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# Cartogram of the peptic ulcer disease of stomach and duodenum incidence in Kazakhstan

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# Summary slide

## Background

- The incidence of peptic ulcer disease of stomach and duodenum (PUD) is declining. However, it continues to be a source of significant morbidity and mortality worldwide.

## Aim

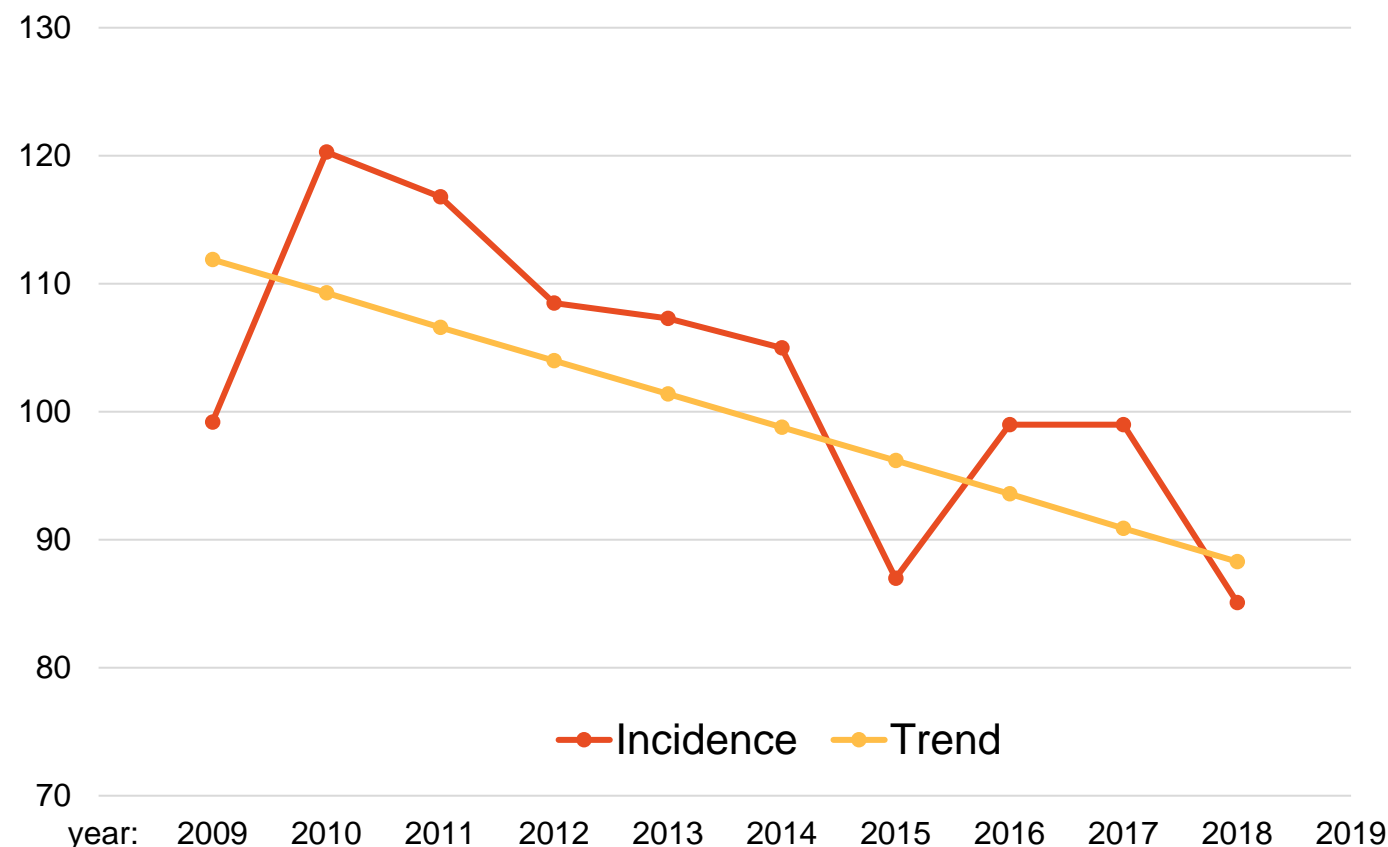
- To study the regional features of PUD incidence in Kazakhstan by compiling cartogram.

## Methods

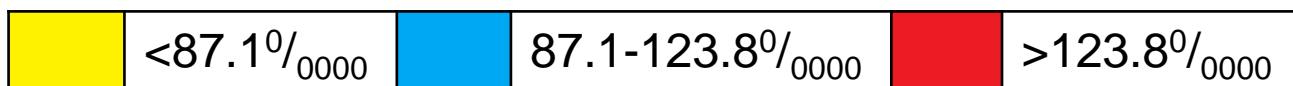
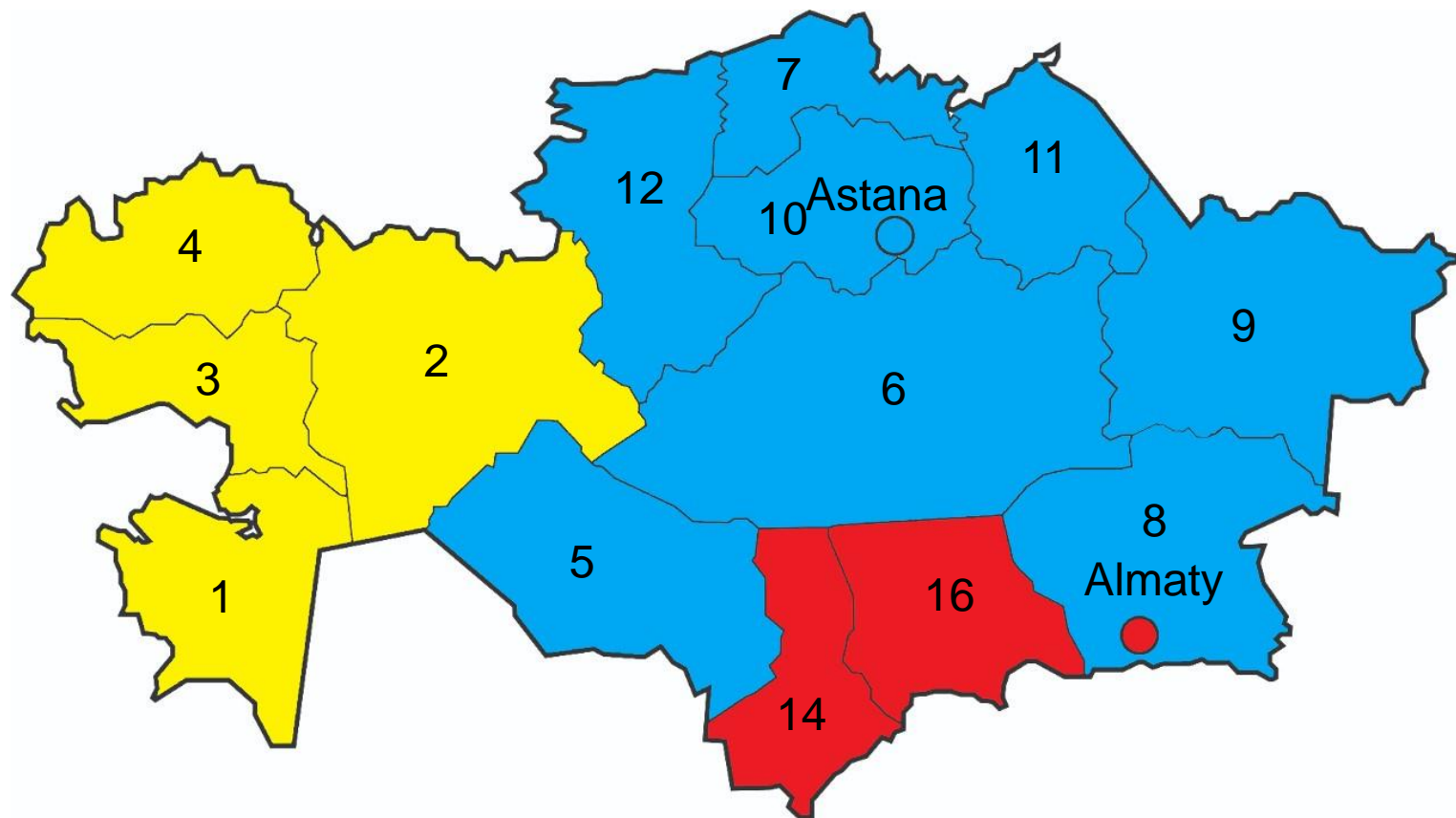
- We used the incidence rates for 10 years (2009-2018) provided by the Ministry of Health of Kazakhstan and applied the method of compiling cartograms.

# Results

- During the study period, 174,641 cases of PUD were recorded in country. The average annual incidence was  $102.7 \pm 3.0$  per 100,000 population. In dynamics, the incidence rates tended to decrease from  $99.2 \pm 0.8^{0}_{0000}$  in 2009 to  $85.1 \pm 0.7^{0}_{0000}$  in 2018, the established difference is statistically significant ( $t=13.26$ ;  $p=0.000$ ;  $T=-2.6$ ).



# Results



- Regions:** 1. Mangistau ( $60.7\text{‰}$ );  
2. Aktobe ( $74.6\text{‰}$ );  
3. Atyrau ( $76.4\text{‰}$ );  
4. West Kazakhstan ( $83.5\text{‰}$ );  
5. Kyzylorda ( $87.1\text{‰}$ );  
6. Karaganda ( $90.4\text{‰}$ );  
7. North Kazakhstan ( $90.7\text{‰}$ );  
8. Almaty ( $91.0\text{‰}$ );  
9. East Kazakhstan ( $91.3\text{‰}$ );  
10. Akmola ( $94.2\text{‰}$ );  
11. Pavlodar ( $100.1\text{‰}$ );  
12. Kostanay ( $101.9\text{‰}$ );  
13. Astana city ( $109.6\text{‰}$ );  
14. South Kazakhstan ( $123.8\text{‰}$ );  
15. Almaty city ( $128.9\text{‰}$ );  
16. Zhambyl ( $164.9\text{‰}$ ).

# Conclusions

Thus, the established epidemiological peculiarities of incidence of peptic ulcer disease of stomach and duodenum indicate its geographic variability, with a territorial differentiation of loci with low values in the western regions and high values in the mainly southern regions. The obtained results will provide the public health managers a clear spatial picture of PUD frequency and incidence, which must be used to monitor and assess the treatment, to conduct proper prevention and further research.