## Observed associations between highest qualification and grip strength in men.

|  | Below 45 | 45 to <50 | 50 to <55 | 55 to <60 | 60 to <65 | Above 65 |
| --- | --- | --- | --- | --- | --- | --- |
| **Highest Qualification** | **Coef. (95% CI)**1 | **Coef. (95% CI)**1 | **Coef. (95% CI)**1 | **Coef. (95% CI)**1 | **Coef. (95% CI)**1 | **Coef. (95% CI)**1 |
| **Men** |  |  |  |  |  |  |
| Degree & higher | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) |
| A-levels, professional, or equiv. | 0.76 [0.43, 1.09] | 0.51 [0.22, 0.80] | 0.17 [-0.08, 0.43] | 0.03 [-0.19, 0.25] | -0.12 [-0.31, 0.06] | -0.22 [-0.43, -0.02] |
| O-levels, CSEs, or equiv. | 1.41 [1.13, 1.69] | 0.52 [0.27, 0.77] | -0.03 [-0.28, 0.21] | -0.40 [-0.63, -0.17] | -0.63 [-0.83, -0.43] | -0.79 [-1.01, -0.56] |
| No qualification | -1.79 [-2.35, -1.23] | -2.34 [-2.77, -1.91] | -2.02 [-2.34, -1.69] | -2.01 [-2.27, -1.75] | -1.88 [-2.08, -1.68] | -1.68 [-1.87, -1.48] |
| 1Coefficient: Difference in mean outcome (unit) (95% Confidence Interval) | | | | | | |

## Observed associations between highest qualification and grip strength in women.

| **Highest Qualification** | **Coef. (95% CI)**1 |
| --- | --- |
| **Women** |  |
| Degree & higher | 0.00 (ref) |
| A-levels, professional, or equiv. | -1.12 [-1.19, -1.06] |
| O-levels, CSEs, or equiv. | -1.35 [-1.41, -1.29] |
| No qualification | -3.72 [-3.80, -3.65] |
| 1Coefficient: Difference in mean outcome (unit) (95% Confidence Interval) | |

## Observed associations between IMD and grip strength in men and women.

| **Index of Multiple Deprivation** | **Coef. (95% CI)**1 |
| --- | --- |
| **Women** |  |
| 1 (most affluent) | 0.00 (ref) |
| 2 | -0.10 [-0.18, -0.02] |
| 3 | -0.29 [-0.37, -0.22] |
| 4 | -0.58 [-0.65, -0.50] |
| 5 (least affluent) | -1.07 [-1.15, -0.99] |
| **Men** |  |
| 1 (most affluent) | 0.00 (ref) |
| 2 | -0.15 [-0.27, -0.03] |
| 3 | -0.43 [-0.55, -0.31] |
| 4 | -1.09 [-1.21, -0.97] |
| 5 (least affluent) | -2.23 [-2.35, -2.12] |
| 1Coefficient: Difference in mean outcome (unit) (95% Confidence Interval) | |

## Associations between education and grip strength in men, excluding those unable to grip trength for health reasons.

|  | Below 45 | 45 to <50 | 50 to <55 | 55 to <60 | 60 to <65 | Above 65 |
| --- | --- | --- | --- | --- | --- | --- |
| **Highest Qualification** | **Coef. (95% CI)**1 | **Coef. (95% CI)**1 | **Coef. (95% CI)**1 | **Coef. (95% CI)**1 | **Coef. (95% CI)**1 | **Coef. (95% CI)**1 |
| **Model: 1** |  |  |  |  |  |  |
| Degree & higher | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) |
| A-levels, professional, or equiv. | 0.73 [0.40, 1.07] | 0.49 [0.20, 0.78] | 0.15 [-0.10, 0.40] | 0.02 [-0.20, 0.24] | -0.13 [-0.32, 0.06] | -0.23 [-0.44, -0.03] |
| O-levels, CSEs, or equiv. | 1.39 [1.11, 1.67] | 0.51 [0.25, 0.76] | -0.04 [-0.29, 0.20] | -0.41 [-0.64, -0.18] | -0.62 [-0.82, -0.42] | -0.78 [-1.01, -0.56] |
| No qualification | -1.85 [-2.41, -1.30] | -2.35 [-2.79, -1.92] | -2.05 [-2.37, -1.72] | -2.03 [-2.29, -1.76] | -1.88 [-2.08, -1.69] | -1.66 [-1.85, -1.46] |
| **Model: 2** |  |  |  |  |  |  |
| Degree & higher | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) |
| A-levels, professional, or equiv. | 1.06 [0.75, 1.38] | 0.80 [0.52, 1.07] | 0.59 [0.35, 0.83] | 0.49 [0.28, 0.70] | 0.33 [0.15, 0.50] | 0.14 [-0.05, 0.34] |
| O-levels, CSEs, or equiv. | 1.86 [1.60, 2.13] | 0.99 [0.75, 1.23] | 0.50 [0.27, 0.74] | 0.08 [-0.14, 0.30] | -0.23 [-0.42, -0.03] | -0.48 [-0.70, -0.27] |
| No qualification | -0.51 [-1.04, 0.03] | -0.96 [-1.38, -0.55] | -0.75 [-1.06, -0.43] | -0.74 [-0.99, -0.48] | -0.76 [-0.95, -0.57] | -0.68 [-0.87, -0.49] |
| **Model: 3** |  |  |  |  |  |  |
| Degree & higher | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) |
| A-levels, professional, or equiv. | 1.19 [0.87, 1.51] | 0.92 [0.64, 1.20] | 0.73 [0.49, 0.98] | 0.64 [0.42, 0.85] | 0.46 [0.28, 0.64] | 0.27 [0.08, 0.47] |
| O-levels, CSEs, or equiv. | 2.06 [1.79, 2.33] | 1.17 [0.92, 1.41] | 0.66 [0.43, 0.90] | 0.25 [0.03, 0.47] | -0.08 [-0.27, 0.11] | -0.34 [-0.55, -0.12] |
| No qualification | -0.17 [-0.71, 0.36] | -0.67 [-1.09, -0.25] | -0.45 [-0.77, -0.13] | -0.45 [-0.70, -0.19] | -0.49 [-0.69, -0.30] | -0.42 [-0.61, -0.23] |
| **Model: 4** |  |  |  |  |  |  |
| Degree & higher | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) | 0.00 (ref) |
| A-levels, professional, or equiv. | 1.00 [0.68, 1.32] | 0.77 [0.49, 1.05] | 0.59 [0.35, 0.84] | 0.61 [0.40, 0.82] | 0.46 [0.28, 0.64] | 0.24 [0.04, 0.43] |
| O-levels, CSEs, or equiv. | 1.48 [1.19, 1.77] | 0.76 [0.50, 1.02] | 0.42 [0.18, 0.67] | 0.22 [0.00, 0.45] | -0.06 [-0.25, 0.14] | -0.37 [-0.58, -0.15] |
| No qualification | 0.12 [-0.43, 0.67] | -0.47 [-0.91, -0.03] | -0.26 [-0.59, 0.08] | -0.27 [-0.54, 0.01] | -0.39 [-0.59, -0.19] | -0.47 [-0.67, -0.27] |
| 1Coefficient: Difference in mean outcome (unit) (95% Confidence Interval) | | | | | | |

## Associations between education and grip strength in women, excluding those unable to grip trength for health reasons.

| **Highest Qualification** | **Coef. (95% CI)**1 |
| --- | --- |
| **Model: 1** |  |
| Degree & higher | 0.00 (ref) |
| A-levels, professional, or equiv. | -0.73 [-0.80, -0.67] |
| O-levels, CSEs, or equiv. | -1.11 [-1.17, -1.06] |
| No qualification | -2.18 [-2.25, -2.11] |
| **Model: 2** |  |
| Degree & higher | 0.00 (ref) |
| A-levels, professional, or equiv. | -0.46 [-0.52, -0.40] |
| O-levels, CSEs, or equiv. | -0.79 [-0.84, -0.73] |
| No qualification | -1.42 [-1.49, -1.35] |
| **Model: 3** |  |
| Degree & higher | 0.00 (ref) |
| A-levels, professional, or equiv. | -0.39 [-0.45, -0.33] |
| O-levels, CSEs, or equiv. | -0.70 [-0.76, -0.64] |
| No qualification | -1.28 [-1.35, -1.21] |
| **Model: 4** |  |
| Degree & higher | 0.00 (ref) |
| A-levels, professional, or equiv. | -0.34 [-0.41, -0.28] |
| O-levels, CSEs, or equiv. | -0.63 [-0.69, -0.58] |
| No qualification | -1.13 [-1.20, -1.06] |
| **Model: 5** |  |
| Degree & higher | 0.00 (ref) |
| A-levels, professional, or equiv. | -0.38 [-0.44, -0.31] |
| O-levels, CSEs, or equiv. | -0.67 [-0.73, -0.61] |
| No qualification | -1.15 [-1.22, -1.08] |
| 1Coefficient: Difference in mean outcome (unit) (95% Confidence Interval) | |

## Associations between IMD and grip strength in men and women, excluding those unable to grip trength for health reasons.

|  | Women | Men |
| --- | --- | --- |
| **Index of Multiple Deprivation** | **Coef. (95% CI)**1 | **Coef. (95% CI)**1 |
| **Model: 1** |  |  |
| 1 (most affluent) | 0.00 (ref) | 0.00 (ref) |
| 2 | -0.10 [-0.17, -0.03] | -0.17 [-0.28, -0.05] |
| 3 | -0.33 [-0.41, -0.26] | -0.51 [-0.63, -0.40] |
| 4 | -0.74 [-0.81, -0.67] | -1.34 [-1.45, -1.23] |
| 5 (least affluent) | -1.41 [-1.48, -1.33] | -2.71 [-2.83, -2.60] |
| **Model: 2** |  |  |
| 1 (most affluent) | 0.00 (ref) | 0.00 (ref) |
| 2 | 0.00 [-0.07, 0.07] | 0.04 [-0.07, 0.15] |
| 3 | -0.14 [-0.21, -0.07] | -0.13 [-0.24, -0.02] |
| 4 | -0.41 [-0.48, -0.34] | -0.70 [-0.81, -0.59] |
| 5 (least affluent) | -0.85 [-0.92, -0.78] | -1.62 [-1.73, -1.51] |
| **Model: 3** |  |  |
| 1 (most affluent) | 0.00 (ref) | 0.00 (ref) |
| 2 | 0.03 [-0.04, 0.10] | 0.07 [-0.04, 0.18] |
| 3 | -0.09 [-0.15, -0.02] | -0.07 [-0.18, 0.04] |
| 4 | -0.32 [-0.39, -0.25] | -0.59 [-0.70, -0.48] |
| 5 (least affluent) | -0.69 [-0.76, -0.62] | -1.44 [-1.55, -1.33] |
| **Model: 4** |  |  |
| 1 (most affluent) | 0.00 (ref) | 0.00 (ref) |
| 2 | 0.05 [-0.02, 0.12] | 0.03 [-0.08, 0.14] |
| 3 | -0.05 [-0.12, 0.02] | -0.11 [-0.22, 0.00] |
| 4 | -0.24 [-0.32, -0.17] | -0.61 [-0.72, -0.51] |
| 5 (least affluent) | -0.52 [-0.59, -0.45] | -1.33 [-1.44, -1.21] |
| **Model: 5** |  |  |
| 1 (most affluent) | 0.00 (ref) | 0.00 (ref) |
| 2 | 0.04 [-0.03, 0.11] | 0.02 [-0.08, 0.13] |
| 3 | -0.05 [-0.12, 0.02] | -0.10 [-0.21, 0.00] |
| 4 | -0.22 [-0.29, -0.15] | -0.55 [-0.66, -0.44] |
| 5 (least affluent) | -0.54 [-0.61, -0.47] | -1.25 [-1.36, -1.14] |
| 1Coefficient: Difference in mean outcome (unit) (95% Confidence Interval) | | |

## Sensitivity analysis to examine the impact of the different categorisations used for ethnicity.

|  | Women | Men |
| --- | --- | --- |
| **Characteristic** | **Coef. (95% CI)**1 | **Coef. (95% CI)**1 |
| **Model: 1** |  |  |
| White British | 0.00 (ref) | 0.00 (ref) |
| Indian | -5.38 [-5.60, -5.16] | -7.59 [-7.90, -7.28] |
| Pakistani | -5.27 [-5.72, -4.82] | -6.53 [-7.05, -6.02] |
| Black Caribbean | 1.07 [0.85, 1.30] | 1.83 [1.41, 2.25] |
| Black African | -0.39 [-0.68, -0.10] | -3.05 [-3.46, -2.63] |
| Chinese | -2.41 [-2.79, -2.04] | -4.86 [-5.56, -4.15] |
| Mixed | -0.07 [-0.35, 0.21] | -0.30 [-0.81, 0.21] |
| Other | -2.81 [-3.01, -2.61] | -5.75 [-6.05, -5.45] |
| **Model: 2** |  |  |
| White British | 0.00 (ref) | 0.00 (ref) |
| Indian | -3.62 [-3.83, -3.41] | -5.39 [-5.69, -5.09] |
| Pakistani | -3.67 [-4.11, -3.24] | -4.55 [-5.04, -4.06] |
| Black Caribbean | 1.20 [0.99, 1.42] | 2.39 [1.99, 2.79] |
| Black African | 0.10 [-0.18, 0.38] | -1.66 [-2.05, -1.26] |
| Chinese | -0.86 [-1.22, -0.49] | -1.95 [-2.63, -1.28] |
| Mixed | 0.31 [0.04, 0.57] | 0.29 [-0.20, 0.77] |
| Other | -1.52 [-1.71, -1.33] | -3.61 [-3.91, -3.32] |
| **Model: 3** |  |  |
| White British | 0.00 (ref) | 0.00 (ref) |
| Indian | -3.49 [-3.70, -3.28] | -5.25 [-5.55, -4.95] |
| Pakistani | -3.41 [-3.85, -2.98] | -4.30 [-4.79, -3.81] |
| Black Caribbean | 1.40 [1.18, 1.61] | 2.19 [1.79, 2.59] |
| Black African | 0.42 [0.14, 0.70] | -1.74 [-2.14, -1.34] |
| Chinese | -1.13 [-1.49, -0.76] | -2.22 [-2.90, -1.55] |
| Mixed | 0.35 [0.08, 0.61] | 0.24 [-0.25, 0.72] |
| Other | -1.44 [-1.64, -1.25] | -3.54 [-3.83, -3.25] |
| **Model: 4** |  |  |
| White British | 0.00 (ref) | 0.00 (ref) |
| Indian | -3.53 [-3.74, -3.31] | -5.20 [-5.50, -4.91] |
| Pakistani | -3.28 [-3.71, -2.86] | -4.02 [-4.50, -3.53] |
| Black Caribbean | 1.56 [1.35, 1.77] | 2.30 [1.90, 2.70] |
| Black African | 0.50 [0.22, 0.78] | -1.59 [-1.98, -1.19] |
| Chinese | -1.02 [-1.38, -0.65] | -2.04 [-2.70, -1.37] |
| Mixed | 0.40 [0.13, 0.66] | 0.29 [-0.20, 0.77] |
| Other | -1.39 [-1.58, -1.20] | -3.44 [-3.73, -3.15] |
| 1Coefficient: Difference in mean outcome (unit) (95% Confidence Interval) | | |

## Sensitivity analysis focusing exclusively on England for IMD.

|  | Women | Men |
| --- | --- | --- |
| **Index of Multiple Deprivation** | **Coef. (95% CI)**1 | **Coef. (95% CI)**1 |
| **Model: 1** |  |  |
| 1 (most affluent) | 0.00 (ref) | 0.00 (ref) |
| 2 | -0.04 [-0.12, 0.04] | -0.17 [-0.29, -0.04] |
| 3 | -0.28 [-0.35, -0.20] | -0.52 [-0.64, -0.40] |
| 4 | -0.68 [-0.75, -0.60] | -1.38 [-1.50, -1.25] |
| 5 (least affluent) | -1.30 [-1.38, -1.22] | -2.68 [-2.80, -2.56] |
| **Model: 2** |  |  |
| 1 (most affluent) | 0.00 (ref) | 0.00 (ref) |
| 2 | 0.06 [-0.01, 0.13] | 0.04 [-0.07, 0.16] |
| 3 | -0.09 [-0.16, -0.01] | -0.13 [-0.25, -0.02] |
| 4 | -0.36 [-0.43, -0.28] | -0.73 [-0.85, -0.61] |
| 5 (least affluent) | -0.75 [-0.82, -0.67] | -1.60 [-1.71, -1.48] |
| **Model: 3** |  |  |
| 1 (most affluent) | 0.00 (ref) | 0.00 (ref) |
| 2 | 0.08 [0.01, 0.16] | 0.07 [-0.04, 0.19] |
| 3 | -0.03 [-0.11, 0.04] | -0.07 [-0.19, 0.05] |
| 4 | -0.27 [-0.34, -0.20] | -0.63 [-0.74, -0.51] |
| 5 (least affluent) | -0.59 [-0.67, -0.51] | -1.42 [-1.54, -1.31] |
| **Model: 4** |  |  |
| 1 (most affluent) | 0.00 (ref) | 0.00 (ref) |
| 2 | 0.09 [0.02, 0.17] | 0.03 [-0.09, 0.14] |
| 3 | -0.01 [-0.08, 0.07] | -0.12 [-0.24, -0.01] |
| 4 | -0.21 [-0.28, -0.13] | -0.66 [-0.77, -0.54] |
| 5 (least affluent) | -0.43 [-0.51, -0.36] | -1.32 [-1.44, -1.21] |
| **Model: 5** |  |  |
| 1 (most affluent) | 0.00 (ref) | 0.00 (ref) |
| 2 | 0.09 [0.02, 0.16] | 0.02 [-0.09, 0.13] |
| 3 | 0.00 [-0.08, 0.07] | -0.11 [-0.23, 0.00] |
| 4 | -0.19 [-0.26, -0.11] | -0.58 [-0.70, -0.47] |
| 5 (least affluent) | -0.47 [-0.55, -0.39] | -1.25 [-1.37, -1.13] |
| 1Coefficient: Difference in mean outcome (unit) (95% Confidence Interval) | | |