# Logistic regression for pharmacist intervention rate

From the database, all pharmacists have a known CI rate (including rates of zero), known training level (as participation was recorded) and known ‘additional qualifications’ (as they were coded as ‘none’ if unknown). One pharmacist did not have a workload recorded as the pharmacy did not receive a site visit, therefore the number of full-time equivalent pharmacists was not recorded. The other missing values are due to the pharmacists not completing the surveys (Table 1).

|  | N | Mean | Std. Deviation | Missing | | No. of Extremesa | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Count | Percent | Low | High |
| CI rate | 509 | 0.325 | 0.491 | 0 | 0.0 | 0 | 43 |
| Adaptability score | 445 | 5.955 | 1.794 | 64 | 12.6 | 0 | 16 |
| Confidence score | 445 | 6.299 | 2.311 | 64 | 12.6 | 0 | 38 |
| Clinical knowledge score | 419 | 53.120 | 7.425 | 90 | 17.7 | 11 | 0 |
| Average pharmacist workload | 508 | 478.037 | 185.158 | 1 | 0.2 | 0 | 9 |
| Additional qualifications | 509 |  |  | 0 | 0.0 |  |  |
| CPD | 446 |  |  | 63 | 12.4 |  |  |
| Training | 509 |  |  | 0 | 0.0 |  |  |
| a. Number of cases outside the range (Q1 - 1.5\*IQR, Q3 + 1.5\*IQR). | | | | | | | |

Table 1: Missing value analysis

Table 2 shows the differences in mean between the pharmacists with the data present and not present. The mean CI rate was much higher in the group where the surveys were answered, indicating that the pharmacists who answered the surveys may have been more motivated.

|  | t | df | # Present | # Missing | Mean(Present) | Mean(Missing) |
| --- | --- | --- | --- | --- | --- | --- |
| Adaptability score | 7.7 | 256.2 | 445 | 64 | 0.357 | 0.104 |
| Clinical knowledge score | 6.8 | 326.6 | 419 | 90 | 0.367 | 0.132 |
| CPD | 7.8 | 249.0 | 446 | 63 | 0.357 | 0.010 |

Table 2: Separate variance t-tests

Table 3 shows that 416 cases have all data, 24 are missing only the clinical knowledge score and 59 are missing all survey data. As seen previously, the remaining case is missing a figure for the pharmacist workload.

| No. of Cases | Missing Patternsa | | | | | | | Complete if ...b |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CI Rate | Additional quals | Training | Average pharmacist workload | CPD | Adaptability score | Clinical knowledge score |
| 416 |  |  |  |  |  |  |  | 416 |
| 24 |  |  |  |  |  |  | X | 440 |
| 59 |  |  |  |  | X | X | X | 508 |
| Patterns with less than 1% cases (5 or fewer) are not displayed. | | | | | | | | |
| a. Variables are sorted on missing patterns. | | | | | | | | |
| b. Number of complete cases if variables missing in that pattern (marked with X) are not used. | | | | | | | | |

Table 3: Missing data patterns

Ideally, the MCAR test should be non-significant, as this means the distribution of missing values is unpredictable. For this dataset, the MCAR test was approaching significance and may therefore be predictable (*p* = 0.06). However, this is expected, because the pharmacists who did not fill out one survey, often did not fill out another survey, resulting in a predictable missing value distribution (Table 4).

| EM Correlationsa | | | | |
| --- | --- | --- | --- | --- |
|  | CI Rate | Adaptability score | Clinical knowledge score | Average pharmacist workload |
| CIRate | 1 |  |  |  |
| Adaptability score | -0.160 | 1 |  |  |
| Clinical knowledge score | 0.127 | -0.168 | 1 |  |
| Average pharmacist workload | -0.083 | 0.098 | -0.028 | 1 |
| a. Little's MCAR test: Chi-Square = 19.044, DF = 11, Sig. = .060 | | | | |

Table 4: Distribution of missing values