### Supplementary Table 1. Multivariable logistic regression analysis

| Surgical treatments versus topical treatments | Number (%) | Chi-2 P-value | Crude OR (95% CI) | P-value | OR adjusted for age (95% CI) | P-value |
|-----------------------------------------------|------------|---------------|------------------|---------|-----------------------------|---------|
| Age > 66 years at diagnosis (median) compared to ≤ 66 years | 59/163 (36.2%) 433/835 (51.9%) | < 0.001 | 1.90 (1.34-2.69) | < 0.001 | - | - |
| PeIN size > 1 cm compared to ≤ 1 cm | 44/97 (45.4%) 224/522 (42.9%) | 0.66 | 0.91 (0.59 – 1.40) | 0.66 | - | - |
| PeIN localisation on glans and/or prepuce compared to penile shaft | 111/139 (79.9%) 545/656 (83.1%) | 0.36 | 1.24 (0.78 – 1.97) | 0.36 | - | - |
| Diagnose made by histology compared to clinical diagnose | 112/112 (100.0%) 534/546 (97.8%) | 0.24 * | No calculated logistic regression due to zero cases of dermatological cases with clinical diagnose | - | - | - |
| Reported complications compared to no reported complications | 5/45 (11.1%) 46/504 (9.1%) | 0.60 * | 1.25 (0.47 – 3.31) | 0.66 | - | - |

### Local surgery versus laser surgery

| Age > 66 years at diagnosis (median) compared to ≤ 66 years | 58/128 (45.3%) 276/552 (50.0%) | 0.34 | 1.21 (0.82 – 1.78) | 0.34 | - | - |
| PeIN size > 1 cm compared to ≤ 1 cm | 42/95 (44.2%) 140/353 (39.7%) | 0.42 | 1.21 (0.76 – 1.91) | 0.43 | - | - |
| PeIN localisation on glans and/or prepuce compared to penile shaft | 85/88 (96.6%) 332/435 (76.3%) | < 0.001 | 8.79 (2.72 – 28.39) | < 0.001 | 8.77 (2.71 – 28.32) | < 0.001 |
| Diagnose made by histology compared to clinical diagnose | 62/62 (100.0%) 364/374 (97.3%) | 0.37 * | No calculated logistic regression due to zero cases of laser surgery cases with clinical diagnose | - | - | - |
| Complications | 7/58 (12.1%) 16/348 (4.6%) | 0.03 * | 2.85 (1.12 – 7.26) | 0.03 | 2.82 (1.10 – 7.19) | 0.03 |

### Five first years (2000 – 2004) versus five last years (2015 – 2019)

| Age > 66 years at diagnosis (median) compared to ≤ 66 years | 78/175 (44.6%) 225/409 (55.0%) | 0.02 | 1.52 (1.07 – 2.17) | 0.02 | - | - |
| Comparison                                                                 | N1/N2 (Percentage) | p-value | OR (CI)   | *Fisher's exact test for small numbers* |
|----------------------------------------------------------------------------|---------------------|---------|-----------|----------------------------------------|
| PeIN size > 1 cm compared to ≤ 1 cm                                        | 58/134 (43.3%)      | 0.38    | 1.22 (0.78 – 1.91)                      | -                                      |
|                                                                            | 75/195 (38.5%)      |         | 0.38      | -                                      |
| PeIN localisation on glans and/or prepuce compared to penile shaft         | 15/18 (83.3%)       | 1.00 *  | 1.02 (0.29 – 3.62)                      | 0.98                                   |
|                                                                            | 321/384 (83.6%)     |         | 0.98      | -                                      |
| Surgical treatments versus topical treatments                               | 141/157 (89.8%)     | 0.11    | 1.62 (0.90 – 2.93)                      | 0.111                                  |
|                                                                            | 294/348 (84.5%)     |         | 0.111     | -                                      |
| Local surgery versus laser surgery                                         | 88/122 (72.1%)      | < 0.001 | 5.77 (2.95 – 11.28)                     | < 0.001                                |
|                                                                            | 209/223 (93.7%)     |         | 5.77      | 9.48 (2.29 – 39.24)                    |
|                                                                            | < 0.001             |         | < 0.001   | 0.002                                  |
| Imiquimod and topical 5-FU versus PDT/cryotherapy/diathermy               | 3/14 (21.4%)        | < 0.001 | 9.69 (2.35 – 39.97)                     | 0.002                                  |
|                                                                            | 37/51 (72.5%)       |         | 9.69      | 0.002                                  |

*Chi-2 = Chi-squared test, OR = Odds ratio, CI = Confidence Interval*