EXPLORING THREE DECADES OF RECONSTRUCTED CAUSE-OF-DEATH TIME SERIES
CZECH REPUBLIC, WEST GERMANY and FRANCE

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BACKGROUND

During more than a hundred years of existence of International Classification of Diseases (ICD), countries accumulated large collections of cause-of-death (COD) data which remain under-explored due to breaks introduced by decennial classification revisions. We have reconstructed the COD time series for the former West Germany and Czech Republic and compared them to the existing series for France. The data cover two ICD revisions (ICD8 and ICD9) and provide the 3-digit level detail.

1. RECONSTRUCTING THE TIME SERIES

- Define correspondences between ICD8 and ICD9
- Construct elementary associations (Fig. 1)
- Calculate transition coefficients
- Check series by age and sex
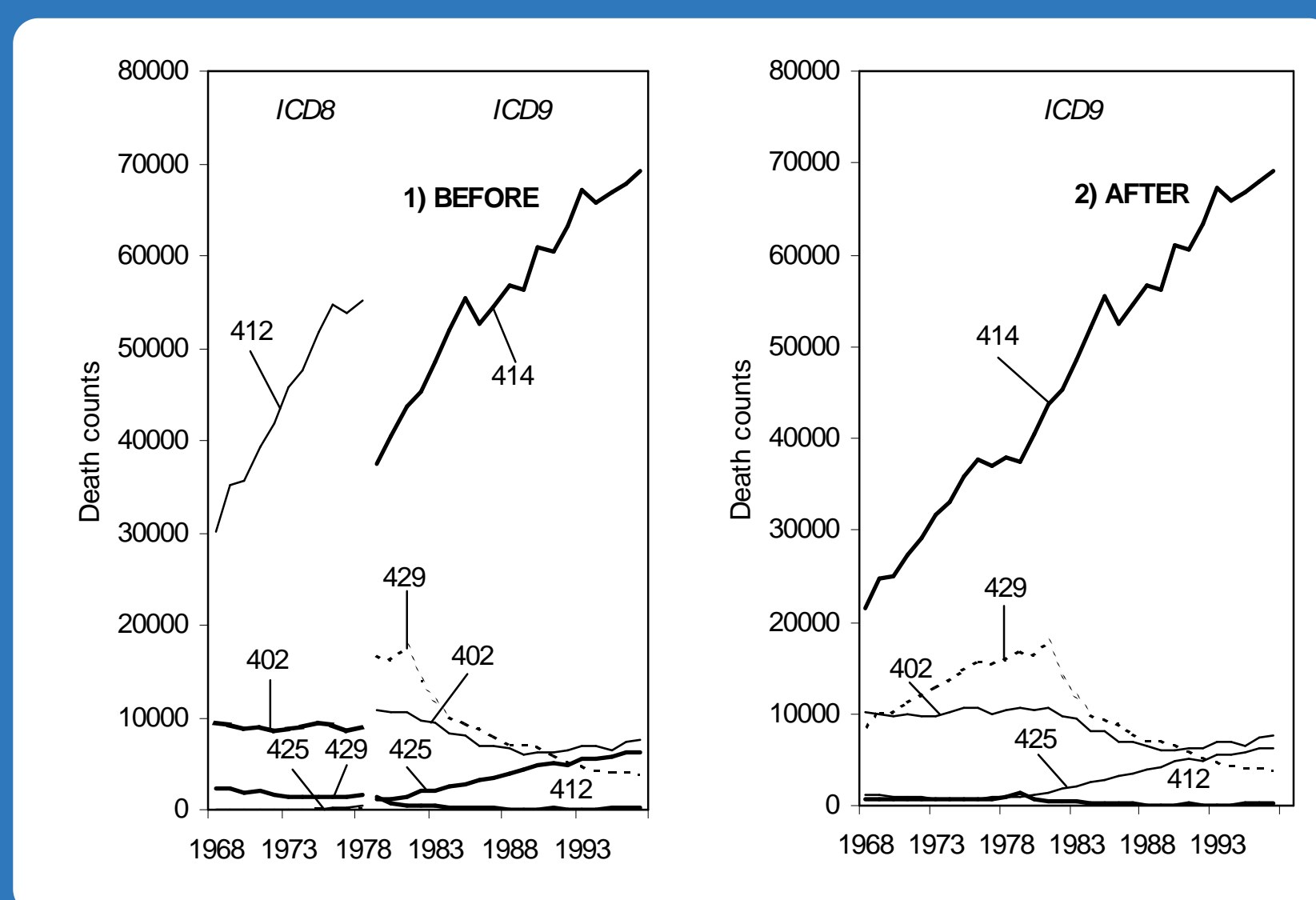- Check for additional breaks in data, not related to the classification change

Fig. 1 Elementary association

2. DISEASE PATTERNS IN MOTION

The overall mortality in time, when broken down by the main chapters of ICD9, not only differs by levels, but also by structure. The three countries represent three dissimilar mortality profiles:
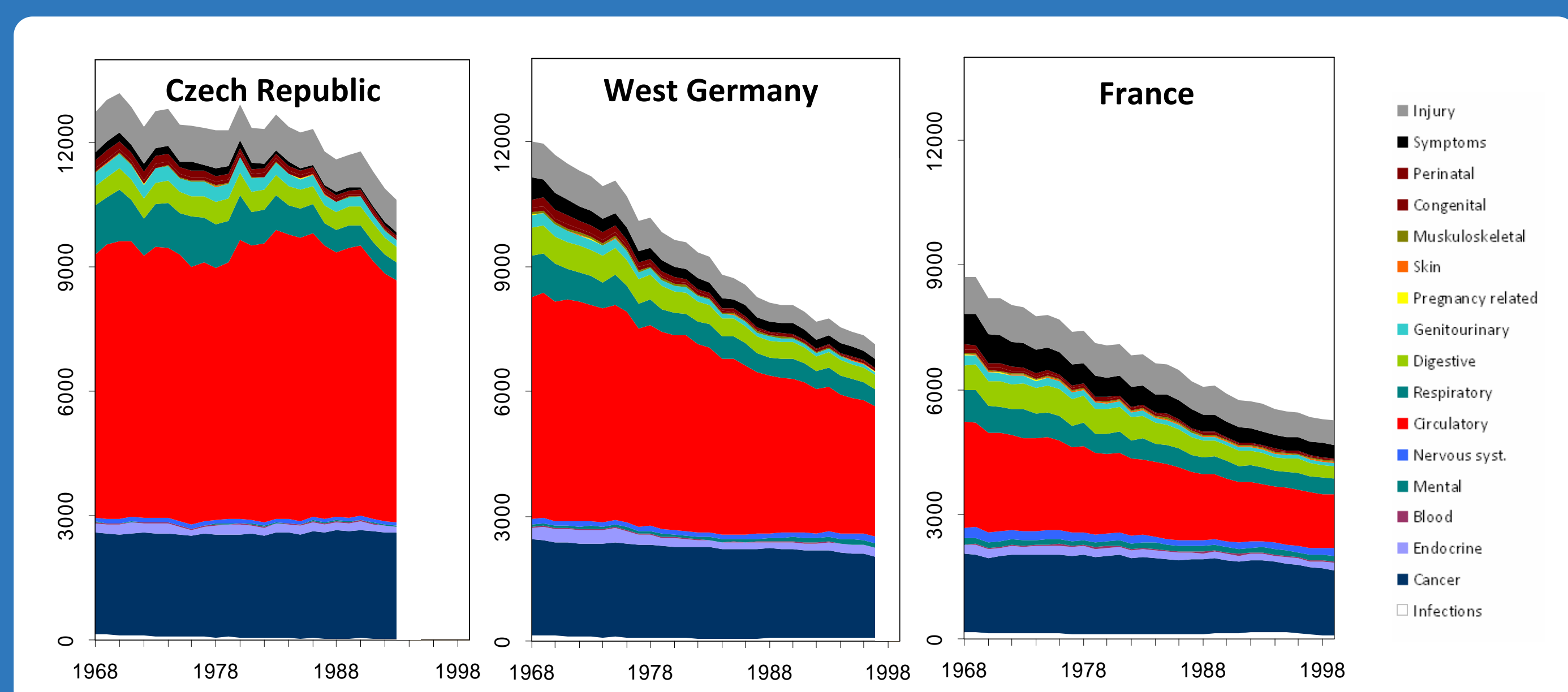

Fig.2 Age standardized death rates* by ICD9 chapters

3. HETEROGENEITY

The ICD consists of nearly 1,000 3-digit items, but the overall mortality is concentrated in roughly one half of them. Moreover, 90% of mortality is classified into 100-150 causes, depending on the heterogeneity of the COD profile. After reaching 90%, the marginal explanatory value of each added ICD item quickly decreases.
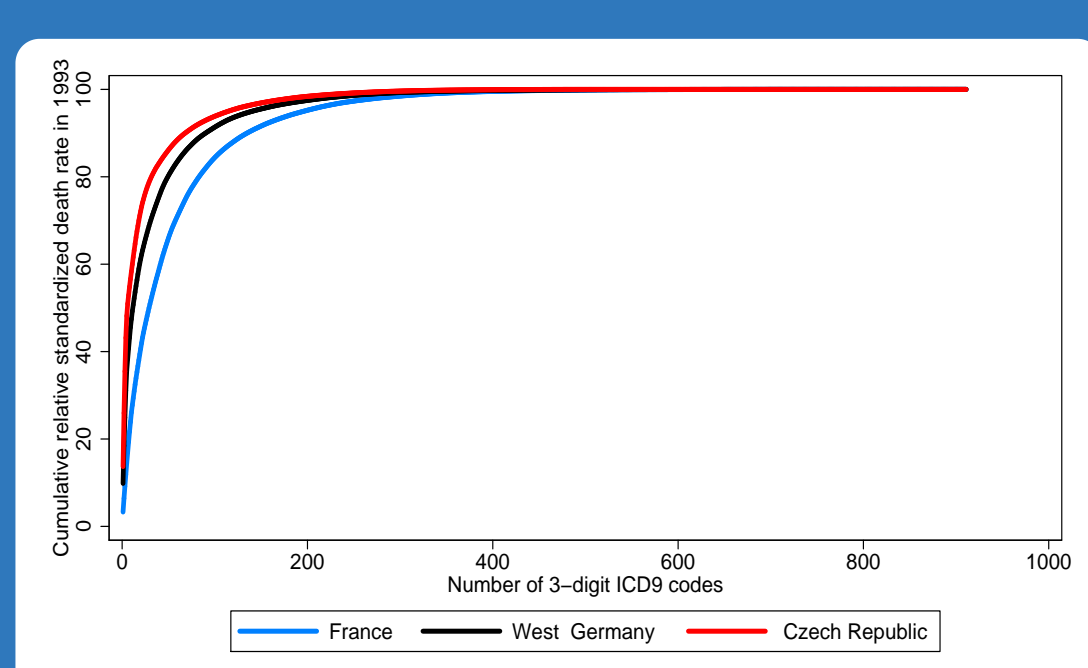

Fig.3 Concentration of mortality into 3-digit ICD9 items

*** Per 1,000,000. Both sexes combined.**

4. MOST FREQUENT DISEASES

The first four positions are occupied by four major types of circulatory diseases: chronic, acute, cerebrovascular and ill-defined. The improvements of mortality in West Germany (Fig.2) were driven by acute forms of circulatory mortality.

Cancer mortality strongly varies based on tumour localization. The ICD8/ICD9 period has seen increases (lung), declines (stomach) as well as reversals (colon).

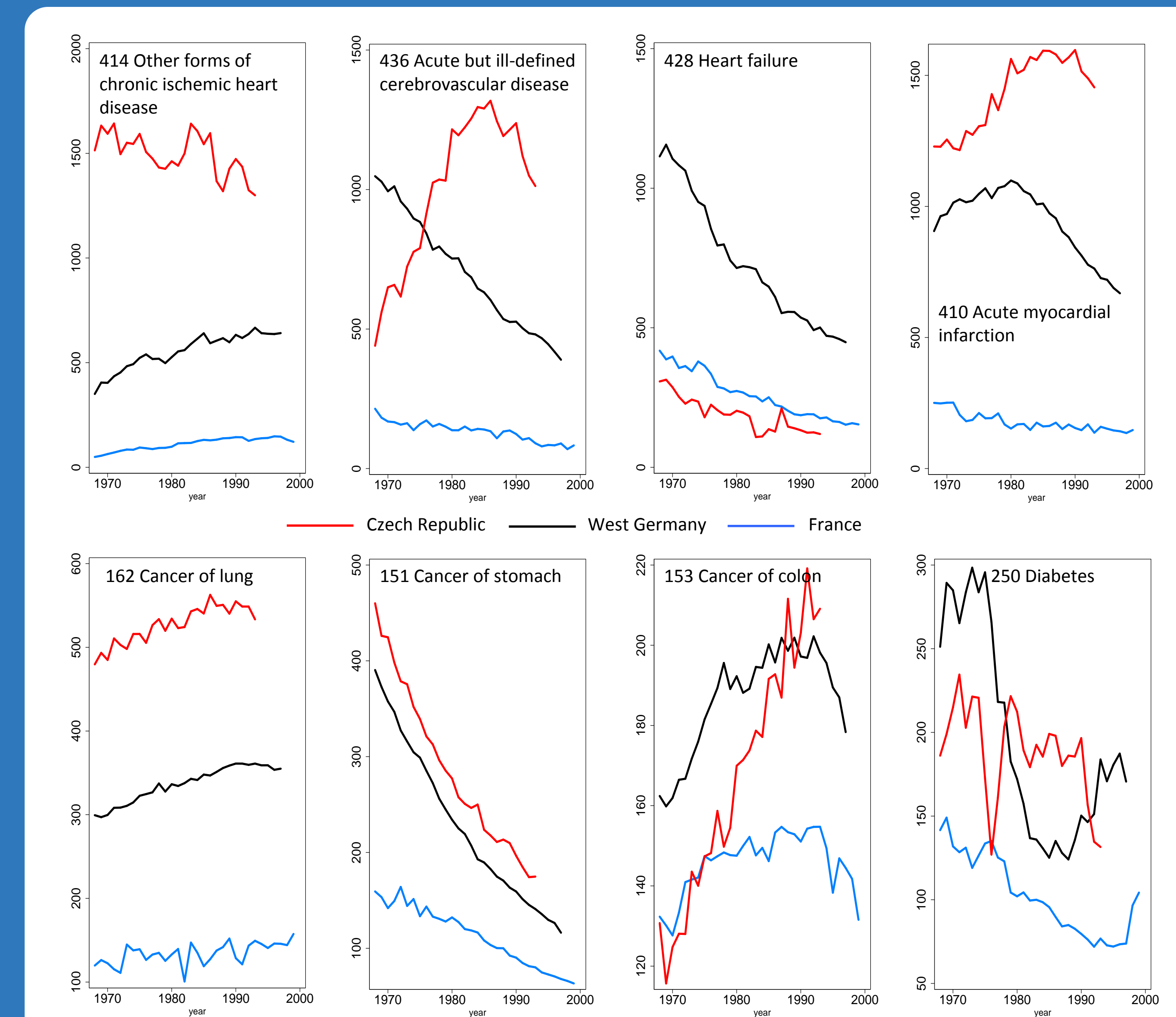Reversing trends were also observed in mortality from diabetes.

Fig. 4 Age standardized death rates* for most frequent causes

5. "PROBLEMATIC" CAUSES OF DEATH

Some causes of death evolve as a result of better medical awareness, as was the case of Alzheimer disease (first graph). The second graph shows a gradual change of preference of one cause over the others, observed only in West Germany.

The remaining graphs point at another problem in COD data, especially present in France — the lack of specificity. To improve the comparability, the poorly defined causes can be proportionally redistributed into other causes of death.
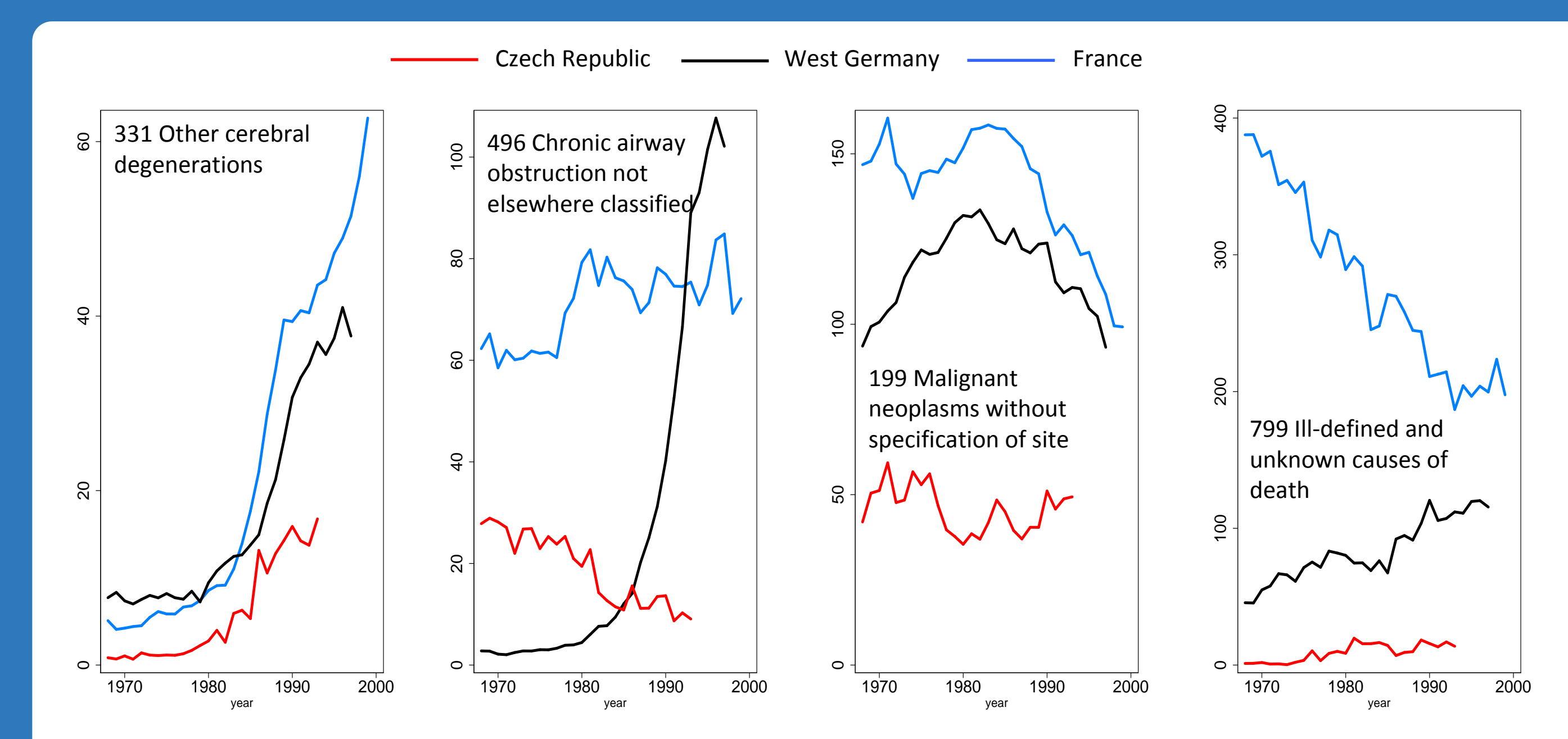

Fig. 5 Age standardized death rates* for problematic causes

FINAL NOTES

Detailed COD data certainly improve understanding of the mortality trends. Their limitations can be overcome by thorough inspection and careful analysis. The reconstructed series (for France and West Germany) are available on-line. To keep the series up to date, transition to ICD10 is planned.