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Estimation of the overall AMR burden in Switzerland is affected by linguistic region and level of care stratifications

03. Bacterial susceptibility & resistance
3h. Policy aspects of AMR incl societal impact, economics, mitigation

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Background

Number of disability-adjusted life years (DALYs) is a composite measure which has widely been used in public health to quantify different disease burdens including antimicrobial resistance (AMR) (e.g. Cassini et al. (Lancet Infect Dis, 2019)). Switzerland has different linguistic regions in which characteristic AMR distributions were observed in the past. The aim of this study was to investigate whether stratifications by the linguistic regions and the level of care affect the total AMR burden estimation in Switzerland (2010-2019).
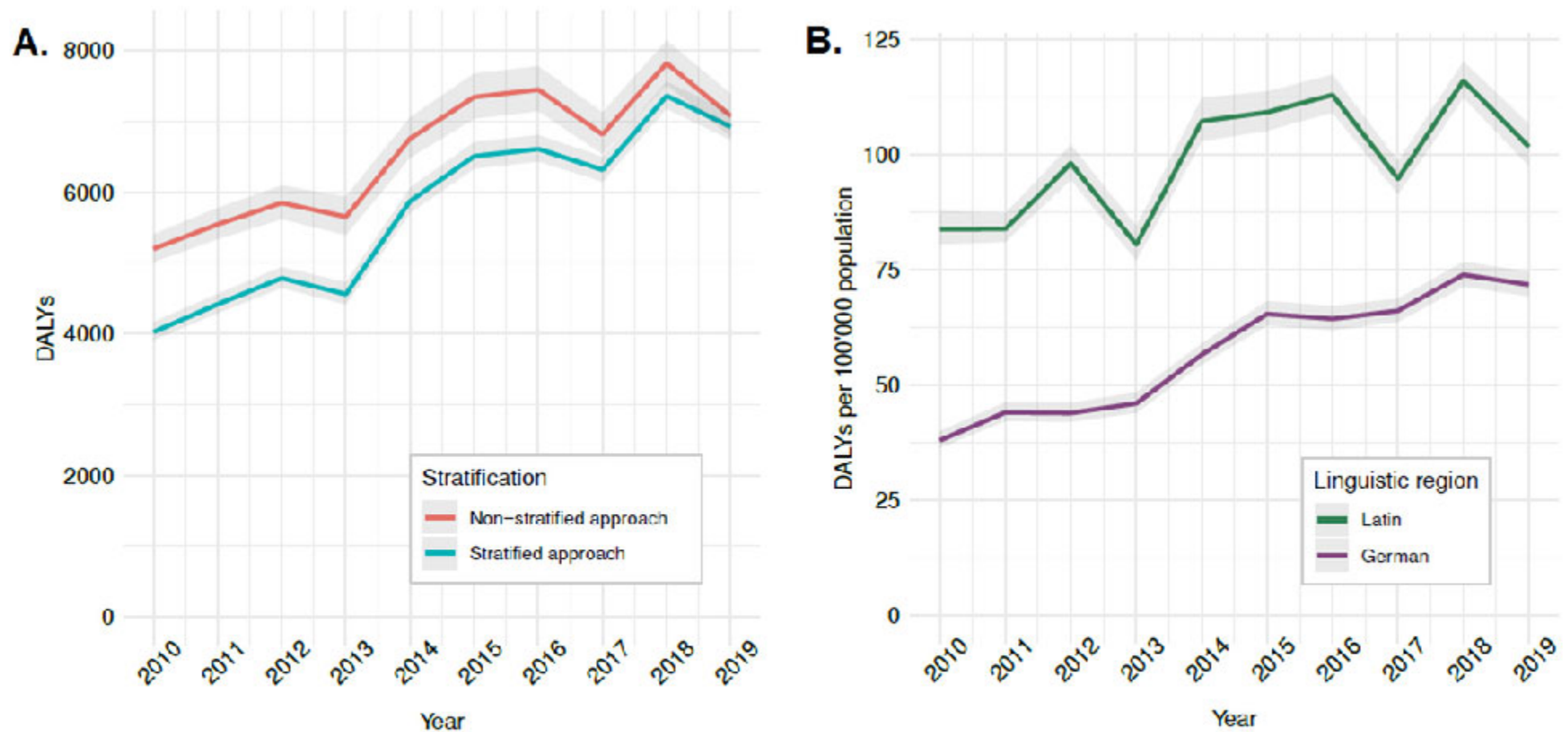
Methods

Yearly data on bloodstream infections were prospectively collected within the Swiss national antibiotic resistance database ANRESIS. DALYs were estimated from this dataset according to Cassini et al. (Lancet Infect Dis, 2019) ("non-stratified approach"). The proceeding was then slightly adapted by calculating separate coverage correction factors and number of DALYs for each linguistic region/level of care combination ("stratified approach").

Results

By using the stratified approach it was estimated that DALYs increased from 4023 (UI 95% 3908-4166) in 2010 to 6919 (UI 95% 6734 - 7130) DALYs in 2019 (+72%, Figure 1A, red line). DALYs per 100'000 population were higher in the Latin part of Switzerland compared with the German part throughout the whole study period (Figure 1B). The stratification according to the level of care revealed differences concerning the absolute number of DALYs (which were higher in university hospitals) and moreover the slope of the increase (e.g. university hospitals Latin part +15%, non-university hospitals Latin part +59%). A comparison of the stratified approach (Figure 1, blue line) with the original non-stratified approach (Figure 1, red line) shows considerable differences in both absolute values and the slope, particularly in the early years of the study when the hospital coverage rate was lower (2010 54%, 2019 89%).

Conclusions

Both approaches show an increase of the AMR burden in Switzerland from 2010-2019. However, as estimated DALYs differ considerably depending on the linguistic region and the level of care a stratification by these factors may improve the overall AMR burden estimation. Particularly in countries with low AMR surveillance coverages a potential overestimation of the AMR burden might be avoided by using a stratified approach.

Figure 1: A. Estimation of DALYs caused by infections with antibiotic-resistant bacteria in Switzerland from 2010 to 2019 estimated with two different methodological approaches. In the "Stratified approach " (blue line) stratifications by the linguistic region and the level of care were performed and data were then aggregated on a national level. In the "Non-stratified approach" (red line) no such stratifications were performed. 95% uncertainty intervals are depicted by grey ribbons. |
B. Estimation of DALYs per 100'000 population by linguistic regions in Switzerland 2010-2019.

Regional stratification

Conflicts of interest

Do you have any conflicts of interest to declare?
I have no potential conflict of interest to report