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# Risk Factors for Cancer in the Workplace

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| | Metal Oxide Fumes | | | | | | Metallic Dust | | | | | | Soldering Fumes | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | 17 | 1.0 | 0.6 – 1.6 | 4 | 0.6 | 0.2 – 1.3 | 27 | 1.0 | 0.7 – 1.5 | 10 | 0.8 | 0.4 – 1.4 | 5 | 0.9 | 0.4 – 2.0 | 2 | 0.7 | 0.2 – 2.3 |
| Stomach | 48 | 1.1 | 0.8 – 1.4 | 20 | 1.1 | 0.7 – 1.7 | 70 | 1.0 | 0.8 – 1.3 | 30 | 1.0 | 0.7 – 1.4 | 18 | 1.1 | 0.7 – 1.7 | 11 | 1.5 | 0.9 – 2.6 |
| Colon | 89 | 1.0 | 0.8 – 1.3 | 29 | 0.8 | 0.6 – 1.2 | 124 | 0.9 | 0.7 – 1.1 | 57 | 0.9 | 0.7 – 1.2 | 25 | 0.7 | 0.5 – 1.1 | 11 | 0.7 | 0.4 – 1.2 |
| Rectum | 53 | 1.1 | 0.8 – 1.4 | 17 | 0.8 | 0.5 – 1.3 | 69 | 0.9 | 0.7 – 1.1 | 30 | 0.8 | 0.6 – 1.2 | 15 | 0.8 | 0.5 – 1.3 | 8 | 0.8 | 0.4 – 1.5 |
| Pancreas | 20 | 1.0 | 0.7 – 1.6 | 9 | 1.1 | 0.6 – 2.0 | 28 | 0.9 | 0.6 – 1.4 | 16 | 1.2 | 0.8 – 1.9 | 8 | 1.1 | 0.6 – 2.1 | 1 | 0.3 | 0.1 – 1.5 |
| Lung | 183 | 1.2 | 0.9 – 1.4 | 83 | 1.1 | 0.8 – 1.4 | 276 | 1.3 | 1.1 – 1.6 | 130 | 1.2 | 1.0 – 1.6 | 54 | 0.9 | 0.6 – 1.2 | 30 | 0.9 | 0.6 – 1.4 |
| Prostate | 90 | 1.0 | 0.8 – 1.3 | 42 | 1.3 | 0.9 – 1.9 | 140 | 1.2 | 1.0 – 1.5 | 65 | 1.4 | 1.0 – 1.8 | 27 | 1.0 | 0.7 – 1.4 | 14 | 1.1 | 0.6 – 1.8 |
| Bladder | 96 | 1.1 | 0.9 – 1.4 | 34 | 0.9 | 0.6 – 1.2 | 137 | 1.0 | 0.8 – 1.2 | 62 | 1.0 | 0.7 – 1.2 | 34 | 1.1 | 0.8 – 1.5 | 14 | 0.8 | 0.5 – 1.3 |
| Kidney | 31 | 1.0 | 0.7 – 1.3 | 14 | 1.1 | 0.7 – 1.8 | 48 | 1.0 | 0.8 – 1.4 | 20 | 0.9 | 0.6 – 1.4 | 12 | 1.0 | 0.6 – 1.7 | 7 | 1.3 | 0.7 – 2.5 |
| Skin melanoma | 13 | 0.7 | 0.4 – 1.2 | 4 | 0.7 | 0.3 – 1.6 | 17 | 0.6 | 0.4 – 0.9 | 7 | 0.5 | 0.3 – 1.0 | 8 | 1.2 | 0.6 – 2.3 | 1 | 0.3 | 0.1 – 1.8 |
| N.H. lymphoma | 29 | 0.7 | 0.5 – 1.0 | 13 | 0.8 | 0.5 – 1.3 | 54 | 0.9 | 0.7 – 1.2 | 30 | 1.2 | 0.8 – 1.6 | 17 | 1.2 | 0.8 – 1.8 | 12 | 1.9 | 1.1 – 3.2 |
| | Aluminum Compounds | | | | | | Aluminum Alloy Dust | | | | | | Alumina | | | | | |
| Esophagus | 19 | 1.1 | 0.7 – 1.7 | 4 | 1.1 | 0.4 – 2.6 | 5 | 0.9 | 0.4 – 1.9 | 1 | 0.5 | 0.1 – 2.6 | 17 | 1.3 | 0.8 – 2.1 | 3 | 1.8 | 0.6 – 5.0 |
| Stomach | 41 | 0.9 | 0.7 – 1.2 | 13 | 1.2 | 0.7 – 2.0 | 13 | 0.9 | 0.6 – 1.5 | 6 | 1.0 | 0.5 – 2.1 | 37 | 1.1 | 0.8 – 1.5 | 9 | 2.1 | 1.1 – 3.9 |
| Colon | 86 | 1.0 | 0.8 – 1.3 | 21 | 1.0 | 0.7 – 1.5 | 26 | 0.9 | 0.6 – 1.3 | 10 | 0.9 | 0.5 – 1.6 | 67 | 1.0 | 0.8 – 1.3 | 10 | 1.0 | 0.6 – 1.9 |
| Rectum | 44 | 0.8 | 0.6 – 1.1 | 11 | 0.9 | 0.5 – 1.6 | 13 | 0.7 | 0.4 – 1.1 | 7 | 1.1 | 0.5 – 2.1 | 38 | 0.9 | 0.6 – 1.2 | 4 | 0.7 | 0.3 – 1.7 |
| Pancreas | 16 | 0.9 | 0.6 – 1.4 | 4 | 1.1 | 0.4 – 2.5 | 2 | 0.3 | 0.1 – 1.1 | 2 | 0.9 | 0.3 – 2.9 | 15 | 1.1 | 0.7 – 1.8 | 2 | 1.3 | 0.4 – 4.4 |
| Lung | 199 | 1.3 | 1.1 – 1.6 | 50 | 1.3 | 0.9 – 1.9 | 63 | 1.2 | 0.8 – 1.6 | 24 | 0.9 | 0.6 – 1.5 | 160 | 1.4 | 1.1 – 1.7 | 26 | 1.5 | 0.9 – 2.5 |
| Prostate | 94 | 1.3 | 1.0 – 1.6 | 29 | 1.6 | 1.1 – 2.4 | 40 | 1.8 | 1.3 – 2.6 | 19 | 2.2 | 1.3 – 3.7 | 65 | 1.0 | 0.8 – 1.4 | 9 | 1.0 | 0.5 – 2.0 |
| Bladder | 86 | 0.9 | 0.7 – 1.2 | 19 | 0.8 | 0.5 – 1.3 | 26 | 0.9 | 0.6 – 1.2 | 8 | 0.6 | 0.3 – 1.1 | 66 | 0.9 | 0.7 – 1.1 | 10 | 1.0 | 0.6 – 1.9 |
| Kidney | 31 | 1.0 | 0.7 – 1.4 | 7 | 0.9 | 0.5 – 1.7 | 14 | 1.4 | 0.9 – 2.3 | 5 | 1.2 | 0.5 – 2.5 | 20 | 0.8 | 0.5 – 1.2 | 2 | 0.5 | 0.2 – 1.7 |
| Skin melanoma | 10 | 0.6 | 0.4 – 1.1 | 2 | 0.5 | 0.2 – 1.6 | 3 | 0.6 | 0.2 – 1.5 | 2 | 0.9 | 0.3 – 2.9 | 8 | 0.6 | 0.3 – 1.2 | 0 | 0.0 | 0.0 – 1.8 |
| N.H. lymphoma | 39 | 1.2 | 0.9 – 1.6 | 8 | 0.9 | 0.5 – 1.7 | 13 | 1.1 | 0.7 – 1.9 | 6 | 1.2 | 0.6 – 2.4 | 32 | 1.2 | 0.9 – 1.7 | 2 | 0.5 | 0.1 – 1.6 |
| | Aluminum Fumes | | | | | | Arsenic Compounds | | | | | | Brass Dust | | | | | |
| Esophagus | 0 | 0.0 | 0.0 – 1.9 | 0 | 0.0 | 0.0 – 5.9 | 2 | 0.7 | 0.2 – 2.4 | 1 | 0.8 | 0.1 – 4.6 | 0 | 0.0 | 0.0 – 1.9 | 0 | 0.0 | 0.0 – 4.5 |
| Stomach | 3 | 0.6 | 0.2 – 1.7 | 1 | 0.5 | 0.1 – 2.9 | 8 | 1.2 | 0.6 – 2.2 | 3 | 1.1 | 0.4 – 3.1 | 5 | 1.1 | 0.5 – 2.4 | 0 | 0.0 | 0.0 – 1.8 |
| Colon | 6 | 0.7 | 0.4 – 1.5 | 1 | 0.4 | 0.1 – 2.3 | 14 | 1.2 | 0.7 – 2.0 | 5 | 0.9 | 0.4 – 2.1 | 10 | 1.1 | 0.6 – 2.1 | 4 | 1.0 | 0.4 – 2.4 |
| Rectum | 8 | 1.2 | 0.6 – 2.3 | 3 | 1.9 | 0.6 – 5.6 | 9 | 1.1 | 0.6 – 1.9 | 3 | 0.7 | 0.2 – 2.0 | 7 | 1.2 | 0.6 – 2.5 | 1 | 0.4 | 0.1 – 2.2 |
| Pancreas | 1 | 0.7 | 0.1 – 3.5 | 1 | 1.9 | 0.3 – 11.0 | 3 | 1.2 | 0.4 – 3.2 | 0 | 0.0 | 0.0 – 3.0 | 5 | 3.9 | 1.7 – 8.9 | 3 | 5.2 | 1.7 – 15.8 |
| Lung | 23 | 1.1 | 0.7 – 1.9 | 8 | 0.8 | 0.4 – 1.9 | 26 | 0.9 | 0.6 – 1.5 | 11 | 1.0 | 0.5 – 2.0 | 24 | 1.1 | 0.7 – 1.8 | 10 | 1.6 | 0.7 – 3.7 |
| Prostate | 10 | 1.2 | 0.6 – 2.2 | 5 | 1.8 | 0.7 – 4.7 | 16 | 1.4 | 0.8 – 2.5 | 9 | 1.8 | 0.9 – 3.9 | 11 | 1.0 | 0.6 – 1.9 | 6 | 1.4 | 0.6 – 3.2 |
| Bladder | 8 | 0.8 | 0.4 – 1.5 | 2 | 0.4 | 0.1 – 1.5 | 11 | 0.8 | 0.4 – 1.3 | 4 | 0.8 | 0.3 – 2.0 | 11 | 0.9 | 0.5 – 1.7 | 7 | 1.8 | 0.8 – 4.0 |
| Kidney | 3 | 0.9 | 0.3 – 2.4 | 0 | 0.0 | 0.0 – 3.0 | 3 | 0.6 | 0.2 – 1.7 | 2 | 1.1 | 0.3 – 3.6 | 0 | 0.0 | 0.0 – 1.0 | 0 | 0.0 | 0.0 – 2.4 |
| Skin melanoma | 1 | 0.7 | 0.1 – 3.7 | 1 | 2.3 | 0.4 – 12.8 | 1 | 0.6 | 0.1 – 3.1 | 0 | 0.0 | 0.0 – 3.6 | 1 | 0.5 | 0.1 – 2.9 | 0 | 0.0 | 0.0 – 4.5 |
| N.H. lymphoma | 5 | 1.7 | 0.8 – 3.8 | 3 | 2.7 | 0.9 – 7.7 | 5 | 1.0 | 0.5 – 2.2 | 2 | 1.0 | 0.3 – 3.3 | 6 | 1.7 | 0.8 – 3.6 | 3 | 1.9 | 0.7 – 5.4 |

## TABLE 1 (continued)
## Odds Ratios and 90% Confidence Intervals for the Associations Between 183 Substances[a] and 11 Types of Cancer at Two Levels of Exposure[b]

| Cancer site | Any | | | Substantial | | | Any | | | Substantial | | | Any | | | Substantial | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n[c] | OR[d] | 90% C.I.[e] | n | OR | 90% C.I. | n | OR | 90% C.I. | n | OR | 90% C.I. | n | OR | 90% C.I. | n | OR | 90% C.I. |
| | Stainless Steel Dust | | | | | | Lead Compounds | | | | | | Basic Lead Carbonate | | | | | |
| Esophagus | 5 | 1.6 | 0.7 – 3.5 | 2 | 2.0 | 0.6 – 7.2 | 41 | 0.7 | 0.5 – 1.0 | 5 | 0.8 | 0.4 – 1.9 | 4 | 1.6 | 0.7 – 3.9 | 1 | 2.9 | 0.4 – 20.2 |
| Stomach | 7 | 0.7 | 0.3 – 1.3 | 4 | 0.9 | 0.4 – 2.1 | 126 | 1.2 | 1.0 – 1.6 | 17 | 1.8 | 1.1 – 2.8 | 5 | 1.0 | 0.5 – 2.2 | 1 | 2.1 | 0.3 – 12.6 |
| Colon | 10 | 0.5 | 0.3 – 0.8 | 3 | 0.3 | 0.1 – 0.9 | 223 | 1.0 | 0.9 – 1.2 | 17 | 0.7 | 0.5 – 1.2 | 8 | 0.7 | 0.4 – 1.4 | 0 | 0.0 | 0.0 – 2.9 |
| Rectum | 10 | 0.7 | 0.4 – 1.3 | 2 | 0.3 | 0.1 – 1.1 | 123 | 1.0 | 0.8 – 1.3 | 11 | 0.9 | 0.5 – 1.7 | 4 | 0.7 | 0.3 – 1.7 | 0 | 0.0 | 0.0 – 8.5 |
| Pancreas | 6 | 1.7 | 0.8 – 3.5 | 4 | 3.0 | 1.2 – 7.3 | 54 | 1.1 | 0.8 – 1.6 | 5 | 0.9 | 0.4 – 2.0 | 1 | 0.6 | 0.1 – 3.2 | 1 | 4.6 | 0.7 – 30.4 |
| Lung | 51 | 1.3 | 0.9 – 1.8 | 20 | 1.0 | 0.6 – 1.6 | 434 | 1.0 | 0.8 – 1.2 | 53 | 1.2 | 0.9 – 1.7 | 28 | 1.4 | 0.9 – 2.3 | 3 | 1.0 | 0.2 – 3.9 |
| Prostate | 19 | 1.0 | 0.6 – 1.6 | 9 | 1.3 | 0.7 – 2.6 | 210 | 1.0 | 0.9 – 1.2 | 24 | 1.0 | 0.6 – 1.5 | 12 | 1.3 | 0.7 – 2.4 | 1 | 0.6 | 0.1 – 3.6 |
| Bladder | 24 | 1.2 | 0.8 – 1.8 | 8 | 0.9 | 0.5 – 1.7 | 231 | 1.1 | 0.9 – 1.3 | 24 | 1.1 | 0.7 – 1.6 | 12 | 1.1 | 0.6 – 2.0 | 1 | 0.8 | 0.1 – 5.2 |
| Kidney | 7 | 1.0 | 0.5 – 1.8 | 4 | 1.4 | 0.6 – 3.2 | 88 | 1.2 | 1.0 – 1.6 | 6 | 0.8 | 0.4 – 1.7 | 3 | 0.9 | 0.3 – 2.4 | 0 | 0.0 | 0.0 – 10.1 |
| Skin melanoma | 5 | 1.3 | 0.6 – 2.7 | 2 | 1.2 | 0.4 – 4.1 | 37 | 0.7 | 0.5 – 1.1 | 4 | 1.0 | 0.4 – 2.5 | 0 | 0.0 | 0.0 – 1.6 | 0 | 0.0 | 0.0 – 17.3 |
| N.H. lymphoma | 12 | 1.4 | 0.9 – 2.4 | 4 | 1.1 | 0.5 – 2.6 | 88 | 0.8 | 0.7 – 1.1 | 8 | 0.8 | 0.4 – 1.5 | 5 | 1.3 | 0.6 – 2.9 | 0 | 0.0 | 0.0 – 7.9 |
| | Lead Chromate | | | | | | Lead Fumes | | | | | | Manganese Compounds | | | | | |
| Esophagus | 5 | 1.2 | 0.5 – 2.6 | 1 | 1.8 | 0.2 – 12.6 | 2 | 0.7 | 0.2 – 2.2 | 0 | 0.0 | 0.0 – 3.8 | 8 | 1.4 | 0.7 – 2.6 | 0 | 0.0 | 0.0 – 4.7 |
| Stomach | 7 | 0.9 | 0.5 – 1.7 | 0 | 0.0 | 0.0 – 11.1 | 12 | 1.3 | 0.8 – 2.2 | 3 | 1.3 | 0.4 – 3.5 | 12 | 0.8 | 0.5 – 1.3 | 1 | 0.4 | 0.1 – 2.1 |
| Colon | 16 | 1.0 | 0.6 – 1.6 | 1 | 1.6 | 0.2 – 11.3 | 9 | 0.5 | 0.3 – 0.8 | 1 | 0.2 | 0.0 – 1.0 | 19 | 0.7 | 0.4 – 1.0 | 2 | 0.4 | 0.1 – 1.5 |
| Rectum | 4 | 0.4 | 0.2 – 0.9 | 1 | 3.4 | 0.4 – 27.3 | 5 | 0.4 | 0.2 – 0.9 | 2 | 0.6 | 0.2 – 2.3 | 19 | 1.1 | 0.7 – 1.7 | 1 | 0.5 | 0.1 – 2.4 |
| Pancreas | 0 | 0.0 | 0.0 – 1.0 | 0 | 0.0 | 0.0 – 24.0 | 7 | 1.9 | 1.0 – 3.8 | 2 | 2.6 | 0.7 – 8.9 | 9 | 1.4 | 0.8 – 2.6 | 0 | 0.0 | 0.0 – 3.8 |
| Lung | 35 | 1.3 | 0.8 – 2.0 | 3 | 2.4 | 0.4 – 15.0 | 41 | 1.1 | 0.7 – 1.6 | 7 | 0.8 | 0.4 – 1.8 | 71 | 1.3 | 1.0 – 1.7 | 12 | 1.4 | 0.7 – 2.6 |
| Prostate | 15 | 1.0 | 0.6 – 1.7 | 0 | 0.0 | 0.0 – 4.0 | 15 | 0.8 | 0.5 – 1.3 | 6 | 1.7 | 0.7 – 4.2 | 31 | 1.1 | 0.8 – 1.6 | 6 | 2.0 | 0.8 – 5.0 |
| Bladder | 23 | 1.5 | 1.0 – 2.3 | 1 | 1.5 | 0.2 – 11.8 | 16 | 0.8 | 0.5 – 1.3 | 3 | 0.5 | 0.2 – 1.3 | 32 | 1.2 | 0.8 – 1.7 | 7 | 2.2 | 0.9 – 5.0 |
| Kidney | 8 | 1.6 | 0.9 – 3.0 | 0 | 0.0 | 0.0 – 24.1 | 8 | 1.3 | 0.7 – 2.3 | 3 | 1.9 | 0.7 – 5.3 | 9 | 0.9 | 0.5 – 1.5 | 2 | 1.4 | 0.4 – 4.8 |
| Skin melanoma | 0 | 0.0 | 0.0 – 1.1 | 0 | 0.0 | 0.0 – 21.2 | 1 | 0.3 | 0.1 – 1.8 | 0 | 0.0 | 0.0 – 3.6 | 3 | 0.6 | 0.2 – 1.6 | 0 | 0.0 | 0.0 – 4.2 |
| N.H. lymphoma | 3 | 0.4 | 0.2 – 1.2 | 0 | 0.0 | 0.0 – 12.5 | 13 | 1.8 | 1.1 – 3.0 | 3 | 1.6 | 0.6 – 4.6 | 12 | 1.0 | 0.6 – 1.7 | 1 | 0.6 | 0.1 – 3.0 |
| | Manganese Fumes | | | | | | Nickel Compounds | | | | | | Nickel Fumes | | | | | |
| Esophagus | 3 | 0.6 | 0.2 – 1.6 | 0 | 0.0 | 0.0 – 4.7 | 7 | 1.4 | 0.7 – 2.8 | 1 | 1.5 | 0.3 – 8.1 | 2 | 0.9 | 0.3 – 2.9 | 1 | 2.6 | 0.5 – 15.3 |
| Stomach | 10 | 0.8 | 0.5 – 1.4 | 1 | 0.4 | 0.1 – 2.3 | 13 | 0.8 | 0.5 – 1.3 | 2 | 0.8 | 0.2 – 2.5 | 5 | 0.7 | 0.3 – 1.5 | 2 | 1.4 | 0.4 – 5.0 |
| Colon | 15 | 0.7 | 0.4 – 1.0 | 2 | 0.5 | 0.1 – 1.6 | 23 | 0.7 | 0.5 – 1.1 | 5 | 1.0 | 0.4 – 2.3 | 11 | 0.9 | 0.5 – 1.6 | 0 | 0.0 | 0.0 – 1.2 |