Supplementary material

**Table S1.** Summary laboratory examination results for *Legionella* spp. by culture per sample type.

|  |  |  |
| --- | --- | --- |
| **Total samples collected** | | |
| **Sample type** | **Number of samples (%/ 95% Confidence Interval Limits)** | Hotels (%) | |
| Cold water distribution system | 1885 (56.93/ 55.24-58.61) | 132 (-) | |
| Hot water distribution system | 1387 (41.89/ 40.22-43.58) | 129 (-) | |
| Sediment from room shower water sample and from filtering systems | 37 (1.12/ 0.81-1.54) | 13 (-) | |
| Soil | 2 (0.06/ 0.02-0.22) | 1 (-) | |
| Total | 3311 | - | |
| Positive samples | | |
| Cold water distribution system | 320 (46.72/ 43.01-50.46) | 71 (53.79) | |
| Hot water distribution system | 360 (52.55/ 48.81-56.27) | 70 (54.26) | |
| Sediment from room shower water sample and from filtering systems | 5 (0.73/ 0.31-1.70) | 3 (23.08) | |
| Soil | - | - | |
| Total | 685 (100.00) | - | |

**Table S2.** Concentrations of *Legionella* non *pneumophila* spp. in samples collected from water systems (CFU/L).

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Legionella non pneumophila spp.*** | ***L. anisa*** | ***L. rubrilucens*** | ***L. erythra*** | ***L. londiniesis*** | ***L. taurinensis*** | ***L. santicrusis*** | ***L. oakridgensis*** | ***L. birminghamensis*** | ***L. tusconensis*** | ***L. brunensis*** | ***L. maceachernii*** | **Other species** |
| Number of samples | 47 | 25 | 46 | 11 | 20 | 2 | 2 | 3 | 1 | 3 | 1 | 64 |
| Mean | 25157.45 | 10959.2 | 34156.96 | 4309.09 | 34887.5 | 50 | 125 | 21733.33 | 65000 | 45500 | 330000 | 6036.72 |
| Median | 3000 | 650 | 1100 | 250 | 625 | 50 | 125 | 150 | 65000 | 52000 | 330000 | 575 |
| Std. Deviation | 61715.44 | 27110.403 | 112126.949 | 9370.534 | 144857.859 | 0 | 35.355 | 37470.066 | - | 23436.083 | - | 31328.949 |
| Minimum | 50 | 50 | 50 | 50 | 50 | 50 | 100 | 50 | 65000 | 19500 | 330000 | 50 |
| Maximum | 350000 | 130000 | 660000 | 32000 | 650000 | 50 | 150 | 65000 | 65000 | 65000 | 330000 | 250000 |
| Cold water samples | | | | | | | | | | | | |
| Number of samples | 29 | 14 | 21 | 3 | 13 | 0 | 0 | 2 | 1 | 3 | 1 | 40 |
| Mean | 20741.38 | 17945 | 33124.76 | 50 | 3488.46 | - | - | 32525 | 65000 | 45500 | 330000 | 7963.75 |
| Median | 2500 | 400 | 400 | 50 | 700 | - | - | 32525 | 65000 | 52000 | 330000 | 550 |
| Std. Deviation | 46184.77 | 35087.425 | 84553.193 | 0 | 5584.508 | - | - | 45926.585 | - | 23436.083 | - | 39453.507 |
| Minimum | 50 | 50 | 50 | 50 | 50 | - | - | 50 | 65000 | 19500 | 330000 | 50 |
| Maximum | 230000 | 130000 | 330000 | 50 | 19500 | - | - | 65000 | 65000 | 65000 | 330000 | 250000 |
| Hot water samples | | | | | | | | | | | | |
| Number of samples | 18 | 11 | 24 | 8 | 6 | 2 | 2 | 1 | 0 | 0 | 0 | 24 |
| Mean | 32272.22 | 2068.18 | 36087.5 | 5906.25 | 108691.67 | 50 | 125 | 150 | - | - | - | 2825 |
| Median | 6500 | 650 | 1125 | 3025 | 250 | 50 | 125 | 150 | - | - | - | 775 |
| Std. Deviation | 81890.5 | 2862.628 | 135463.092 | 10712.091 | 265186.411 | 0 | 35.355 | - | - | - | - | 5641.461 |
| Minimum | 50 | 50 | 100 | 50 | 50 | 50 | 100 | 150 | - | - | - | 50 |
| Maximum | 350000 | 6500 | 660000 | 32000 | 650000 | 50 | 150 | 150 | - | - | - | 21050 |
| Swab samples\* | | | | | | | | | | | | |
| Number of samples | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

\*collected from the internal surfaces of showerheads.

**Table S3.** Inspection results of hotel water distribution systems.

|  |  |
| --- | --- |
| **Inspection item** | **%** |
| No water storage tanks protection | 100 |
| \* The showers are NOT clean and free of salts | 81.2 |
| \* The residual chlorine <0.2 mg/L | 72.8 |
| The hot water temperature is <50 °C. after 1 min of flushing | 63.6 |
| The cold-water temperature in taps is >25 °C. after 2 min of flushing | 54.5 |
| Water store and circulation temperature <60 °C | 54.5 |
| The water exiting the heating unit <60 °C and returning <50 °C | 54.5 |
| The amount of stored water is > 1 day | 45.5 |
| There is NO recording book for monitoring | 45.5 |
| \* The outgoing temperature (cold) water from the tank is >25 °C | 36.3 |
| There are leaks in the distribution system | 27.2 |
| \* NO random sampling for water microbiological examination at least every 6 months | 27.2 |
| There is no thermal stratification of the water inside the heaters and storage water | 27.2 |
| The water distribution system cannot provide adequate water supply at peak times | 18.2 |
| No stable water consumption through the week | 18.2 |
| \* *Legionella* detected the last six months (at a concentration of more than 103 CFU/L) | 18.2 |
| The filters are NOT in good condition | 9 |
| \* The distribution system is NOT cleaned and disinfected when remained out of service > 1 month | 9 |
| \* The distribution system and the tanks NOT cleaned with appropriate disinfectants at least annually | 9 |
| The water supply is interrupted for a long time | 9 |
| \* The difference in temperature between 2 successive measurements of hot water is >10 °C/1 min | 9 |
| There is a water taste and odor problem | 9 |