

Living in a safe, connected area improves life chances for children in poverty in Wales: A record linkage cohort study

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This Data Insight examines factors in the local area that can help a child overcome the negative impact of poverty by looking at which different socio-economic determinants of a local area are associated with resilience in children. This study has used the Welsh Index of Multiple Deprivation (WIMD 2011) to identify the concentrations and variations of several domains of deprivation for small areas in Wales and its impact on children.

Background

Latest figures suggest that in 2020, 29.3% of children aged between 0 and 19 are living in poverty in Wales, which is a 1% rise compared to the previous year¹.

Living in persistent poverty has a detrimental impact on child health, cognitive and behavioural outcomes². Children growing up in poverty are less likely to achieve in school and more likely to experience mental health problems.

After a steady fall in the last decade (post 2010), the child poverty rate has also now started to increase in the UK^{3,4}. This is due to real-term cuts in benefits, increasing housing costs and restricted possibilities to improve income from work (e.g. due to salary reductions, freeze in promotions)⁵. As a result, relative child poverty is now more prevalent in working families as opposed to workless households⁶.

A report from End Child Poverty carried out by Loughborough University has shown that child poverty is disproportionately rising in the UK's most impoverished areas⁷. The report shows that in some parts of Wales, children from deprived families are six times more likely to be growing up in poverty than their neighbours, even if they are living in less deprived areas. A child growing up in a deprived area implies that they are also

more likely to be provided with insufficient educational support, lack of recreational space (no safe park or playground) and receive poor quality childcare and health support in their area⁸.

The latest report from the Welsh Index of Multiple Deprivation (WIMD) 2019 from Welsh Government highlighted 'deep-rooted' deprivation by highlighting the areas in Wales which have remained as the top most deprived areas for more than 15 years, which indicates a lack of social mobility in most of these areas⁹. But, despite being born into poverty some children beat the odds and achieve well despite coming from disadvantage¹⁰.

What we did

This retrospective cohort study included 159,131 children who lived in Wales and completed their age 16 exams (Key Stage 4 (KS4)) between 2009 and 2016.

Free School Meal (FSM) provision was used as an indicator of household level deprivation. Area level deprivation was measured by the Welsh Index of Multiple Deprivation 2011.

The study population has been linked with their education data to obtain the KS4 record. The mental health, substance misuse and alcohol record were derived from the Patient Episode Database for Wales (PEDW), Welsh Longitudinal GP Dataset - Welsh Primary Care (WLGP) and substance misuse dataset. The ICD10 and READ codes for all mental health conditions, substance abuse and alcohol are mentioned in the Supplementary material Codes 3, 4 & 5.

The data linkage was performed with the help of an anonymised encrypted linkage key known as the anonymised linking field provided by the trusted third party in the SAIL Databank at Swansea University.

The outcome variable of 'Overall doing well' was comprised of achieved at KS4, no mental health condition and no substance or alcohol abuse records. Bidirectional logistic regression models were used to investigate the association between local area deprivation and children's outcome.

What we found

The study found living in an area with high community safety, good connectivity and higher area income (e.g. more people in work), was associated with children in poverty doing well (e.g. in education and mental health).

Those receiving FSM were more likely (compared to non-FSM) to live in a single parent household (29.2% compared to 13.1%, respectively), live with three or more other children (18.5% compared to 5.8%, respectively) in the same household or to have special educational needs (36.5% compared to 17.6%). They were also more likely to live with a household member who had an alcohol problem (11% compared to 3.8%), depression (63.3% compared to 39.8%), or a serious mental illness (4.6% compared to 1.2%), (see Table 1).

Table 1: Characteristics of study population by FSM eligibility

	FSM		Non-FSM		Difference (95%CI)
	N = 24,148	%	N = 134,983	%	
Gender					
Boy	12,175	50.4	68,704	50.9	11
Girl	11,973	49.6	66,279	49.1	20
Living area					
Urban	18,829	78.0	92,749	68.7	9.3(8.7 to 9.8)
Rural	53,19	22.0	42,234	31.3	
Number of adults in the household					
1	7,062	29.2	17,639	13.1	16.2(15.6 to 16.8)
2	9,058	37.5	63,682	47.2	-9.7 (-10.3 to -9.0)
3 and above	8,028	33.2	53,662	39.8	-6.5 (-7.2 to -5.9)
Number of other children in the household					
0	7,079	29.3	57,438	42.6	-13.2 (-13.9 to -12.6)
1	7,557	31.3	50,774	37.6	-6.3 (-7.0 to -5.7)
2	5,036	20.9	18,878	14.0	6.9 (6.3 to 7.4)
3 and above	4,476	18.5	7,893	5.8	12.7 (12.2 to 13.2)
Living with someone who had alcohol problems					
No	21,499	89.0	129,874	96.2	
Yes	2,649	11.0	5,109	3.8	7.2 (6.8 to 7.6)
Living with someone who had depression					
No	8865	36.7	81255	60.2	
Yes	15283	63.3	53728	39.8	23.5(22.8 to 24.1)
Living with someone who had serious mental illness					
No	23,035	95.4	133,371	98.8	
Yes	1,113	4.6	1,612	1.2	3.4 (3.2 to 3.7)
Exam year					
2009	2,804	11.6	17,661	13.1	
2010	2,943	12.2	17,686	13.1	
2011	3,125	12.9	17,247	12.8	
2012	3,039	12.6	16,779	12.4	
2013	3,428	14.2	17,511	13.0	
2014	3,110	12.9	16,836	12.5	
2015	2,938	12.2	15,958	11.8	
2016	2,761	11.4	15,305	11.3	

Special Education Need

No	15,338	63.5	111,206	82.4	
Yes	8,810	36.5	23,777	17.6	18.9 (18.3 to 19.5)

Overall Welsh Index of Multiple Deprivation (WIMD)

1 (Most deprived)	11,395	47.2	26,004	19.3
2	5,891	24.4	26,724	19.8
3	3,678	15.2	27,481	20.4
4	1,865	7.7	24,686	18.3
5 (Least deprived)	1,319	5.5	30,088	22.3

Income WIMD

1 (Most deprived)	11,439	47.4	25,539	18.9
2	6,071	25.1	27,613	20.5
3	3,599	14.9	27,105	20.1
4	2,018	8.4	26,627	19.7
5 (Least deprived)	1,021	4.2	28,099	20.8

Health WIMD

1 (Most deprived)	10,173	42.1	26,465	19.6
2	6,359	26.3	27,836	20.6
3	3,963	16.4	27,315	20.2
4	2,281	9.4	25,830	19.1
5 (Least deprived)	1,372	5.7	27,537	20.4

Access to service WIMD

1 (Most deprived)	1,834	7.6	23,492	17.4
2	3,926	16.3	30,234	22.4
3	6,206	25.7	28,194	20.9
4	6,640	27.5	28,758	21.3
5 (Least deprived)	5,542	23.0	24,305	18.0

Community safety WIMD

1 (Most deprived)	9,828	40.7	24,835	18.4
2	6,293	26.1	27,291	20.2
3	4,386	18.2	27,722	20.5
4	2,429	10.1	28,324	21.0
5 (Least deprived)	1,212	5.0	26,811	19.9

Physical environment WIMD

1 (Most deprived)	5,501	22.8	26,282	19.5
2	4,786	19.8	28,204	20.9
3	4,866	20.2	28,320	21.0
4	4,256	17.6	25,648	19.0
5 (Least deprived)	4,739	19.6	26,529	19.7

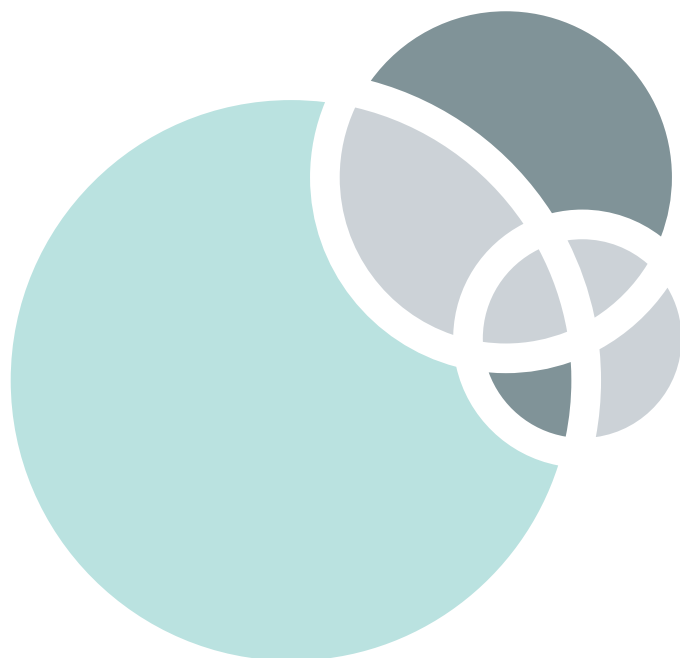
Housing WIMD

1 (Most deprived)	6,185	25.6	22,805	16.9
2	5,422	22.5	25,205	18.7
3	5,338	22.1	26,437	19.6
4	4,756	19.7	27,487	20.4
5 (Least deprived)	2,447	10.1	33,049	24.5

There were 22% of FSM children who were classified as 'Overall doing well' compared to 54.9% of non-FSM children (difference: 32.9% (95%CI: 32.3% to 33.5%)). The children who were classified as 'Overall not doing well' were mainly due to them not achieving KS4 (75.1% of children on FSM) and due to having a mental health condition (11% of FSM children) (see Table 2).

Table 2: Breakdown of Overall Doing Well outcome variable

	FSM		Non-FSM		Difference (P)
	N = 24,148	%	N = 134,983	%	
Overall Doing Well					
yes	5311	22.0	74060	54.9	-32.9 (95%CI: -33.5 to -32.3)
No	18837	78.0	60923	45.1	
KS4 not achieved					
Achieved	6005	24.9	79083	58.6	-33.7- (95%CI:-33.1 to -34.3)
Not achieved	18143	75.1	55900	41.4	
Alcohol record					
No	22645	93.8	129441	95.9	-2.1- (95CI: -2.5 to -1.8)
yes	1503	6.2	5542	4.1	
Substance misuse record					
No	23709	98.2	134130	99.4	1.2- (95%CI: -1.4 to -1.0)
yes	439	1.8	853	0.6	
Any mental health condition					
No	21487	89.0	128172	95.0	6.0- (95%CI: -6.4 to -5.6)
yes	2661	11.0	6811	5.0	

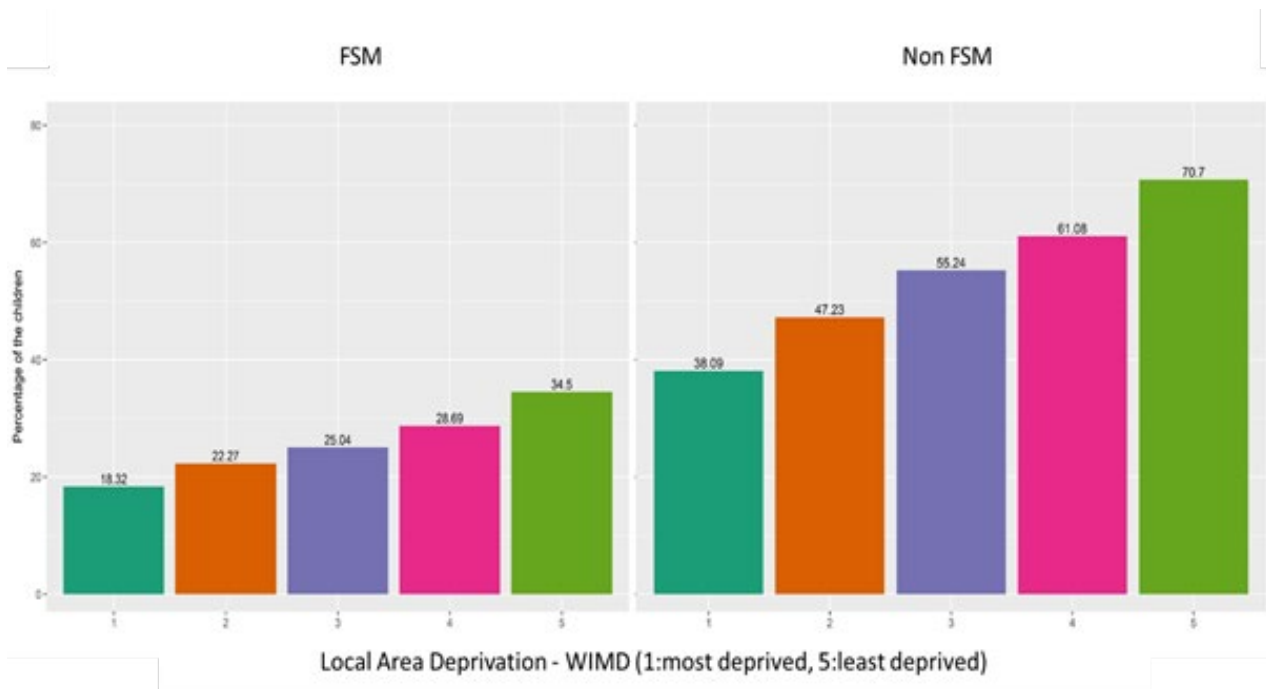


FSM children living in areas with higher community safety, higher relative income, and to a lesser extent higher access to services, are more likely to do well than their peers (see Table 3). Children from disadvantaged households are significantly more likely to do well if they are living in least deprived areas than the children from most deprived areas (see Figure 1).

Table 3: Association between WIMD (Income, Access to service, Community safety and overall WIMD score) and odds of ‘Overall doing well’ for the FSM and non-FSM children

Variables	FSM children			Non-FSM children		
	Odds Ratio	Lower CI	Upper CI	Odds Ratio	Lower CI	Upper CI
Income WIMD						
1 (Most deprived)	1.00			1.00		
2	1.00	0.91	1.11	1.22	1.17	1.27
3	1.19	1.04	1.36	1.39	1.32	1.46
4	1.39	1.16	1.67	1.70	1.60	1.81
5 (Least deprived)	1.61	1.26	2.05	2.14	1.99	2.31
Access to service WIMD						
1 (Most deprived)	1.00			1.00		
2	0.97	0.83	1.13	0.92	0.88	0.96
3	1.05	0.90	1.22	0.94	0.90	0.98
4	1.03	0.88	1.20	0.97	0.92	1.01
5 (Least deprived)	1.26	1.07	1.48	1.09	1.03	1.15
Community safety WIMD						
1 (Most deprived)	1.00			1.00		
2	1.16	1.05	1.27	1.11	1.07	1.16
3	1.37	1.22	1.54	1.24	1.18	1.30
4	1.47	1.25	1.72	1.38	1.30	1.46
5 (Least deprived)	1.95	1.57	2.42	1.69	1.58	1.81

Figure 1: The percentage of the children (FSM and non-FSM) who are ‘Overall doing well’ across all area level deprivation scores



Why it matters

This study found that the area in which a person grows up has an important impact on how well they do, especially at school, suggesting a neighbourhood effect on education irrespective of FSM status¹¹. This study highlights specific aspects of neighbourhood characteristics e.g., community safety, area income and connectivity, which impact on children overcoming the negative aspects of poverty.

These findings suggest that investing in community development and local area improvements such as promoting community safety, improving the access to public services and return to work schemes, can also help local children to do well in terms of education, mental health and reducing risk-taking behaviours (alcohol/drug use).

The findings of the study can provide important insights for targeted policy development and intervention.

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References

- ¹ Observatory PHW. Public Health Wales Observatory - Overview - child profile. <http://www.publichealthwalesobservatory.wales.nhs.uk/child-profile-overview> (accessed 5 Aug 2020).
- ² Wickham S, Anwar E, Barr B, et al. Poverty and child health in the UK: using evidence for action. *Arch Dis Child* 2016;101:759–66. doi:10.1136/archdischild-2014-306746
- ³ Wang H, Liddell CA, Coates MM, et al. Global, regional, and national levels of neonatal, infant, and under-5 mortality during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet* 2014;384:957–79. doi:10.1016/S0140-6736(14)60497-9
- ⁴ Taylor-Robinson D, Lai ETC, Wickham S, et al. Assessing the impact of rising child poverty on the unprecedented rise in infant mortality in England, 2000–2017: time trend analysis. *BMJ Open* 2019;9:e029424. doi:10.1136/bmjopen-2019-029424
- ⁵ Joyce R. Child poverty in Britain: Recent trends and future prospects. IFS Working Papers 2014. doi:10.1920/wp.ifs.2015.1507
- ⁶ Lambie-Mumford H, Green MA. Austerity, welfare reform and the rising use of food banks by children in England and Wales. *Area* 2017;49:273–9. doi:<https://doi.org/10.1111/area.12233>
- ⁷ Vizard P, Obolenskaya P, Burchardt T. Child Poverty Amongst Young Carers in the UK: Prevalence and Trends in the Wake of the Financial Crisis, Economic Downturn and Onset of Austerity. *Child Indic Res* 2019;12:1831–54. doi:10.1007/s12187-018-9608-6
- ⁸ Loughborough University. Poverty in your area 2019 | Improving the lives of children and families. <http://www.endchildpoverty.org.uk/poverty-in-your-area-2019/> (accessed 17 Jun 2020).
- ⁹ Welsh Index of Multiple Deprivation (full Index update with ranks): 2019 | GOV.WALES. <https://gov.wales/welsh-index-multiple-deprivation-full-index-update-ranks-2019> (accessed 17 Jun 2020).
- ¹⁰ Galster G, Marcotte DE, Man dell M, et al. The Influence of Neighborhood Poverty During Childhood on Fertility, Education, and Earnings Outcomes. *Hous Stud* 2007;22:723–51. doi:10.1080/02673030701474669
- ¹¹ Sattler K, Gershoff E. Thresholds of Resilience and Within- and Cross-Domain Academic Achievement among Children in Poverty. *Early Child Res Q* 2019;46:87–96. doi:10.1016/j.ecresq.2018.04.003
- ¹² Dool EM. Neighbourhood effects on educational attainment: does family background influence the relationship? *Sheff Econ Res Pap SERPS* 2017;201700.

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