Appendix 1

* *Score Equation of Principal Components*

Given the eigenvector $\hat{e}\_{j}=\left[\begin{array}{c}β\_{j,1}\\β\_{j,2}\\…\\β\_{j,n}\end{array}\right]$, the following equation is obtained:

|  |  |
| --- | --- |
| $$\hat{Y}\_{j}=β\_{j,1}Z\_{1}+β\_{j,2}Z\_{2}+…+β\_{j,n}Z\_{n}$$ | (1) |

$\hat{Y}\_{j}$ *= score of component j resulting from the analysis of principal components*

$β\_{j,k}$ = *multiplicative constant of the k-th original standardized variable associated with component j*

$Z\_{k}$ *= value of the k-th original standardized variable for a given health region*

* *Complete Equation of ICI with standardized variables*

|  |  |  |
| --- | --- | --- |
|  | $$ICI = 0,114 Z\_{1}+0,125 Z\_{2 }+0,122 Z\_{3}+0,115 Z\_{4}+$$$$ 0,092 Z\_{5}+0,065 Z\_{6 }+0,118 Z\_{7}+0,113 Z\_{8}+$$$$ 0,110 Z\_{9}+0,117 Z\_{10}+0,118 Z\_{11}$$ | (2) |

Where:

$Z\_{1}$ *= standardized value of resuscitators per 10 thousand users*

$Z\_{2}$ *= standardized value of respirators/ventilators per 10 thousand users*

$Z\_{3}$ *= standardized value of ECG monitors per 10 thousand users*

$Z\_{4}$ *= standardized value of defibrillators per 10 thousand users*

$Z\_{5}$ *= standardized value of CT scanners per 10 thousand users*

$Z\_{6}$ *= standardized value of clinical beds/intermediate care per 10 thousand users*

$Z\_{7}$ *= standardized value of ICU beds per 10 thousand users*

$Z\_{8}$ *= standardized value of nurses per 10 thousand users*

$Z\_{9}$ *= standardized value of physical therapists per 10 thousand users*

$Z\_{10}$ *= standardized value of doctors per 10 thousand users*

$Z\_{11}$ *= standardized value of certified nursing assistants per 10 thousand users*

* *Derivation of the Complete Equation of the ICI as a function of the original variables*

|  |  |  |
| --- | --- | --- |
|  | $$ICI=\sum\_{i=1}^{n}\left[\left(\frac{β\_{1,i}}{σ\_{i}}\right).X\_{i}\right]-\sum\_{i=1}^{n}\left[\left(\frac{β\_{1,i}}{σ\_{i}}\right).μ\_{i}\right]$$ | (3.1) |
|  | $$ICI =(0,034 X\_{1}+0,080 X\_{2 }+0,053 X\_{3}+0,125 X\_{4}+$$$$ 0,659 X\_{5}+0,019 X\_{6 }+0,099 X\_{7}+0,033 X\_{8}+$$$$ 0,108 X\_{9}+0,007 X\_{10}+0,011 X\_{11})-(1,816)$$ | (3.2) |

Where:

$X\_{1}$ *= original value of resuscitators per 10 thousand users*

$X\_{2}$ *= original value of respirators/ventilators per 10 thousand users*

$X\_{3}$ *= original value of ECG monitors per 10 thousand users*

$X\_{4}$ *= original value of defibrillators per 10 thousand users*

$X\_{5}$ *= original value of CT scanners per 10 thousand users*

$X\_{6}$ *= original value of clinical beds/intermediate care per 10 thousand users*

$X\_{7}$ *= original value of ICU beds per 10 thousand users*

$X\_{8}$ *= original value of nurses per 10 thousand users*

$X\_{9}$ *= original value of physical therapists per 10 thousand users*

$X\_{10}$ *= original value of doctors per 10 thousand users*

$X\_{11}$ *= original value of certified nursing assistants per 10 thousand users*