**Supplementary Table 1: Job Descriptions of Cleanup Workers**

|  |  |  |
| --- | --- | --- |
| **Job Descriptions** | **Number of Workers** | **Percent** |
| **Total** | 1,343 | 100.0 |
| Contaminated Sand/Trash Removal | 778 | 57.9 |
| Oil Vacuum/Oil Slick Removal | 315 | 23.5 |
| Support Personnel\* | 61 | 4.5 |
| Supervisor/Health Care Professional | 38 | 2.8 |
| Transport Driver/Ship Pilot | 23 | 1.7 |
| Oil Dispersant Applicator | 17 | 1.3 |
| Environmental Sampling Personnel | 9 | 0.7 |
| Others | 44 | 3.3 |
| Missing | 58 | 4.3 |

**\*Coordinators, PTTGC Corporate Representatives, Visitors, Photographers, and Journalists were grouped as the support personnel.**

**Supplementary Table2: Personal Protective Equipment Use of Workers**

|  |  |  |
| --- | --- | --- |
| **Personal Protective Equipment (PPE) Use** | **Number of Workers** | **Percent** |
| **Total** | 1,343 | 100.0 |
| Any PPE Use | 1132 | 84.3 |
| Mask\* | 603 | 44.9 |
| Coveralls | 523 | 38.9 |
| Gloves | 770 | 57.3 |
| Boots | 589 | 43.9 |
| Missing Data | 49 | 3.6 |
| Complete Set of PPE (Wearing 4 of The Above) | 226 | 16.8 |
| **Frequency of PPE Use** |  |  |
| - Never | 46 | 3.4 |
| - Sometimes | 737 | 54.9 |
| - Often | 426 | 31.7 |
| Missing Data | 134 | 9.9 |

**\* Either one of N95, R95 or mask with filter**

**Supplementary Table 3: Log-Linear Regression with GEE\* of Urinary 1-OHPG by PPE Use (n=1,294)\*\***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type of PPE** | **Geometric Mean Ratio of 1-OHPG (95% CI)** | | | |
| **Univariable Model** | **Model 1** | **Model 2** | **Model 3** |
| **Any PPE Use**  (vs No PPE use) | 0.99 (0.79-1.25) | 0.97 (0.77-1.22) | 0.97 (0.78-1.20) | 0.97 (0.80-1.16) |
| **Mask**  (vs No Mask use) | **1.27 (1.09-1.47)** | 1.12 (0.95-1.31) | 1.14 (0.98-1.32) | **1.17 (1.02-1.33)** |
| **Coveralls**  (vs No Coverall use) | **1.40 (1.20-1.63)** | **1.22 (1.04-1.44)** | 1.16 (0.99-1.35) | **1.15 (1.01-1.31)** |
| **Gloves**  (vs No Glove use) | 0.95 (0.82-1.11) | 1.05 (0.89-1.23) | 1.03 (0.89-1.20) | 0.98 (0.86-1.11) |
| **Boots**  (vs No Boots use) | 0.89 (0.77-1.04) | 0.95 (0.82-1.11) | 0.96 (0.84-1.11) | 0.98 (0.87-1.11) |
| **Frequency**  - Never  - Sometimes  - Often | 1.0 (Ref)  0.71 (0.47-1.06)  0.72 (0.48-1.07) | 1.0 (Ref)  0.76 (0.51-1.13)  0.75 (0.51-1.11) | 1.0 (Ref)  0.78 (0.55-1.11)  0.78 (0.56-1.10) | 1.0 (Ref)  0.82 (0.60-1.11)  0.85 (0.63-1.15) |

**Model 1: Adjusted by days of cleanup (day 2-4, day 5-7, day 8-14, day 15-21 and day 22-28)**

**Model 2: Adjusted by days of cleanup and urinary cotinine**

**Model 3: Adjusted by days of cleanup, urinary cotinine and creatinine**

\*Generalized Estimating Equation with Exchangeable Correlation Structure

\*\*49 workers had at least one piece of missing data

**Supplementary Table 4: Urinary t,t-MA Detectable Percentages by Job Description**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | **Urinary t,t-MA** | | | |
| **Job Descriptions** | **Total**  **(N)** | **Detectable** | | **Non-detectable** | |
| **N** | **Percent** | **N** | **Percent** |
| **Total** | 1,343 | 436 | 32.5 | 907 | 67.5 |
| Oil Dispersant Applicator | 17 | 5 | 29.4 | 12 | 70.6 |
| Contaminated Sand/Trash Removal | 778 | 265 | 34.1 | 513 | 65.9 |
| Environmental Sampling Personnel | 9 | 1 | 11.1 | 8 | 88.9 |
| Oil Vacuum/Oil Slick Removal | 315 | 91 | 28.9 | 224 | 71.1 |
| Supervisor/Health Care Professional | 38 | 10 | 26.3 | 28 | 73.7 |
| Transport Driver/Ship Pilot | 23 | 11 | 47.8 | 12 | 52.2 |
| Support Personnel | 61 | 21 | 34.4 | 38 | 62.3 |
| Others | 44 | 16 | 36.4 | 28 | 63.6 |
| Missing | 58 | 16 | 27.6 | 42 | 72.4 |

**Supplementary Table 5: Logistic Regression with GEE\* of Detectable t,t-MA by Job Description (Subgroup Nonsmokers) (N=655)\*\***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Job Descriptions** | **Odds Ratio of t,t-MA Detectable (95% CI)** | | | | | |
| **Univariable Model** | **Model 1** | **Model 2** | **Model 3** | **Model 4** |
| **Support Personnel\*\*\*** | 1.00 (Ref) | 1.00 (Ref) | 1.00 (Ref) | 1.00 (Ref) | 1.00 (Ref) |
| **Oil Dispersant Applicator** | NA | NA | NA | NA | NA |
| **Contaminated Sand/**  **Trash Removal** | 1.05 (0.48-2.29) | 1.23 (0.55-2.71) | 0.64 (0.28-1.44) | 1.13 (0.51-2.51) | 0.56 (0.24-1.29) |
| **Environmental Sampling Personnel** | NA | NA | NA | NA | NA |
| **Oil Vacuum/**  **Oil Slick Removal** | 0.96 (0.42-2.28) | 1.03 (0.44-2.39) | 0.55 (0.23-1.34) | 0.94 (0.40-2.20) | 0.49 (0.20-1.19) |
| **Supervisor/**  **Health Care Professional** | 0.77 (0.23-2.58) | 0.87 (0.26-3.00) | 0.49 (0.13-1.82) | 0.86 (0.25-2.96) | 0.47 (0.12-1.76) |
| **Transport Driver/Ship Pilot** | 1.38 (0.30-6.27) | 1.58 (0.29-8.79) | 1.73 (0.31-8.12) | 1.33 (0.24-7.23) | 1.33 (0.31-5.74) |
| **Others** | 1.59 (0.56-4.54) | 1.40 (0.48-4.05) | 0.72 (0.21-2.51) | 1.29 (0.45-3.71) | 0.65 (0.18-2.29) |

**Model 1: Adjusted by days of cleanup (day 2-4, day 5-7, day 8-14, day 15-28)**

**Model 2: Adjusted by days of cleanup and urinary creatinine**

**Model 3: Adjusted by days of cleanup and urinary cotinine**

**Model 4: Adjusted by days of cleanup, urinary cotinine and creatinine**

NA because 0/6 of the oil dispersant applicator and 0/8 of environmental sampling personnel had detectable t,t-MA levels

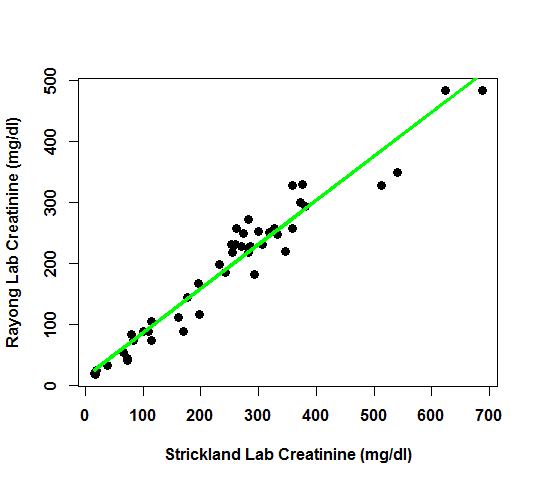
\* Generalized Estimating Equation with Exchangeable Correlation Structure

\*\*24 Unknown Job Description

\*\*\* Coordinators, PTTGC Corporate Representatives, Visitors, Photographers, and Journalists were grouped as the support personnel.

**Supplementary Figure 1: Scatter Plot Illustrating Differences in Urinary Creatinine Levels between Strickland’s (X-axis) and Rayong’s (Y-axis) Laboratory**

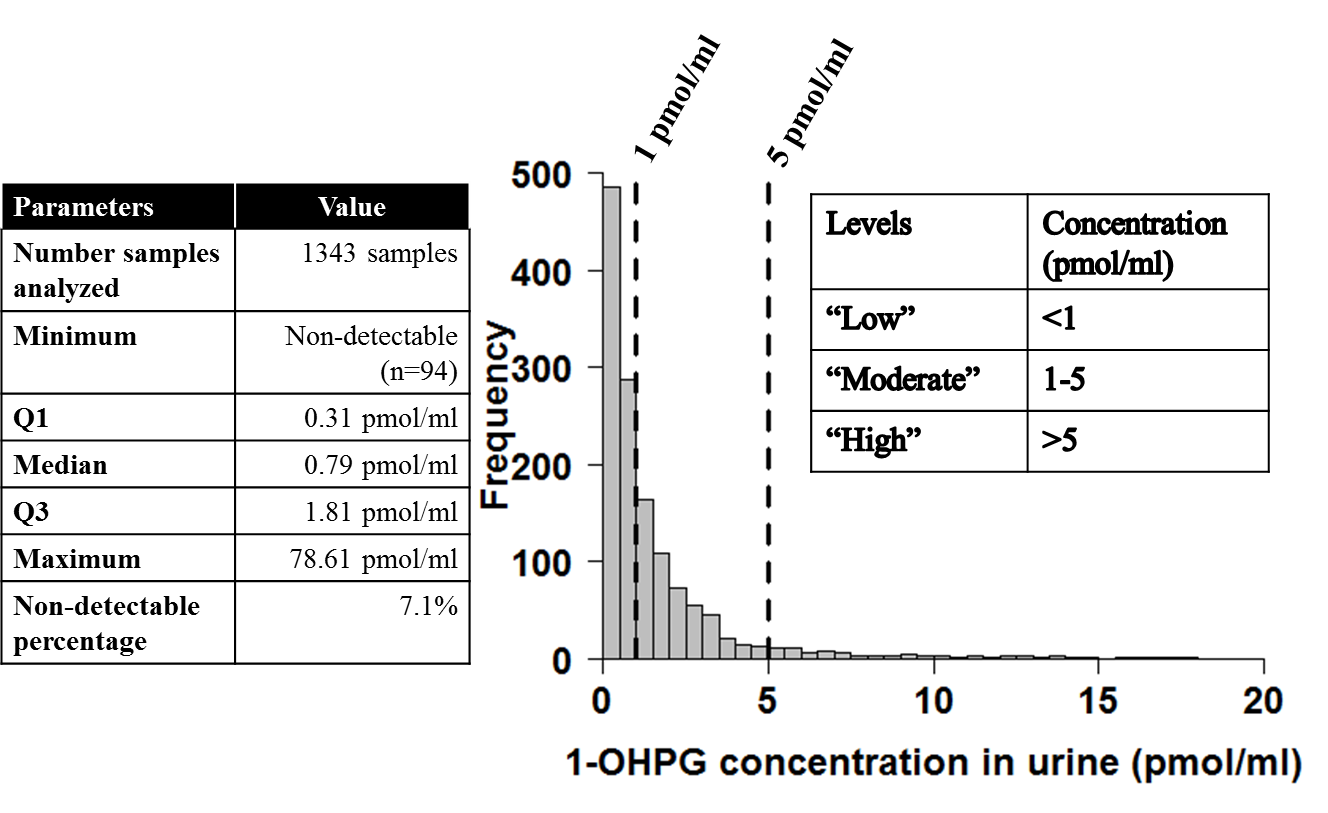
**Y = 0.724X + 14.8**



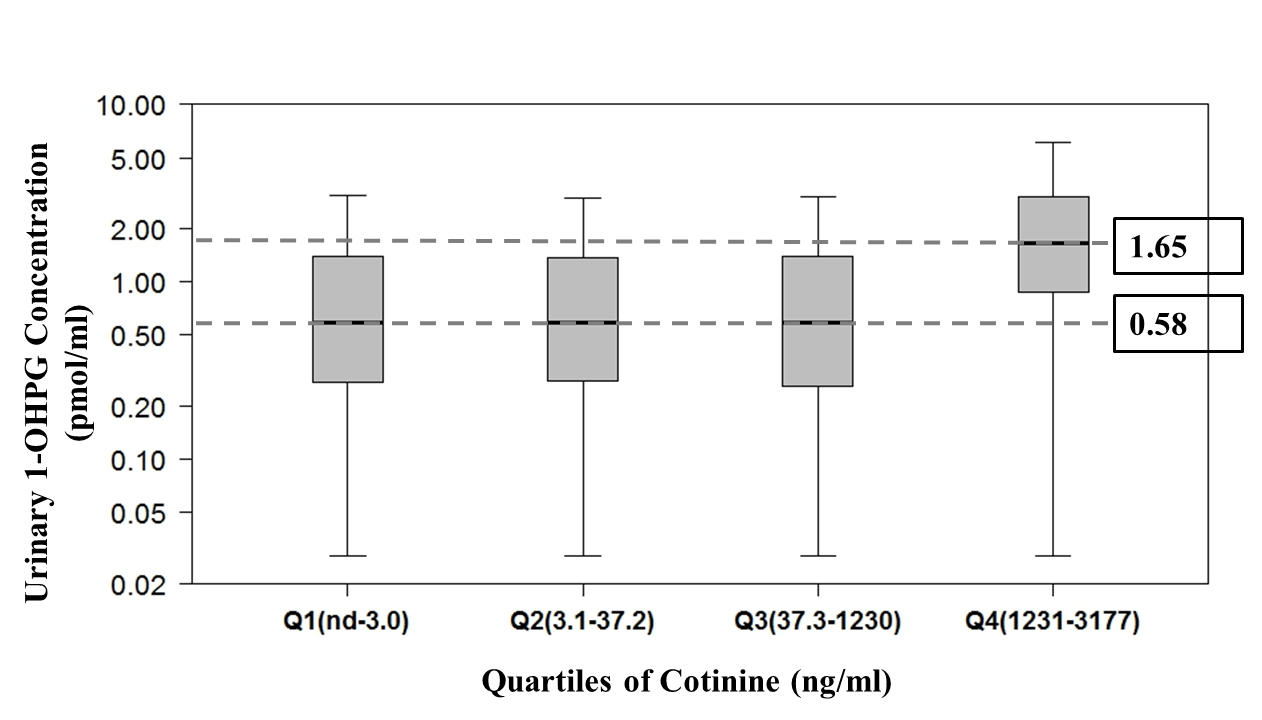
From linear regression, the derived equation was:

Y (Rayong’s Creatinine) = 0.724\*X (Strickland’s Creatinine) + 14.8; (r2=0.94)

**Supplementary Figure 2: Laboratory Results of Urinary 1-OHPG (n=1,343)**



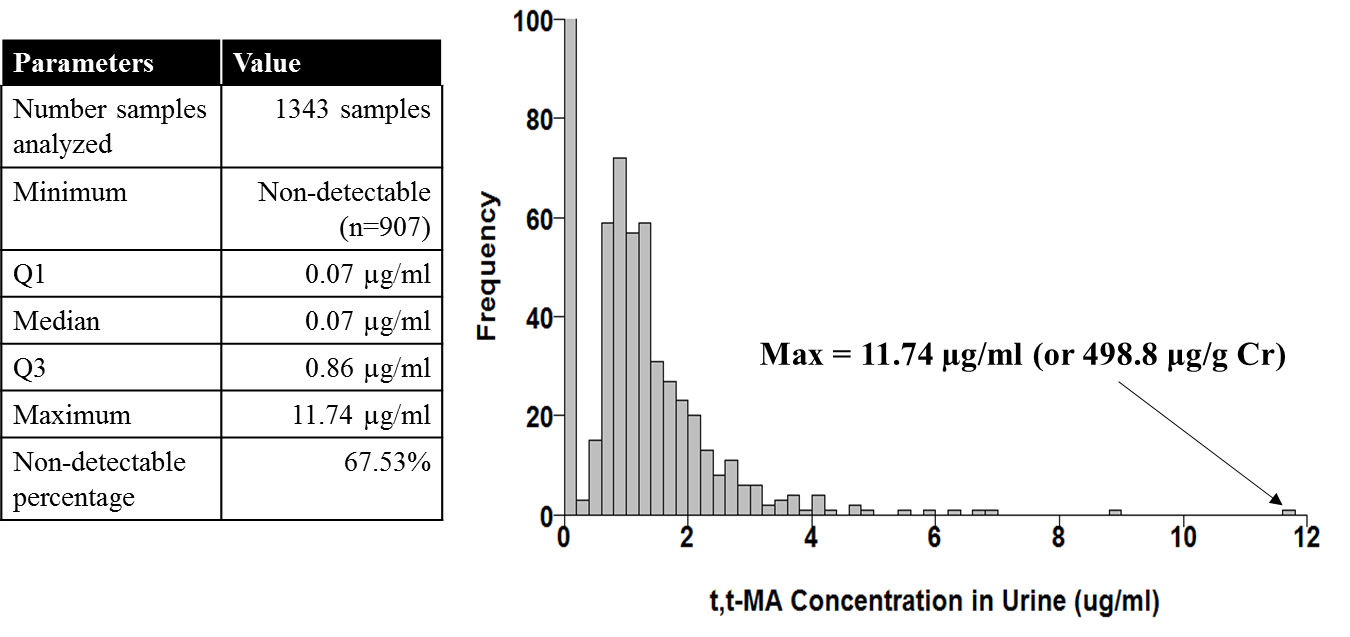
**Supplementary Figure 3: Urinary 1-OHPG (Logscale) by Quartiles of Cotinine**



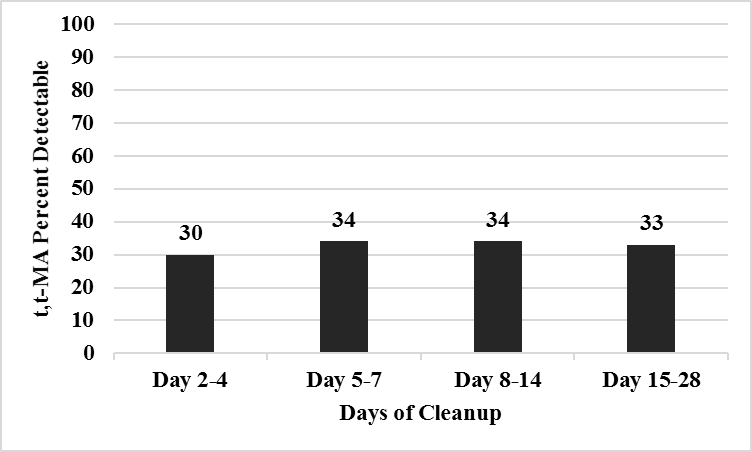
**Supplementary Figure 4: Urinary t,t-MA Results from Rayong Hospital**

**907**

**907**



**Supplementary Figure 5: Urinary t,t-MA Detectable Percentages by Days of Cleanup (n = 1,343)**



**Supplementary Figure 6: Urinary t,t-MA Detectable Percentages by Cotinine Quartiles (n = 1,343)**

