

Supplementary Table and Figures

It should be noted that among the children identified as having a tracer condition through their GP records, who then completed a Children and Young People's Health Partnership (CYPHP) Healthcheck, 96% (4,546/4,719) reported having a condition.

Sensitivity analyses

Table S1: Bivariate, Multivariable analyses investigating Step 2, engagement with proactive identification of unmet need (completing CYPHP Healthcheck) sensitivity analyses

| | Excluding Lambeth N=9,078 | Missing category N=19,773 | Complete data analysis N=13,596 | Bivariate N=19,773 |
|-----------------------|------------------------------|------------------------------|---------------------------------------|-----------------------|
| | OR 95%CI | OR 95%CI | OR 95%CI | OR 95%CI |
| Age at start of study | 1.03 (1.00 to 1.05) | 1.04 (1.03 to 1.06) | 1.05 (1.03 to 1.07) | 1.19 (1.16 to 1.22) |
| Age squared* | 0.99 (0.99 to 1.00) | 0.99 (0.99 to 0.99) | 0.99 (0.99 to 0.99) | 0.98 (0.98 to 0.99) |
| Sex | NS | NS | NS | 0.96 (1.26 to 0.74) |
| Most vs Least | 0.66 (0.52 to 0.82) | 0.70 (0.59 to 0.83) | 0.69 (0.56 to 0.84) | 0.67 (0.57 to 0.80) |
| Ethnicity | | | | |
| White | Reference | Reference | Reference | Reference |
| Asian | 0.68 (0.56 to 0.83) | 0.72 (0.62 to 0.84) | 0.71 (0.61 to 0.83) | 0.76 (0.65 to 0.88) |
| Black | 0.70 (0.61 to 0.80) | 0.70 (0.64 to 0.78) | 0.69 (0.62 to 0.76) | 0.75 (0.68 to 0.82) |
| Mixed | 0.89 (0.74 to 1.06) | 0.89 (0.79 to 1.02) | 0.89 (0.78 to 1.01) | 0.93 (0.82 to 1.06) |
| Other ethnicity | 0.62 (0.50 to 0.78) | 0.64 (0.52 to 0.78) | 0.63 (0.52 to 0.77) | 0.63 (0.52 to 0.77) |
| (Missing Category) | N/A | 0.72 (0.65 to 0.79) | N/A | N/A |
| Condition | | | | |
| Constipation | Reference | Reference | Reference | Reference |
| Eczema | 2.18 (1.89 to 2.51) | 2.23 (1.99 to 2.49) | 2.38 (2.08 to 2.72) | 2.08 (1.87 to 2.33) |
| Asthma | 1.84 (1.60 to 2.11) | 2.35 (2.12 to 2.62) | 2.41 (2.12 to 2.74) | 1.95 (1.77 to 2.15) |
| 2+ Conditions | 3.84 (3.26 to 4.52) | 4.15 (3.67 to 4.70) | 4.18 (3.61 to 4.84) | 3.82 (3.39 to 4.31) |
| Federation | | | | |
| Southwark North | Reference | Reference | | |
| Southwark South | 1.16 (1.02 to 1.31) | 1.14 (0.94 to 1.38) | 1.10 (0.89 to 1.35) | 1.19 (0.97 to 1.45) |
| Lambeth | (Excluded) | 0.49 (0.41 to 0.58) | 0.48 (0.40 to 0.58) | 0.54 (0.45 to 0.64) |

CYPHP – Children and Young People's Health Partnership. *Age is not linearly associated with Healthcheck uptake, a quadratic variable is added to the model to improve fit. Random effects multivariable models with multiple imputed ethnicity to account for missing data, clustered by GP practice.

Children registered with a GP in Lambeth were less likely to complete a Healthcheck than those from Southwark OR: 0.49 (0.42 to 0.58), when comparing to Southwark North.

Table S2: Multivariable analyses investigating engagement with proactive identification of unmet need (CYPHP Healthcheck) for individual conditions (Asthma, constipation and eczema)

| | Asthma N=10,564 | Constipation N=5,785 | Eczema N=5,904 |
|-----------------------|---------------------|-------------------------|---------------------|
| | OR 95%CI | OR 95%CI | OR 95%CI |
| Age at start of study | 1.01 (0.99 to 1.03) | 1.08 (1.04 to 1.12) | 1.05 (1.02 to 1.08) |
| Age squared* | 0.99 (0.99 to 0.99) | 0.99 (0.99 to 0.99) | 0.99 (0.99 to 1.00) |
| Most vs Least | 0.77 (0.62 to 0.97) | 0.67 (0.49 to 0.92) | 0.76 (0.56 to 1.03) |
| Ethnicity | | | |
| White | <i>Reference</i> | <i>Reference</i> | <i>Reference</i> |
| Asian | 0.70 (0.57 to 0.87) | 0.83 (0.62 to 1.12) | 0.69 (0.53 to 0.88) |
| Black | 0.79 (0.70 to 0.90) | 0.87 (0.72 to 1.05) | 0.60 (0.50 to 0.72) |
| Mixed | 0.93 (0.79 to 1.10) | 1.09 (0.85 to 1.38) | 0.82 (0.65 to 1.02) |
| Other ethnicity | 0.63 (0.49 to 0.81) | 0.68 (0.48 to 0.97) | 0.55 (0.39 to 0.78) |
| GP Federation | | | |
| SN | <i>Reference</i> | <i>Reference</i> | <i>Reference</i> |
| Lambeth | 0.60 (0.50 to 0.71) | 0.43 (0.36 to 0.53) | 0.40 (0.31 to 0.50) |
| SS | 1.16 (0.95 to 1.42) | 1.23 (0.99 to 1.52) | 0.93 (0.71 to 1.21) |

CYPHP – Children and Young People’s Health Partnership. *Age is not linearly associated with Healthcheck uptake, a quadratic variable is added to the model to improve fit. Random effects multivariable models with multiple imputed ethnicity to account for missing data, clustered by GP practice.

Table S3: Descriptive statistics of unmet need among children who engaged with Children and Young Person Health Partnership, Population Health Management model

| | Population 2 | Population 3 | | |
|------------------------------|-----------------------------|--|----------|-------|
| | Engaged with PHM* N=4719 | Children with unmet needs** N=2,749 | | |
| | Number | Number | Column % | Row % |
| Asthma | 2124 | 886 | 32.2% | 41.7% |
| Constipation | 661 | 564 | 20.5% | 85.3% |
| Eczema | 1061 | 690 | 25.1% | 65.0% |
| More than 1 condition | 873 | 654 | 23.8% | 74.9% |
| Age | | | | |
| <1 year | 341 | 232 | 8.4% | 68.0% |
| 1-<2 years | 306 | 227 | 8.3% | 74.2% |
| 2-<5 years | 1099 | 714 | 26.0% | 65.0% |
| 5-<8 years | 969 | 575 | 20.9% | 59.3% |
| 8-<13 | 1570 | 830 | 30.2% | 52.9% |
| 13-<16 years | 434 | 216 | 7.9% | 49.8% |
| Sex | | | | |
| Female | 2181 | 1,363 | 49.6% | 62.5% |
| Male | 2538 | 1431 | 52.1% | 56.4% |
| Ethnicity | | | | |
| Asian | 284 | 174 | 6.3% | 61.3% |
| Black | 1,116 | 715 | 26.0% | 64.1% |
| Mixed | 478 | 271 | 9.9% | 56.7% |
| Other | 161 | 98 | 3.6% | 60.9% |
| White | 1,282 | 692 | 25.2% | 54.0% |
| Missing data | 1,398 | 844 | 30.7% | 60.4% |
| Deprivation*** | | | | |
| 1: (Most deprived) | 1,988 | 1,261 | 45.9% | 63.4% |
| 2 | 1,652 | 977 | 35.5% | 59.1% |
| 3 | 786 | 407 | 14.8% | 51.8% |
| 4 | 259 | 128 | 4.7% | 49.4% |
| 5(Least deprived) | 33 | 20 | 0.7% | 60.6% |
| Missing data | 1 | 1 | | |

*Children who engaged with Children and Young Person Health Partnership, Population Health Management (CYPHP) model by completing the CYPHP Healthcheck, ** Children identified with unmet needs as those who met the threshold for care in the CYPHP Healthcheck. Deprivation levels determined from English Indices of Multiple Deprivation (2019) score quintiles

Table S4: Multivariable analyses investigating engaged children receiving service for individual conditions (Asthma, constipation and eczema)

| | Asthma | Constipation | Eczema |
|-----------------|---------------------|---------------------|---------------------|
| | N=1,697 | N=665 | N=1,031 |
| | OR (95%CI) | OR (95%CI) | OR (95%CI) |
| Most vs Least | 1.83 (1.09 to 3.08) | 1.07 (0.47 to 2.45) | 1.49 (0.79 to 2.81) |
| Ethnicity | | | |
| White | <i>Reference</i> | <i>Reference</i> | <i>Reference</i> |
| Asian | 1.02 (0.62 to 1.65) | 0.93 (0.50 to 1.73) | 0.94 (0.57 to 1.56) |
| Black | 1.70 (1.29 to 2.23) | 1.39 (0.87 to 2.20) | 1.05 (0.74 to 1.49) |
| Mixed | 1.03 (0.71 to 1.48) | 0.90 (0.53 to 1.54) | 0.74 (0.47 to 1.17) |
| Other ethnicity | 0.98 (0.51 to 1.89) | 1.04 (0.34 to 3.22) | 0.60 (0.24 to 1.49) |

OR - odds ratio and 95% confidence interval of receiving specialist care with Children and Young Person Health Partnership, among children who completed the CYPHP Healthcheck, with 95% Confidence interval. For each individual tracer condition

Table S5: Multivariable analyses investigating children with a tracer condition receiving service for all and individual conditions (Asthma, constipation and eczema)

| | All tracer conditions | Asthma | Constipation | Eczema |
|-----------------|------------------------------|---------------------|---------------------|---------------------|
| | N=12,823 | N=6,803 | N=3,892 | N=3,859 |
| | OR 95%CI | OR 95%CI | OR 95%CI | OR 95%CI |
| Most vs Least | 0.89 (0.65 to 1.22) | 0.96 (0.62 to 1.48) | 0.80 (0.47 to 1.35) | 1.00 (0.62 to 1.62) |
| Ethnicity | | | | |
| White | <i>Reference</i> | <i>Reference</i> | <i>Reference</i> | <i>Reference</i> |
| Asian | 0.81 (0.62 to 1.06) | 0.72 (0.49 to 1.06) | 0.98 (0.63 to 1.50) | 0.73 (0.50 to 1.07) |
| Black | 1.00 (0.84 to 1.19) | 1.13 (0.90 to 1.41) | 1.12 (0.83 to 1.51) | 0.69 (0.53 to 0.92) |
| Mixed | 1.00 (0.80 to 1.25) | 1.01 (0.74 to 1.37) | 1.05 (0.72 to 1.53) | 0.76 (0.53 to 1.09) |
| Other ethnicity | 0.65 (0.43 to 0.98) | 0.70 (0.41 to 1.20) | 0.60 (0.29 to 1.27) | 0.47 (0.22 to 1.00) |

OR - odds ratio and 95% confidence interval of received specialist service with Children and Young Person Health Partnership, among all children identified with a tracer condition and registered with GP practices offering Children and Young Person Health Partnership specialist care.

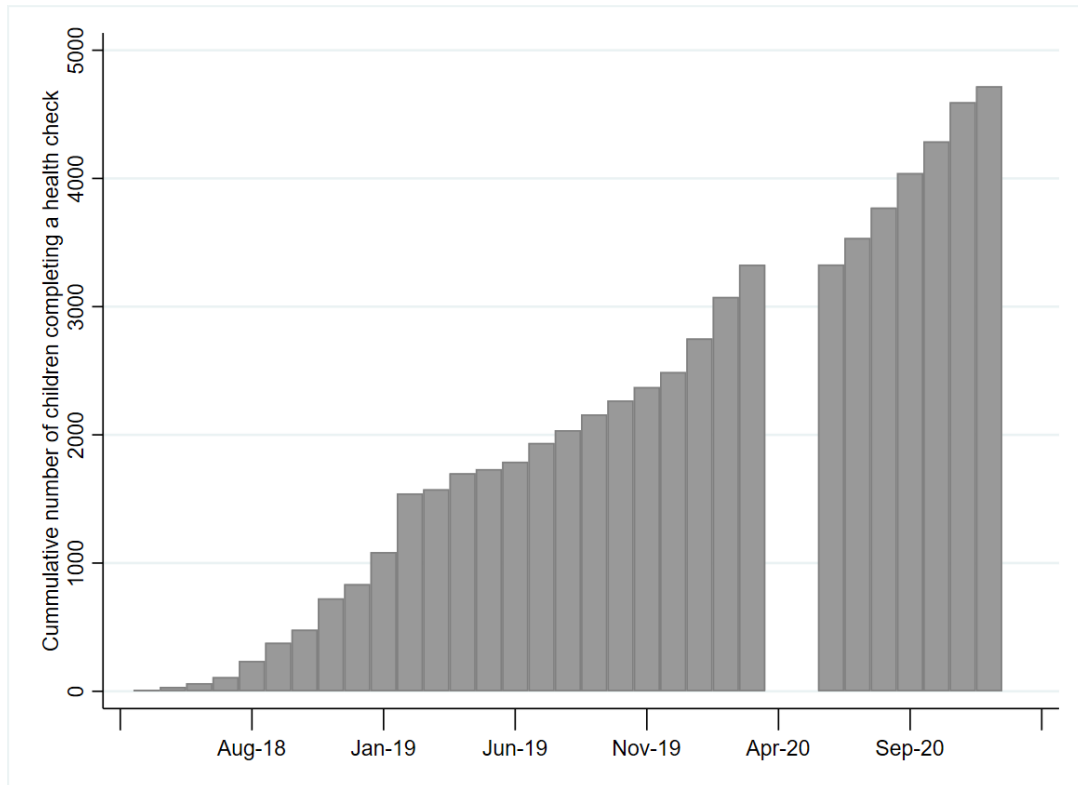


Figure S1: Cumulative number of children completing a CYPHP Healthcheck by month