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Myocardial infarction incidence, cardiovascular disease, and external cause mortality pattern among German repatriates: the impact of factual circumstances

Promotionsfach: Public Health
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Mass immigration of German repatriates from the *former Soviet Union* (FSU) in the 1990s sustainably altered the composition of the German society. Their having come from countries suffering the highest *cardiovascular disease* (CVD) mortality worldwide aroused public health concerns. Surprisingly, an initial lower all-cause and CVD mortality compared to the general German population was observed in this immigrant population in former large register-based studies. Our research project involved a longer observation period than previous studies, following up a newly established cohort of German repatriates from the FSU, allocated to the Augsburg region between 1990 and 1999. It was thus possible to gain in-depth insight into deaths due to CVD, *cerebrovascular disease* (CVA) and *ischemic heart disease* (IHD), and to investigate *acute myocardial infarction* (AMI) incidence among German repatriates for the first time. In addition, external causes and suicides formed a particular focus.

Altogether 6,378 individuals meeting the inclusion criteria were identified in the residents' registers and their final vital status in May 2010 assessed. The majority of German repatriates remained within Augsburg city or nearby after leaving transitional accommodation. Only 2.1% of the cohort was lost to follow-up in the address tracing process. The follow-up accumulated more than 92,000 *person years* (PY). Of 487 deaths observed in the cohort, 18 (3.7 %) causes of death could not be determined. Age-adjusted mortality measures were used to screen the cohort for conspicuous mortality patterns. Time trend analyses were conducted to obtain deeper insight into cohort dynamics. As yearly rate estimates were inaccurate due to low event numbers and PYs, various parametric and non-parametric methods were applied to reduce uncertainty in the data.

Female all-cause mortality was lower compared to that of the general German population (SMR=0.85 [0.75; 0.97]), as were CVD (0.82 [0.65; 1.02]), CVA (0.54 [0.25; 1.02]) and IHD mortality for males (0.84 [0.60; 1.14]), though the latter three were not significant. These effects depended on the immigration period and on calendar year. Females immigrating between 1990 and 1994 had lower all-cause (0.79 [0.67; 0.93]), CVD (0.90 [0.70; 1.14]) and CVA mortality (0.72 [0.37; 1.26]); for IHD an opposite effect was observed (1.19 [0.83; 1.67]). Protective effects mostly disappeared in the second immigration period (1995-1999). Early male immigrants had lower CVD (0.79 [0.59; 1.04]), IHD (0.70 [0.44; 1.06]), and CVA mortality (0.53 [0.19; 1.15]). Time trends for both CVD and IHD showed initial advantages in the repatriate cohort, with rates converging to those of the general German population towards the end of the observation period. Males aged below 50 years seemed to have a higher risk of CVD death (1.26 [0.58; 2.39]). In contrast to CVD and IHD, males suffered significantly more from incident AMI compared to the general male population (SIR=1.30 [1.02; 1.65]), with young male re-settlers (1.51 [1.05; 2.17]) and males immigrating late (1.72 [1.25; 2.38]) being most affected. Time trend analyses showed male repatriates' incidence rates crossing over the general population's rates around the turn of the millennium.

Deaths due to external causes presented a major problem among males (SMR=1.58 [1.09; 2.23]). Intentional self-harm appeared to be at alarmingly high levels among males (1.81 [0.99; 3.05]). Male immigrants who experienced migration during puberty were particularly at risk (3.84 [1.05; 9.84]). However, there was no association between increasing all-cause mortality and deaths due to suicides and increasing number of moves. The main results of this study were consistent with previous findings, although often not statistically significant, due to lack of power.

Some common sources of bias are assessed and discussed. The healthy migrant effect was most likely not present in the cohort. Bias due to selective loss to follow-up, missing death certificates, and under-registration of repatriates could be largely ruled out. Death certificate misclassification probably resulted in some information bias. However, SMR underestimation was much more likely than overestimation.

As most CVDs usually become manifest a long time after exposure to risk factors, and the better health system and emergency care in Germany alone cannot explain the initially advantageous mortality patterns among repatriates, their CVD mortality should have been lower compared to the Russian general population as well. Although it was not possible to obtain data on lifestyle-related risk factors in this study, conclusions regarding living conditions in the FSU could be drawn based on the available evidence on risk factors among repatriates in Germany. The difficult history repatriates are known to have faced in the FSU, in combination with data on their educational levels, suggest that after World War II several generations experienced lower *socioeconomic position* (SEP) than Russians. Young Russian males in particular engaged in detrimental drinking behavior, which likely contributed most to premature CVD death. As it would be expected for ethnic Germans with their lower SEP to have higher levels of CVD than the Russian population, it can be concluded that ethnic Germans in the FSU did not engage in such behaviors. They seem to have defined their own microcosm, intolerant of such behavior. This conclusion is supported by observations regarding strong family bonds and the importance of cultural identity. If ethnic Germans had been drinking as Russians and thus had a similar risk of mid-term non-atherosclerotic fatal IHDs, in order to then have the observed lower CVD in Germany, the repatriates would have had to change their drinking behaviors abruptly after arriving in Germany. However, late immigrants of more mixed ethnicity seemed to be behaviorally more similar to Russians and thus more exposed to AMI risk factors. These late migrants had poorer language skills, and integration into the German society often failed.

After arrival in Germany, the majority of re-settlers experienced a cultural clash, and the envisioned homeland was stranger than their hostile but well-known origin. While some re-settler subgroups, such as individuals organized in the *Landsmannschaft*, seemed to benefit from migration to Germany, others seemed to jump out of the frying pan and into the fire. The much denser population and permanent high unemployment rates produced intense friction, and encapsulation in ghetto communities became common. Male German repatriates who migrated at a young age were most at risk of committing suicide.

Public health researchers and health politicians should be sensitised to the high AMI incidence and the burden of suicides among German repatriates from the FSU. A former comparatively lower CVD mortality has disappeared by now and may possibly turn into the opposite in future. CVD screening programmes should be implemented that specifically target repatriates, complemented by increased migrant-specific primary prevention efforts. Combating mental disorders might require setting-oriented approaches that take families' migration history into account, rather than targeting individuals. Reactivation of resources

proven to have been protective in the FSU, such as strong family bonds and group coherence, should become part of such efforts.