

Bringing the Confidence Intervals into Choropleth Mortality Map: An Example of Tainan, Taiwan

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Abstract : Background: Choropleth mortality map is commonly used to identify areas with higher mortality risk. However, the use of choropleth map alone might result in the misinterpretation of differences in mortality rates between areas. Two areas with different color shades might not actually have a significant difference in mortality rates. The mortality rates estimated for an area with a small population would be less stable. We suggest of bringing the 95% confidence intervals (CI) into the choropleth mortality map to help users interpret the areal mortality rate difference more properly. Method: In the first choropleth mortality map, we used only three color to indicate standardized mortality ratio (SMR) for each district in Tainan, Taiwan. The red color denotes that the SMR of that district was significantly higher than the Tainan average; on the contrary, the green color suggests that the SMR of that district was significantly lower than the Tainan average. The yellow color indicates that the SMR of that district was not statistically significantly different from the Tainan average. In the second choropleth mortality map, we used traditional sequential color scheme (color ramp) for different SMR in 37 districts in Tainan City with bar chart of each SMR with 95% CI in which the users could examine if the line of 95% CI of SMR of two districts overlapped (nonsignificant difference). Results: The all-causes SMR of each district in Tainan for 2008 to 2013 ranged from 0.77 (95% CI 0.75 to 0.80) in East District to 1.39 Beimen (95% CI 1.25 to 1.52). In the first choropleth mortality map, only 16 of 37 districts had red color and 8 districts had green color. For different causes of death, the number of districts with red color differed. In the first choropleth mortality map we added a bar chart with line of 95% CI of SMR in each district, in which the users could visualize the SMR differences between districts. Conclusion: Through the use of 95% CI the users could interpret the areal mortality differences more properly.

Keywords : choropleth map, small area variation, standardized mortality ratio (SMR), Taiwan

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