## S5 Table

A) Linear mixed effects regression model with a random effect of rater ID and fixed effects for density, oedema, year and size (with 95\% confidence interval) to determine the effect of artificial bubo characteristics on measurement accuracy

| Characteristic | Regression coefficient | $\mathbf{9 5 \% ~ C I}$ | p-value |
| :--- | :--- | :--- | :--- |
| Size* |  |  |  |
| $\mathbf{1 2 0 . 3 m m}$ | -5.51 | -9.52 to -1.51 | 0.007 |
| $\mathbf{9 4 . 7}$ | 3.22 | -1.58 to 8.03 | 0.189 |
| $\mathbf{7 7 . 8}$ | 16.1 | 12.0 to 20.1 | $<0.001$ |
| $\mathbf{6 4 . 9}$ | -13.2 | 8.45 o 18.0 | $<0.001$ |
| $\mathbf{5 2 . 7}$ | 40.5 | 36.0 to 45.1 | $<0.001$ |
| Density | -1.76 | -5.01 to 1.48 | 0.287 |
| Year | 9.44 | 6.53 to 12.4 | $<0.001$ |
| Presence of oedema | 2.60 | -0.95 to 6.16 | 0.151 |

[^0]
## B) Number and percentage of measurements recorded within $5 \%$ intervals of the artificial bubo's true size, shown until $95 \%$ of all measurements are captured

|  | ํํ | ిిసి | ஷి | ిì | 순 | ిిల్ల |  | ০ৃণ | ì | ిì | 웅 | ిిం | 웅 | ㅇํ | ㅇํ | ిిం | かì | ઠిం | ஸì | Ò |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \hline \text { Overall } \\ & (\mathrm{N}=698) \\ & \hline \end{aligned}$ | $\begin{gathered} 179 \\ (26 \%) \end{gathered}$ | $\begin{gathered} \hline 307 \\ (44 \%) \end{gathered}$ | $\begin{gathered} \hline 403 \\ (58 \%) \end{gathered}$ | $\begin{gathered} \hline 464 \\ (66 \%) \end{gathered}$ | $\begin{gathered} \hline 508 \\ (73 \%) \end{gathered}$ | $\begin{gathered} \hline 550 \\ (79 \%) \end{gathered}$ | $\begin{gathered} \hline 574 \\ (82 \%) \end{gathered}$ | $\begin{gathered} 592 \\ (85 \%) \end{gathered}$ | $\begin{gathered} \hline 610 \\ (87 \%) \end{gathered}$ | $\begin{gathered} \hline 627 \\ (90 \%) \end{gathered}$ | $\begin{gathered} \hline 638 \\ (91 \%) \end{gathered}$ | $\begin{gathered} \hline 645 \\ (92 \%) \end{gathered}$ | $\begin{gathered} \hline 657 \\ (94 \%) \end{gathered}$ | $\begin{gathered} \hline 664 \\ (95 \%) \end{gathered}$ | - | - | - | - | - | - |
| $\begin{aligned} & \text { Hard } \\ & (\mathrm{N}=349) \end{aligned}$ | $\begin{gathered} 87 \\ (25 \%) \end{gathered}$ | $\begin{gathered} 147 \\ (42 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 197 \\ (56 \%) \end{gathered}$ | $\begin{gathered} 223 \\ (64 \%) \end{gathered}$ | $\begin{gathered} 244 \\ (70 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 270 \\ (77 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 284 \\ (81 \%) \end{gathered}$ | $\begin{gathered} 294 \\ (84 \%) \end{gathered}$ | $\begin{gathered} 309 \\ (89 \%) \end{gathered}$ | $\begin{gathered} \hline 319 \\ (91 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 321 \\ (92 \%) \end{gathered}$ | $\begin{gathered} 326 \\ (93 \%) \end{gathered}$ | $\begin{gathered} \hline 331 \\ (95 \%) \end{gathered}$ | - | - | - | - | - | - | - |
| Soft $\text { ( } \mathrm{N}=349 \text { ) }$ | $\begin{gathered} 92 \\ (26 \%) \end{gathered}$ | $\begin{gathered} \hline 160 \\ (46 \%) \end{gathered}$ | $\begin{gathered} \hline 206 \\ (59 \%) \end{gathered}$ | $\begin{gathered} 241 \\ (69 \%) \end{gathered}$ | $\begin{gathered} 264 \\ (76 \%) \end{gathered}$ | $\begin{gathered} \hline 280 \\ (80 \%) \end{gathered}$ | $\begin{gathered} \hline 290 \\ (83 \%) \end{gathered}$ | $\begin{gathered} \hline 298 \\ (85 \%) \end{gathered}$ | $\begin{gathered} 301 \\ (86 \%) \end{gathered}$ | $\begin{gathered} \hline 308 \\ (88 \%) \end{gathered}$ | $\begin{gathered} \hline 317 \\ (91 \%) \end{gathered}$ | $\begin{gathered} \hline 319 \\ (91 \%) \end{gathered}$ | $\begin{gathered} \hline 326 \\ (93 \%) \end{gathered}$ | $\begin{gathered} 328 \\ (94 \%) \end{gathered}$ | $\begin{gathered} 336 \\ (96 \%) \end{gathered}$ | - | - | - | - | - |
| Oedema $(\mathrm{N}=213)$ | $\begin{gathered} \hline 66 \\ (31 \%) \end{gathered}$ | $\begin{gathered} 111 \\ (52 \%) \end{gathered}$ | $\begin{gathered} 148 \\ (69 \%) \end{gathered}$ | $\begin{gathered} \hline 166 \\ (78 \%) \end{gathered}$ | $\begin{gathered} 181 \\ (85 \%) \end{gathered}$ | $\begin{gathered} 188 \\ (88 \%) \end{gathered}$ | $\begin{gathered} 192 \\ (90 \%) \end{gathered}$ | $\begin{gathered} \hline 193 \\ (91 \%) \end{gathered}$ | $\begin{gathered} \hline 194 \\ (91 \%) \end{gathered}$ | $\begin{gathered} \hline 196 \\ (92 \%) \end{gathered}$ | $\begin{gathered} 197 \\ (92 \%) \end{gathered}$ | $\begin{gathered} \hline 200 \\ (94 \%) \end{gathered}$ | $\begin{gathered} \hline 205 \\ (96 \%) \end{gathered}$ | - | - | - | - | - | - | - |
| $\begin{aligned} & \text { No oedema } \\ & (\mathrm{N}=485) \end{aligned}$ | $\begin{gathered} 113 \\ (23 \%) \end{gathered}$ | $\begin{gathered} 196 \\ (40 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 255 \\ (53 \%) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 298 \\ (61 \%) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 327 \\ (67 \%) \end{gathered}$ | $\begin{gathered} 362 \\ (75 \%) \end{gathered}$ | $\begin{gathered} \hline 382 \\ (79 \%) \end{gathered}$ | $\begin{gathered} \hline 399 \\ (82 \%) \end{gathered}$ | $\begin{gathered} 416 \\ (86 \%) \end{gathered}$ | $\begin{gathered} 431 \\ (89 \%) \end{gathered}$ | $\begin{gathered} 441 \\ (91 \%) \end{gathered}$ | $\begin{gathered} \hline 445 \\ (92 \%) \end{gathered}$ | $\begin{gathered} 452 \\ (93 \%) \end{gathered}$ | $\begin{gathered} 458 \\ (94 \%) \end{gathered}$ | $\begin{gathered} 466 \\ (96 \%) \end{gathered}$ | - | - | - | - | - |
| $\begin{aligned} & \text { Size }=121.6 \\ & (N=108) \end{aligned}$ | $\begin{gathered} 36 \\ (33 \%) \end{gathered}$ | $\begin{gathered} 64 \\ (59 \%) \end{gathered}$ | $\begin{gathered} 86 \\ (80 \%) \end{gathered}$ | $\begin{gathered} 91 \\ (84 \%) \end{gathered}$ | $\begin{gathered} 97 \\ (90 \%) \end{gathered}$ | $\begin{gathered} 103 \\ (95 \%) \end{gathered}$ | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| $\begin{aligned} & \text { Size }=120.3 \\ & (N=160) \end{aligned}$ | $\begin{gathered} 62 \\ (39 \%) \end{gathered}$ | $\begin{gathered} 96 \\ (60 \%) \end{gathered}$ | $\begin{gathered} 130 \\ (81 \%) \end{gathered}$ | $\begin{gathered} \hline 141 \\ (88 \%) \end{gathered}$ | $\begin{gathered} \hline 150 \\ (94 \%) \end{gathered}$ | $\begin{gathered} 153 \\ (96 \%) \end{gathered}$ | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| $\begin{aligned} & \text { Size }=94.7 \\ & (\mathrm{~N}=88) \end{aligned}$ | $\begin{gathered} 26 \\ (30 \%) \end{gathered}$ | $\begin{gathered} 48 \\ (55 \%) \end{gathered}$ | $\begin{gathered} 57 \\ (65 \%) \end{gathered}$ | $\begin{gathered} 73 \\ (83 \%) \end{gathered}$ | $\begin{gathered} 76 \\ (86 \%) \end{gathered}$ | $\begin{gathered} \hline 79 \\ (90 \%) \end{gathered}$ | $\begin{gathered} \hline 81 \\ (92 \%) \end{gathered}$ | $\begin{gathered} \hline 82 \\ (93 \%) \end{gathered}$ | $\begin{gathered} 84 \\ (95 \%) \end{gathered}$ | - | - | - | - | - | - | - | - | - | - | - |
| $\begin{aligned} & \text { Size }=77.8 \\ & (N=150) \\ & \hline \end{aligned}$ | $\begin{gathered} 32 \\ (21 \%) \end{gathered}$ | $\begin{gathered} 56 \\ (37 \%) \end{gathered}$ | $\begin{gathered} 78 \\ (52 \%) \end{gathered}$ | $\begin{gathered} 91 \\ (61 \%) \end{gathered}$ | $\begin{gathered} \hline 101 \\ (67 \%) \end{gathered}$ | $\begin{gathered} 112 \\ (75 \%) \end{gathered}$ | $\begin{gathered} 114 \\ (76 \%) \end{gathered}$ | $\begin{gathered} 120 \\ (80 \%) \end{gathered}$ | $\begin{gathered} 122 \\ (81 \%) \end{gathered}$ | $\begin{gathered} 127 \\ (85 \%) \end{gathered}$ | $\begin{gathered} 130 \\ (87 \%) \end{gathered}$ | $\begin{gathered} 132 \\ (88 \%) \end{gathered}$ | $\begin{gathered} 137 \\ (91 \%) \end{gathered}$ | $\begin{gathered} 137 \\ (91 \%) \end{gathered}$ | $\begin{gathered} 140 \\ (93 \%) \end{gathered}$ | $\begin{gathered} 141 \\ (94 \%) \end{gathered}$ | $\begin{gathered} 142 \\ (95 \%) \end{gathered}$ | - | - | - |
| $\begin{aligned} & \text { Size }=64.9 \\ & (\mathrm{~N}=86) \end{aligned}$ | $\begin{gathered} 16 \\ (19 \%) \end{gathered}$ | $\begin{gathered} 33 \\ (38 \%) \end{gathered}$ | $\begin{gathered} 39 \\ (45 \%) \end{gathered}$ | $\begin{gathered} 46 \\ (53 \%) \end{gathered}$ | $\begin{gathered} 56 \\ (65 \%) \end{gathered}$ | $\begin{gathered} 69 \\ (80 \%) \end{gathered}$ | $\begin{gathered} \hline 75 \\ (87 \%) \end{gathered}$ | $\begin{gathered} \hline 77 \\ (90 \%) \end{gathered}$ | $\begin{gathered} 81 \\ (94 \%) \end{gathered}$ | $\begin{gathered} 82 \\ (95 \%) \end{gathered}$ | - | - | - | - | - | - | - | - | - | - |
| $\begin{array}{\|l} \hline \text { Size }=52.7 \\ (N=106) \\ \hline \end{array}$ | $\begin{gathered} \hline 7 \\ (7 \%) \end{gathered}$ | $\begin{gathered} \hline 10 \\ (9 \%) \end{gathered}$ | $\begin{gathered} 13 \\ (12 \%) \end{gathered}$ | $\begin{gathered} 22 \\ (21 \%) \end{gathered}$ | $\begin{gathered} 28 \\ (26 \%) \end{gathered}$ | $\begin{gathered} 34 \\ (32 \%) \end{gathered}$ | $\begin{gathered} 40 \\ (38 \%) \end{gathered}$ | $\begin{gathered} 49 \\ (46 \%) \end{gathered}$ | $\begin{gathered} 59 \\ (56 \%) \end{gathered}$ | $\begin{gathered} 67 \\ (63 \%) \end{gathered}$ | $\begin{gathered} 74 \\ (70 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 75 \\ (71 \%) \end{gathered}$ | $\begin{gathered} \hline 82 \\ (77 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 87 \\ (82 \%) \end{gathered}$ | $\begin{gathered} 94 \\ (89 \%) \end{gathered}$ | $\begin{gathered} \hline 96 \\ (91 \%) \end{gathered}$ | $\begin{gathered} 97 \\ (92 \%) \end{gathered}$ | $\begin{gathered} \hline 100 \\ (94 \%) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 100 \\ (94 \%) \end{gathered}$ | $\begin{gathered} 102 \\ (96 \%) \end{gathered}$ |

C) Mean absolute difference ( mm ), standard deviation (SD) and limits of agreement (LoA) between raters' first and second measurements for all artificial buboes and per characteristic

|  | Median percentage difference (range) | Median absolute difference, mm (range) | LoA for BA plots* |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | Lower | Upper |
| Overall $(\mathrm{N}=239)$ | 11\% (0\% to 129\%) | 11.84 (0.03 to 76.87) | -51.56 | 34.27 |
| Hard $(N=121)$ | 12\% (0\% to 104\%) | 11.84 (0.14 to 64.18) | -46.84 | 31.89 |
| Soft $\text { ( } \mathrm{N}=118 \text { ) }$ | 11\% (0\% to 129\%) | 12.2 (0.03 to 76.87) | -56.17 | 36.49 |
| Oedema $(N=66)$ | 12\% (0\% to 129\%) | 12.67 (0.03 to 76.87) | -54.83 | 31.60 |
| No oedema $(\mathrm{N}=173)$ | 12\% (0\% to 104\%) | 11.46 (0.08 to 72.06) | -50.22 | 35.20 |
| $\begin{aligned} & \text { Size }=121.6 \\ & (N=40) \end{aligned}$ | 9\% (0\% to 51\%) | 11.69 (0.17 to 53.9) | -43.27 | 27.71 |
| $\begin{aligned} & \text { Size }=120.3 \\ & (N=58) \end{aligned}$ | 9\% (0\% to 69\%) | 11.22 (0.03 to 72.06) | -48.09 | 34.61 |
| $\begin{aligned} & \text { Size }=94.7 \\ & (N=26) \\ & \hline \end{aligned}$ | 10\% (0\% to 54\%) | 10.75 (0.40 to 56.58) | -50.01 | 34.39 |
| $\begin{aligned} & \text { Size }=77.8 \\ & (N=51) \end{aligned}$ | 15\% (2\% to 128\%) | 13.24 (1.56 to 76.87) | -72.12 | 42.05 |
| $\begin{aligned} & \text { Size }=64.9 \\ & (N=25) \end{aligned}$ | 16\% (0\% to 38\%) | 1.48 (0.08 to 26.40) | -31.28 | 22.77 |
| $\begin{aligned} & \text { Size }=52.7 \\ & (N=39) \end{aligned}$ | 12\% (0\% to 104\%) | 10.87 (0.17 to 64.18) | -45.64 | 30.89 |

[^1]D) Average n of intrarater second measurements within $5 \%$ intervals of the rater's first measurement

| Characteristic and average number of measurements per rater | 5\% | 10\% | 15\% | 20\% | 25\% | 30\% | 35\% | 40\% | 45\% | 50\% | 55\% | 60\% | 65\% | 70\% | 75\% | 80\% |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Overall $(\mathrm{N}=12)$ | 3 | 5 | 7 | 8 | 9 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 12 | - | - |
| Hard $(N=6)$ | 1 | 3 | 4 | 4 | 5 | 5 | 5 | 6 | - | - | - | - | - | - | - | - |
| $\begin{aligned} & \text { Soft } \\ & (\mathrm{N}=6) \end{aligned}$ | 1 | 3 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | - | - |
| Oedema $(\mathrm{N}=3)$ | 1 | 1 | 2 | 2 | 2 | 3 | - | - | - | - | - | - | - | - | - | - |
| No oedema $(\mathrm{N}=9)$ | 2 | 4 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 9 | - | - | - |
| $\begin{aligned} & \text { Size }=121.6 \\ & (N=2) \end{aligned}$ | 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| $\begin{aligned} & \text { Size }=120.3 \\ & (N=3) \end{aligned}$ | 1 | 2 | 2 | 2 | 2 | 3 | - | - | - | - | - | - | - | - | - | - |
| $\begin{aligned} & \text { Size }=94.7 \\ & (N=1) \end{aligned}$ | 0 | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| $\begin{aligned} & \text { Size }=77.8 \\ & (N=2) \\ & \hline \end{aligned}$ | 0 | 1 | 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - |
| $\begin{aligned} & \text { Size = } 64.9 \\ & (\mathrm{~N}=1) \end{aligned}$ | 0 | 0 | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| $\begin{aligned} & \text { Size = 52.7 } \\ & (N=2) \end{aligned}$ | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | - | - | - | - | - | - | - | - |

E) Number and percentage of raters' second measurements recorded within $5 \%$ intervals of the raters' first measurement of the same artificial bubo, shown until $95 \%$ of all measurements are captured

|  | $\begin{array}{\|l\|} \hline 5 \% \\ \mathrm{n}(\%) \end{array}$ | $\begin{aligned} & \text { 10\% } \\ & \mathrm{n}(\%) \end{aligned}$ | $\begin{aligned} & \text { 15\% } \\ & \mathrm{n} \text { (\%) } \end{aligned}$ | $\begin{aligned} & \text { 20\% } \\ & \text { n (\%) } \end{aligned}$ | $\begin{aligned} & \text { 25\% } \\ & \text { n (\%) } \end{aligned}$ | $\begin{array}{\|l} \hline 30 \% \\ \mathrm{n}(\%) \end{array}$ | $\begin{aligned} & \text { 35\% } \\ & \text { n (\%) } \end{aligned}$ | $\begin{aligned} & \text { 40\% } \\ & \mathrm{n} \text { (\%) } \end{aligned}$ | $\begin{aligned} & \text { 45\% } \\ & \mathrm{n} \text { (\%) } \end{aligned}$ | $\begin{array}{\|l} \text { 50\% } \\ \mathrm{n}(\%) \end{array}$ | $\begin{array}{\|l\|} \hline \text { 55\% } \\ \text { n (\%) } \end{array}$ | $\begin{array}{\|l\|} \hline 60 \% \\ \mathrm{n}(\%) \end{array}$ | $\begin{aligned} & \text { 65\% } \\ & \text { n (\%) } \end{aligned}$ | $\begin{aligned} & \text { 70\% } \\ & \mathrm{n} \text { (\%) } \end{aligned}$ | $\begin{aligned} & \text { 75\% } \\ & \text { n (\%) } \end{aligned}$ | $\begin{aligned} & \text { 80\% } \\ & \text { n (\%) } \end{aligned}$ | $\begin{aligned} & \text { 85\% } \\ & \text { n (\%) } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \hline \text { Overall } \\ & (\mathrm{N}=238) \end{aligned}$ | $\begin{gathered} 56 \\ (23 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 107 \\ (45 \%) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 145 \\ (61 \%) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 165 \\ (69 \%) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 174 \\ (73 \%) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 195 \\ (82 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 203 \\ (85 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 211 \\ (88 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 219 \\ (92 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 225 \\ (94 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 227 \\ (95 \%) \\ \hline \end{gathered}$ | - | - | - | - | - | - |
| Hard (119) | $\begin{gathered} 33 \\ (28 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 56 \\ (47 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 75 \\ (63 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 91 \\ (76 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 94 \\ (79 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 102 \\ (86 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 105 \\ (88 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 109 \\ (92 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 113 \\ (95 \%) \\ \hline \end{gathered}$ | - | - | - | - | - | - | - | - |
| $\begin{aligned} & \hline \text { Soft } \\ & (\mathrm{N}=118) \end{aligned}$ | $\begin{gathered} 29 \\ (25 \%) \end{gathered}$ | $\begin{gathered} 55 \\ (47 \%) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 73 \\ (62 \%) \end{gathered}$ | $\begin{gathered} \hline 79 \\ (67 \%) \end{gathered}$ | $\begin{gathered} \hline 84 \\ (71 \%) \end{gathered}$ | $\begin{gathered} 97 \\ (82 \%) \end{gathered}$ | $\begin{gathered} \hline 100 \\ (85 \%) \end{gathered}$ | $\begin{gathered} \hline 103 \\ (87 \%) \end{gathered}$ | $\begin{gathered} \hline 104 \\ (88 \%) \end{gathered}$ | $\begin{gathered} \hline 106 \\ (90 \%) \end{gathered}$ | $\begin{gathered} \hline 108 \\ (92 \%) \end{gathered}$ | $\begin{gathered} 109 \\ (92 \%) \end{gathered}$ | $\begin{gathered} 109 \\ (92 \%) \end{gathered}$ | $\begin{gathered} 113 \\ (95 \%) \end{gathered}$ | - | - | - |
| Oedema $(\mathrm{N}=65)$ | $\begin{gathered} 10 \\ (15 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 28 \\ (43 \%) \end{gathered}$ | $\begin{gathered} 44 \\ (68 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 47 \\ (72 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 49 \\ (75 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 56 \\ (86 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 58 \\ (89 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 58 \\ (89 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 58 \\ (89 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 59 \\ (91 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 61 \\ (94 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 62 \\ (95 \%) \\ \hline \end{gathered}$ | - | - | - | - | - |
| No oedema ( $\mathrm{N}=153$ ) | $\begin{gathered} 44 \\ (29 \%) \end{gathered}$ | $\begin{gathered} 73 \\ (48 \%) \end{gathered}$ | $\begin{gathered} 92 \\ (60 \%) \end{gathered}$ | $\begin{gathered} 109 \\ (71 \%) \end{gathered}$ | $\begin{gathered} \hline 114 \\ (75 \%) \end{gathered}$ | $\begin{gathered} 128 \\ (84 \%) \end{gathered}$ | $\begin{gathered} 132 \\ (86 \%) \end{gathered}$ | $\begin{gathered} 138 \\ (90 \%) \end{gathered}$ | $\begin{gathered} 142 \\ (93 \%) \end{gathered}$ | $\begin{gathered} 144 \\ (94 \%) \end{gathered}$ | $\begin{gathered} 147 \\ (96 \%) \end{gathered}$ | - | - | - | - | - | - |
| $\begin{aligned} & \text { Size }=121.6 \\ & (N=40) \end{aligned}$ | $\begin{gathered} 11 \\ (28 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 22 \\ (55 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 30 \\ (75 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 33 \\ (83 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 36 \\ (90 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 37 \\ (93 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 38 \\ (95 \%) \\ \hline \end{gathered}$ | - | - | - | - | - | - | - | - | - | - |
| $\begin{aligned} & \text { Size }=120.3 \\ & (N=58) \end{aligned}$ | $\begin{gathered} 15 \\ (26 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 31 \\ (53 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 43 \\ (74 \%) \end{gathered}$ | $\begin{gathered} 47 \\ (81 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 48 \\ (83 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 51 \\ (88 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 52 \\ (90 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 54 \\ (93 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 56 \\ (97 \%) \\ \hline \end{gathered}$ | - | - | - | - | - | - | - | - |
| $\begin{aligned} & \text { Size }=94.7 \\ & (\mathrm{~N}=26) \\ & \hline \end{aligned}$ | $\begin{gathered} 7 \\ (27 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 13 \\ (50 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 16 \\ (62 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 19 \\ (73 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 19 \\ (73 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 23 \\ (88 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 24 \\ (92 \%) \end{gathered}$ | $\begin{gathered} 24 \\ (92 \%) \end{gathered}$ | $\begin{gathered} 24 \\ (92 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 24 \\ (92 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 26 \\ (100 \%) \\ \hline \end{gathered}$ | - | - | - | - | - | - |
| $\begin{aligned} & \text { Size }=77.8 \\ & (\mathrm{~N}=50) \\ & \hline \end{aligned}$ | $\begin{gathered} 8 \\ (16 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 15 \\ (30 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 24 \\ (48 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 29 \\ (58 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 31 \\ (62 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 35 \\ (70 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 37 \\ (74 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 37 \\ (74 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 38 \\ (76 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 40 \\ (80 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 42 \\ (84 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 43 \\ (86 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 43 \\ (86 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 46 \\ (92 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 47 \\ (94 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 47 \\ (94 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 48 \\ (96 \%) \\ \hline \end{gathered}$ |
| $\begin{aligned} & \text { Size }=64.9 \\ & (\mathrm{~N}=25) \\ & \hline \end{aligned}$ | $\begin{gathered} 6 \\ (24 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 9 \\ (36 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 12 \\ (48 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 16 \\ (64 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 17 \\ (68 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 22 \\ (88 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 23 \\ (92 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 25 \\ (100 \%) \\ \hline \end{gathered}$ | - | - | - | - | - | - | - | - | - |
| $\begin{aligned} & \text { Size }=52.7 \\ & (\mathrm{~N}=39) \end{aligned}$ | $\begin{gathered} 9 \\ (23 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 17 \\ (44 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 20 \\ (51 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 21 \\ (54 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 23 \\ (59 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 27 \\ (69 \%) \end{gathered}$ | $\begin{gathered} 29 \\ (74 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 33 \\ (85 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 33 \\ (85 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 34 \\ (87 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 35 \\ (90 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 36 \\ (92 \%) \\ \hline \end{gathered}$ | $\begin{gathered} 37 \\ (95 \%) \\ \hline \end{gathered}$ | - | - | - | - |

F) Linear regression using a mixed effects model (with $95 \%$ confidence interval) to determine the effect of artificial bubo characteristics on the percentage difference between the raters' first and second measurements

| Characteristic | Estimate | $\mathbf{9 5 \% ~ C l}$ | p-value |
| :--- | :--- | :--- | :--- |
| Size | -0.0012943 | -0.001412802 to -0.001175798 | 0.033330 |
| Density | 0.0119047 | -0.05416122 to 0.07797062 | 0.724270 |
| Presence of oedema | 0.0493535 | -0.01926767 to 0.1179747 | 0.159961 |

G) Number and percentage of interrater measurements that were within $5 \%$ intervals of the measurements of other raters of the same artificial bubo, shown until $95 \%$ of all measurements are captured

|  | $\begin{gathered} 5 \% \\ \mathrm{n}(\%) \\ \hline \end{gathered}$ | $\begin{gathered} 10 \% \\ \text { n (\%) } \end{gathered}$ | $\begin{gathered} 15 \% \\ \text { n (\%) } \\ \hline \end{gathered}$ | $\begin{gathered} \text { 20\% } \\ \text { n (\%) } \end{gathered}$ | $\begin{gathered} \text { 25\% } \\ \text { n (\%) } \\ \hline \end{gathered}$ | $\begin{gathered} \hline 30 \% \\ \mathrm{n}(\%) \\ \hline \end{gathered}$ | $\begin{aligned} & \text { 35\% } \\ & \text { n (\%) } \end{aligned}$ | $\begin{aligned} & \text { 40\% } \\ & \text { n (\%) } \end{aligned}$ | $\begin{gathered} 45 \% \\ \mathrm{n}(\%) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 50 \% \\ \mathrm{n}(\%) \\ \hline \end{gathered}$ | $\begin{aligned} & \text { 55\% } \\ & \text { n (\%) } \\ & \hline \end{aligned}$ | $\begin{gathered} \hline 60 \% \\ \mathrm{n}(\%) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 65 \% \\ \mathrm{n}(\%) \\ \hline \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Overall (N=34655) | $\begin{gathered} \hline 6924 \\ (20 \%) \end{gathered}$ | $\begin{aligned} & 13056 \\ & (38 \%) \end{aligned}$ | $\begin{aligned} & 18572 \\ & (54 \%) \end{aligned}$ | $\begin{aligned} & 22903 \\ & (66 \%) \end{aligned}$ | $\begin{aligned} & 26087 \\ & (75 \%) \end{aligned}$ | $\begin{aligned} & 28426 \\ & (82 \%) \end{aligned}$ | $\begin{aligned} & 30205 \\ & (87 \%) \end{aligned}$ | $\begin{aligned} & 31294 \\ & (90 \%) \end{aligned}$ | $\begin{aligned} & \hline 32010 \\ & (92 \%) \end{aligned}$ | $\begin{aligned} & 32491 \\ & (94 \%) \end{aligned}$ | $\begin{aligned} & 32771 \\ & (95 \%) \end{aligned}$ | - | - |
| $\begin{gathered} \text { Hard } \\ (\mathrm{N}=17286) \end{gathered}$ | $\begin{aligned} & \hline 3766 \\ & (22 \%) \\ & \hline \end{aligned}$ | $\begin{gathered} \hline 7042 \\ (41 \%) \\ \hline \end{gathered}$ | $\begin{aligned} & 9867 \\ & (57 \%) \end{aligned}$ | $\begin{aligned} & \hline 12003 \\ & (69 \%) \\ & \hline \end{aligned}$ | $\begin{aligned} & 13478 \\ & (78 \%) \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 14557 \\ & (84 \%) \\ & \hline \end{aligned}$ | $\begin{aligned} & 15363 \\ & (89 \%) \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 15877 \\ & (92 \%) \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 16173 \\ & (94 \%) \\ & \hline \end{aligned}$ | $\begin{aligned} & 16375 \\ & \text { (95\%) } \\ & \hline \end{aligned}$ | - | - | - |
| $\begin{gathered} \text { Soft } \\ (\mathrm{N}=17369) \end{gathered}$ | $\begin{gathered} \hline 3158 \\ (18 \%) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 6014 \\ (35 \%) \end{gathered}$ | $\begin{aligned} & 8705 \\ & (50 \%) \end{aligned}$ | $\begin{aligned} & 10900 \\ & (63 \%) \end{aligned}$ | $\begin{aligned} & 12609 \\ & (73 \%) \end{aligned}$ | $\begin{aligned} & 13869 \\ & (80 \%) \\ & \hline \end{aligned}$ | $\begin{aligned} & 14842 \\ & (85 \%) \end{aligned}$ | $\begin{aligned} & 15417 \\ & (89 \%) \\ & \hline \end{aligned}$ | $\begin{aligned} & 15837 \\ & (91 \%) \end{aligned}$ | $\begin{aligned} & 16116 \\ & \text { (93\%) } \\ & \hline \end{aligned}$ | $\begin{aligned} & 16334 \\ & \text { (94\%) } \\ & \hline \end{aligned}$ | $\begin{aligned} & 16515 \\ & \text { (95\%) } \\ & \hline \end{aligned}$ | - |
| $\begin{gathered} \text { Oedema } \\ \text { ( } \mathrm{N}=11132 \text { ) } \end{gathered}$ | $\begin{gathered} 2252 \\ (20 \%) \end{gathered}$ | $\begin{aligned} & 4245 \\ & (38 \%) \end{aligned}$ | $\begin{gathered} 6019 \\ (54 \%) \end{gathered}$ | $\begin{aligned} & 7415 \\ & (67 \%) \end{aligned}$ | $\begin{aligned} & 8429 \\ & (76 \%) \end{aligned}$ | $\begin{gathered} 9130 \\ (82 \%) \end{gathered}$ | $\begin{gathered} 9690 \\ (87 \%) \end{gathered}$ | $\begin{aligned} & 10034 \\ & (90 \%) \end{aligned}$ | $\begin{aligned} & 10252 \\ & (92 \%) \end{aligned}$ | $\begin{aligned} & 10386 \\ & (93 \%) \end{aligned}$ | $\begin{aligned} & 10482 \\ & (94 \%) \end{aligned}$ | $\begin{aligned} & 10587 \\ & (95 \%) \end{aligned}$ | - |
| No oedema $(\mathrm{N}=23523)$ | $\begin{aligned} & 4672 \\ & (20 \%) \end{aligned}$ | $\begin{aligned} & 8812 \\ & (37 \%) \end{aligned}$ | $\begin{aligned} & 12553 \\ & (53 \%) \end{aligned}$ | $\begin{aligned} & 15488 \\ & (65 \%) \end{aligned}$ | $\begin{aligned} & 17658 \\ & (75 \%) \end{aligned}$ | $\begin{aligned} & 19296 \\ & (82 \%) \end{aligned}$ | $\begin{aligned} & 20515 \\ & (87 \%) \end{aligned}$ | $\begin{aligned} & 21260 \\ & (90 \%) \end{aligned}$ | $\begin{aligned} & 21758 \\ & (92 \%) \end{aligned}$ | $\begin{aligned} & 22105 \\ & (94 \%) \end{aligned}$ | $\begin{aligned} & 22289 \\ & (95 \%) \end{aligned}$ | - | - |
| $\begin{gathered} 121.6 \\ (N=5724) \end{gathered}$ | $\begin{gathered} 1477 \\ (26 \%) \end{gathered}$ | $\begin{gathered} 2733 \\ (48 \%) \end{gathered}$ | $\begin{aligned} & 3765 \\ & (66 \%) \end{aligned}$ | $\begin{gathered} 4273 \\ (75 \%) \end{gathered}$ | $\begin{aligned} & \hline 4930 \\ & (86 \%) \end{aligned}$ | $\begin{gathered} \hline 5208 \\ (91 \%) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 5389 \\ (94 \%) \\ \hline \end{gathered}$ | $\begin{aligned} & 5469 \\ & (96 \%) \end{aligned}$ | - | - | - | - | - |
| $\begin{gathered} 120.3 \\ (\mathrm{~N}=8327) \end{gathered}$ | $\begin{gathered} 1939 \\ (23 \%) \end{gathered}$ | $\begin{aligned} & \hline 3635 \\ & (44 \%) \end{aligned}$ | $\begin{aligned} & 5131 \\ & (62 \%) \end{aligned}$ | $\begin{gathered} \hline 6219 \\ (75 \%) \end{gathered}$ | $\begin{gathered} \hline 6954 \\ (84 \%) \end{gathered}$ | $\begin{gathered} \hline 7475 \\ (90 \%) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 7835 \\ (94 \%) \end{gathered}$ | $\begin{gathered} \hline 7930 \\ (95 \%) \\ \hline \end{gathered}$ | - | - | - | - | - |
| $\begin{gathered} 94.7 \\ (\mathrm{~N}=3912) \end{gathered}$ | $\begin{gathered} 830 \\ (21 \%) \end{gathered}$ | $\begin{aligned} & 1565 \\ & (40 \%) \end{aligned}$ | $\begin{gathered} 2215 \\ (57 \%) \end{gathered}$ | $\begin{gathered} \hline 2696 \\ (69 \%) \end{gathered}$ | $\begin{gathered} \hline 3066 \\ (78 \%) \end{gathered}$ | $\begin{gathered} \hline 3309 \\ (85 \%) \end{gathered}$ | $\begin{gathered} \hline 3512 \\ (90 \%) \end{gathered}$ | $\begin{gathered} \hline 3650 \\ (93 \%) \end{gathered}$ | $\begin{array}{r} \hline 3720 \\ (95 \%) \\ \hline \end{array}$ | - | - | - | - |
| $\begin{gathered} 77.8 \\ (\mathrm{~N}=7368) \end{gathered}$ | $\begin{gathered} 1138 \\ (15 \%) \end{gathered}$ | $\begin{aligned} & 2206 \\ & (30 \%) \end{aligned}$ | $\begin{aligned} & 3166 \\ & (43 \%) \end{aligned}$ | $\begin{gathered} \hline 3963 \\ (54 \%) \\ \hline \end{gathered}$ | $\begin{aligned} & \hline 4592 \\ & (62 \%) \\ & \hline \end{aligned}$ | $\begin{aligned} & 5128 \\ & (70 \%) \end{aligned}$ | $\begin{gathered} \hline 5604 \\ (76 \%) \end{gathered}$ | $\begin{aligned} & 5999 \\ & (81 \%) \end{aligned}$ | $\begin{aligned} & 6333 \\ & (86 \%) \end{aligned}$ | $\begin{gathered} 6561 \\ (89 \%) \end{gathered}$ | $\begin{gathered} 6765 \\ (92 \%) \end{gathered}$ | $\begin{gathered} 6904 \\ (94 \%) \end{gathered}$ | $\begin{aligned} & 6968 \\ & (95 \%) \end{aligned}$ |
| $\begin{gathered} 64.9 \\ (N=3812) \end{gathered}$ | $\begin{gathered} 700 \\ (18 \%) \end{gathered}$ | $\begin{aligned} & 1360 \\ & (36 \%) \end{aligned}$ | $\begin{aligned} & 1952 \\ & (51 \%) \end{aligned}$ | $\begin{gathered} 2498 \\ (66 \%) \end{gathered}$ | $\begin{gathered} 2935 \\ (77 \%) \end{gathered}$ | $\begin{aligned} & 3230 \\ & (85 \%) \end{aligned}$ | $\begin{gathered} 348 \\ (90 \%) \end{gathered}$ | $\begin{aligned} & 3569 \\ & (94 \%) \end{aligned}$ | $\begin{aligned} & \hline 3605 \\ & (95 \%) \end{aligned}$ | - | - | - | - |
| $\begin{gathered} 52.7 \\ (\mathrm{~N}=5512) \end{gathered}$ | $\begin{gathered} 840 \\ (15 \%) \end{gathered}$ | $\begin{aligned} & 1558 \\ & (28 \%) \end{aligned}$ | $\begin{aligned} & 2343 \\ & (43 \%) \end{aligned}$ | $\begin{gathered} 3054 \\ (55 \%) \end{gathered}$ | $\begin{aligned} & \hline 3610 \\ & (65 \%) \end{aligned}$ | $\begin{gathered} 4076 \\ (74 \%) \end{gathered}$ | $\begin{gathered} \hline 4417 \\ (80 \%) \end{gathered}$ | $\begin{aligned} & 4677 \\ & (85 \%) \end{aligned}$ | $\begin{aligned} & 4893 \\ & (89 \%) \end{aligned}$ | $\begin{gathered} 5054 \\ (92 \%) \end{gathered}$ | $\begin{aligned} & 5119 \\ & (93 \%) \end{aligned}$ | $\begin{aligned} & 5175 \\ & \text { (94\%) } \end{aligned}$ | $\begin{aligned} & 5224 \\ & (95 \%) \end{aligned}$ |


[^0]:    *Compared to largest artificial bubo (121.6mm)

[^1]:    *using +ve and -ve values

