associations stood out in the Shanxi study: experience of accidents, either personally or through relatives and friends; occupational disease; and sleeping for fewer than seven hours. The adjusted odds ratios for depressive symptoms were 1.72 (95% confidence interval 1.25–2.38), 3.36 (1.25–9.23) and 1.71 (1.25–2.36), respectively. The group with occupational disease was small—21 people. An odds ratio describes a statistical association and is different from a ratio of probabilities. [N01]

In Russia's ESSE-RF study across ten regions, a very low self-assessment of material wellbeing was also associated with depressive symptoms: the adjusted odds ratio relative to the well-off group was 2.20 (1.76–2.75). This is a result for the combined sample, not a separate estimate for Kuzbass. [N02]

> **Money matters. But so do health, sleep, family relationships, the fear of losing an income and working conditions themselves. A well-paid job can also be a job someone is afraid to lose.**

Why income findings differ

The Chinese studies differ in sample size, year and scale, and in whether they measure personal earnings or family income. They capture different aspects of family and working life. Even within one survey, mean scores and the probability of crossing a threshold are different outcomes. Together, the studies point to the need to consider pay, workload, illness, sleep and family circumstances at the same time.

Workers: job insecurity, sleep and support

In Australia, 1,457 employees at eight coal operations were surveyed in 2013–2015. Greater psychological distress on the K10 scale was associated with job dissatisfaction, fear of losing one's job, staying for financial reasons and lower perceived support from the employer. After adjustment, differences by mining method, shift length and fly-in fly-out arrangements were less clear-cut. [M002]

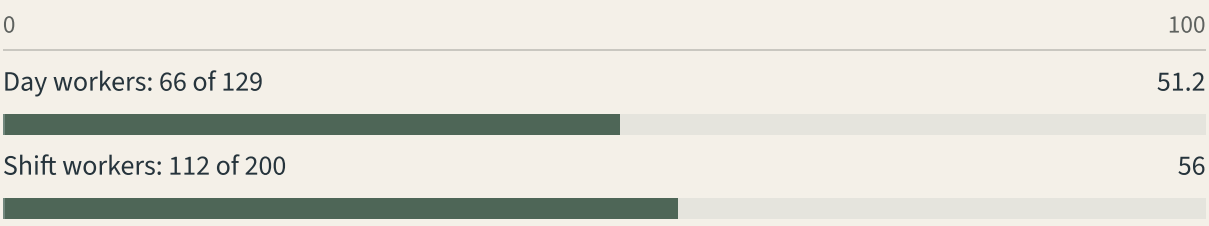
This finding concerns what happens within a workplace: how secure people feel about their future and whether they can count on support. Pay alone tells us too little about those conditions.

A Mongolian survey in October 2023 found poor sleep quality in 178 of 329 coal company employees—54.1%. The proportion was 51.2% among day workers and 56% among shift workers; the difference was not statistically significant. Within the shift-working group, moderate or high stress was associated with higher odds of poor sleep: adjusted odds ratio 2.67 (1.27–5.63). [M011]

Poor sleep among employees of one coal company

PSQI threshold for poor sleep

October 2023 · % of participants



329 employees; the between-group difference was not statistically significant (p=0.390).

Source: [M011]

A Polish study published in 2019 included 483 mine workers; the survey period could not be established. Its comparison produced a different result: stress was lower, and self-rated health and functioning better, than in the other heavy industries surveyed. Within

the mining group, however, greater stress went alongside poorer ratings. The proportion working specifically in coal mines was not specified; the comparison concerns mining as a whole. [M017]

What these studies share is their attention to how work is organised and how people are doing. Their results differ, and that is useful: they help us identify particular conditions rather than assume that everyone in an industry feels the same way.

What workplace surveys measure

A cross-sectional survey is useful for identifying how symptoms and working circumstances occur together. Poorer wellbeing may also change how people assess their job and its security. The practical result is a set of specific workplace characteristics that can be monitored: job security, support from colleagues and employers, sleep, working time and conflict with family life.

Illness does not end when work does

Current and former coal miners were assessed at a lung disease clinic in Virginia from 1 July 2018 to 28 April 2020. The median patient age was 66. Among those who completed the PHQ-9, 883 of 2,364 people—37.4%—reached the threshold for substantial depressive symptoms. A question about thoughts of death or self-harm received a positive response from 295 of 2,599 people—11.4%. The denominators differ because not everyone completed the same questions. [M023]

These were people seeking medical care, many already in later life. The finding shows a need for mental health support alongside treatment for lung disease. For an individual, an occupational illness can mean a changed daily life, reduced capabilities and prolonged treatment.

Support when operations close is another issue. A British survey published in 1995 found poorer psychological wellbeing and more reports of alcohol use among workers at a colliery threatened with closure. The available abstract does not give the survey period. A US county-level analysis for 2000–2016 links declining coal employment with worsening outcomes for some mortality measures, especially where dependence on the industry was high. [M004; M020]

Over a longer period, former coal areas in England and Wales saw their mortality gap with matched comparison areas narrow between 1981 and 2019. The first years after job losses and the decades that follow are different stages in an area’s life. People need income, retraining, healthcare and access to new employment during the transition, not only promises about the future. [B028]

Outcomes after leaving work

The Virginia clinical sample includes current and former workers presenting with lung problems. It shows a substantial need for mental health support among older people with an occupational history. Estimating the separate effect of leaving work would require comparable groups and observations before and after departure. The available finding measures patients' need for support, rather than the rate of symptom change after leaving a job.

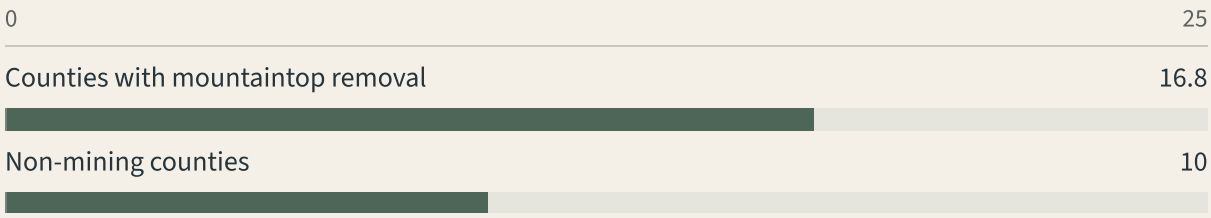
Residents: coal in the lives of people who do not work in the industry

In Central Appalachia, researchers compared data from 8,591 adult residents for 2006. In counties with mountaintop-removal coal mining, 16.8% reached the PHQ-8 threshold for depressive symptoms, compared with 10% in non-mining counties. After adjustment for income, education, employment and other characteristics, the odds ratio was 1.40 (1.15–1.71). For counties with other mining methods, it was 1.22 (0.99–1.50). The latter interval includes 1, the value indicating equal odds. [M001]

Depressive symptoms among Appalachian residents

PHQ-8 threshold ≥10

2006 · % of adults surveyed



8,591 study participants. Exposure assigned by county; symptom screening.

Source: [M001]

The participants were county residents, not just company employees. Exposure was assigned by area; individual pollution exposure and occupational status were not separately distinguished. The study allows us to discuss population mental health in an environment altered by industry.

Air studies show that particles do not stop at the boundary of a work site. In Australia's Upper Hunter, PM2.5 analysis in two settlements identified a mixed soil factor, with soil and coal dust among its possible sources. Monitoring in the Lower Hunter included both

residential and port stations. The air residents breathe is a mixture from several sources; it needs to be measured where people actually live. [D01; D02]

A South African report from 2024 describes a survey of 400 households in Phola; the survey period could not be established. Respondents from 370 households regarded mental health problems as a problem in their community. That records residents' perceptions, rather than 370 clinical diagnoses. Coal mines and power stations operate alongside one another in Phola. The report shows the concerns people bring to researchers and civil society organisations. [M014]

In Mozambique, interviews in 2012 with families resettled for coal mining in 2009–2011 describe the loss of suitable land and difficulties with water, markets and food. More than a home address changes. Ways of feeding a family and familiar social ties change too. The report did not count psychiatric diagnoses; it documents living conditions after resettlement. [M035]

Stress, depressive symptoms and dependence on circumstances that are hard to change alone recur among both workers and residents. At work, these circumstances include employment, workload, illness and support. In a community, they include the environment, resettlement, family resources and access to help.

> **Environment, resettlement and family resources**
>
> The Appalachian county analysis measures the association between place of residence and symptoms; the Mozambique interviews reveal changes in land, water and ways of feeding a family; the Phola survey records community perceptions. These materials offer complementary accounts, but not interchangeable disease percentages. Monitoring a community requires individual surveys and information about access to help alongside environmental measurements.

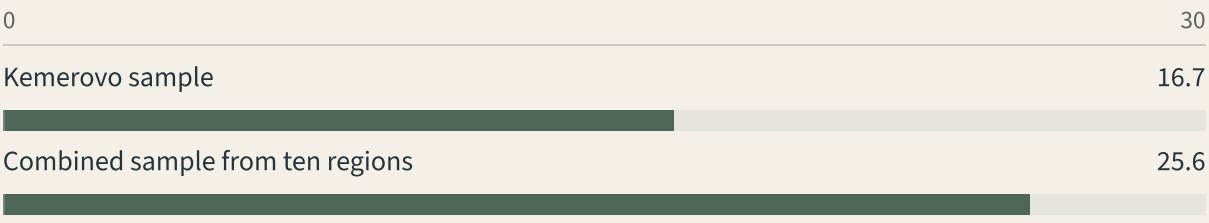
What we know about Kuzbass

Local surveys do not only produce unfavourable findings. In the ESSE-RF study published in 2014, the Kemerovo sample included 1,616 people aged 25–64. Some 16.7% reached a HADS-D score of at least 8, and 5% a score of at least 11. Across the combined sample from ten regions, the figures were 25.6% and 8.8%, respectively. The Kemerovo sample had the lowest proportion with symptoms among these ten regional samples. [N02]

The Kemerovo sample and ten ESSE-RF regions

HADS-D threshold ≥8

Published in 2014; data collection dates not established · % of participants aged 25–64

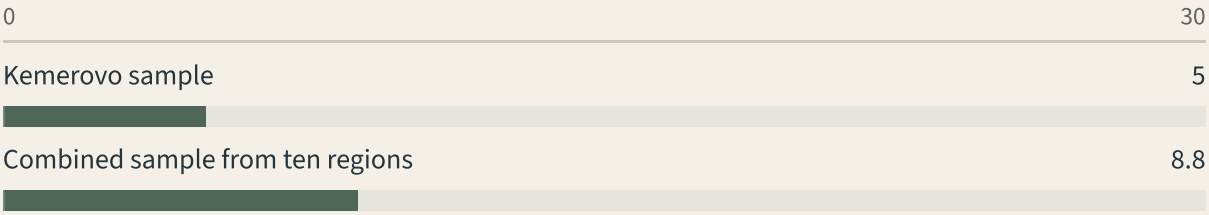


Kemerovo: n=1,616. The combined sample includes Kemerovo.

Source: [N02]

HADS-D threshold ≥11

Published in 2014; data collection dates not established · % of participants aged 25–64



A higher threshold on the same questionnaire, not a separate register of diagnoses.

Source: [N02]

This is an important result, and I keep it alongside the troubling mortality figures. It describes a particular adult survey, not the whole period from 2017 to 2021. A comparable regional depression series for those five years could not be obtained for this article.

There are also accounts from local doctors. In a collection published in 2021, specialists at the Kiselyovsk psychoneurological dispensary described nine patients with depressive disorders. Seven showed substantial improvement after comprehensive care. This is a small clinical series, with no stated control group or recruitment dates. Its value lies in a specific experience of helping people in the city. [N03]

The same collection describes how the pandemic changed psychiatric services in Kuzbass: planned hospital admissions and some rehabilitation services were suspended, and care shifted towards outpatient services. The number of recorded consultations therefore also depends on how services were operating at the time. [N03]

Two levels of Kuzbass data

The regional adult survey, nine clinical cases in Kiselyovsk and regional mortality describe different populations. A favourable finding in one sample and a troubling measure in another group can coexist. For local practice, this means tracking symptom detection, consultations, treatment and causes of death separately, retaining the age, sex and area for each measure.

Children: development, behaviour and family circumstances

Findings for children need to be read separately from those for adults. A study of 778 children from a Brazilian coal mining region, published in 2021, found no statistically significant difference in Raven's test results between areas directly and indirectly affected by the complex. Results were associated with maternal education, birth weight and family characteristics. The publication's abstract is available; it does not establish the survey period. [M003]

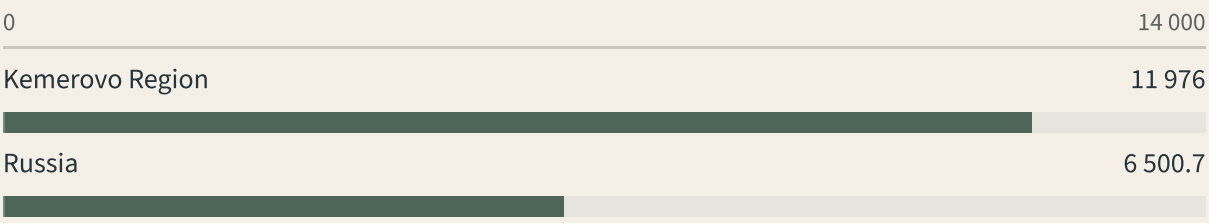
In Mongolia, blood lead levels and the SDQ behavioural questionnaire were compared in 241 children aged 4–7 from Nalaikh and Sharyn Gol. The abstract of the 2021 publication reports associations with prosocial behaviour and hyperactivity, without effect sizes or confidence intervals; the survey period could not be established. Another study, conducted in July 2017 in South Gobi, found higher blood lead levels in the small-scale mining area of Bayandalai than in coal-mining Tsogttsetsii. Local sources of exposure differ. [M012; M013]

In Kuzbass, official records of mental and behavioural disorders among adolescents aged 15–17 were studied using data for 2005–2013. In 2013, the Kemerovo Region figure was 11,976 per 100,000 adolescents of that age, compared with 6,500.7 across Russia. In the authors' table, the region ranked third nationally in both 2005 and 2013. This is a broad class of disorders; the figures do not describe depression separately. [N04]

Mental disorders among adolescents: a historical snapshot

Total registered morbidity

2013 · per 100,000 adolescents aged 15–17



Mental and behavioural disorders form a broad class, not just depression.

Source: [N04]

There is more recent clinical material too: among 145 children and adolescents treated in a department of the Kuzbass Clinical Psychiatric Hospital in the first quarter of 2021, the authors described 17 adolescents with self-harm—12 girls and 5 boys. These were patients in that department. The age range of patients admitted also changed from 2021, which matters when comparing with earlier years. [N03]

For children, what matters is the difficulties actually measured: attention, sleep, development, self-harm and family stability. Calling a child “underdeveloped” or residents “aggressive” replaces a research question with a label. The studies reviewed contain specific tests and observations, but no overall assessment of aggressive behaviour among people living in coal regions.

Child development and the scope of the instruments

Raven’s test, the SDQ behavioural questionnaire, lead concentrations and the official class of mental disorders measure different things. An association between a substance and a behavioural scale does not turn a laboratory result into a diagnosis. Family characteristics in the Brazilian study and different metal sources in Mongolia show which variables should be included in local child development studies.

Suicides: five years in Kuzbass

Suicide mortality is a measure in its own right. It is not the same as the prevalence of depression: they tell us different things about people's health.

The recorded rate in Kuzbass was higher than Russia's in all five selected years. Per 100,000 population: [K119]

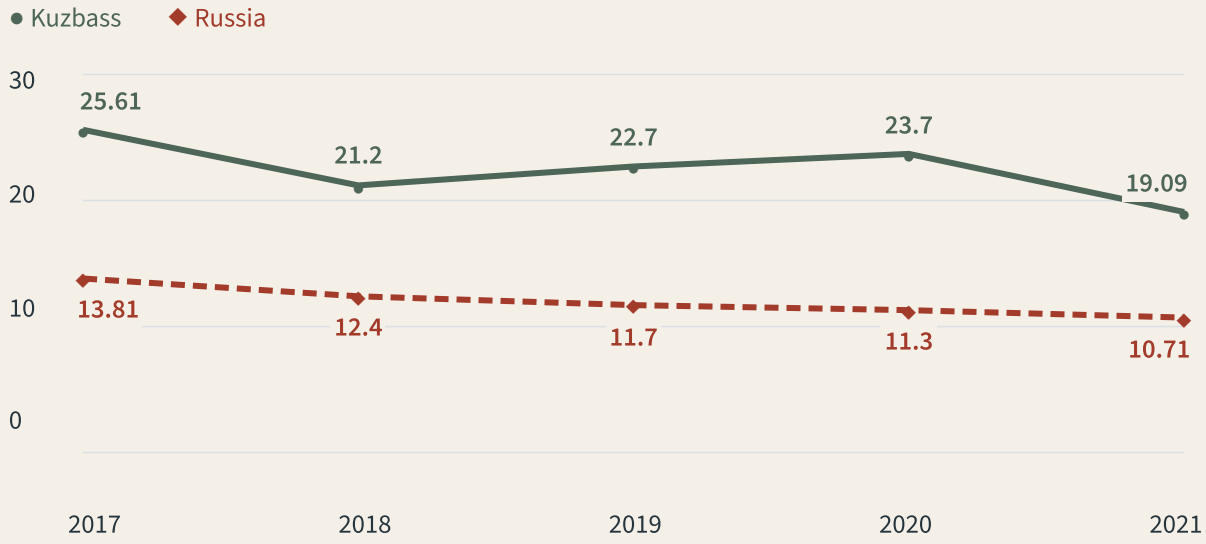
Year	Kuzbass	Russia
2017	25.61	13.81
2018	21.2	12.4
2019	22.7	11.7
2020	23.7	11.3
2021	19.09	10.71

Both rates were lower at the end of the period than at the beginning. A substantial gap remained between them. These are crude rates for the entire population, without adjustment to a common age structure.

Change over time

Kuzbass and Russia: five years

Registered deaths by suicide per 100,000 population. Both sexes, all ages; crude rates.



Source: [K119]. Values are not age-standardised.

Russia's coal regions differ considerably. In 2021, Buryatia recorded 32.93 deaths per 100,000 population, Tuva 21.42, Khakassia 21.31 and Rostov Region 4.56. Regional analysis therefore needs to consider conditions in each particular area. [K119]

Workers have separate cohort findings. In the analysis of the Queensland coal worker cohort, follow-up began with a worker's first medical examination from 1 January 1993 and continued until death or 30 November 2020. There were 228 recorded deaths by suicide among men in production occupations. The standardised mortality ratio was 123 (108–140) relative to Australia and 101 (88–115) relative to Queensland. On this scale, 100 means equality with the expected level. Choosing a national or local comparison changes the result. [B020]

Among women in production occupations, the adjusted mortality ratio for suicide was 3.48 (95% CI 1.25–9.67), compared with the other women in the same cohort; 10 deaths were recorded. The wide interval reflects the small number of cases. The male estimate above uses national and regional comparisons; the female estimate is an internal comparison within the cohort. [B020]

Workers and residents: different denominators

A regional rate describes the entire population. A cohort measure concerns people with a recorded occupational history; the comparison group changes the expected number of deaths. In Queensland, the national SMR of 123 and regional SMR of 101 are two answers for the same production group. The female aRMR of 3.48 is a separate internal comparison with other women in the cohort. Combining the three into one ranking would discard their original definitions.

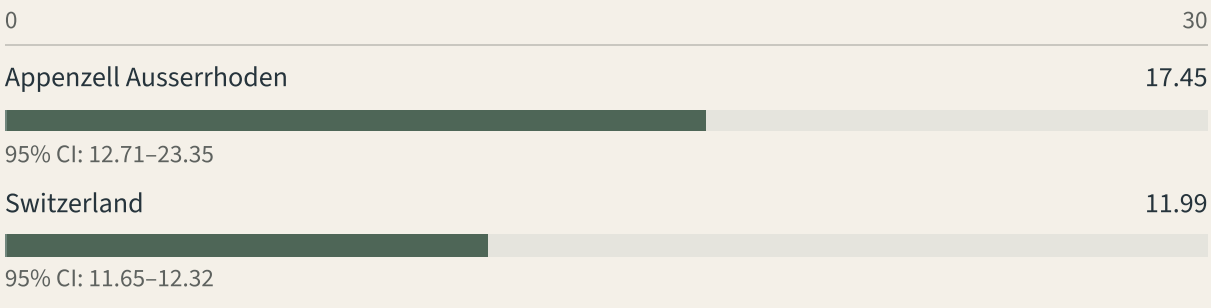
Suicides in the comparison areas

In Appenzell Ausserrhoden, the average standardised suicide rate excluding assisted suicide for 2017–2021 was 17.45 per 100,000 population, compared with 11.99 across Switzerland. The intervals were 12.71–23.35 and 11.65–12.32. On this measure, the canton fares worse than the country as a whole. [K117]

Suicides: the canton and Switzerland

Switzerland: standardised rate

2017–2021 · deaths per 100,000, all ages



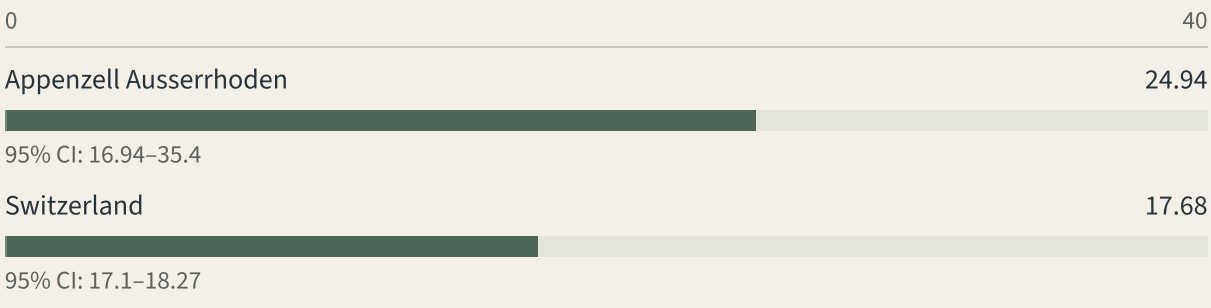
Both sexes; excluding assisted suicide; five-year average.

Source: [K117]

The canton's rate was 24.94 (16.94–35.40) for men and 9.95 (5.41–16.75) for women. The Swiss figures were 17.68 and 6.29, respectively. These are five-year estimates; the small number of local cases is reflected in wide intervals. [K117]

Suicide mortality: Switzerland — men

2017–2021 · per 100,000 of the respective sex

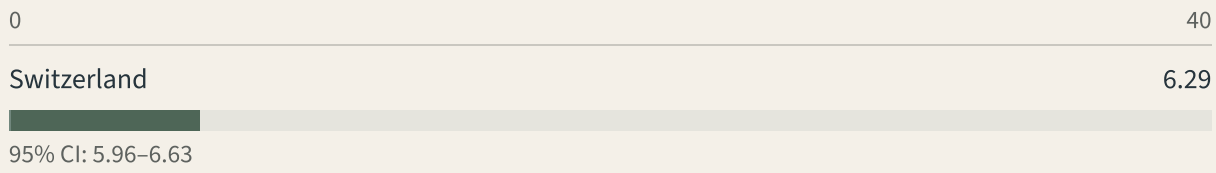


Standardised rate; all ages; excluding assisted suicide.

Source: [K117]

Suicide mortality: Switzerland — women

2017–2021 · per 100,000 of the respective sex



Standardised rate; all ages; excluding assisted suicide.

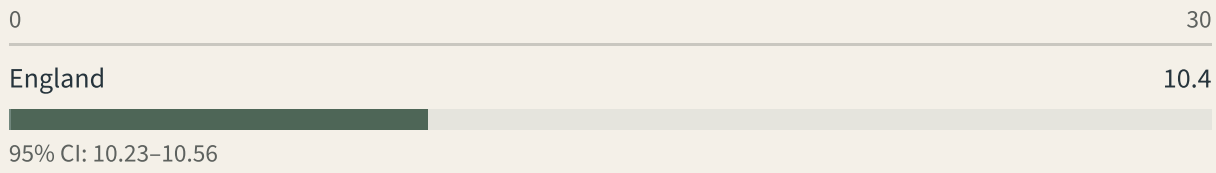
Source: [K117]

In England in 2019–2021, the standardised rate was 11.24 in Camden and 12.37 in Tonbridge and Malling, compared with 10.40 across England. There were 55 and 42 registered deaths, respectively, over those three years. The intervals for the local estimates were 8.36–14.76 and 8.90–16.74; both include the England benchmark. [E01]

Suicides: two boroughs and England

England: standardised rate

2019–2021 · deaths per 100,000, ages 10+



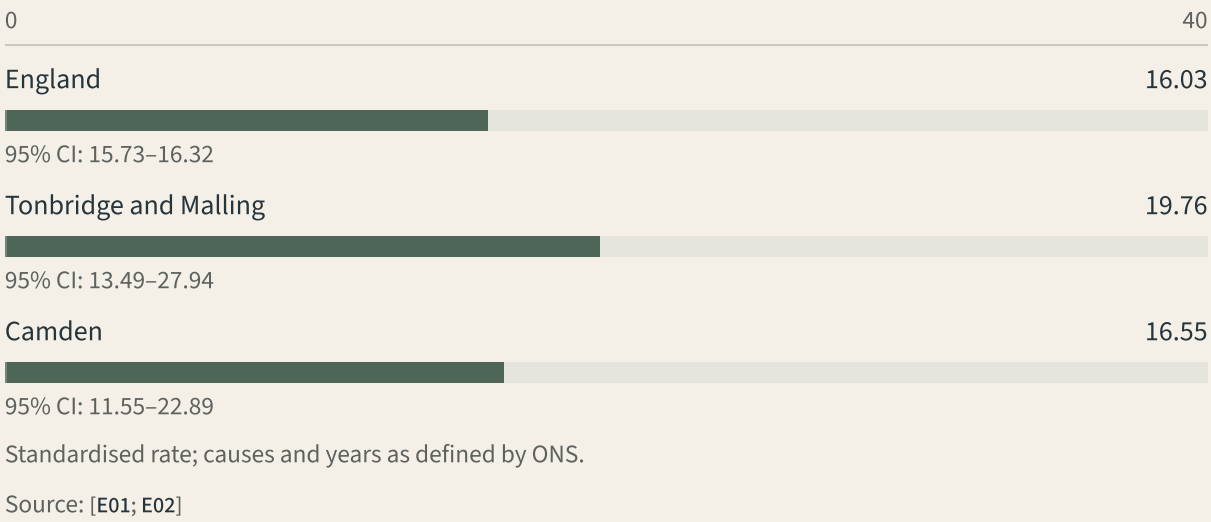
Both sexes; undetermined intent included from age 15; years of registration.

Source: [E01; E02]

The male rates were 16.55 in Camden, 19.76 in Tonbridge and Malling and 16.03 across England. The female rates were 6.33, 5.59 and 5.11. In both English boroughs and the Swiss canton, male mortality was higher than female mortality. [E01; K117]

Suicide mortality: England — men

2019–2021 · per 100,000 of the respective sex, ages 10+

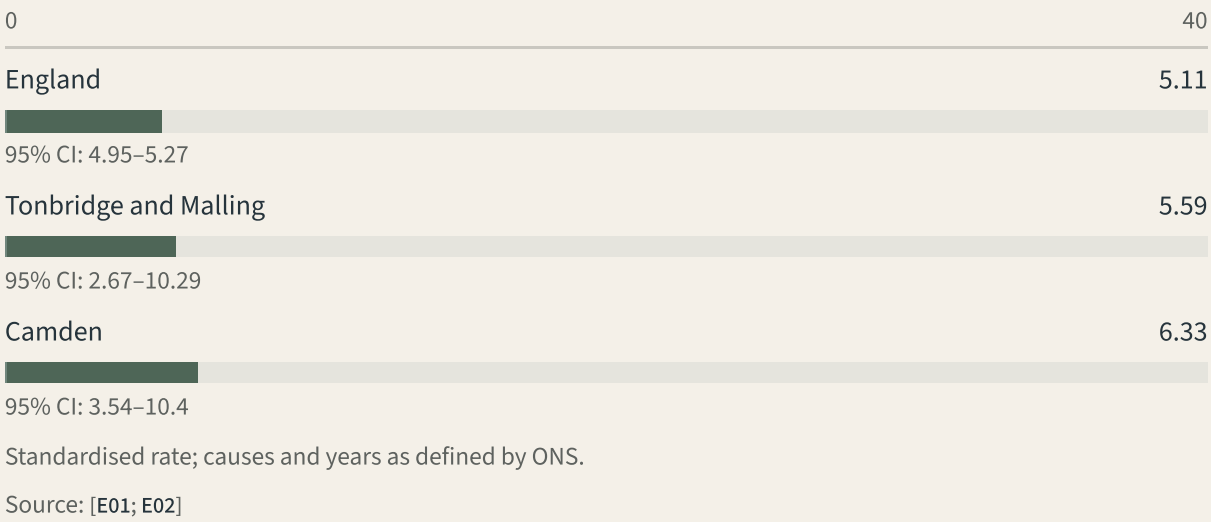


Standardised rate; causes and years as defined by ONS.

Source: [E01; E02]

Suicide mortality: England — women

2019–2021 · per 100,000 of the respective sex, ages 10+



Standardised rate; causes and years as defined by ONS.

Source: [E01; E02]

One explanation is needed to read these numbers. The English series also includes deaths of undetermined intent from age 15 and uses years of registration; its main age coverage is 10 and over. The Russian category and Swiss series have different definitions. The Swiss measure excludes assisted suicide. The comparisons are therefore presented in separate national panels: each area alongside its country, using that country's definition. I do not combine these rates into a single international ranking. [E02; K117; K119]

Three national recording systems

Suicide mortality: areas and their benchmarks

Population measures, not industry workers. Different periods and definitions; no combined ranking.

Area and geographical level	Period	Per 100,000	95% CI	Sex and age	Definition / type of rate	Source
Kuzbass — region	2021	19.09	—	Both sexes; all ages	Suicides; crude rate	[K119]
Russia — country	2021	10.71	—	Both sexes; all ages	Suicides; crude rate	[K119]
Appenzell Ausserrhoden — canton	2017–2021	17.45	12.71–23.35	Both sexes; all ages	Standardised; European population 2010 as used by Obsan; excluding assisted suicide	[K117]
Switzerland — country	2017–2021	11.99	11.65–12.32	Both sexes; all ages	Same Obsan definition	[K117]
Camden — London borough	2019–2021	11.24	8.36–14.76	Both sexes; ages 10+	ESP2013 standardised; includes undetermined intent from age 15; years of registration	[E01; E02]
Tonbridge and Malling — borough	2019–2021	12.37	8.90–16.74	Both sexes; ages 10+	Same ONS definition	[E01; E02]
England — part of the United Kingdom	2019–2021	10.40	10.23–10.56	Both sexes; ages 10+	Same ONS definition	[E01; E02]

The Swiss series uses five-year averages; the English series uses three-year registration figures. Russian values are annual. Separate chart panels compare each area only with its own national benchmark.

The substantive finding is clear: high life expectancy and more favourable results on some surveys can coexist with a suicide rate above the national level. That is the picture in the Swiss canton chosen here.

What the canton and English boroughs show

The canton combines high life expectancy, a lower proportion reporting psychological distress in some surveys, and a suicide rate above Switzerland's. In England, point estimates for the two boroughs are above the national figure, while local intervals include it. The substantive conclusion is that different measures of wellbeing do not form one scale on which an area is always "better" or "worse".

How many years of life do the statistics show?

Life expectancy at birth is the number of years a hypothetical generation would live under the age-specific mortality rates of the chosen period. It is not the average age of those who died, or a prediction of each child's future.

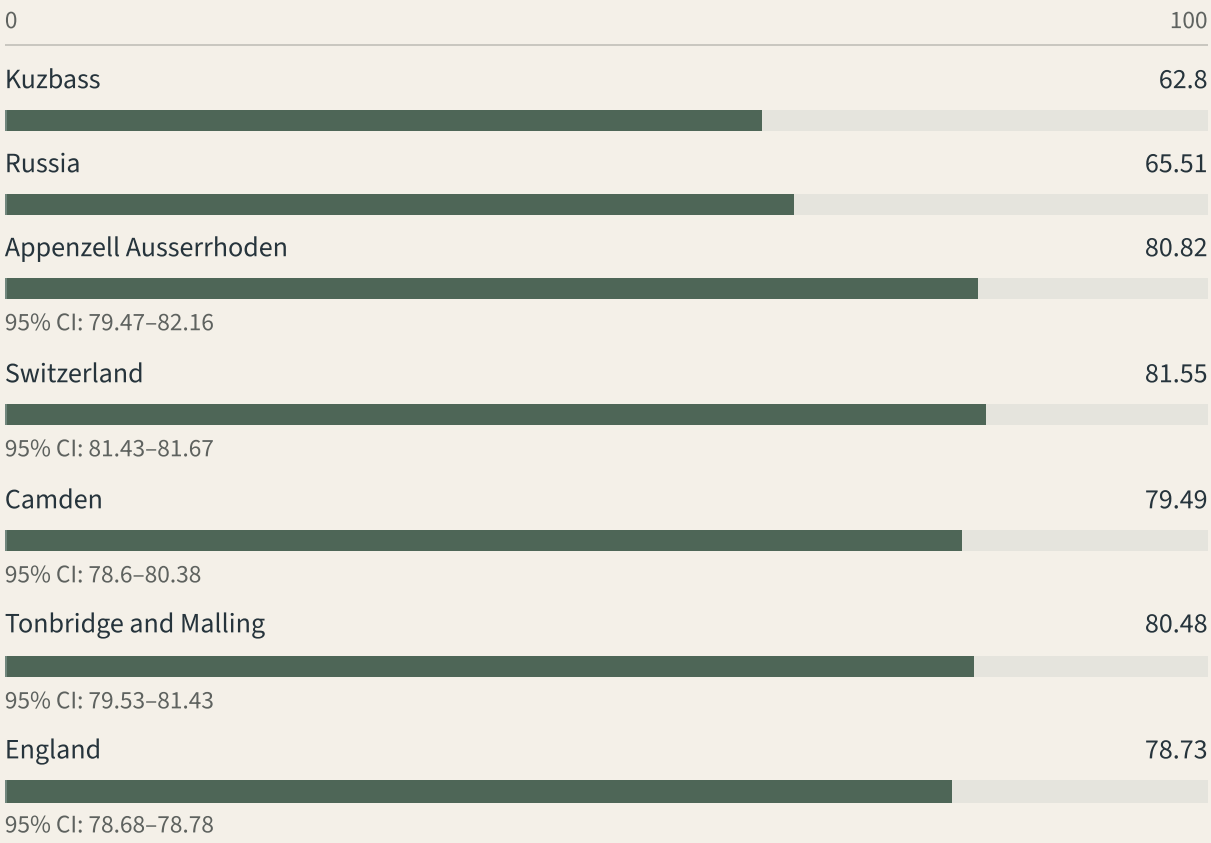
The annual estimates for 2021 are shown below. Men and women are presented separately; the sources are Rosstat, Obsan and OHID/ONS. [M038; K110; E01]

Area	Men, years	Women, years
Kuzbass	62.80	72.37
Russia	65.51	74.51
Appenzell Ausserrhoden	80.82	86.23
Switzerland	81.55	85.53
Camden	79.49	83.85
Tonbridge and Malling	80.48	84.54
England	78.73	82.77

In 2021, the gap between the male figures for Kuzbass and the selected areas abroad was about 17–18 years; for women, it was 11–14 years. These are differences between territorial estimates, reflecting the combined effects of living conditions and mortality.

Life expectancy in 2021 — men

2021 · life expectancy at birth, years

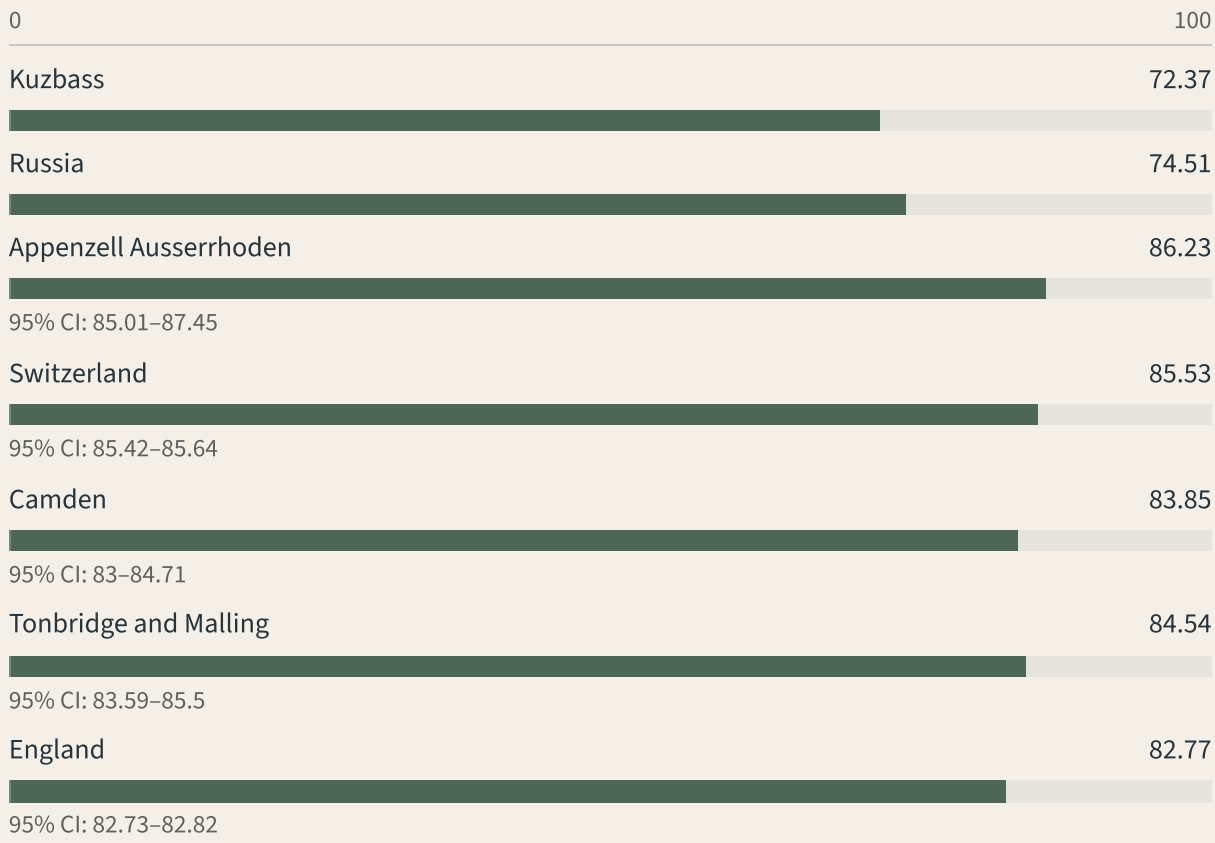


Annual period estimate. Intervals are shown where published; differences reflect the combined effects of living conditions and mortality.

Source: [M038; K110; E01]

Life expectancy in 2021 — women

2021 · life expectancy at birth, years



Annual period estimate. Intervals are shown where published; differences reflect the combined effects of living conditions and mortality.

Source: [M038; K110; E01]

The pre-pandemic year of 2019 also shows a large gap. For men, life expectancy was 64.32 years in Kuzbass, 81.86 in the canton, 80.59 in Camden and 80.89 in Tonbridge and Malling. For women, the figures were 75.11, 84.44, 85.19 and 85.57, respectively. The difference therefore existed before the pandemic. Annual estimates for a small canton fluctuate; the intervals are provided in the separate file “Сравнение_ОПЖ_2019_2021_V02.csv” in the article’s data package. [M038; K110; E01]

Life expectancy before the pandemic: 2019

Life expectancy at birth, years. Annual estimate.

Area	Men, years	95% CI	Women, years	95% CI
Kuzbass	64.32	—	75.11	—
Russia	68.24	—	78.17	—
Appenzell Ausserrhoden	81.86	80.45–83.26	84.44	82.83–86.05
Switzerland	81.82	81.7–81.94	85.5	85.38–85.61
Camden	80.59	79.6–81.57	85.19	84.23–86.15
Tonbridge and Malling	80.89	79.89–81.89	85.57	84.58–86.56
England	79.87	79.81–79.92	83.56	83.51–83.6

Intervals are given where published. Sources: [M038; K110; E01].

The picture is more varied within each country. In 2021, men in the canton had lower life expectancy than men in Switzerland as a whole, while women had higher life expectancy. In Camden and Tonbridge and Malling, both point estimates were above those for England. Kuzbass was below the Russian level for both sexes.

Other mining areas differ too. In West Virginia in 2021, life expectancy was 68.1 years for men and 74.2 for women, compared with 73.5 and 79.3 across the United States. In Poland's Silesian Voivodeship, it was 71.3 and 78.9, compared with 71.8 and 79.7 nationally. Queensland's figures for 2019–2021 were 80.9 and 85.1, compared with 81.3 and 85.4 across Australia. [M029; M028; M026]

In Ömnögovi in 2021, the combined estimate for both sexes was 72.91 years, compared with 71.01 across Mongolia. The table used does not give a breakdown by sex for the province. In Shanxi, the published figures for 2020 were 75.64 years for men and 80.47 for women. These figures cover entire administrative areas, with all their industries and living conditions. [M030; M031]

A comparable life expectancy estimate for coal industry workers could not be obtained: the studies of their mortality reviewed here use other measures. For children, infant and under-five mortality are kept as separate measures. In Ömnögovi, for example, infant mortality in 2021 was 11 per thousand live births, compared with 12 across Mongolia; in 2019, it was 21 and 13. A single annual observation for a small area does not replace a time series. [M030]

Interpreting the life expectancy gap

Differences are seen both in 2019, before the pandemic, and in 2021. The pandemic period therefore does not account for the whole observed picture. Life expectancy brings together mortality from different causes and the effects of living conditions, age at death, prevention and treatment. This report uses it as an overall territorial benchmark, kept separate from occupational mortality.

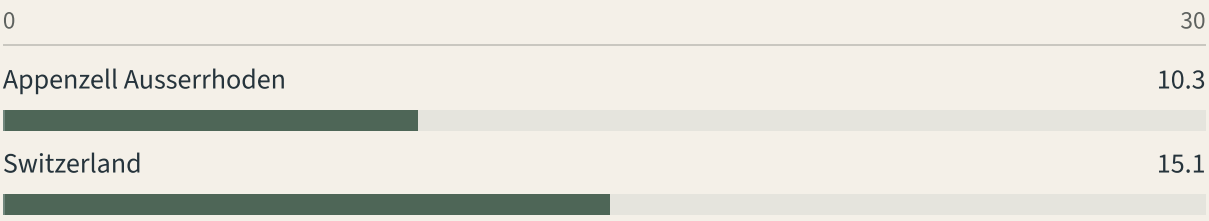
The Swiss canton and a London borough: wellbeing is not shared equally

In the 2017 Swiss survey, 10.3% of respondents aged 15 and over in Appenzell Ausserrhoden reported moderate or severe psychological distress, compared with 15.1% nationally. Emotional exhaustion at work was reported by 13.2% of employed people aged 15–64 in the canton and 19.8% across Switzerland. These are survey measures, not a register of diagnoses. [S01]

Psychological distress and exhaustion: canton and country

Moderate / severe psychological distress

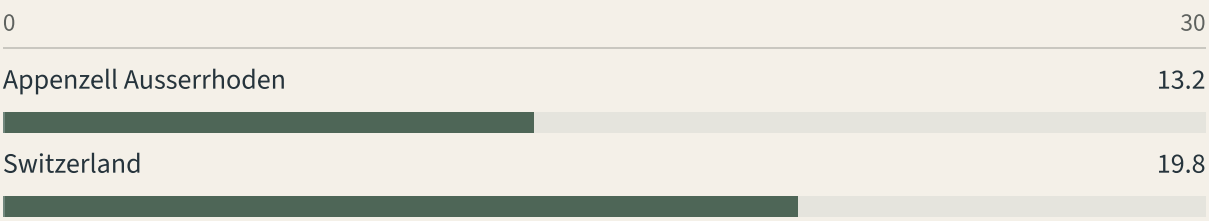
SGB 2017 · % of private-household residents aged 15+



Source: [S01]

Emotional exhaustion at work

SGB 2017 · % of employed people aged 15–64



Responses “somewhat agree” and “fully agree”. Not a register of diagnoses.

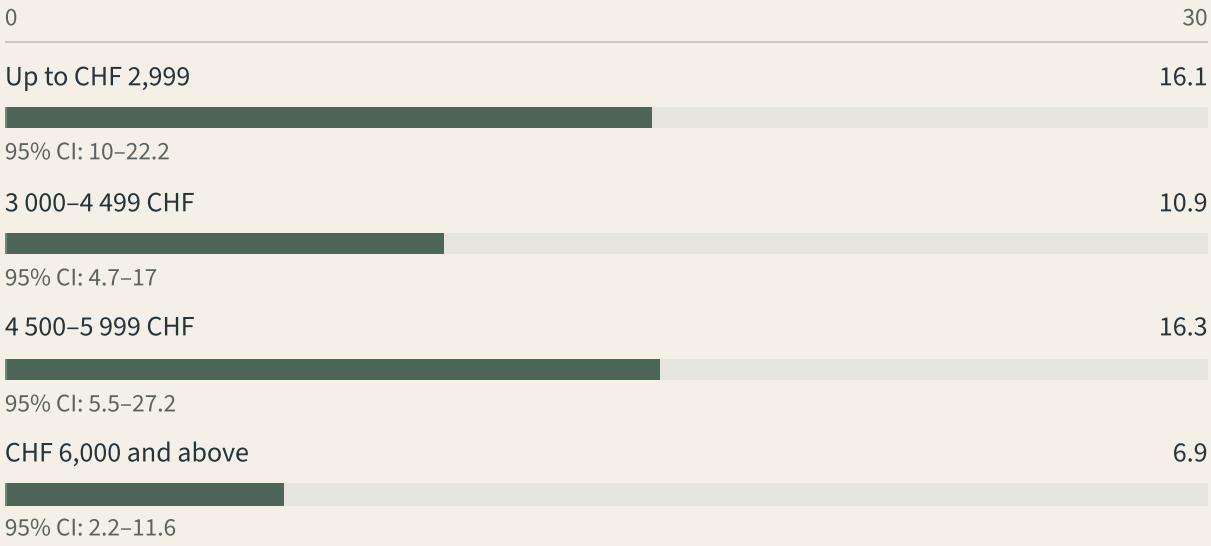
Source: [S01]

The earlier survey from 2012 allows us to look at income within the canton. Moderate or severe psychological distress was reported by 16.1% in the lowest equivalised household income group and 6.9% in the highest. The intermediate groups had figures of 10.9% and 16.3%: there was no steady gradient, and the intervals around the local estimates were wide. The separate PHQ-9 measure of depressive symptoms was 2.4% in the canton, compared with 6.5% across Switzerland. This is a historical comparison within a single survey. [S02]

Historical snapshot: income and psychological distress

Moderate / severe distress, MHI

SGB 2012 · % of canton respondents



Equivalised household income. Small subgroups; unadjusted descriptive estimates.

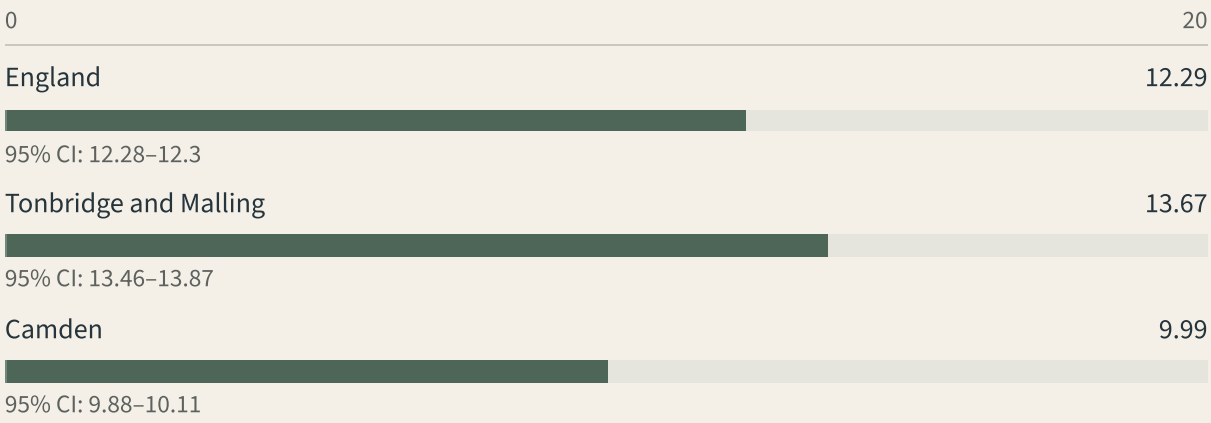
Source: [S02]

In English general practices in 2020/21, depression was recorded in 9.99% of registered patients aged 18 and over in Camden, 13.67% in Tonbridge and Malling and 12.29% across England. Practices are assigned to an area by their address. These figures describe registered patients, rather than results from the same questionnaires used in Switzerland. [E01]

Recorded depression in English general practices

Patients with recorded depression

2020/21 · % of patients aged 18+



Practices assigned to an area by address. QOF registration, not a general survey of residents.

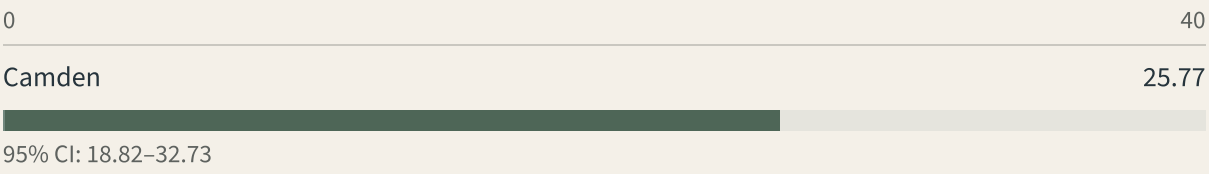
Source: [E01]

In Camden in 2020/21, 25.77% of respondents reported high anxiety on the previous day, and 13.69% reported low life satisfaction. The England benchmarks were 24.13% and 6.07%. Camden's intervals were wide: 18.82–32.73 and 7.18–20.21, respectively. This survey period fell during the pandemic. [E01]

Residents' wellbeing during the pandemic

High anxiety on the previous day

2020/21 · % of respondents aged 16+

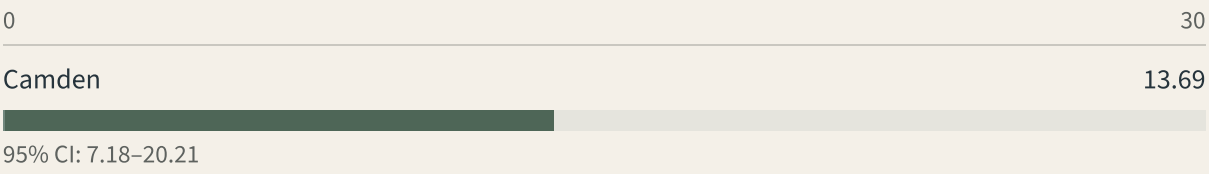


Responses of 6–10 out of 10; not a diagnosis of an anxiety disorder.

Source: [E01]

Low life satisfaction

2020/21 · % of respondents aged 16+



Responses of 0–4 out of 10; the local estimate has a wide interval.

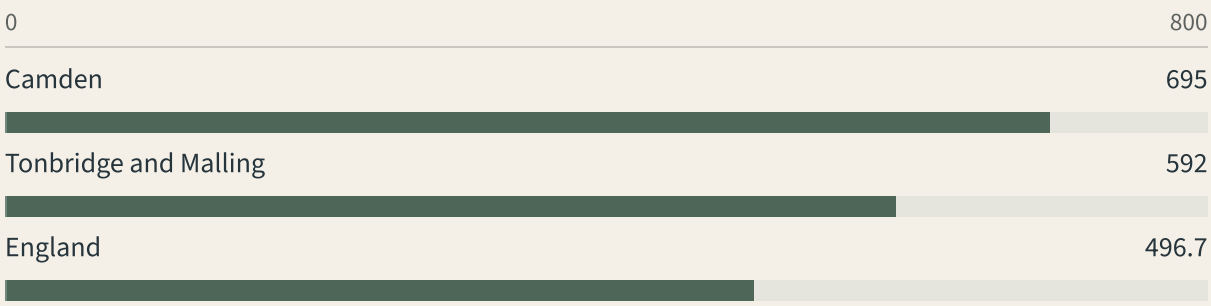
Source: [E01]

Meanwhile, median weekly earnings among Camden residents in 2021 were £695, compared with £496.70 across England—about 40% higher. In Tonbridge and Malling, they were £592, about 19% higher. These are gross earnings excluding overtime, covering full-time and part-time employees in the PAYE system. [E01]

Employees' earnings in the English areas

Median weekly earnings of residents

2021 · GBP per week



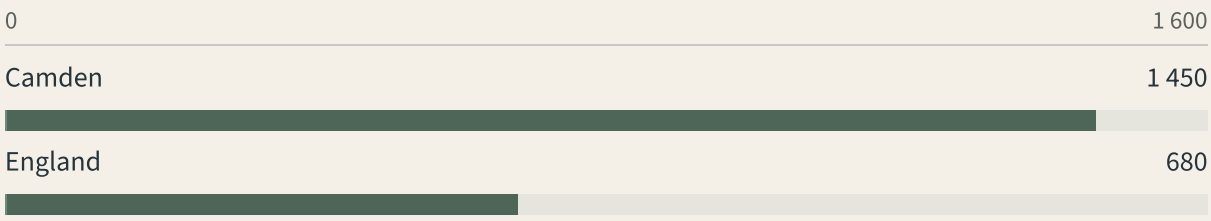
Gross earnings excluding overtime; full-time and part-time employees, PAYE.

Source: [E01]

But Camden is expensive to live in. Median monthly private rent for a one-bedroom flat in 2020/21 was £1,450, compared with £680 across England—more than twice as much. In 2021, 9.5% of Camden households had fewer bedrooms than they needed, compared with 4.3% in England and Wales. Earnings and rents come from different statistical populations: these two medians cannot tell us the share of income a particular family spends on rent. [E03]

Private rent for a one-bedroom flat

2020/21 · GBP per month, median

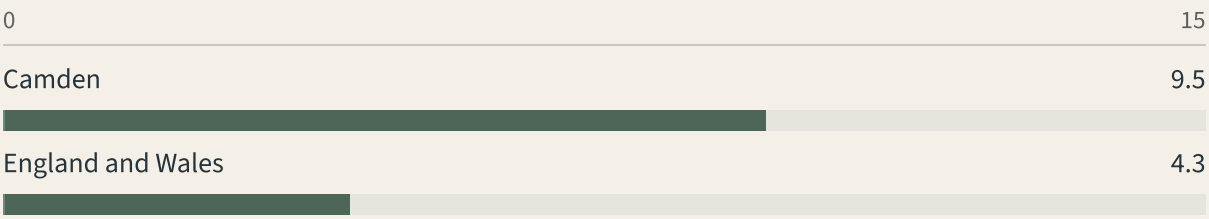


A separate population of rental agreements; not the share of a particular family's spending.

Source: [E03]

Households with too few bedrooms

2021 · % of households



The benchmark is England and Wales, not England alone.

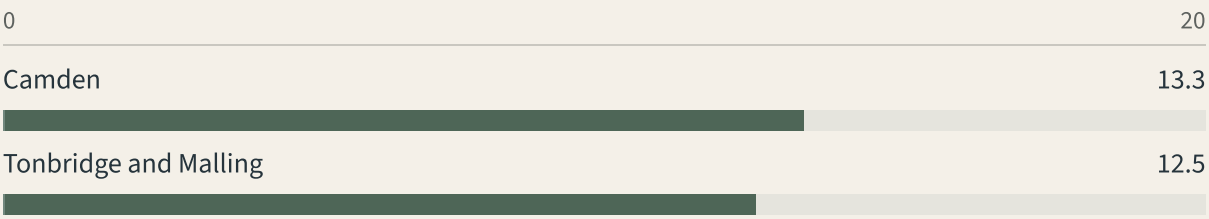
Source: [E03]

In the provisional DWP release for the financial year ending in 2021, 13.3% of children under 16 in Camden and 12.5% in Tonbridge and Malling lived in relative low-income families. This estimate is before housing costs. It has a different meaning from the Russian share of the entire population below the national poverty line. [E04]

Children in relative low-income families

Before housing costs

Financial year ending in 2021 · % of children under 16



Provisional DWP release of 31 March 2022. These are family income figures, not numbers of children with mental disorders.

Source: [E04]

An area with high wages can therefore also have expensive rents, cramped housing and substantial psychological distress among some residents. Comparable income remaining after essential costs could not be established for all four areas. Earnings, poverty and housing measures are therefore presented separately.

Material wellbeing is uneven

Camden illustrates high median earnings, high rents, life dissatisfaction among some residents and too few bedrooms in some households at the same time. These data concern different populations; dividing average rent by average pay does not replace a household budget survey. Housing costs, disposable income and the distribution of resources within an area are useful for assessing how well people can meet their needs.

What recurs across countries?

Studies of workers return repeatedly to working conditions, the threat of job loss, sleep, chronic illness and support. Studies of residents return to changes in their area, family resources, resettlement and access to help. These are overlapping, but not identical, circumstances.

Several studies find an association between material circumstances and mental health. Its direction and strength depend on what is measured: personal earnings or family income, symptom scores or crossing a threshold. Practical decisions therefore need to take money, working conditions, housing, health and access to care into account together.

In an evaluation of the MATES in Mining programme published in 2018, participants reported greater confidence immediately after training in recognising mental health difficulties in colleagues and helping them find support. A separate survey about ten months later assessed stigma, help-seeking and perceived support from the employer. The study did not assess a reduction in deaths. [M036]

During the selected pre-war period, Kuzbass combined coal mining wages above the regional average with population incomes and life expectancy below the Russian level, and higher recorded suicide mortality. Yet a local historical survey of depressive symptoms found a more favourable result than the combined sample from ten regions. Both sides of this picture remain in the article.

The Swiss canton shows another combination: high life expectancy, more favourable nationally comparable estimates for some mental health measures, and at the same time a suicide rate above the national figure. The English boroughs show higher pay, differences in recorded depression and, in Camden, high housing costs.

It matters to me that this is not reduced to a single number for the “price of coal”. Different people stand behind a wage, a diagnosis and a mortality rate. The coal industry provides earnings, changes the environment and ties families’ futures to its own. Its place in an area’s life needs to be assessed through all these consequences.

A well-paid job matters. So does being able to live nearby, raise children, receive treatment and find support when working is no longer possible. That is what a comparison of coal regions—and the places where organisations involved in the coal supply chain have their addresses—should tell us.

Natalia Zubkova

Practical implications

Recurring themes—symptoms, sleep, illness, job security and support—provide a basis for support services. The MATES evaluation distinguishes immediate training outcomes from a survey about ten months later. Changes in mental health literacy and help-seeking should be considered separately from deaths; this allows a particular stage of prevention to be assessed.

Discussion

The overall picture

Workers and residents share an area's economy, but differ in exposure and in how they enter studies. For workers, illness, job insecurity, sleep and support recur. For residents, the environment, family finances, resettlement and access to help recur. Bringing these themes together offers a framework for monitoring living conditions; the frequencies of specific outcomes remain tied to their own samples.

Confounding and possible directions of association

Age, sex, chronic illness, education, income and family circumstances affect the likelihood of symptoms and death. Income may be both an initial resource and a consequence of employment history or illness. Adjustments must therefore be read alongside the research question. Mechanically adding every available variable to a model does not make all results comparable.

The healthy worker effect

People entering and remaining in employment are selected by health and capacity to work. Illness may lead someone to leave an occupation. An external comparison with the general population and an internal comparison between occupations therefore answer different questions. Following former workers and retaining occupational histories are important for assessing long-term outcomes.

Applicability to Kuzbass

International studies help identify instruments and possible pathways: sleep, occupational disease, workplace support, family resources and involuntary environmental changes. Their ORs, SMRs and symptom proportions are not substituted for surveys in Kuzbass. Local evidence comes from ESSE-RF, regional and municipal clinical material, adolescent disorder registration and official territorial time series.

Registration and small numbers

For small areas, multi-year periods and uncertainty around estimates matter. English registration years, Switzerland's exclusion of assisted suicide and the Russian crude rate define different scopes. Pandemic changes in care affect consultations and recorded diagnoses. Information about treatment access is therefore considered alongside the cases themselves.

Coverage and unresolved questions

The collection provides findings from several countries, but research coverage is uneven. A comparable annual depression series for Kuzbass for 2017–2021 was not obtained, nor a separate life expectancy estimate for workers; data collection periods remain unidentified in several studies. Unknown dates and missing indicator rows are noted in the source records without extending that status to the entire international literature.

Answers to the research questions

Earnings and residents' resources

Coal mining may pay above-average wages for particular jobs. In Kuzbass, this coexists with lower cash income per person than across Russia. Mongolia and other countries show differing territorial results.

Workers

Studies highlight occupational illness, work organisation, sleep, family conflict and support. The Virginia clinic shows a need for care among older current and former workers.

Adult residents

The Appalachian county analysis identifies higher odds of symptoms in mountaintop-removal areas. African material describes perceptions of mental health problems and changes in living conditions after resettlement. The Kemerovo sample has a lower symptom proportion than the combined ten-region benchmark.

Children

Available findings concern specific cognitive and behavioural scales and registered classes of disorders. Territorial monitoring requires age groups, family characteristics and the source of exposure.

Suicide mortality

Kuzbass was above the Russian benchmark in 2017–2021. Appenzell Ausserrhoden was above Switzerland on the selected five-year standardised estimate. Local intervals in the English boroughs include the national rate. Among Queensland workers, results depend on the external or internal comparison group.

Life expectancy

Kuzbass is below Russia for men and women; selected areas abroad have higher estimates, with a gap visible before the pandemic. These numbers describe overall population mortality and living conditions.

The role of living standards

Income matters, alongside housing costs, employment, illness and access to help. Different measures of wellbeing may place the same area differently.

Contribution and practical use

This report contributes a consistent comparison of groups, periods, instruments and national definitions, with saved underlying rows and reproducible arithmetic. Its practical result is a set of measures for monitoring areas and workforces, and questions requiring local data.

Evidence package for EN PDF V02

The supporting materials are supplied in a separate archive coal-mental-health-research-en-v01.zip. It contains the PDF, editable HTML with resources, underlying CSV and JSON files, saved copies of 53 sources, the search log, a checksum manifest, reproduce.mjs and checking reports.

The archive does not yet have a public HTTPS address: it is prepared for review before publication. Paths below identify files inside the extracted archive. They are not separate web links; the PDF itself contains no embedded files.

Appendix A. Calculations and underlying data

The reproducible arithmetic comparisons below use the underlying values in the accepted data package. Percentages were calculated before rounding; the table displays two decimal places. Different currencies and national definitions of pay are retained within their own comparisons.

Comparison	a	b	Formula	Result, %
Coal pay relative to the Kuzbass average	73102	48313	(a/b-1)*100	51.31
Kuzbass average pay relative to Russia	48313	57244	(a/b-1)*100	-15,60
Camden median earnings relative to England	695	496.7	(a/b-1)*100	39.92
Tonbridge and Malling median earnings relative to England	592	496.7	(a/b-1)*100	19.19
One-bedroom rent in Camden relative to England	1450	680	(a/b-1)*100	113.24
US mean hourly coal pay relative to all industries	34.78	28.01	(a/b-1)*100	24.17
Polish coal pay relative to the enterprise sector	9374.77	5889.84	(a/b-1)*100	59.17
Coal mining's share of Kuzbass employment	99.3	1156.6	99.3/1156.6*100	8.59

Full tables: identification of 404 underlying rows (data/Идентификация_исходных_строк_V02.csv) and 555 chart data rows (data/Данные_для_графиков_V02.csv). Fields include the measure, area, period, sex, age, unit, type of rate, source and saved extract. These files accompany this PDF in the package.

Recalculate: reproduce.mjs; results: execution report (qa/recalculation.json). The script repeats eight arithmetic comparisons; it does not reproduce the regression models of the primary publications.

Appendix B. Source records

Records retain the identifiers used in the accepted article. Access descriptions refer to the materials actually used. Files are listed in the source manifest (data/source-manifest.json) with checksums.

[B020] Glass D.C. et al. Are mortality rates similar between jobs in the Queensland coal mine workers' cohort?. BMC Public Health. 2025. DOI 10.1186/s12889-025-24163-4

https://doi.org/10.1186/s12889-025-24163-4

Area. Australia; Queensland

Group. Men in production occupations; women separately

Observation period. From the first medical examination from 1 January 1993 until death or 30 November 2020

Design. Registry cohort, ever-employed occupational categories

Measure. Suicide mortality; SMR and internal aRMR

Result used. Men in production: 228 deaths; SMR relative to Australia 123 (108–140), relative to Queensland 101 (88–115). Women in production: 10 deaths; internal aRMR 3.48 (1.25–9.67).

Limitations. Neutral SMR=100; aRMR=1. Age/calendar structure accounted for; internal models also adjust for smoking. Few women; ever-employed categories overlap.

Result location. Methods → Study cohort; Table 4: women relative to other women in the cohort; Results, Tables 3 and 5: death counts and SMRs for women and men

Access and material used. Full text saved; specified sections checked

Sample overlap. Same cohort as B032

Saved material. sources/B020-B020-queensland-worker-jobs.xml

↩1 ↩2

[K119] Rosstat/EMISS. Indicator 31270: deaths by cause per 100000 population. Saved extract.

https://www.fedstat.ru/indicator/31270

Area. Russia; regions

Group. All residents

Observation period. 2017–2021

Design. Cause-of-death registration

Measure. Suicides; crude rate per 100000

Result used. Russian coal regions and two comparison areas were extracted; the complete extracted file contains 120 territorial rows, including districts.

[K119] — continued

Limitations. Population, not workers. The CSV unit is “persons”; indicator title/methodology confirmed through mirror metadata. The direct EMISS page was inaccessible during checking. Age standardisation is not specified.

Result location. Cause code 249; all settlements; values for 2017–2021

Access and material used. Saved CSV parsed again; metadata: https://repository.econdata.tech/dataset/emiss_31270

Sample overlap. Not established

Saved material. sources/K119-K119-fedstat-31270.csv

↩1 ↩2 ↩3 ↩4 ↩5 ↩6

[K117] Obsan/BFS. Suizid und Suizidhilfe; five-year canton estimates

https://ind.obsan.admin.ch/indicator/obsan/suizid-und-suizidhilfe

Result location. API https://ind.obsan.admin.ch/api/_010/kg/json; category_id=1, kanton_nr=0,15; year=2017-21; sex_id=0,1,2

Access and material used. Named tables or sections of the saved material checked

Saved material. sources/K117-K117-AR01-suicide.json

↩1 ↩2 ↩3 ↩4 ↩5 ↩6 ↩7 ↩8 ↩9

[B028] Shaikh M. The health legacy of coal mining: Analysis of mortality rates over time in England and Wales (1981–2019). SSM—Population Health. 2024;27:101706. DOI 10.1016/j.ssmph.2024.101706

https://doi.org/10.1016/j.ssmph.2024.101706

Area. England and Wales; 329 districts

Group. Residents of former coal areas

Observation period. 1981–2019

Design. Longitudinal area comparison with matched controls

Measure. Age-standardised mortality; 2013 European standard

Result used. Initial excess of 122.6 for men and 66.5 for women per 100000; by 2019 the gap had narrowed by 91% and 70%.

Limitations. Long-term overall health, not clinical depression; matching model and social change. The rate of improvement should not be transferred to another region.

Result location. Results; Methods

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/B028-B028-uk-legacy-mortality.xml

↩1

[K110] Obsan/BFS. Life expectancy at birth, by canton

https://ind.obsan.admin.ch/api/_001/kg/json

Result location. category_id=1; kanton_nr=0,15; year=2019,2021; sex_id=1,2

Access and material used. Named tables or sections of the saved material checked

Saved material. sources/K110-K110-S09-life-observatory-data-kg.json

↩1 ↩2 ↩3 ↩4 ↩5

[M001] Hendryx M., Innes-Wimsatt K.A. Increased Risk of Depression for People Living in Coal Mining Areas of Central Appalachia. Ecopsychology. 2013;5(3):179–187. DOI 10.1089/eco.2013.0029

https://doi.org/10.1089/eco.2013.0029

Area. United States; Kentucky, Tennessee, Virginia, West Virginia

Group. 8591 adult residents

Observation period. 2006

Design. Cross-sectional telephone BRFSS; counties with MTR, other mining and no mining

Measure. PHQ-8 ≥10; symptoms over two weeks

Result used. MTR: 16.8%; no mining: 10.0%. Adjusted OR 1.40 (1.15–1.71); other mining 1.22 (0.99–1.50).

Limitations. County-level exposure; individual dose and occupation not distinguished. Adjustments: age, sex, ethnicity, income, education, unemployment, marital status, physician supply, urban residence. Smoking, BMI and alcohol were included in sensitivity analysis, not the final table. OR is not RR.

Result location. Methods; Results; Tables 3–4, printed pp. 183–184

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M001-M001-appalachia-depression.pdf

↩1 ↩2

[M002] Considine R. et al. The Contribution of Individual, Social and Work Characteristics to Employee Mental Health in a Coal Mining Industry Population. PLoS ONE. 2017;12:e0168445. DOI 10.1371/journal.pone.0168445

https://doi.org/10.1371/journal.pone.0168445

Area. Australia; NSW and Queensland

Group. 1457 employees at 8 coal operations

Observation period. 12.2013–03.2015

Design. Cross-sectional survey

Measure. K10; psychological distress

[M002] — continued

Result used. Greater distress associated with fear of job loss, job dissatisfaction, financial reasons for staying and lower perceived employer support. After adjustment, differences by FIFO, shift length and mining method were not clear-cut.

Limitations. Self-report; participation differed by recruitment method; national comparison with employed people in 2007. Social, personal and work variables included in the model.

Result location. Results 3.5.4; Table 3; Limitations

Access and material used. Full text saved; specified sections checked

Sample overlap. Same project/overlapping sample: M007, M008, M036

Saved material. sources/M002-M002-australia-distress.xml

↩ 1

[M010] Liu L., Wang L., Chen J. Prevalence and Associated Factors of Depressive Symptoms among Chinese Underground Coal Miners. BioMed Research International. 2014:987305. DOI 10.1155/2014/987305

https://doi.org/10.1155/2014/987305

Area. China; north-east, 6 underground coal mines

Group. 1936 men

Observation period. 07–08.2013

Design. Cross-sectional survey; 2500 invited

Measure. CES-D ≥16

Result used. 62.8% reached the depressive symptom threshold. The model considered stress and psychosocial resources, accounting for age, education, marital status, chronic illness, income and working hours.

Limitations. Scale threshold rather than clinical diagnosis; cross-sectional design; men only. Authors discuss the threshold's applicability in China.

Result location. Methods; Tables 1–4; Discussion

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M010-M010-china-coal-depression.xml

↩ 1 ↩ 2 ↩ 3

[M011] Nanjid Z. et al. Factors Associated with Sleep Disturbance Among Miners in Mongolia: A Cross-Sectional Study. The Kitakanto Medical Journal. 2025;75:15–22. DOI 10.2974/kmj.75.15

https://doi.org/10.2974/kmj.75.15

Area. Mongolia; one coal company, name undisclosed

Group. 329 employees; 288 men, 41 women

Observation period. 10.2023

Design. Cross-sectional survey

Measure. PSQI; PSS

Result used. Poor sleep: 178/329 (54.1%); day workers 66/129 (51.2%), shift workers 112/200 (56.0%), p=0.390. Within shift workers, moderate/high stress associated with poor sleep: AOR 2.672 (1.268–5.628).

Limitations. One company, self-selection and exclusion of some people with neurological/psychiatric conditions; sleep is not a depression diagnosis.

Result location. Methods; Table 2A; Table 3

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M011-M011-mongolia-sleep.pdf

↩1 ↩2

[M012] Mönkhnaran A., Zoljargal E., Erdenechimeg E. Studies of lead exposure in children aged 4–7 years in relation to their behavioral problems. Health Sciences. 2021;17(8).

https://journal.mnums.edu.mn/index.php/emsu/en/article/view/525

Area. Mongolia; Sharyn Gol and Nalaikh

Group. 241 children aged 4–7

Observation period. Survey year not established from the available abstract; published in 2021

Design. Cross-sectional survey

Measure. Blood lead; SDQ

Result used. Mean lead levels: Nalaikh 5.26; Sharyn Gol 6.17 µg/dL. Authors report associations with the prosocial scale (p=0.014) and hyperactivity (p=0.050).

Limitations. The abstract provides no effect sizes/CIs or external control group. Individual lead sources not established; not a measure of aggression or intellectual disorder.

Result location. Abstract

Access and material used. Abstract read; full text not obtained

Sample overlap. Not established

Saved material. sources/M012-M012-access-note.txt

↩1

[M013] Surenbaatar U. et al. Environmental health survey for children residing near mining areas in South Gobi, Mongolia. Annals of Occupational and Environmental Medicine. 2021;33:e10. DOI 10.35371/aoem.2021.33.e10

https://doi.org/10.35371/aoem.2021.33.e10

Area. Mongolia; Tsogttsetsii, Khanbogd, Bayandalai

Group. 118 children aged 9–12

Observation period. 07.2017

Design. Cross-sectional biomonitoring study

Measure. Blood lead, geometric mean

Result used. Tsogttsetsii (coal): 4.78; Khanbogd (copper): 5.15; Bayandalai (small-scale mining): 7.42 µg/dL.

Limitations. An exposure biomarker, not intelligence or a psychiatric diagnosis. The highest value was not in the coal settlement. Groups and other exposure sources differ.

Result location. Methods; Results, concentration tables

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M013-M013-mongolia-child-metals.xml

↩ 1

[M003] Dupont-Soares M. et al. Maternal, neonatal and socio-economic factors associated with intellectual development among children from a coal mining region in Brazil. Environmental Geochemistry and Health. 2021;43:3055–3066. DOI 10.1007/s10653-021-00817-1

https://doi.org/10.1007/s10653-021-00817-1

Area. Brazil; coal area and 6 neighbouring municipalities

Group. 778 children

Observation period. Survey year not established from the abstract

Design. Cross-sectional comparison of direct and indirect influence zones

Measure. Raven’s Coloured Progressive Matrices

Result used. No statistically significant difference between zones. Results associated with maternal education, birth weight and family characteristics.

Limitations. Full text not obtained. Screening categories on the test are not equated with a clinical diagnosis; coal power generation is also present nearby.

[M003] — continued

Result location. Abstract

Access and material used. Europe PMC abstract and bibliographic data; PubMed placeholder HTML not used

Sample overlap. Not established

Saved material. sources/M003-M003-brazil-children-abstract.json

↩ 1

[M014] Life After Coal et al. Coal's Health Impacts in Phola. September 2024.

https://lifeaftercoal.org.za/wp-content/uploads/2025/07/Coals-Health-Impacts-in-Phola-Report-2024-.pdf

Area. South Africa; Phola, Mpumalanga

Group. 400 adult household representatives

Observation period. 2024 report; survey period not extracted

Design. Community study; convenience sample

Measure. Perceptions of community problems

Result used. In Table 3, mental health problems were named by 370/400, suicides by 356/400. These are responses about community problems, not counts of patients or deaths.

Limitations. Non-representative sample; residents' perceptions; mixed exposure to mining and power stations. Percentages in the income table should not be presented as official unemployment.

Result location. Methods; Table 3, PDF p. 8, printed pp. 12–13

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M014-M014-phola.pdf

↩ 1

[M035] Human Rights Watch. What is a House without Food? Mozambique's Coal Mining Boom and Resettlements. 23 May 2013.

https://www.hrw.org/report/2013/05/23/what-house-without-food/mozambiques-coal-mining-boom-and-resettlements

Area. Mozambique; Tete, Moatize, Cateme, Mwaladzi

Group. Resettled families

Observation period. Resettlement in 2009–2011; field interviews in 2012

Design. Primary human rights investigation

Measure. Interviews: land, water, food, income

Result used. Documents loss of suitable land and difficulties accessing markets, water and food after resettlement for coal mining.

Limitations. Qualitative study of living conditions; clinical depression and its prevalence were not measured.

Result location. Methodology; Land; Food; Gender

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M035-M035-mozambique-resettlement.html

↩ 1

[M017] Mościcka-Teske A., Sadłowska-Wrzesińska J., Najder A., Butlewski M. The relationship between psychosocial risks and occupational functioning among miners. IJOMEH. 2019;32(1):87–98. DOI 10.13075/ijomeh.1896.01162

https://doi.org/10.13075/ijomeh.1896.01162

Area. Poland; mines, exact coal share of sample not established

Group. 483 employees

Observation period. Survey period not established; published in 2019

Design. Cross-sectional comparison with other heavy industries

Measure. Psychosocial Risk Scale; self-rated health and work

Result used. In this sample, miners reported less stress and better functioning than workers in the comparison industries. Within the group, greater stress associated with poorer health and work ratings.

Limitations. Mineral composition and areas not specified; retained as a mining comparison, not an exclusively coal estimate.

Result location. Abstract; Material and Methods; Results

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M017-M017-poland-psychosocial.pdf

↩ 1

[M023] Harris D. et al. Characterization of Mental Illness Among US Coal Miners. JAMA Network Open. 2021;4:e2111110. DOI 10.1001/jamanetworkopen.2021.11110

https://doi.org/10.1001/jamanetworkopen.2021.11110

Area. United States; Stone Mountain lung disease clinic, Virginia

Group. Current and former miners; 2808 screened out of 2826 patients

Observation period. 01.07.2018–28.04.2020

Design. Clinical cross-sectional sample; median age 66

Measure. PHQ-9; item 9; PTSD screening

Result used. PHQ-9 ≥10: 883/2364 (37.4%). Positive response about thoughts of death/self-harm: 295/2599 (11.4%). PTSD screening: 639/2441 (26.2%).

Limitations. Selected clinical group with lung problems; 99.7% men; denominators differ. Thoughts distinguished from attempts and deaths. Current and former workers do not provide independent estimates.

Result location. Methods; Results; Table; Discussion

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M023-M023-us-clinic-mental.xml

↩ 1

[M004] Rowlands P., Huws R. Psychological effects of colliery closures. International Journal of Social Psychiatry. 1995;41:21–25. DOI 10.1177/002076409504100102

https://doi.org/10.1177/002076409504100102

Area. England; two collieries

Group. Workers at a colliery threatened with closure and a comparison colliery

Observation period. Published in 1995

Design. Postal survey; 30% response

Measure. GHQ; alcohol; doctor visits

Result used. The group threatened with closure had higher mean GHQ scores, reported alcohol use and doctor visits.

Limitations. Abstract; exact effects and sample size not obtained; low response. Historical context.

Result location. Abstract

Access and material used. Europe PMC abstract

Sample overlap. Not established

Saved material. sources/M004-M004-uk-closures-abstract.json

↩ 1

[M020] Mortality during resource booms and busts. Journal of Environmental Economics and Management. 2022;115:102696. DOI 10.1016/j.jeem.2022.102696

https://doi.org/10.1016/j.jeem.2022.102696

Area. United States; coal mining and oil/gas counties, analysed separately

Group. County populations

Observation period. 2000–2016

Design. Panel econometric study

Measure. Mortality and number of operating facilities

Result used. Declining coal operations associated with increased all-cause and some cause-specific mortality, particularly in highly mining-dependent counties. Drug mortality estimates are sensitive to the start of the period.

Limitations. Model-based area estimates; coal findings kept separate from shale development. No numerical suicide effect was extracted for this summary.

Result location. Results; sensitivity analyses; Discussion

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M020-M020-us-boom-bust-bioc.xml

↩ 1

[M036] Tynan R.J. et al. MATES in mining intervention. International Journal of Mental Health Systems. 2018;12:66. DOI 10.1186/s13033-018-0245-8 [descriptive shortened title]

https://doi.org/10.1186/s13033-018-0245-8

Area. Australia; 8 coal mines

Group. Workers; 4 intervention operations

Observation period. 10-month follow-up

Design. Before/after comparison with control operations

Measure. Mental health literacy, support, help-seeking

Result used. In an evaluation of the MATES in Mining programme published in 2018, participants reported greater confidence immediately after training in recognising mental health difficulties in colleagues and helping them find support. A separate survey about ten months later assessed stigma, help-seeking and perceived support from the employer. The study did not assess a reduction in deaths. [M036]

Limitations. The outcome was readiness to support others and seek help, not suicide mortality; not a randomised individual therapy study.

[M036] — continued

Result location. Study design; Process evaluation; Outcome evaluation

Access and material used. Full text saved; specified sections checked

Sample overlap. Same eight-operation research project as M002

Saved material. sources/M036-M036-mates-intervention.html

↩ 1

[M019] Bowen E., Christiadi, Deskins J., Lego B. An Overview of Coal and the Economy in Appalachia: Fourth Quarter 2020 Update. ARC, 2021.

https://www.arc.gov/wp-content/uploads/2021/04/Coal-and-the-Economy-in-Appalachia_Q4_2020-Update.pdf

Area. United States; Appalachia, coal and non-coal counties

Group. Residents and jobs

Observation period. Data through 2020; some social indicators from 2019

Design. Official regional economic analysis

Measure. Earnings per job; poverty

Result used. Coal counties had higher earnings per job than non-coal Appalachia, but somewhat higher poverty too. Central Appalachia was the most disadvantaged.

Limitations. Average earnings per job differ from family income; exact chart values were not digitised.

Result location. Printed pp. 31–34; Figures 26–29

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M019-M019-appalachia-income.pdf

↩ 1

[M034] National Statistics Office of Mongolia; World Bank. Mongolia Poverty Report 2020. 2022.

https://downloads.1212.mn/jVxOHxKpts-i_J93C4vLZtGWv1rCpsL2c_EmDg_U.pdf

Area. Mongolia; Ömnögovi/South Gobi and nationwide

Group. Household population

Observation period. 2020

Design. National consumption survey

Measure. Poverty under the national threshold

Result used. Mongolia 27.8%; Ömnögovi 16.4%, the lowest provincial estimate.

Limitations. The province combines coal and copper; sampling uncertainty affects local estimates. National poverty lines differ between countries.

Result location. National results; Figure 1.22, printed p. 25

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M034-M034-mongolia-poverty.pdf

↩1 ↩2

[M038] Rosstat. Regions of Russia. Socio-economic Indicators. 2022 [in Russian].

https://rosstat.gov.ru/storage/mediabank/Region_Pokaz_2022.pdf

Area. Russia; Kemerovo Region

Group. All residents; men/women separately

Observation period. 2019–2021 in the extract

Design. Official mortality and income tables

Measure. Life expectancy at birth, years; poverty, %

Result used. 2021: Kuzbass 67.61 years, men 62.80, women 72.37; Russia 70.06 / 65.51 / 74.51. Poverty 12.5% versus 11.0%.

Limitations. Rosstat's 2022 edition. Later retrospective table K003 contains different values; editions are not mixed. Pandemic years 2020–2021 distinguished.

Result location. Table 2.15, PDF pp. 80–85 (printed pp. 79–84); Table 4.20, PDF pp. 241–243

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M038-M038-russia-regions2022.pdf

↩1 ↩2 ↩3 ↩4 ↩5 ↩6 ↩7

[M037] Omskstat. Cash Income and Expenditure of the Population of Omsk Region. 2021 and the Second Quarter of 2022 [in Russian].

https://55.rosstat.gov.ru/storage/mediabank/ddn-info_2kv-2022.pdf

Area. Russia; Siberian Federal District

Group. All residents

Observation period. 2021

Design. Official regional extract

Measure. Cash income per person, RUB/month

Result used. Kuzbass 28289; Khakassia 25737; Krasnoyarsk Krai 35703; Russia 40040.

Limitations. Provisionally approved 2021 edition; mean income is not miners' pay. No substitution of current values at another year's prices.

Result location. PDF p. 2

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M037-M037-russia-income2021.pdf

↩ 1 ↩ 2

[M026] Australian Bureau of Statistics. Life expectancy, 2019–2021. Released 8 November 2022.

https://www.abs.gov.au/statistics/people/population/life-expectancy/2019-2021

Area. Australia; Queensland, NSW

Group. Men and women

Observation period. 2019–2021

Design. Official mortality tables

Measure. Life expectancy at birth, years

Result used. Queensland 80.9/85.1; NSW 81.4/85.4; Australia 81.3/85.4 (men/women).

Limitations. Three-year period; whole states, not just coal settlements.

Result location. State and territory life expectancy

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M026-M026-abs-life.html

↩ 1

[M028] Statistics Poland (GUS). Trwanie życia w 2021 r. 2022.

https://stat.gov.pl/download/gfx/portalinformacyjny/pl/defaultaktualnosci/5470/2/16/1/trwanie_zycia_w_2021_roku.pdf

Area. Poland; Silesian Voivodeship

Group. Men/women

Observation period. 2019–2021

Design. Official mortality tables

Measure. Life expectancy at birth, years

Result used. 2021: Silesia 71.3/78.9; Poland 71.8/79.7. In 2019: 73.8/80.8 and 74.1/81.8, respectively.

Limitations. The voivodeship includes other industries and cities; 2020–2021 were pandemic years.

Result location. Table 3, printed p. 15

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M028-M028-poland-life.pdf

↩ 1

[M029] Arias E. et al. U.S. State Life Tables, 2021. National Vital Statistics Reports. 2024;73(7).

https://www.cdc.gov/nchs/data/nvsr/nvsr73/nvsr73-07.pdf

Area. United States; WV, Kentucky, Wyoming

Group. All residents; men/women

Observation period. 2021

Design. Official mortality tables

Measure. Life expectancy at birth, years

Result used. WV 71.0/68.1/74.2; Kentucky 72.3/69.6/75.3; Wyoming 75.0/72.5/77.7; United States 76.4/73.5/79.3 (all/men/women).

Limitations. States are not equivalent to coal areas; pandemic year.

Result location. Table A, PDF p. 3

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M029-M029-us-life.pdf

↩ 1

[M030] National Statistics Office of Mongolia. Mongolian Statistical Yearbook 2021.

https://downloads.1212.mn/Statistical_Yearkbook_2021_eng.pdf

Area. Mongolia; Ömnögovi

Group. Population; men/women nationwide; children

Observation period. 2017–2021

Design. Official statistics

Measure. Life expectancy; infant and under-five mortality

Result used. 2021: Ömnögovi life expectancy 72.91; national 71.01 (men 67.05, women 76.47). Infant mortality: Ömnögovi 11, national 12 per 1000 live births.

Limitations. The selected local life expectancy table has no sex breakdown; national figures are not assigned to the province. Child measures are rounded to whole numbers by the publisher.

Result location. Tables 3.30–3.31 PDF68; 8.13–8.14 PDF239

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M030-M030-mongolia-yearbook.pdf

↩1 ↩2

[M031] Shanxi statistical service; publication by the Lüliang administration. 10 June 2022.

https://www.lvliang.gov.cn/llxxgk/zfxxgk/xxgkml/gbmwj/tjj/fdzdgknr_55648/sjfb_55659/202206/t20220610_1659122.html

Area. China; Shanxi

Group. All residents; men/women

Observation period. 2020

Design. Official census data

Measure. Life expectancy at birth, years

Result used. All 77.91; men 75.64; women 80.47.

Limitations. Whole province; a national figure from an identical table was not extracted.

Result location. Main text of the announcement

Access and material used. Full text saved; specified sections checked

Sample overlap. Not established

Saved material. sources/M031-M031-shanxi-life.html

↩1

[W01] Kemerovostat: tables in Ugol Kuzbassa magazine, May–June 2023

https://uk42.ru/assets/files/IMG/2023/05/UK-2023-05-WEB.pdf

Result location. PDF p. 45, printed p. 43; employment and wages

Access and material used. Official data reproduced with attribution to Kemerovostat; the agency's direct original file was not found.

Saved material. sources/W01-kuzbass-2023.pdf

↩1 ↩2 ↩3

[W03] BLS OEWS May 2021, NAICS212100, All occupations

https://www.bls.gov/oes/2021/may/naics4_212100.htm

Result location. Row 00-0000; note 2

Access and material used. Official table read on the web; local HTML download returned HTTP403. A data extract, not original HTML, was saved.

Saved material. sources/W03-us-oews-extract.txt

↩1 ↩2 ↩3

[W04] BLS OEWS May 2021, National estimates, All occupations

https://www.bls.gov/oes/2021/may/oes_nat.htm

Result location. Row 00-0000

Access and material used. Official table read on the web; HTML returned HTTP403.

Saved material. sources/W04-us-oews-extract.txt

↩1 ↩2 ↩3

[W05] ABS Average Weekly Earnings, November 2021

https://www.abs.gov.au/statistics/labour/earnings-and-working-conditions/average-weekly-earnings-australia/nov-2021

Result location. Industry: full-time adult ordinary-time, original

Access and material used. Full page saved; industry table and definitions used; Mining is broader than coal.

Saved material. sources/W05-australia.html

↩1 ↩2

[W06] NBS China: urban non-private units, annual wages 2021

https://www.stats.gov.cn/english/PressRelease/202205/t20220523_1857683.html

Result location. Table by sector, Total / Mining

Access and material used. Full page; Mining is broader than coal; urban non-private sector, not the entire population.

Saved material. sources/W06-china-nonprivate.html

↩1 ↩2

[W07] NBS China: urban private units, annual wages 2021

https://www.stats.gov.cn/english/PressRelease/202205/t20220523_1857682.html

Result location. Table by sector, Total / Mining

Access and material used. Urban private sector; not combined with non-private.

Saved material. sources/W07-china-private.html

↩1 ↩2

[W09] Minerals Council South Africa. Facts and Figures 2022

https://www.mineralscouncil.org.za/component/jdownloads/?catid=17&id=2170&m=0&task=download.send

Result location. Printed p. 33, Coal employment and earnings

Access and material used. Primary industry publication; table attributed to DMRE and the Minerals Council. Not an independent assessment of residents' wellbeing.

Saved material. sources/W09-south-africa-coal.pdf

↩1

[W11] GUS Statistical Bulletin 02/2023

https://new.stat.gov.pl/file/118317/download?token=N_ASK6ip

Result location. Table 19, printed p. 59, row 2021 M01-12

Access and material used. Coal and lignite separately; comparison with the same enterprise sector, not the entire national economy.

Saved material. sources/W11-poland-bulletin.pdf

↩1 ↩2

[W12] Mongolian Statistical Yearbook 2021

https://downloads.1212.mn/Statistical_Yearbook_2021_eng.pdf

Result location. PDF p. 116, Table 4.19.1; PDF p. 118, industry table; PDF p. 79, median

Access and material used. Extract from previously saved full M030. Enterprise employees registered for social insurance; Mining includes other minerals.

Saved material. sources/W12-mongolia-wages-extract.txt

↩1 ↩2

[W13] Rosstat. Regions of Russia 2022 [in Russian]

https://rosstat.gov.ru/storage/mediabank/Region_Pokaz_2022.pdf

Result location. Table4.6, PDF203–204

Access and material used. Extract from previously saved full M038; average gross monthly pay, before tax deductions.

Saved material. sources/W13-russia-wages-extract.txt

↩1 ↩2

[D01] CSIRO. Upper Hunter Valley Particle Characterization Study, 2013

https://www.environment.nsw.gov.au/sites/default/files/upper-hunter-valley-particle-characterization-study-final-report.pdf

Result location. Table 9, printed p. 39; Conclusions; observations from 2012

Access and material used. Full PDF saved; results and factor definitions read; the PMF soil factor combines soil and coal dust.

Saved material. sources/D01-upper-hunter.pdf

↩1

[D02] CSIRO/ANSTO/NSW. Lower Hunter Particle Characterisation Study, 2016

https://www.environment.nsw.gov.au/sites/default/files/lower-hunter-particle-characterisation-study-final-report-160243.pdf

Result location. Executive summary; 01.03.2014–28.02.2015

Access and material used. Full PDF saved; summary findings checked, not all 194 pages.

Saved material. sources/D02-lower-hunter.pdf

↩1

[A01] MIR Trade. About company; address in the saved area profile, checked 21 October 2026

https://mirtrade.ch/about-company/

Result location. Area profile and corporate webpage

Access and material used. Named tables or sections of the saved material checked

Saved material. sources/A01-references.json

↩ 1

[A02] RECOSI / Bettercoal. Register, registered office and complaints address; checked 26 October 2026

https://find-and-update.company-information.service.gov.uk/company/07968009

Result location. Also https://www.bettercoal.org/terms and https://www.bettercoal.org/grievance-mechanism

Access and material used. Address extract with links saved

Saved material. sources/A02-Bettercoal_адреса_26-10-2026.txt

↩ 1

[A03] Uniper. The dilemma of investing in social and environmental remediation activities

https://www.uniper.energy/sustainability/dilemma-investing-social-and-environmental-remediation-activities

Result location. Account of the September 2019 mission and visit to Kiselyovsk

Access and material used. Extract with link saved; account by a mission participant

Saved material. sources/A03-Bettercoal_Кузбасс_и_рамка_сравнения.txt

↩ 1

[N01] Hao J. et al. Associated factors of anxiety and depressive symptoms among coal miners in Shanxi, China: a cross-sectional study. BMC Public Health. 2025;25:2838. DOI 10.1186/s12889-025-24127-8

https://pmc.ncbi.nlm.nih.gov/articles/PMC12362932/

Result location. Methods; Tables 1–3. Survey in August–September 2022

Access and material used. Named tables or sections of the saved material checked

Saved material. sources/N01-china-2025.xml

↩ 1 ↩ 2

[N02] Shalnova S.A. et al. Prevalence of anxiety and depression in different regions of the Russian Federation and their associations with sociodemographic factors (ESSE-RF study) [title translated from Russian]. Terapevticheskii Arkhiv. 2014;86(12):53–60. DOI 10.17116/terarkh2014861253-60

https://doi.org/10.17116/terarkh2014861253-60

Result location. Table 1, printed p. 57; Table 2, p. 58. Separate collection dates for the table with n=1616 were not established

Access and material used. Named tables or sections of the saved material checked

Saved material. sources/N02-esse-2014.pdf

↩1 ↩2 ↩3 ↩4

[N03] Third Kornilov Readings. Clinical and Socio-biological Aspects of Affective Disorders [title translated from Russian]. Conference proceedings, 29 April 2021; edited by N.A. Bokhan

https://mental-health.ru/files/confs/2021/2021_06_kemerovo.pdf

Result location. Lisovitskaya et al., pp. 103–105; Sinkina and Dits, pp. 179–181; Sorokina, pp. 182–183

Access and material used. Selected abstracts read, not the whole proceedings

Saved material. sources/N03-kemerovo-conference-2021.pdf

↩1 ↩2 ↩3

[N04] Gudinova Zh.V. et al. Comparative Characteristics of Mental Disorders among Adolescents ... in 2005–2013 [title translated from Russian]. Sovremennye Problemy Nauki i Obrazovaniya. 2015;5

https://science-education.ru/ru/article/view?id=21802

Result location. Methods; Results, PDF p. 3; Table 1, PDF p. 5

Access and material used. Named tables or sections of the saved material checked

Saved material. sources/N04-adolescents-2015.pdf

↩1 ↩2

[S01] Obsan. Gesundheitsbericht Appenzell Ausserrhoden 2021. Bericht 02/2021. SGB 2017

https://www.obsan.admin.ch/sites/default/files/obsan_02_2021_bericht_ar_1.pdf

Result location. pp. 49–50, G22–G24

Access and material used. Named tables or sections of the saved material checked

Saved material. sources/S01-S03-health-2021.pdf

↩1 ↩2 ↩3

[S02] Obsan Dossier 29. Gesundheitsreport Kanton Appenzell Ausserrhoden. 2014. SGB 2012

https://www.ar.ch/fileadmin/user_upload/Departement_Gesundheit_Soziales/Amt_fuer_Gesundheit/02_Publikationen/Berichte/Gesundheit_AR_2012.pdf

Result location. Table 2.15, p. 36/PDF p. 38; Table 2.19, p. 42/PDF p. 44

Access and material used. Named tables or sections of the saved material checked

Saved material. sources/S02-AR-2012.pdf

↩ 1 ↩ 2

[E01] OHID. Public Health Profiles / Fingertips. Underlying data from ONS, NHS and other agencies

https://fingertips.phe.org.uk/

Result location. Indicators 93351, 92313, 848, 22304, 22301, 41001, 90366; exact fields and rows in the supporting tables

Access and material used. Named tables or sections of the saved material checked

Saved material. sources/E01-data-2017-2021.json

↩ 1 ↩ 2 ↩ 3 ↩ 4 ↩ 5 ↩ 6 ↩ 7 ↩ 8 ↩ 9 ↩ 10 ↩ 11 ↩ 12 ↩ 13 ↩ 14 ↩ 15 ↩ 16 ↩ 17 ↩ 18 ↩ 19 ↩ 20

[E02] ONS. Suicides in England and Wales: 2021 registrations. 06.09.2022

https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/suicidesintheunitedkingdom/2021registrations

Result location. Definition, registration years, change to the standard of proof in July 2018

Access and material used. Webpage read; research extract saved

Saved material. sources/E02-Продолжение_исследования_V01.txt

↩ 1 ↩ 2 ↩ 3 ↩ 4 ↩ 5 ↩ 6 ↩ 7

[E03] Camden. State of the Borough Report 2023

https://www.camden.gov.uk/documents/d/guest/state-of-borough-report-2023

Result location. p. 59, rent in 2020/21; p. 62, overcrowding in 2021

Access and material used. Named tables or sections of the saved material checked

Saved material. sources/E03-camden-2023.pdf

↩ 1 ↩ 2 ↩ 3

[E04] DWP. Children in low income families: local area statistics 2014 to 2021. 31.03.2022

https://www.gov.uk/government/statistics/children-in-low-income-families-local-area-statistics-2014-to-2021

Result location. 1_Relative_Local_Authority, rows 194 and 266; FYE2021, before housing costs, provisional release

Access and material used. Named tables or sections of the saved material checked

Saved material. sources/E04-child-poverty-2021.ods

↩ 1 ↩ 2

Appendix C. Saved search log

Date: 25 October 2026. Web search queries actually run.
The log was compiled from the current working session history; the timing of individual queries and the number of results screened were not recorded. This was not a complete systematic search.

coal mining mental health depression community longitudinal mine closure suicide primary study
coal miners suicide Australia cohort mortality mental health study
coal mining children intellectual development Candiota 778 2021
coal mining communities depression mental health Hendryx Zullig 2011 quality life
coal mining children aggression behaviour China lead study
coal mine workers psychological distress Australia 2015 1457 financial stress
coal mining regional prosperity life expectancy income mental health longitudinal Germany United Kingdom study
coal miners depression China occupational stress effort reward imbalance cross sectional 2014
coal mining children neurobehavioral development study cognitive Candiota Colombia
Кузбасс ожидаемая продолжительность жизни 2021 мужчины женщины Кемеровостат 2017 2019
"24707503" PMC
"33496915" full text
site:42.rosstat.gov.ru "2021" "продолжительность" "мужчин"
coal mining mental health poverty Colombia South Africa community study
"Prevalence and associated factors of depressive symptoms" "coal" 2014 PMC
site:42.rosstat.gov.ru "2021" "продолжительность жизни" "62"
coal mining mental health solastalgia Hunter Valley residents study 2014
coal mining children mental health aggression study community mental distress
угольные регионы психическое здоровье дети Кузбасс депрессия исследование
site:42.rosstat.gov.ru "2021" "бедности" "доход"

The final batch of three queries returned truncated output; its results were not used in the note. Saved documents and actual download errors are listed in data/new-source-manifest.json. Previously collected material is listed separately in data/inherited-manifest.json. Re-extraction of the Russian CSV: extract-russian.mjs; report: logs/russian-extraction-check.json. Gaps and next steps: notes/ПЕРВЫЕ_РЕЗУЛЬТАТЫ_V01.txt, section 6.