

# Applicability of food monitoring data for assessing relative exposure contributions of pyrethroids in retrospective human biomonitoring risk estimations.

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## SUPPLEMENTARY MATERIAL

**Table S1. HBM-GVs calculated for the selected biomarkers of each active substance**

| Active substance | ADI 2020 | ADI before 2020 | Biomarker | Fue | HBM-GV before 2020 |        | HBM-GV 2020 |            |
|------------------|----------|-----------------|-----------|-----|--------------------|--------|-------------|------------|
|                  |          |                 |           |     | Children           | Adults | Children    | Adults     |
| Cyfluthrin       | 0,01     | 0,003           | DCCA      | 36  | 19                 | 28,5   | <b>57</b>   | <b>86</b>  |
|                  |          |                 | F3PBA     | 47  | 27,6               | 41,5   | <b>84</b>   | <b>126</b> |
| Cypermethrin     | 0,005    | 0,05            | DCCA      | 36  | 300                | 450    | <b>30</b>   | <b>45</b>  |
|                  |          |                 | 3PBA      | 9   | 77                 | 116    | <b>8</b>    | <b>12</b>  |
| Permethrin       | 0,01     | 0,05            | DCCA      | 36  | 320                | 480    | <b>64</b>   | <b>96</b>  |
|                  |          |                 | 3PBA      | 9   | 82                 | 123    | <b>16</b>   | <b>25</b>  |
| L-Cyhalothrin    | 0,025    | 0,025           | CFMP      | 21  | 9                  | 14     | <b>9</b>    | <b>14</b>  |
|                  |          |                 | 3PBA      | 9   | 3,6                | 5,4    | <b>3,6</b>  | <b>5,4</b> |
| Deltamethrin     | 0,01     | 0,01            | DBCA      | 45  | 89                 | 133    | <b>89</b>   | <b>133</b> |
|                  |          |                 | 3PBA      | 9   | 13                 | 19     | <b>13</b>   | <b>19</b>  |
| Bifenthrin       | 0,015    | 0,015           | CFMP      | 21  | 60                 | 90     | <b>60</b>   | <b>90</b>  |

**Table S2. Summary of the refined risk characterization outcomes, as Hazard Quotients (HQ) for the HBM4EU adult and children population groups.**

|             |      | TOTAL RISK   |            |            |               |            |              |          |
|-------------|------|--------------|------------|------------|---------------|------------|--------------|----------|
|             |      | ADULTS       |            |            |               |            |              |          |
|             |      | Cypermethrin | Permethrin | Cyfluthrin | L-Cyhalothrin | Bifenthrin | Deltamethrin | TOTAL HQ |
|             |      | HQ DCCA      | HQ DCCA    | HQ DCCA    | HQ CFMP       | HQ CFMP    | HQ DBCA      | TOTAL HQ |
| Percentile  |      | Average      | Average    | Average    |               |            |              | SUM      |
| France      | 0.05 | 0.00141      | 0.0003     | 0.0002     |               |            | 0.00071      | 0.00     |
|             | 0.10 | 0.00191      | 0.0004     | 0.0002     |               |            | 0.00142      | 0.00     |
|             | 0.25 | 0.00325      | 0.0006     | 0.0004     |               |            | 0.00269      | 0.01     |
|             | 0.50 | 0.00601      | 0.0011     | 0.0007     |               |            | 0.00476      | 0.01     |
|             | 0.75 | 0.01148      | 0.0021     | 0.0013     |               |            | 0.00939      | 0.02     |
|             | 0.90 | 0.02082      | 0.0038     | 0.0023     |               |            | 0.02518      | 0.05     |
|             | 0.95 | 0.03275      | 0.0060     | 0.0037     |               |            | 0.04050      | 0.08     |
| Switzerland | 0.05 | 0.00138      | 0.0003     | 0.0002     |               |            |              | 0.00     |
|             | 0.10 | 0.00138      | 0.0003     | 0.0002     |               |            |              | 0.00     |
|             | 0.25 | 0.00249      | 0.0005     | 0.0003     |               |            |              | 0.00     |
|             | 0.50 | 0.00456      | 0.0008     | 0.0005     |               |            | 0.00098      | 0.01     |
|             | 0.75 | 0.00954      | 0.0018     | 0.0011     |               |            | 0.00188      | 0.01     |
|             | 0.90 | 0.01490      | 0.0027     | 0.0017     | 0.0124        | 0.0011     | 0.00392      | 0.04     |
|             | 0.95 | 0.02273      | 0.0042     | 0.0026     | 0.0198        | 0.0017     | 0.00671      | 0.06     |
| Germany     | 0.05 | 0.00138      | 0.0003     | 0.0002     |               |            |              | 0.00     |
|             | 0.10 | 0.00138      | 0.0003     | 0.0002     |               |            |              | 0.00     |
|             | 0.25 | 0.00138      | 0.0003     | 0.0002     |               |            |              | 0.00     |
|             | 0.50 | 0.00263      | 0.0005     | 0.0003     |               |            |              | 0.00     |
|             | 0.75 | 0.00498      | 0.0009     | 0.0006     |               |            | 0.00143      | 0.01     |
|             | 0.90 | 0.00831      | 0.0015     | 0.0009     | 0.0069        | 0.0006     | 0.00311      | 0.02     |

|        |      |         |        |        |        |        |         |      |
|--------|------|---------|--------|--------|--------|--------|---------|------|
|        | 0.95 | 0.01177 | 0.0022 | 0.0013 | 0.0124 | 0.0011 | 0.00407 | 0.03 |
| Israel | 0.05 | 0.00187 | 0.0003 | 0.0002 |        |        |         | 0.00 |
|        | 0.10 | 0.00187 | 0.0003 | 0.0002 |        |        |         | 0.00 |
|        | 0.25 | 0.00387 | 0.0007 | 0.0004 |        |        |         | 0.01 |
|        | 0.50 | 0.00773 | 0.0014 | 0.0009 | 0.0084 | 0.0007 | 0.00091 | 0.02 |
|        | 0.75 | 0.01367 | 0.0025 | 0.0015 | 0.0192 | 0.0017 | 0.00157 | 0.04 |
|        | 0.90 | 0.03409 | 0.0063 | 0.0038 | 0.0369 | 0.0032 | 0.00273 | 0.09 |
|        | 0.95 | 0.04258 | 0.0078 | 0.0048 | 0.0481 | 0.0042 | 0.00315 | 0.11 |

|             |      | TOTAL RISK CHILDREN |            |            |               |            |              |          |
|-------------|------|---------------------|------------|------------|---------------|------------|--------------|----------|
|             |      | Cypermethrin        | Permethrin | Cyfluthrin | L-Cyhalothrin | Bifenthrin | Deltamethrin |          |
|             |      | HQ DCCA             | HQ DCCA    | HQ DCCA    | HQ CFMP       | HQ CFMP    | HQ DBCA      | TOTAL HQ |
| Percentile  |      | Average             | Average    | Average    |               |            |              | SUM      |
| France      | 0.05 | 0.0032              | 0.0006     | 0.0004     |               |            | 0.00223      | 0.01     |
|             | 0.1  | 0.0045              | 0.0008     | 0.0005     |               |            | 0.00317      | 0.01     |
|             | 0.25 | 0.0065              | 0.0012     | 0.0007     |               |            | 0.00567      | 0.01     |
|             | 0.5  | 0.0109              | 0.0020     | 0.0012     |               |            | 0.01111      | 0.03     |
|             | 0.75 | 0.0197              | 0.0036     | 0.0022     |               |            | 0.02332      | 0.05     |
|             | 0.9  | 0.0420              | 0.0077     | 0.0047     |               |            | 0.04253      | 0.10     |
|             | 0.95 | 0.0671              | 0.0124     | 0.0076     |               |            | 0.06008      | 0.15     |
| Netherlands | 0.05 | 0.0067              | 0.0012     | 0.0008     |               |            |              | 0.01     |
|             | 0.1  | 0.0086              | 0.0016     | 0.0010     |               |            |              | 0.01     |
|             | 0.25 | 0.0120              | 0.0022     | 0.0014     |               |            | 0.00494      | 0.02     |
|             | 0.5  | 0.0225              | 0.0041     | 0.0025     | 0.0115        |            | 0.00974      | 0.05     |
|             | 0.75 | 0.0426              | 0.0078     | 0.0048     | 0.0230        |            | 0.01554      | 0.09     |
|             | 0.9  | 0.0648              | 0.0119     | 0.0073     | 0.0532        | 0.0045     | 0.02813      | 0.17     |
|             | 0.95 | 0.0913              | 0.0168     | 0.0103     | 0.0913        | 0.0076     | 0.04337      | 0.26     |

|                |      |        |        |        |        |        |         |      |
|----------------|------|--------|--------|--------|--------|--------|---------|------|
| <b>Belgium</b> | 0.05 | 0.0086 | 0.0018 | 0.0009 |        |        |         | 0.01 |
|                | 0.1  | 0.0114 | 0.0023 | 0.0012 |        |        |         | 0.01 |
|                | 0.25 | 0.0204 | 0.0042 | 0.0021 |        |        | 0.00279 | 0.03 |
|                | 0.5  | 0.0366 | 0.0076 | 0.0038 |        |        | 0.00606 | 0.05 |
|                | 0.75 | 0.0663 | 0.0136 | 0.0071 | 0.0130 | 0.0011 | 0.01285 | 0.11 |
|                | 0.9  | 0.1358 | 0.0274 | 0.0154 | 0.0281 | 0.0024 | 0.02469 | 0.23 |
|                | 0.95 | 0.1601 | 0.0326 | 0.0176 | 0.0555 | 0.0046 | 0.03441 | 0.30 |
| <b>Cyprus</b>  | 0.05 | 0.0080 | 0.0016 | 0.0009 |        |        | 0.00183 | 0.01 |
|                | 0.1  | 0.0100 | 0.0018 | 0.0011 |        |        | 0.00244 | 0.02 |
|                | 0.25 | 0.0181 | 0.0033 | 0.0020 |        |        | 0.00362 | 0.03 |
|                | 0.5  | 0.0328 | 0.0060 | 0.0037 |        |        | 0.00645 | 0.05 |
|                | 0.75 | 0.0543 | 0.0107 | 0.0061 | 0.0074 | 0.0006 | 0.01228 | 0.09 |
|                | 0.9  | 0.0915 | 0.0191 | 0.0103 | 0.0150 | 0.0013 | 0.02907 | 0.17 |
|                | 0.95 | 0.1218 | 0.0264 | 0.0138 | 0.0188 | 0.0016 | 0.04476 | 0.23 |
| <b>Israel</b>  | 0.05 | 0.0045 | 0.0008 | 0.0005 |        |        |         | 0.01 |
|                | 0.1  | 0.0043 | 0.0008 | 0.0005 |        |        |         | 0.01 |
|                | 0.25 | 0.0075 | 0.0014 | 0.0008 |        |        |         | 0.01 |
|                | 0.5  | 0.0133 | 0.0024 | 0.0015 | 0.0076 | 0.0006 | 0.00198 | 0.03 |
|                | 0.75 | 0.0329 | 0.0061 | 0.0037 | 0.0138 | 0.0012 | 0.00372 | 0.06 |
|                | 0.9  | 0.0707 | 0.0130 | 0.0080 | 0.0373 | 0.0031 | 0.01005 | 0.14 |
|                | 0.95 | 0.1083 | 0.0199 | 0.0122 | 0.0546 | 0.0046 | 0.01095 | 0.21 |