

Laboratorinis darbas 2

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Straipsnis

Determination of Predictors Associated With HIV/AIDS Patients on ART Using Accelerated Failure Time Model for Interval Censored Survival Data

Metai: 2015

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Tikslas ir duomenys:

Pagrindinis tyrimo tikslas yra ištirti pagrindinius nepriklausomus kintamuosius darančius įtaką išgyvenamumo laikui sergantiems ŽIV/AIDS ligomis, kurie gydosi Antiretrovirusine terapija (Antiretroviral Therapy (ART)).

- Duomenys rinkti 2004 - 2010
- 2052 pacientų duomenų
- Tyrimo pabaigoje buvo 273 mirusių pacientų
- Intervalinis cenzūravimas (mirties data tarp paskutinio apsilankymo ir tyrimo pabaigos)

Duomenų savybės

Table 1. Descriptive statistics of HIV/AIDS patients on ART

| Variable | Category (Code) | Number of patients (Percent) N = 2052 |
|----------------------------|-------------------------------|--|
| Age | ≥35 years (0) | 729 (35.5) |
| | <35 years (1) | 1323 (64.5) |
| Sex | Male (0) | 1341 (65.4) |
| | Female (1) | 711 (34.6) |
| Mode of Transmission (MOT) | Sexual (1) | 1524 (74.3) |
| | Blood + IDU(2) | 168 (8.2) |
| | Unknown(3) | 360 (17.5) |
| CD4+ cell | ≥350 (0) | 129 (6.3) |
| | <350 (1) | 1923 (93.7) |
| Location Status | Urban (0) | 1817 (88.5) |
| | Rural (1) | 235 (11.5) |
| Marital Status | Married (0) | 1655 (80.7) |
| | Unmarried (1) | 397 (19.3) |
| Smoking | Yes (1) | 654 (31.9) |
| | No (0) | 1398 (68.1) |
| Alcohol | Yes (1) | 738 (36.0) |
| | No (0) | 1314 (64.0) |
| Drug | Yes (1) | 31 (1.5) |
| | No (0) | 2021 (98.5) |
| BMI | <18.5 k.g/m ² (1) | 643 (31.3) |
| | 18.5-25k.g/m ² (2) | 1333 (65.0) |
| | ≥25 k.g/m ² (3) | 76 (3.7) |
| Hemoglobin | <8 g dL ⁻¹ (1) | 107 (5.2) |
| | 8-14 g dL ⁻¹ (2) | 1833 (89.3) |
| | ≥14 g dL ⁻¹ (3) | 112 (5.5) |
| Status | Alive (0) | 1779 (86.7) |
| | Death (1) | 273 (13.3) |

Naudoti modeliai

Naudotas AFT(Accelerated Failure Time) modelis.

Nagrinėti eksponentinis, Weibull, log-normalus, log-logistinis modeliai.

Modeliams lyginti naudota AIC ir BIC kriterijai

Rezultatai

Kovariantės age, sex, CD4, transmission (unknown), hemoglobin, BMI reikšmingos visuose modeliuose.

Location reikšminga tik eksponentiniame ir Weibull modeliuose.

Drug reikšminga tik log-normal ir log-logistic modeliuose.

Rezultatai

Table 2. A parametric accelerated failure time model for interval censored survival data of HIV/AIDS infected patients on ART

| Parameters | Exponential | | | Weibull | | | Lognormal | | | Log-logistic | | |
|---------------------|-------------|-----------|---------|----------|-----------|---------|-----------|-----------|---------|--------------|-----------|---------|
| | β | Std.Error | TR | β | Std.Error | TR | β | Std.Error | TR | β | Std.Error | TR |
| Age(<35 years) | 0.017 | 0.008 | 1.017* | 0.014 | 0.006 | 1.014** | 0.017 | 0.007 | 1.017* | 0.015 | 0.006 | 1.015* |
| Sex (Female) | 0.719 | 0.144 | 2.052** | 0.573 | 0.124 | 1.774** | 0.677 | 0.137 | 1.968** | 0.628 | 0.129 | 1.874** |
| CD4 (<350 cell/mm3) | -1.720 | 0.582 | 0.179** | -1.389 | 0.478 | 0.249** | -1.511 | 0.431 | 0.221** | -1.377 | 0.451 | 0.252** |
| MOT | | | | | | | | | | | | |
| Sexual | Ref | | 1 | Ref | | 1 | Ref | | 1 | Ref | | 1 |
| Blood+ IDU | -0.225 | 0.201 | 0.799 | -0.174 | 0.162 | 0.840 | -0.201 | 0.197 | 0.818 | -0.187 | 0.175 | 0.829 |
| Unknown | 0.380 | 0.165 | 1.462* | 0.394 | 0.133 | 1.483* | 0.479 | 0.149 | 1.614** | 0.431 | 0.136 | 1.539** |
| Hemoglobin | 0.316 | 0.031 | 1.372** | 0.252 | 0.032 | 1.287** | 0.307 | 0.038 | 1.359** | 0.277 | 0.035 | 1.319** |
| BMI | -0.049 | 0.021 | 0.952* | -0.039 | 0.017 | 0.962** | -0.053 | 0.021 | 0.948** | -0.045 | 0.019 | 0.956** |
| Location Status | -0.380 | 0.188 | 0.684* | -0.336 | 0.152 | 0.715* | -0.298 | 0.182 | 0.742 | -0.322 | 0.163 | 0.725* |
| Marital Status | -0.139 | 0.158 | 0.870 | -0.119 | 0.127 | 0.888 | -0.089 | 0.145 | 0.915 | -0.101 | 0.132 | 0.904 |
| Smoking | 0.158 | 0.162 | 1.171 | 0.130 | 0.131 | 1.139 | 0.157 | 0.138 | 1.170 | 0.158 | 0.132 | 1.171 |
| Alcohol | -0.130 | 0.155 | 0.878 | -0.121 | 0.125 | 0.886 | -0.125 | 0.132 | 0.882 | -0.132 | 0.125 | 0.876 |
| Drug | -0.644 | 0.379 | 0.525 | -0.492 | 0.308 | 0.611 | -0.775 | 0.38 | 0.461* | -0.583 | 0.351 | 0.558* |
| Intercept | 4.181 | | | 4.118 | | | 3.815 | | | 3.683 | | |
| λ | 0.015 | | | 0.006 | | | 0.666 | | | 0.74 | | |
| γ | | | | 1.234 | | | 1.50 | | | 1.352 | | |
| AIC | 1599.012 | | | 1593.210 | | | 1588.039 | | | 1589.677 | | |
| BIC | 1612.651 | | | 1604.851 | | | 1599.651 | | | 1601.021 | | |

Rezultatai

Pagal AIC ir BIC kriterijus lognormal modelis turi mažiausiąs reikšmes, kas reiškia kad jis geriausias. Tačiau skirtumas tarp modelių nėra toks žymus.

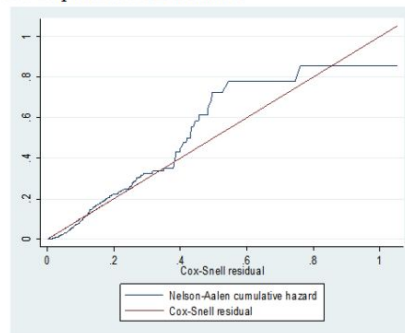
Pagal straipsnio autorius lognormal ir log-logistic modeliai yra panašiai geri ir darant išvadas dėmesį reiktų atkreipti į abu juos.

Rezultāti

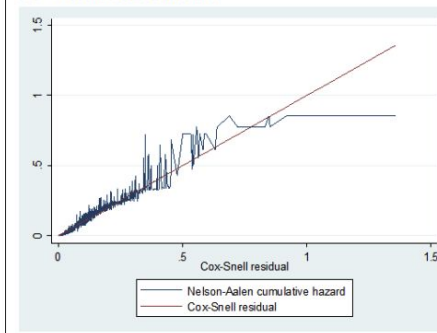
Matome kad visi modeļi yra gana adekvatūs nes grafikas tiesiski kyla į viršų.

Tačiau Lognormal ir Log-logistic atrodo geriau.

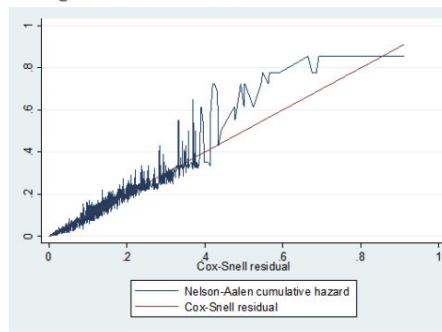
2.1 Exponential AFT Model



2.2 Weibull AFT Model



2.3 Lognormal AFT Model



2.4 Log-logistic AFT Model

