

Mann Whitney

| n_1, n_2 | Livello di significatività a due code | | | n_1, n_2 | Livello di significatività a due code | | |
|------------|--|--------|-------|------------|--|---------|---------|
| | 0.05 | 0.01 | 0.001 | | 0.05 | 0.01 | 0.001 |
| 2, 8 | 3, 19 | | | 4, 9 | 15, 41 | 11, 45 | |
| 2, 9 | 3, 21 | | | 4, 10 | 15, 45 | 12, 48 | |
| 2, 10 | 3, 23 | | | 4, 11 | 16, 48 | 12, 52 | |
| 2, 11 | 4, 24 | | | 4, 12 | 17, 51 | 13, 55 | |
| 2, 12 | 4, 26 | | | 4, 13 | 18, 54 | 14, 58 | 10, 62 |
| 2, 13 | 4, 28 | | | 4, 14 | 19, 57 | 14, 62 | 10, 66 |
| 2, 14 | 4, 30 | | | 4, 15 | 20, 60 | 15, 65 | 10, 70 |
| 2, 15 | 4, 32 | | | 4, 16 | 21, 63 | 15, 69 | 11, 73 |
| 2, 16 | 4, 34 | | | 4, 17 | 21, 67 | 16, 72 | 11, 77 |
| 2, 17 | 5, 35 | | | 4, 18 | 22, 70 | 16, 76 | 11, 81 |
| 2, 18 | 5, 37 | | | 4, 19 | 23, 73 | 17, 79 | 12, 84 |
| 2, 19 | 5, 39 | 3, 41 | | 4, 20 | 24, 76 | 18, 82 | 12, 88 |
| 2, 20 | 5, 41 | 3, 43 | | 4, 21 | 25, 79 | 18, 86 | 12, 92 |
| 2, 21 | 6, 42 | 3, 45 | | 4, 22 | 26, 82 | 19, 89 | 13, 95 |
| 2, 22 | 6, 44 | 3, 47 | | 4, 23 | 27, 85 | 19, 93 | 13, 99 |
| 2, 23 | 6, 46 | 3, 49 | | 4, 24 | 28, 88 | 20, 96 | 13, 103 |
| 2, 24 | 6, 48 | 3, 51 | | 4, 25 | 28, 92 | 20, 100 | 14, 106 |
| 2, 25 | 6, 50 | 3, 53 | | | | | |
| | | | | 5, 5 | 17, 38 | 15, 40 | |
| 3, 5 | 6, 21 | | | 5, 6 | 18, 42 | 16, 44 | |
| 3, 6 | 7, 23 | | | 5, 7 | 20, 45 | 17, 48 | |
| 3, 7 | 7, 26 | | | 5, 8 | 21, 49 | 17, 53 | |
| 3, 8 | 8, 28 | | | 5, 9 | 22, 53 | 18, 57 | 15, 60 |
| 3, 9 | 8, 31 | 6, 33 | | 5, 10 | 23, 57 | 19, 61 | 15, 65 |
| 3, 10 | 9, 33 | 6, 36 | | 5, 11 | 24, 61 | 20, 65 | 16, 69 |
| 3, 11 | 9, 36 | 6, 39 | | 5, 12 | 26, 64 | 21, 69 | 16, 74 |
| 3, 12 | 10, 38 | 7, 41 | | 5, 13 | 27, 68 | 22, 73 | 17, 78 |
| 3, 13 | 10, 41 | 7, 44 | | 5, 14 | 28, 72 | 22, 78 | 17, 83 |
| 3, 14 | 11, 43 | 7, 47 | | 5, 15 | 29, 76 | 23, 82 | 18, 87 |
| 3, 15 | 11, 46 | 8, 49 | | 5, 16 | 31, 79 | 24, 86 | 18, 92 |
| 3, 16 | 12, 48 | 8, 52 | | 5, 17 | 32, 83 | 25, 90 | 19, 96 |
| 3, 17 | 12, 51 | 8, 55 | | 5, 18 | 33, 87 | 26, 94 | 19, 101 |
| 3, 18 | 13, 53 | 8, 58 | | 5, 19 | 34, 91 | 27, 98 | 20, 105 |
| 3, 19 | 13, 56 | 9, 60 | | 5, 20 | 35, 95 | 28, 102 | 20, 110 |
| 3, 20 | 14, 58 | 9, 63 | | 5, 21 | 37, 98 | 29, 106 | 21, 114 |
| 3, 21 | 14, 61 | 9, 66 | 6, 69 | 5, 22 | 38, 102 | 29, 111 | 21, 119 |
| 3, 22 | 15, 63 | 10, 68 | 6, 72 | 5, 23 | 39, 106 | 30, 115 | 22, 123 |
| 3, 23 | 15, 66 | 10, 71 | 6, 75 | 5, 24 | 40, 110 | 31, 119 | 23, 127 |
| 3, 24 | 16, 68 | 10, 74 | 6, 78 | 5, 25 | 42, 113 | 32, 123 | 23, 132 |
| 3, 25 | 19, 71 | 11, 76 | 6, 81 | | | | |
| | | | | 6, 6 | 26, 52 | 23, 55 | |
| 4, 4 | 10, 26 | | | 6, 7 | 27, 57 | 24, 60 | |
| 4, 5 | 11, 29 | | | 6, 8 | 29, 61 | 25, 65 | 21, 69 |
| 4, 6 | 12, 32 | 10, 34 | | 6, 9 | 31, 65 | 26, 70 | 22, 74 |
| 4, 7 | 13, 35 | 10, 38 | | 6, 10 | 32, 70 | 27, 75 | 23, 79 |
| 4, 8 | 14, 38 | 11, 41 | | 6, 11 | 34, 74 | 28, 80 | 23, 85 |

Adattata da White [114].

Valori critici del test di Wilcoxon con segno
(versione della statistica ottenuta considerando solo la somma dei ranghi positivi)

| ONE-TAIL | $\alpha = .05$ | $\alpha = .025$ | $\alpha = .01$ | $\alpha = .005$ |
|----------|-----------------------|-----------------|----------------|-----------------|
| TWO-TAIL | $\alpha = .10$ | $\alpha = .05$ | $\alpha = .02$ | $\alpha = .01$ |
| <i>n</i> | <i>(Lower, Upper)</i> | | | |
| 5 | 0,15 | —, — | —, — | —, — |
| 6 | 2,19 | 0,21 | —, — | —, — |
| 7 | 3,25 | 2,26 | 0,28 | —, — |
| 8 | 5,31 | 3,33 | 1,35 | 0,36 |
| 9 | 8,37 | 5,40 | 3,42 | 1,44 |
| 10 | 10,45 | 8,47 | 5,50 | 3,52 |
| 11 | 13,53 | 10,56 | 7,59 | 5,61 |
| 12 | 17,61 | 13,65 | 10,68 | 7,71 |
| 13 | 21,70 | 17,74 | 12,79 | 10,81 |
| 14 | 25,80 | 21,84 | 16,89 | 13,92 |
| 15 | 30,90 | 25,95 | 19,101 | 16,104 |
| 16 | 35,101 | 29,107 | 23,113 | 19,117 |
| 17 | 41,112 | 34,119 | 27,126 | 23,130 |
| 18 | 47,124 | 40,131 | 32,139 | 27,144 |
| 19 | 53,137 | 46,144 | 37,153 | 32,158 |
| 20 | 60,150 | 52,158 | 43,167 | 37,173 |

Source: Adapted from Table 2 of F. Wilcoxon and R. A. Wilcox, *Some Rapid Approximate Statistical Procedures* (Pearl River, NY: Lederle Laboratories, 1964), with permission of the American Cyanamid Company.

Valori critici del test di Wilcoxon con segno
(versione della statistica ottenuta considerando la somma dei ranghi positivi e negativi)

Valori critici del test *W* di Wilcoxon (test a due code)

| <i>n</i> | <i>Valore critico</i> | <i>p</i> | <i>n</i> | <i>Valore critico</i> | <i>p</i> |
|----------|-----------------------|----------|----------|-----------------------|----------|
| 5 | 15 | 0.062 | 13 | 65 | 0.022 |
| 6 | 21 | 0.032 | | 57 | 0.048 |
| | 19 | 0.062 | 14 | 73 | 0.020 |
| 7 | 28 | 0.016 | | 63 | 0.050 |
| | 24 | 0.046 | 15 | 80 | 0.022 |
| 8 | 32 | 0.024 | | 70 | 0.048 |
| | 28 | 0.054 | 16 | 88 | 0.022 |
| 9 | 39 | 0.020 | | 76 | 0.050 |
| | 33 | 0.054 | 17 | 97 | 0.020 |
| 10 | 45 | 0.020 | | 83 | 0.050 |
| | 39 | 0.048 | 18 | 105 | 0.020 |
| 11 | 52 | 0.018 | | 91 | 0.048 |
| | 44 | 0.054 | 19 | 114 | 0.020 |
| 12 | 58 | 0.020 | | 98 | 0.050 |
| | 50 | 0.052 | 20 | 124 | 0.020 |
| | | | | 106 | 0.048 |

Fonte: adattata da F. Mosteller e R. Rourke, *Study, Statistics, Nonparametrics and Order Statistics*, Addison-Wesley, Reading, Mass, 1973, Tab. A-11.

Valori critici del χ_r^2 di Friedman

| k = 3 trattamenti | | | k = 4 trattamenti | | |
|-------------------|------------|-------|-------------------|------------|-------|
| n | χ_r^2 | P | n | χ_r^2 | P |
| 3 | 6,00 | 0,028 | 2 | 6,00 | 0,042 |
| 4 | 6,50 | 0,042 | 3 | 7,00 | 0,054 |
| | 8,00 | 0,005 | | 8,20 | 0,017 |
| 5 | 5,20 | 0,093 | 4 | 7,50 | 0,054 |
| | 6,40 | 0,039 | | 9,30 | 0,011 |
| | 8,40 | 0,008 | 5 | 7,80 | 0,049 |
| 6 | 5,33 | 0,072 | | 9,96 | 0,009 |
| | 6,33 | 0,052 | 6 | 7,60 | 0,043 |
| | 9,00 | 0,008 | | 10,20 | 0,010 |
| 7 | 6,00 | 0,051 | 7 | 7,63 | 0,051 |
| | 8,86 | 0,008 | | 10,37 | 0,009 |
| 8 | 6,25 | 0,047 | 8 | 7,65 | 0,049 |
| | 9,00 | 0,010 | | 10,35 | 0,010 |
| 9 | 6,22 | 0,048 | | | |
| | 8,67 | 0,010 | | | |
| 10 | 6,20 | 0,046 | | | |
| | 8,60 | 0,012 | | | |
| 11 | 6,54 | 0,043 | | | |
| | 8,91 | 0,011 | | | |
| 12 | 6,17 | 0,050 | | | |
| | 8,67 | 0,011 | | | |
| 13 | 6,00 | 0,050 | | | |
| | 8,67 | 0,012 | | | |
| 14 | 6,14 | 0,049 | | | |
| | 9,00 | 0,010 | | | |
| 15 | 6,40 | 0,047 | | | |
| | 8,93 | 0,010 | | | |

Fonte: adattata da Owen, *Handbook of Statistical Tables*, U.S. Department of Energy, Addison-Wesley, Reading, Mass., 1962. Per gentile concessione.