| Antigens | Antibody | Prevalence of responses (%)[b] |
|---|---|---|
| MSP1-19 | IgG | 48.6 |
| | IgG1 | 33.9 |
| | IgG3 | 43.2 |
| | IgM | 45.4 |
| MSP2 3D7 | IgG | 43.7 |
| | IgG1 | 45.6 |
| | IgG3 | 44.5 |
| | IgM | 41 |
| MSP2 FC27 | IgG | 61.2 |
| | IgG1 | 48.1 |
| | IgG3 | 60.7 |
| | IgM | 63.4 |
| AMA-1 | IgG | 57.9 |
| | IgG1 | 63.9 |
| | IgG3 | 42.6 |
| | IgM | 31.2 |

**Supplementary Data Table 1: Seroprevalence of merozoite antigen responses[a]**

[a] Seroprevalence was determined by ELISA.

[b] The threshold for positivity was determined as the mean +3 S.D. of negative control plasma. Each value represents % positive of 183 samples.

| Antigens | | Correlation Coefficient [a] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MSP1-19 | | MSP2 3D7 | | MSP2 FC27 | | AMA-1 | |
| | Antibody | IgG | IgM | IgG | IgM | IgG | IgM | IgG | IgM |
| MSP1-19 | IgG | | | | | | | | |
| | IgM | 0.17* | | | | | | | |
| MSP2 3D7 | IgG | 0.51 | 0.07** | | | | | | |
| | IgM | 0.41 | 0.51 | 0.50 | | | | | |
| MSP2 FC27 | IgG | 0.52 | 0.09** | 0.73 | 0.41 | | | | |
| | IgM | 0.38 | 0.50 | 0.42 | 0.65 | 0.55 | | | |
| AMA-1 | IgG | 0.54 | 0.03** | 0.67 | 0.44 | 0.72 | 0.48 | | |
| | IgM | 0.06** | 0.76 | -0.04** | 0.39 | -0.08** | 0.37 | -0.05** | |

**Supplementary Data Table 2: Correlation between IgG and IgM responses to merozoite antigens of *P. falciparum***

[a] Correlation coefficients were determined by Spearman's method. All correlations are significant at a value of $p<0.001$, unless otherwise indicated. * $p< 0.05$ **$p>0.1$

| | All *P. falciparum* episodes | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **IRR[b]** | **(95%CI)** | ***P*** | **aIRR[c]** | **(95%CI)** | ***P*** | **aIRR-FOI[d]** | **(95%CI)** | ***P*** |
| **MSP1-19** | | | | | | | | | |
| IgG (M) | **1.38** | **(1.04, 1.82)** | **0.025** | 1.13 | (0.85, 1.51) | 0.392 | 1.04 | (0.84, 1.29) | 0.719 |
| IgG (H) | 1.18 | (0.89, 1.56) | 0.261 | 1.06 | (0.82, 1.37) | 0.682 | 0.98 | (0.79, 1.22) | 0.854 |
| IgG1 (M) | 1.18 | (0.90, 1.54) | 0.227 | 1.14 | (0.87, 1.48) | 0.341 | 1.01 | (0.82, 1.24) | 0.95 |
| IgG1 (H) | 0.85 | (0.64, 1.13) | 0.254 | 0.88 | (0.69, 1.13) | 0.308 | 0.86 | (0.69, 1.08) | 0.19 |
| IgG3 (M) | 1.14 | (0.86, 1.51) | 0.352 | 1.16 | (0.90, 1.49) | 0.254 | 1.04 | (0.84, 1.29) | 0.729 |
| IgG3 (H) | 1.14 | (0.87, 1.48) | 0.337 | 1.17 | (0.89, 1.54) | 0.268 | 0.92 | (0.74, 1.14) | 0.465 |
| IgM (M) | 0.96 | (0.75, 1.24) | 0.775 | 0.95 | (0.75, 1.22) | 0.704 | 1.04 | (0.84, 1.28) | 0.746 |
| IgM (H) | 0.90 | (0.68, 1.19) | 0.476 | 0.87 | (0.65, 1.16) | 0.349 | 0.96 | (0.78, 1.19) | 0.702 |
| **MSP2 3D7** | | | | | | | | | |
| IgG (M) | 1.29 | (0.95, 1.75) | 0.098 | 1.14 | (0.84, 1.53) | 0.397 | 1.20 | (0.95, 1.52) | 0.127 |
| IgG (H) | **1.74** | **(1.34, 2.25)** | **<0.001** | 1.21 | (0.88, 1.67) | 0.237 | 1.17 | (0.93, 1.47) | 0.185 |
| IgG1 (M) | 1.19 | (0.87, 1.62) | 0.273 | 1.08 | (0.78, 1.49) | 0.659 | 1.08 | (0.85, 1.37) | 0.512 |
| IgG1 (H) | **1.72** | **(1.30, 2.26)** | **<0.001** | 1.22 | (0.86, 1.74) | 0.269 | 1.11 | (0.88, 1.40) | 0.368 |
| IgG3 (M) | **1.49** | **(1.11, 2.01)** | **0.008** | **1.45** | **(1.08, 1.94)** | **0.014** | 1.17 | (0.93, 1.48) | 0.182 |
| IgG3 (H) | **1.98** | **(1.52, 2.59)** | **<0.001** | 1.36 | (0.97, 1.90) | 0.076 | 1.18 | (0.94, 1.48) | 0.150 |
| IgM (M) | 0.90 | (0.67, 1.19) | 0.448 | 0.80 | (0.61, 1.05) | 0.103 | 0.94 | (0.75, 1.19) | 0.623 |
| IgM (H) | 1.28 | (0.99, 1.65) | 0.056 | 1.05 | (0.81, 1.37) | 0.695 | 1.09 | (0.88, 1.34) | 0.425 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **MSP2 FC27** | | | | | | | | | |
| IgG (M) | **1.51** | **(1.11, 2.06)** | **0.008** | **1.37** | **(1.02, 1.84)** | **0.038** | **1.29** | **(1.01, 1.65)** | **0.039** |
| IgG (H) | **1.99** | **(1.52, 2.62)** | **<0.001** | **1.46** | **(1.04, 2.06)** | **0.029** | **1.29** | **(1.00, 1.65)** | **0.046** |
| IgG1 (M) | **1.66** | **(1.23, 2.25)** | **0.001** | **1.38** | **(1.00, 1.91)** | **0.049** | **1.32** | **(1.03, 1.69)** | **0.026** |
| IgG1 (H) | **2.25** | **(1.72, 2.95)** | **<0.001** | **1.74** | **(1.28, 2.37)** | **<0.001** | **1.40** | **(1.10, 1.79)** | **0.007** |
| IgG3 (M) | **1.67** | **(1.23, 2.26)** | **0.001** | **1.55** | **(1.15, 2.08)** | **0.004** | **1.42** | **(1.13, 1.80)** | **0.003** |
| IgG3 (H) | **2.23** | **(1.69, 2.94)** | **<0.001** | **1.62** | **(1.15, 2.28)** | **0.006** | **1.40** | **(1.08, 1.81)** | **0.011** |
| IgM (M) | 0.92 | (0.69, 1.23) | 0.594 | 1.28 | (0.71, 2.31) | 0.407 | 0.94 | (0.76, 1.16) | 0.567 |
| IgM (H) | **1.36** | **(1.06, 1.75)** | **0.016** | **1.94** | **(1.12, 3.36)** | **0.018** | 1.04 | (0.84, 1.28) | 0.725 |
| **AMA-1** | | | | | | | | | |
| IgG (M) | **1.58** | **(1.18, 2.11)** | **0.002** | **1.39** | **(1.05, 1.84)** | **0.022** | **1.36** | **(1.07, 1.73)** | **0.013** |
| IgG (H) | **2.22** | **(1.67, 2.94)** | **<0.001** | **1.58** | **(1.09, 2.30)** | **0.017** | **1.38** | **(1.07, 1.78)** | **0.012** |
| IgG1(M) | 1.15 | (0.87, 1.53) | 0.326 | 1.13 | (0.86, 1.49) | 0.373 | 1.07 | (0.85, 1.36) | 0.562 |
| IgG1 (H) | **1.76** | **(1.37, 2.26)** | **<0.001** | 1.29 | (0.96, 1.73) | 0.091 | 1.18 | (0.95, 1.47) | 0.130 |
| IgG3 (M) | **1.39** | **(1.03, 1.86)** | **0.03** | **1.36** | **(1.03, 1.81)** | **0.033** | **1.28** | **(1.01, 1.61)** | **0.039** |
| IgG3 (H) | **2.11** | **(1.63, 2.72)** | **<0.001** | **1.67** | **(1.20, 2.31)** | **0.002** | **1.38** | **(1.10, 1.74)** | **0.005** |
| IgM (M) | 0.93 | (0.73, 1.20) | 0.597 | 1.02 | (0.79, 1.31) | 0.902 | 0.98 | (0.80, 1.21) | 0.884 |
| IgM (H) | 0.81 | (0.61, 1.07) | 0.145 | 0.86 | (0.66, 1.11) | 0.241 | 0.95 | (0.76, 1.19) | 0.650 |
| All (H)[e] | **1.47** | **(1.10, 1.95)** | **0.009** | 1.22 | (0.89, 1.67) | 0.217 | 1.19 | (0.91, 1.55) | 0.209 |

**Supplementary Data Table 3: Antibody responses to *P. falciparum* merozoite antigens and prospective risk of *P. falciparum* infection (any density)[a]**

[a] Antibody levels were grouped into tertiles and related to prospective incidence of *P. falciparum* malaria infection (any density). High antibody responders (designated H) or medium antibody responders (designated M) were compared to low responders for each antigen.

[b] Values represent Incidence Rate Ratios +/- Confidence Intervals (IRR).

[c] Adjustments were performed for the variables of village (11 categories), month (6 categories), year (continuous), age (continuous), *P. falciparum* infection status at the start of the interval (0,1), prior drug use (2 categories) and average ITN use (continuous) as defined previously (aIRR)(1).

[d] Adjustments were performed to account only for differences in exposure as defined previously (aIRR-FOI)(2).

[e] Prospective risk of malaria during the study follow up period was examined in 16 individuals who were high responders for all antigens and compared with the rest of the cohort.

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