**Appendix 2**: MATLAB program for gray correlation analysis.

\[ a = vv \text{ is the } 460 \times 9 \text{ matrix of opioid use, usage trends and population data of all aspects} \]

\[ \text{for } i = [1:8] \text{ % standardization of benefit indicators } a(i,:) = (a(i,:) - \text{min}(a(i,:))) / (\text{max}(a(i,:)) - \text{min}(a(i,:))) \];

\[ [m,n] = \text{size}(a); \]

\[ \text{cankao} = \text{max}(a') \text{ % find the value of the reference sequence } t = \text{repmat}(\text{cankao},[1,n]) - a; \text{ % find the difference between the reference sequence and each sequence} \]

\[ m\text{min} = \text{min}(\text{min}(t)); \text{ % calculates the minimum difference} \]

\[ m\text{max} = \text{max}(\text{max}(t)); \text{ % calculates the maximum difference} \]

\[ \text{rho} = 0.5; \text{ % resolution coefficient} \]

\[ \text{xishu} = (m\text{min} + \text{rho} \times m\text{max}) / (t + \text{rho} \times m\text{max}) \text{ % Calculate the grey correlation coefficient} \]

\[ \text{guanliandu} = \text{mean}(\text{xishu}) \text{ % take equal weight and calculate relevance} \]

\[ [\text{gsort},\text{ind}] = \text{sort}(\text{guanliandu},'\text{descend}') \text{ % sorts the relevance by big to small} \]